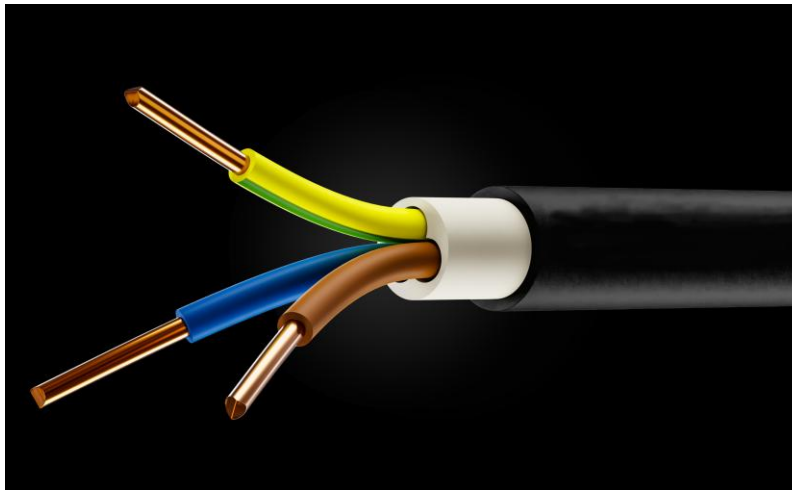
ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

N2XH B2ca and Cca– halogen-free, low smoke, fire resistant power cables with Cu conductors

ELECTROPLAST SA



EPD HUB, HUB-5072

Published on 23.01.2026, last updated on 23.01.2026, valid until 22.01.2031

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.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	ELECTROPLAST SA
Address	Street Subcetate no. 14, Bistrita, county Bistrita-Nasaud, Romania, 420132
Contact details	office@electroplast.ro
Website	www.electroplast.ro

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	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	ENVIROCERT SRL, LCA practititioner: Stefan Cosuta
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Vera Durão, as an authorised verifier acting for EPD Hub Limited

This EPD is intended for business-to-business and/or business-to-consumer communication. 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 construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	N2XH B2ca and Cca– halogen-free, low smoke, fire resistant power cables with Cu conductors
Additional labels	-
Product reference	-
Place(s) of raw material origin	Turkey, Germany, Bulgaria, Austria, Italy
Place of production	ELECTROPLAST SA, str Subcetate nr. 14, Bistrita, jud Bistrita-Nasaud, Romania
Place(s) of installation and use	Romania, UE
Period for data	calendar year 2024
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	-
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	42,8

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 meter of cable N2XH 3x2,5
Declared unit mass	0,166 kg
Mass of packaging	0,0118 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	0,50
GWP-total, A1-A3 ($kgCO_2e$)	0,47
Secondary material, inputs (%)	17,8
Secondary material, outputs (%)	38,1
Total energy use, A1-A3 (kWh)	2,22
Net freshwater use, A1-A3 (m^3)	0,01

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

ELECTROPLAST S.A. is one of the leading electric cables and wires manufacturing companies in Romania. In more than 30 years of experience, Electroplast has continuously improved its products and services.
ELECTROPLAST offers a diverse product range, including copper and aluminum electrical cables, rigid and flexible, unarmed, armored, shielded, shielded-armored.
WE ARE:
-One of the main providers of cables for energy distribution, railways and telecommunications in Romania.
-Certified to produce cables designed for high risk areas (potentially explosive atmospheres - ATEx).
-The Romanian company with the most approved products for railways sector; In Romania we provide more than 60% of energy and signal cables for railways.
Quality is our highest priority – we were the second private company in Romania that got certified to the ISO 9001 by TÜV Bayern Sachsen.
Electroplast SA holds several important certifications related to quality, environmental management, occupational health and safety:
ISO 9001 – Quality Management System, ensuring consistent product quality and customer satisfaction.
ISO 14001 – Environmental Management System, demonstrating commitment to sustainable and environmentally responsible practices.
ISO 45001 – Occupational Health and Safety Management System, ensuring a safe working environment and reducing workplace risks.
The products are tested and verified in our own testing laboratory, accredited by the national accreditation body RENAR Romania, in accordance with ISO 17025.
Electroplast products are certified and approved by certification bodies, recognized at national and international level such as: OICPE, AFER, INSEMEX, CERTIND.

PRODUCT DESCRIPTION

This Environmental Product Declaration covers N2XH low-voltage power cables manufactured by Electroplast SA Romania. These cables are designed for use in fixed electrical installations in residential, commercial, and industrial buildings — including fire-sensitive environments where low smoke emission and halogen-free properties are required for enhanced fire safety.
The representative product for the analysis is the N2XH 3 × 2.5 cable, which represents the largest share of sales volume. Impacts for other products in the same family are presented in Annex 1.

