# Environmental Product Declaration

of multiple products, based on a representative product, in accordance with ISO 14025 and EN 15804:2012+A2:2019/AC:2021 for:

## IFSI / AXCMK / AXQJ – Power cable 0.6/1 kV with Al and Cu conductors, XLPE insulated and HFFR sheathed from

## TT kabeli d.o.o.

| | |
|---|---|
| Programme: | The International EPD® System, www.environdec.com |
| Programme operator: | EPD International AB |
| EPD registration number: | EPD-IES-0020255 |
| Publication date: | 2025-04-24 |
| Valid until: | 2030-04-24 |

*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com*

*v 1.0*

# General information

## Programme information

| | |
|---|---|
| **Programme:** | The International EPD® System |
| **Address:** | EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden |
| **Website:** | www.environdec.com |
| **E-mail:** | info@environdec.com |

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|---|
| CEN standard EN 15804 serves as the Core Product Category Rules (PCR) |
| Product category rules (PCR): PCR 2019:14 CONSTRUCTION PRODUCTS, *version 1.3.4,*<br>*PCR 2019:14-c-PCR-019 Electrical cables and wires (for construction sector) (c-PCR to PCR 2019:14) (Adopted from EPD Norway)*<br>*UN CPC code 46 - Electrical machinery and apparatus, 4634 - Other electric conductors, for a voltage not exceeding 1000 V* |
| PCR review was conducted by: The Technical Committee of the International EPD® System. Chair: Claudia Peña. Contact via info@environdec.com |
| Life Cycle Assessment (LCA)<br><br>LCA practitioner: Davor Ljubas and Željko Jurić, NET ZERO d.o.o., Zagreb, Croatia |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006:<br><br>☐ EPD process certification ☒ EPD verification |
| Third party verifier:<br>- *Jaka Jelenc, EPD Lead verifier*<br><br>*In case of accredited certification bodies:*<br>Accredited by: *Bureau Veritas Certification Sverige AB accredited by SWEDAC with accreditation number 1236.*<br><br>*In case of recognised individual verifiers:*<br>Approved by: The International EPD® System |
| Procedure for follow-up of data during EPD validity involves third party verifier:<br><br>☐ Yes ☒ No |

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

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

equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

## Company information

Owner of the EPD: TT kabeli d.o.o., Knešpolje bb, 88220, Široki Brijeg, Bosnia and Herzegovina
Contact: Eugen Šušak, deputy general director
Description of the organisation: The main subject of business of the company TT kabeli d.o.o. is the production of a wide spectra of cables. TT kabeli d.o.o. is the leading manufacturer of cables for different purposes in the region.

The company TT kabeli d.o.o. was founded in 2007. The company headquarters is located in Široki Brijeg, Knešpolje bb, Bosnia and Herzegovina, as well as the cable production facility. With its quality and partnership-oriented relations, TT kabeli d.o.o. was quickly becoming the leading brand in the production of cable products in the region.

Product-related or management system-related certifications: ISO 9001, ISO 14001, ISO 45001, ISO 50001
Name and location of production site(s): Knešpolje bb, 88220, Široki Brijeg, Bosnia and Herzegovina

More information: About products – https://www.ttcables.com/
LCA practitioner: Davor Ljubas and Željko Jurić
Contact information of the organisation carrying out the underlying LCA study: NET ZERO d.o.o., Mirka Račkog 6, 10290 Zaprešić, CROATIA
Additional information: Acknowledging the growing body of evidence of environmental pollution and the major impact on Earth's climate change, TT kabeli d.o.o. has begun the process of establishing its environmental impacts related to the production of cables. As a suitable first step in determining the impact on the environment, the creation of a Life Cycle Assessment (LCA) Study was initiated in 2023.

LCA is a standardized methodology for assessing the potential environmental impacts of products, services and organizations using a life cycle perspective. This LCA study was conducted in accordance with the standards and guidelines [1-5].

## Product information

Product name: group of cables IFSI / AXCMK / AXQJ
Product identification: are power cables 0,6/1 kV with *Al conductors*, XLPE insulated and HFFR sheathed, with concentric conductor of *Cu wires* with counter helix of *Cu tape*..
Product description: The main application of cables: for fixed installation in dry and damp environment, on or under plaster, on cable trays, same as in walls and concrete. May be buried directly in soil. For outdoor application can be laid in tubes, but in that case should be taken all precautionary measures necessary to prevent water penetration into the tubes. Concentric conductor serves as electromagnetic screen, which could also be applied as neutral conductor. Environment working temperature of these cables: -15 °C to +90 °C.

Group of cables IFSI / AXCMK / AXQJ Eca produced in 2023:

- IFSI EMC 3x50
- IFSI EMC 3x95
- IFSI EMC 4x150
- IFSI EMC 4x240
- IFSI EMC 4x50

- IFSI EMC 4x95
- IFSI EMC 2x10
- IFSI EMC 2x16
- IFSI EMC 2x6
- IFSI EMC 3x10
- IFSI EMC 3x16
- IFSI EMC 3x25
- IFSI EMC 3x6
- IFSI EMC 4x10
- IFSI EMC 4x6
- AXCMK 4x120
- AXCMK 4x150
- AXCMK 4x185
- AXCMK 4x240
- AXCMK 4x25
- AXCMK 4x300
- AXCMK 4x35
- AXCMK 4x50
- AXCMK 4x70
- AXCMK 4x95
- AXQJ 4x150
- AXQJ 4x185
- AXQJ 4x240
- AXQJ 4x50
- AXQJ 4x70
- AXQJ 4x95.

As the representative cable for the whole group, the cable AXCMK 4x185 was chosen according to the suggestions in [6,7] by the ***highest share*** in the production quantities by mass within the cables in the group in 2023.

The EPD does not claim compliance with ISO 21930, therefore variations above 10% are allowed. Applying a representative product ensures fair market representation and supports practical decision-making without skewing results toward extreme cases.

UN CPC code: 46, 4634

Products are produced in one site: Knešpolje bb, 88220, Široki Brijeg, Bosnia and Herzegovina

Electricity use in the production process was modelled by the data from the Ecoinvent database under Electricity, medium voltage, residual mix BA (based on statistics from AIB-2023).

| **Electricity, Bosnia and Herzegovina** | |
|---|---|
| **Renewable** | **34.04%** |
| unspecified | 0.01% |
| biomass | 0.00% |
| solar | 0.56% |
| geothermal | 0.00% |

| | |
|---|---|
| wind | 2.68% |
| hydro | 30.79% |
| **Nuclear** | **0%** |
| **Fossil** | **65.96%** |
| unspecified | 0.00% |
| hard coal | 65.96% |
| lignite | 0.00% |
| oil | 0.00% |
| gas | 0.00% |
| **$CO_2$ ($gCO_2$/kWh)** | **843.93** |

## LCA information

Declared unit: 1 m of power cable
Reference service life: min. 30 years
Time representativeness: reference year 2023
Database(s) and LCA software used: The assessment of the possible environmental impacts of the TT kabeli d.o.o.'s products was carried out with the support of the software **OpenLCA version 2.3** & **Ecoinvent** database **version v3.10**, using the EN 15804 + A2 