Technical Characteristics		
Technical Characteristic	Value	Standards
Voltage rating (U_0/U)	0.6 / 1 kV	HD 604 S1, IEC 60502-1
Testing voltage	4 kV	HD 604 S1, IEC 60502-1
Minimum laying temp.	-5 °C	HD 604 S1, IEC 60502-1
Maximum working temp.	90 °C	HD 604 S1, IEC 60502-1
Maximum short-circuit temp.	250 °C	HD 604 S1, IEC 60502-1
Minimum bending radius	Single-core: 15 × D Multicore: 12 × D	HD 604 S1, IEC 60502-1
CPR fire performance class	B2ca-s1,d0,a1	EN 50399
Low smoke emission	Yes	EN 61034
Halogen-free	Yes	EN 60754
Fire retardant	Yes	EN 60332-3

Construction and Materials
N2XH cables are manufactured in a controlled factory environment using:
- Copper conductors with high conductivity;
- Cross-linked polyethylene (XLPE) insulation;
- Halogen-free flame-retardant (HFFR/LSZH) outer sheath.

Manufacturing steps include conductor stranding, insulation and sheath extrusion, cooling, printing, and final electrical and mechanical testing under strict quality control.

These cables provide:
- Enhanced fire safety through low smoke emission and halogen-free properties;
- Reliable electrical performance under rated and short-circuit conditions;
- Mechanical flexibility consistent with installation requirements.

Finished cables are delivered on wooden or recyclable drums, ready for on-site installation.

Further information can be found at:
www.electroplast.ro

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	38	Turkey, Germany, Bulgaria
Minerals	0,054	Romania
Fossil materials	62	Austria, Italy, Germany
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	0,008

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 meter of cable N2XH 3x2,5
Mass per declared unit	0,166 kg
Functional unit	-
Reference service life	30

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 covers the life-cycle modules listed in the following table.

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	x	x	ND	ND	ND	ND	ND	ND	ND	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

Not declared = ND.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity mix utilized in the factory.
The life-cycle stage “Manufacturing and Packaging covers modules A1 (raw material supply), A2 (transport to factory) and A3 (manufacturing including assembly, finishing, packaging and handling) in accordance with the requirements of EN 15804:2012+A2.

A1 – Raw material supply
This stage includes the extraction, processing and delivery of the primary materials that form the N2XH cables. For Electroplast SA these include copper conductors, cross-linked polyethylene (XLPE) insulation, halogen-free outer sheath materials, auxiliary components and packaging materials. Supplier-specific data, together with appropriate background data, are used to model these flows. The quantities and environmental burdens of all material inputs are tracked and allocated to the declared unit.

A2 – Transport to factory
This stage covers the transportation of raw materials from the suppliers to the Electroplast SA manufacturing plant. It includes inbound logistics for copper, insulation compounds, sheathing materials, and any other components. Transport distances reflect actual recorded logistics data from suppliers to the Electroplast SA manufacturing plant. Transport emissions calculations are based on these real distances, typical truck types, estimated load factors, and fuel consumption, including assumptions on empty-return trips and regional transport infrastructure.

A3 – Manufacturing, Finishing and Packaging
In this stage the raw materials are transformed into finished N2XH halogen-free cables. Key processes at Electroplast SA include:
- Preparation of conductor materials (e.g., copper wire drawing, bundling) and positioning of fillers/tapes.
- Extrusion of XLPE insulation and application of outer halogen-free sheath

according to the N2XH specification.
- Quality control and electrical testing (e.g., insulation resistance, conductor resistance, fire performance) to comply with applicable standards.
- Handling within the factory, storage of finished cable reels or drums until dispatch.

Production losses (scrap and off-cuts) generated during raw material processing and cable manufacturing are included in the inventory. A percent of 1% was taken ton account in this study, according with the production specfic data.

Packaging and preparation for transport: includes packing of cable drums or reels, protective wrappings, pallets or supports, and loading for delivery. Packaging materials are included and any losses from production (e.g., scrap insulation, off-cuts, packaging waste) are recorded.

Waste materials generated during manufacturing (e.g., insulation off-cuts, metal scrap, packaging waste) are collected and recycled where feasible or sent for disposal in accordance with Electroplast SA's procedures. These wastes are transported to authorized recycling facilities located at an average distance of ~50 km from the manufacturing site. Transport assumptions (distance, vehicle type, load factors) reflect regional average practices. Where feasible, material fractions are recycled (e.g., copper scrap), reducing virgin material demand; residual non-recyclable fractions follow appropriate disposal routes.

Electricity Mix and Modeling Approach:

No supplier-specific contractual instruments (such as Guarantees of Origin or equivalent) were available or demonstrated for the reporting period. Therefore, in line with the requirements of EN 15804:2012+A2:2019 and the ECO-Platform LCA Calculation Rules V2.0, residual electricity mix data representative of the geographic market of consumption is used. For the foreground and background modeling of electricity use, the Romania electricity mix dataset from the Ecoinvent database has been applied. This dataset represents the regional/residual grid electricity mix and is considered appropriate in the absence of supplier-specific contractual instruments. This approach ensures that the electricity input is represented consistently with market-based principles as outlined in the PCR Table 2, avoiding double counting and reflecting the best available data for the relevant market.

System boundary and cut-off criteria

For modules A1–A3, the system boundary includes all processes under Electroplast SA's control up to the factory gate. Cut-off criteria ensure that neglected mass, energy or environmental flows do not exceed 5 % of each inventory module.

Data quality and representativeness

The data used reflect the actual production year(s) of Electroplast SA's manufacturing operations for the N2XH cable series. Foreground data (plant energy consumption, material usage, waste data) are collected from internal monitoring. Background data (e.g., upstream material production, transport emissions) are derived from recognized LCA databases consistent with EN 15804. The representativeness of the data is verified and all assumptions are documented.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

A4 – Transport to Building Site

This stage includes the transportation of the finished N2XH cables from the Electroplast manufacturing facility to the installation site. For Electroplast SA, this involves:
- Loading the finished cable reels or coils onto transport vehicles (e.g., trucks) at the factory gate, properly secured for transport.
- Transport over an average distance of 411 km, based on distribution

records for the reference year 2024. Transport distances and vehicle characteristics are based on internal logistics data.
- Unloading at the site, adjacent to the means of transport; the transport stage ends when the cables are delivered to the site in accordance with the EN 15804 definition.
Any packaging materials (wooden reels, plastic film, or strapping) leaving the factory with the product are included within this stage.

A5 – Installation into the Building / Infrastructure
This stage covers the on-site installation of the N2XH cables. For Electroplast SA, the installation scenario includes:
- On-site handling of the cable reels: cable pulling through conduits, trays, or ducts, and final connection.
- Material loss during installation: a 5 % product loss is assumed based on typical installation scenarios; this loss is included in the inventory and represented as waste generated during installation.

Installation materials and energy consumption:
No other auxiliary installation materials (e.g., supports, conduits, fastening accessories) are included in this study. Such materials were excluded from the system boundary as part of cut-off criteria. Similarly, no specific energy consumption during installation (electricity or fuel) has been considered for this stage.

Waste management for A5 (Installation):
Waste arising during the installation stage mainly consists of packaging materials (wooden reels, plastic film). Packaging waste is managed according to typical regional practices as follows:
- Wood packaging: 32 % is recycled, 30 % is incinerated, and 38 % is landfilled.
- Plastic packaging: 40 % is recycled, 37 % is incinerated, and 23 % is landfilled.

Transport assumptions and distances for A5 waste:
Wastes from A5 are transported to regional waste processing facilities. An average transport distance of ~50 km to recycling or disposal facilities is assumed. Transport emissions and fuel consumption are calculated based on these distances and typical truck profiles.

System boundary and cut-off:
For Modules A4–A5, the system boundary includes all processes from the dispatch of finished N2XH cables at the Electroplast factory until the product is installed and ready for use in the building or infrastructure. Excluded processes (e.g., electrical commissioning, testing un- and/or related to cable installation) are outside the product system. Cut-off criteria ensure that neglected flows (mass, energy, or environmental impact) do not exceed the 5 % threshold of each inventory module, as per EN 15804.

Data Quality and Representativeness:
The data used for Modules A4 and A5 reflect the actual or representative conditions of Electroplast SA's logistics and typical installation scenarios. Foreground data (transport distances, vehicle types, cable handling, waste categories, and installation loss) are based on internal records and validated assumptions. Background data (fuel emission factors, vehicle performance, waste treatment profiles) are sourced from recognized LCA databases compliant with EN 15804 (eg. Ecoinvent).

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

C1 – Deconstruction / Disassembly
At the end of their service life, N2XH halogen-free cables are removed using simple manual or mechanical operations, without significant energy demand. The cables are pulled out from conduits, trays or technical channels using basic tools. Since the materials are halogen-free, no hazardous emissions occur during this stage, and workers are not exposed to corrosive or toxic substances. The environmental impact of Module C1 is minimal and primarily associated with manual handling and minor material losses during removal.

C2 – Transport to Waste Processing Facilities
After disassembly, the cables are transported to authorized waste collection and recycling facilities. Transport typically occurs over medium distances within Romania, assumed at ~50 km, using standard road freight (trucks). Emissions and fuel consumption are calculated based on this distance, typical truck performance and load factors. Due to the high mass-to-volume ratio of power cables, transportation efficiency is relatively high, resulting in a low environmental impact per unit of product.

C3 – Waste Processing / Recovery
At the recycling facility, N2XH cables undergo mechanical sorting and shredding:
- Copper conductors: Separated and sent for melting and recovery into the secondary copper market. In the model, 95 % of copper is assumed to be recycled and enters the secondary material system, while 5 % is landfilled due to technical losses or contamination that inhibits recovery.
- Polymeric fractions (insulation and sheath): Due to current regional infrastructure limitations, these halogen-free plastics are treated as part of the communal waste mixture (100 %) and are not recycled mechanically in the model. They are therefore processed according to typical municipal disposal routes.
- Energy consumption and emissions from sorting, shredding, and melting operations are accounted for using typical industrial waste-processing data consistent with recognized LCA datasets.

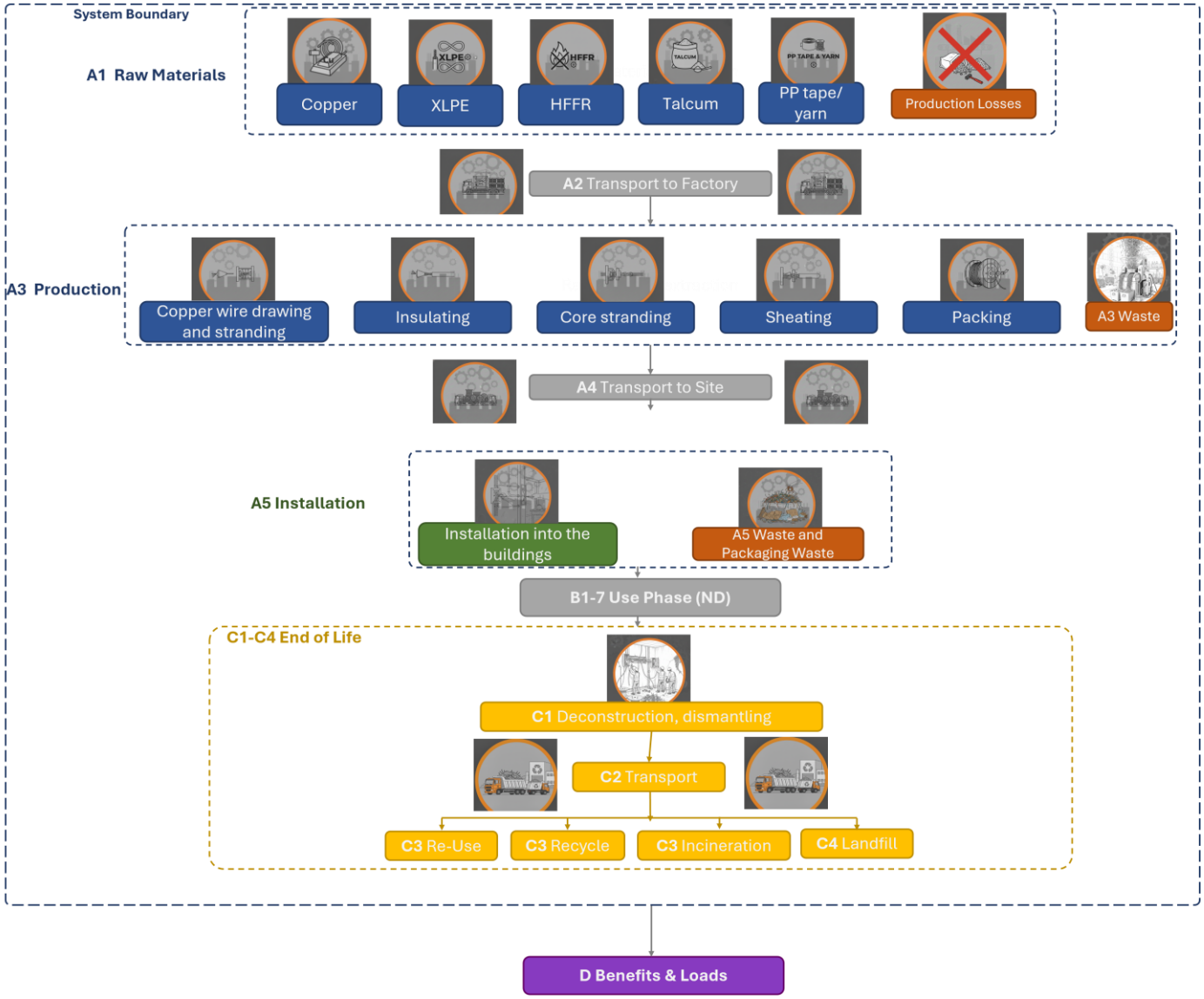
C4 – Final Disposal
Polymer fractions that cannot be materially recycled are disposed of either via incineration with energy recovery (where available) or, in limited cases, through compliant non-hazardous landfill. As N2XH cables contain no halogens, incineration does not generate corrosive gases or halogenated compounds, which reduces environmental and health impacts relative to PVC-based cables.

Module D – Benefits and Loads Beyond the System Boundary
Module D accounts for avoided burdens resulting from the recovery of materials and energy substitution at end of life, in accordance with EN 15804+A2:
- Recycled Copper Benefits: At end of life, 95 % of the copper is recovered and used as secondary copper, thereby substituting the production of an equivalent amount of primary copper (mining, smelting, refining). The resulting avoided impacts are reported as negative flows in Module D.To prevent double counting, Module D includes benefits only for the primary share of copper originally used in the product. Any recycled copper present at the manufacturing stage is excluded, as its environmental benefit has already been accounted for in Module A1. This approach ensures that Module D reflects only the avoided burdens associated with reducing

primary resource extraction and processing.
- Wood Packaging Benefits: Wood packaging materials that are collected and recycled or used for energy recovery also generate avoided burdens in Module D, displacing virgin wood production or fossil fuel consumption where energy recovery occurs.
- Energy from Incineration: When polymeric fractions or wood packaging are incinerated with energy recovery, the energy substituted (typically representing fossil fuel displacement) contributes additional avoided burdens in Module D.

This approach ensures consistency with EN 15804+A2 and guarantees that Module D reports only the net environmental benefits beyond the system boundary, without overlap with impacts already accounted for in Modules A–C

SYSTEM DIAGRAM



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.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

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 1 and 2. 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	Allocated by mass or volume
Packaging material	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

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

This EPD is product and factory specific.

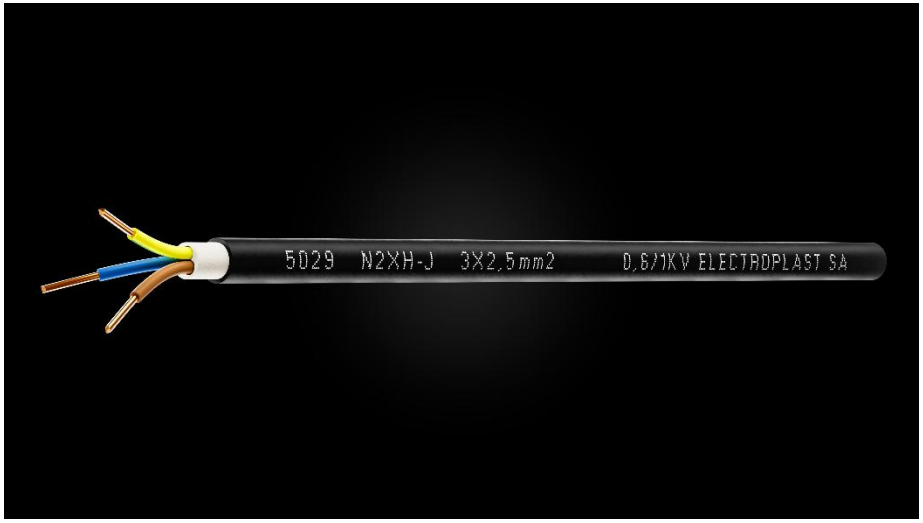
LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.3. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

The life cycle assessment for the N2XH cable series uses a combination of high-quality data sources to ensure representativeness, transparency and compliance with EN 15804:2012+A2 and the applied PCR. These sources include:

- Background LCA Database: The majority of upstream processes (such as raw material extraction, intermediate processing, transport emissions, energy mixes and waste treatment) are modeled using the Ecoinvent database, which provides robust, geographically appropriate, and EN 15804-compatible life cycle inventory datasets.
- Supplier EPDs: Where available, Environmental Product Declarations provided by Electroplast SA's raw material suppliers are used to represent specific material production flows. These supplier EPDs deliver product-specific upstream life cycle data and are integrated into the model for greater accuracy.
- Manufacturer Operational Records: Foreground data for the N2XH production process (e.g., material usage, energy consumption, manufacturing losses, transport distances from suppliers, on-site photovoltaic generation, and waste arisings) are based on internal Electroplast SA production and logistics records for the reference production year(s). These monitored data ensure that the manufacturing and logistics steps reflect actual site performance.
- Statistical Data: Where necessary, official statistics (e.g., Eurostat, national transport and energy statistics) are used to support assumptions for background modelling (such as average fuel consumption rates, vehicle fleet characteristics, and regional energy profiles) when specific measured data are unavailable.

All assumptions and data selections are documented, verified for representativeness, and subjected to internal quality checks. The combined approach ensures that the data used in the LCA reflect actual industrial practice, are consistent with recognized LCA methodology, and support robust and transparent EPD results.



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	4,45E-01	2,60E-02	1,90E-03	4,73E-01	7,87E-03	5,71E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,72E-03	1,71E-03	1,03E-02	-1,91E-01
GWP – fossil	kg CO_2e	4,45E-01	2,60E-02	3,26E-02	5,03E-01	7,86E-03	2,64E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,72E-03	1,72E-03	1,03E-02	-1,87E-01
GWP – biogenic	kg CO_2e	-4,20E-05	5,83E-06	-3,07E-02	-3,08E-02	1,78E-06	3,07E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,76E-07	-5,13E-06	-6,97E-06	-2,90E-03
GWP – LULUC	kg CO_2e	8,39E-04	1,16E-05	3,40E-05	8,84E-04	3,52E-06	4,51E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,63E-07	2,02E-06	8,57E-07	-2,94E-04
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	4,14E-08	3,84E-10	7,99E-10	4,26E-08	1,16E-10	2,14E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,41E-11	1,85E-11	3,26E-11	-1,74E-09
Acidification potential	mol H^+e	2,26E-02	8,86E-05	1,50E-04	2,29E-02	2,68E-05	1,15E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,75E-06	1,84E-05	9,46E-06	-5,55E-03
EP-freshwater[2)]	kg Pe	1,59E-04	2,02E-06	8,59E-06	1,70E-04	6,12E-07	8,64E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,34E-07	9,29E-07	1,39E-07	-4,02E-03
EP-marine	kg Ne	1,18E-03	2,91E-05	2,69E-05	1,23E-03	8,81E-06	6,46E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,86E-06	4,08E-06	2,31E-04	-1,61E-03
EP-terrestrial	mol Ne	1,64E-02	3,17E-04	2,71E-04	1,70E-02	9,58E-05	8,66E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,03E-05	4,60E-05	3,79E-05	-2,37E-02
POCP ("smog")[3)]	kg NMVOCe	4,73E-03	1,31E-04	1,02E-04	4,96E-03	3,95E-05	2,53E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,00E-06	1,36E-05	1,51E-05	-4,58E-03
ADP-minerals & metals[4)]	kg Sbe	5,17E-04	7,25E-08	1,37E-07	5,18E-04	2,19E-08	2,59E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,66E-09	1,01E-07	2,85E-09	-7,40E-05
ADP-fossil resources	MJ	6,14E+00	3,77E-01	7,06E-01	7,22E+00	1,14E-01	3,73E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,42E-02	2,03E-02	2,82E-02	-2,16E+00
Water use[5)]	m^3e depr.	3,27E-01	1,86E-03	2,77E-02	3,57E-01	5,63E-04	1,84E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,12E-04	3,21E-04	1,43E-04	-7,63E-02

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	5,76E-08	2,60E-09	5,67E-10	6,07E-08	7,87E-10	3,12E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,37E-10	2,56E-10	2,04E-10	-4,51E-08
Ionizing radiation[6]	kBq U235e	4,36E-02	3,28E-04	2,16E-02	6,56E-02	9,94E-05	3,30E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,96E-05	7,28E-05	2,99E-05	-1,41E-02
Ecotoxicity (freshwater)	CTUe	1,91E+02	5,33E-02	4,83E-01	1,92E+02	1,61E-02	9,62E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,82E-03	1,18E-02	3,81E-01	-4,81E+01
Human toxicity, cancer	CTUh	4,00E-09	4,29E-12	2,04E-11	4,02E-09	1,30E-12	2,01E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,93E-13	1,37E-12	1,23E-12	-1,04E-10
Human tox. non-cancer	CTUh	2,88E-07	2,44E-10	1,97E-10	2,89E-07	7,39E-11	1,44E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,51E-11	8,78E-11	2,47E-10	-5,94E-09
SQP[7]	-	7,36E+00	3,80E-01	3,10E+00	1,08E+01	1,15E-01	5,53E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,44E-02	3,84E-02	6,48E-02	-4,23E+00

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	1,18E+00	5,17E-03	1,96E-01	1,38E+00	1,56E-03	-1,04E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,32E-04	3,15E-03	4,64E-04	-1,04E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	3,13E-03	3,13E-03	0,00E+00	-3,13E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,90E-02
Total use of renew. PER	MJ	1,18E+00	5,17E-03	1,99E-01	1,39E+00	1,56E-03	-1,07E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,32E-04	3,15E-03	4,64E-04	-1,01E+00
Non-re. PER as energy	MJ	5,58E+00	3,77E-01	6,58E-01	6,61E+00	1,14E-01	3,36E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,42E-02	2,03E-02	-3,97E+00	-2,16E+00
Non-re. PER as material	MJ	6,94E-01	0,00E+00	2,07E-03	6,96E-01	0,00E+00	-2,07E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-2,78E-01	-4,16E-01	2,68E-03
Total use of non-re. PER	MJ	6,27E+00	3,77E-01	6,60E-01	7,31E+00	1,14E-01	3,34E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,42E-02	-2,57E-01	-4,39E+00	-2,16E+00
Secondary materials	kg	2,96E-02	1,61E-04	1,67E-04	2,99E-02	4,86E-05	1,50E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,09E-05	2,35E-05	1,01E-05	2,21E-02
Renew. secondary fuels	MJ	4,96E-04	2,04E-06	1,05E-04	6,03E-04	6,17E-07	3,03E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,38E-07	1,07E-06	1,88E-07	-1,15E-04
Non-ren. secondary fuels	MJ	1,46E-05	0,00E+00	0,00E+00	1,46E-05	0,00E+00	7,32E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	9,43E-03	5,57E-05	6,46E-04	1,01E-02	1,69E-05	4,99E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,20E-06	8,85E-06	-4,06E-04	-3,19E-03

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	8,83E-02	6,39E-04	2,02E-03	9,09E-02	1,93E-04	4,67E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,22E-05	1,58E-04	5,02E-05	-3,96E-02
Non-hazardous waste	kg	6,31E+00	1,18E-02	4,20E-02	6,37E+00	3,58E-03	3,35E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,90E-04	4,45E-03	5,47E-01	4,46E-02
Radioactive waste	kg	1,49E-05	8,04E-08	6,80E-06	2,18E-05	2,43E-08	1,10E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,79E-09	1,79E-08	7,33E-09	-3,46E-06

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	2,25E-09	2,25E-09	0,00E+00	1,13E-10	ND	ND	ND	ND	ND	ND	ND	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	6,34E-04	6,34E-04	0,00E+00	3,85E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	6,32E-02	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	1,96E-08	1,96E-08	0,00E+00	9,81E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	1,17E-05	1,17E-05	0,00E+00	1,92E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,03E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,12E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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	4,45E-01	2,60E-02	3,26E-02	5,04E-01	7,86E-03	2,65E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,72E-03	1,72E-03	1,03E-02	-1,88E-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.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity, medium voltage, supplied by Entrex Services SRL; conventional sources 58.13%, renewable sources 41.87% Electricity CO2e/KWh: 0.28 kgCO2e/kWh Electricity production, photovoltaic, slanted-roof installation, multi-Si, panel Romania, Ecoinvent Electricity CO2e/KWh: 0.077 kgCO2e/kWh Transformation and transmission losses 9% according to national estimations
Heat production, natural gas	natural gas, at boiler atm. low-NOx condensing non-modulating <100kW, Romania, Ecoinvent, 0.0764 kgCO2e/MJ
Diesel	Market for diesel, Romania, Ecoinvent, 0.87 kgCO2e/kg

Transport scenario documentation - A4 (Transport resources)

Scenario parameter	Value
Fuel and vehicle type	EURO5 truck >32 ton (52%), diesel 0.3 litri/km
Average transport distance, km	411 km
Capacity utilization (including empty return) %	90%
Bulk density of transported products (kg/m^3)	2100
Volume capacity utilization factor	<1

Installation scenario documentation - A5 (Installation waste)

Scenario information	Value		
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	Wood packaging		0.01176
	Plastic packaging		0.0000521
Output materials (**specified by type**) as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal (**specified by route**) / kg		Wood packaging	Plastic packaging
	Recycling	0.00376	0.000021
	Energy recovery	0.00358	0.000019
	Disposal	0.00447	0.000012
Direct emissions to ambient air, soil and water / kg	0		

End of Life – Scenario documentation – C1-C4

Scenario information	Value
Collection process – kg collected separately	0.063175
Collection process – kg collected with mixed waste	0
Recovery process – kg for re-use	0
Recovery process – kg for recycling	0
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	0.110
Scenario assumptions e.g. transportation	Transportation to waste processing assumes an average distance of 50 km by >32 t lorry (Euro 5)

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 and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+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

Vera Durão, as an authorised verifier acting for EPD Hub Limited

23.01.2026

ANNEX 1 – SCALLING FACTORS

Name	Mass (kg/ml)	GWP - Fossil - A1-A3 (kgCO2e/ml of cable)	GWP - Total - A1-A3 (kgCO2e/m of cable)	Scaling factor
N2XH-J 2x1,5 RU B2ca	0.1151	0.30	0.28	0.60
N2XH-J 3X1,5 RU B2ca	0.1274	0.33	0.31	0.69
N2XH-J 2x2,5 RU B2ca	0.1473	0.44	0.41	0.87
N2XH-J 4x1,5 RU B2ca	0.1575	0.48	0.45	0.97
N2XH-J 3x2,5 RU B2ca	**0.1659**	**0.50**	**0.47**	**1.00**
N2XH-J 5x1,5 RU B2ca	0.1827	0.60	0.56	1.20
N2XH-O/ -J 1x16 RU B2ca	0.1881	0.62	0.59	1.25
N2XH-J 4x2,5 RU B2ca	0.2075	0.71	0.67	1.43
N2XH-O/-J 3x4 RU B2ca	0.2204	0.77	0.73	1.55
N2XH-J 7x1,5 RU B2ca	0.2237	0.79	0.74	1.58
N2XH-J 5x2,5 RU B2ca	0.2382	0.86	0.80	1.71
N2XH-J 4x4 RU B2ca	0.2779	1.04	0.98	2.08
N2XH-O/ -J 1x25 RM B2ca	0.2817	1.06	0.99	2.11
N2XH-J 3x6 RU B2ca	0.2931	1.11	1.04	2.22
N2XH-J 7x2,5 RU B2ca	0.3036	1.16	1.09	2.32
N2XH-J 5x4 RU B2ca	0.3247	1.26	1.18	2.51
N2XH-J 4x6 RU B2ca	0.3728	1.48	1.39	2.96
N2XH-O/ -J 1x35 RM B2ca	0.3728	1.48	1.39	2.96
N2XH-J 7x4 RU B2ca	0.4167	1.68	1.58	3.36
N2XH-J 3x10 RU B2ca	0.4331	1.76	1.65	3.51
N2XH-J 5x6 RU B2ca	0.4384	1.78	1.67	3.56

Name	Mass (kg/ml)	GWP - Fossil - A1-A3 (kgCO2e/ml of cable)	GWP - Total - A1-A3 (kgCO2e/m of cable)	Scaling factor
N2XH-J 9x2,5 RU B2ca	0.4406	1.79	1.68	3.58
N2XH-O/ -J 1x50 RM B2ca	0.5045	2.09	1.96	4.17
N2XH-J 3x16 RU B2ca	0.6321	2.68	2.52	5.35
N2XH-J 5x10 RU B2ca	0.6675	2.84	2.67	5.68
N2XH-J 1x70 RM B2ca	0.6889	2.94	2.76	5.88
N2XH-J 4x16 RU B2ca	0.8178	3.54	3.32	7.07
N2XH-O/ -J 1x95 RM B2ca	0.9484	4.14	3.89	8.28
N2XH-J 3x25 RM B2ca	0.9702	4.24	3.99	8.48
N2XH-J 5x16 RU B2ca	0.9745	4.26	4.00	8.52
N2XH-J 3x25 RM +16 RU Cca	1.1555	5.10	4.79	10.19
N2XH-O/ -J 1x120 RM B2ca	1.1688	5.16	4.85	10.32
N2XH-O 1x150 RM B2ca	1.4228	6.33	5.95	12.67
N2XH-J 3x35 RM +16 RU Cca	1.4575	6.49	6.10	12.99
N2XH-J 4x25 RM+16 RU B2ca	1.4766	6.58	6.19	13.16
N2XH-J 5x25 RM B2ca	1.5159	6.76	6.36	13.53
N2XH-J 3x50 SM B2ca	1.5347	6.85	6.44	13.70
N2XH-J 3x50 SM+25 RM Cca	1.7375	7.79	7.32	15.58
N2XH-O/ -J 1x185 RM B2ca	1.7746	7.96	7.71	15.92
N2XH-J 4x35 RM+16 RU B2ca	1.9446	8.75	8.22	17.49
N2XH-J 5x35 RM B2ca	2.0384	9.18	8.63	18.36
N2XH-O 1x240 RM B2ca	2.3105	10.50	10.17	22.33
N2XH-J 3x70 SM+35 RM Cca	2.4682	11.17	10.50	22.33
N2XH-J 4x50 RM+25 RM B2ca	2.6198	11.87	11.15	23.73

Name	Mass (kg/ml)	GWP - Fossil - A1-A3 (kgCO2e/ml of cable)	GWP - Total - A1-A3 (kgCO2e/m of cable)	Scaling factor
N2XH-J 5x50 RM B2ca	2.7630	12.53	11.78	25.06
N2XH-O 1x300 RM B2ca	2.9095	13.21	12.41	26.41
N2XH-J 3x95+50 SM B2ca	3.3599	15.29	14.37	30.58
N2XH-J 5x70 RM B2ca	3.7994	17.32	16.28	34.64
N2XH-J 3X120+70 SM B2ca	4.2425	19.37	18.21	38.74
N2XH-J 4x95 RM+50 RM B2ca	4.9291	22.54	21.19	45.08
N2XH-J 3x150+70 SM B2ca	5.0897	23.28	21.89	46.57
N2XH-J 5x95 RM B2ca	5.2072	23.83	22.40	47.66
N2XH-J 4x120 RM+70 RM B2ca	6.1105	28.00	26.32	56.01
N2XH-J 3x185+95 SM B2ca	6.3605	29.16	27.41	58.32
N2XH-J 5x120 RM B2ca	6.4293	29.48	27.71	58.96
N2XH-J 4x150 RM+70 RM B2ca	7.4354	34.13	32.08	68.26
N2XH-J 5x150 RM B2ca	7.8639	36.11	33.94	72.22
N2XH-J 3x240+120 SM B2ca	8.2935	38.10	35.81	76.19
N2XH-J 4x185 RM+95 RM B2ca	9.3241	42.86	40.29	85.72
N2XH-J 4x240 SM B2ca	9.4117	43.27	40.67	86.53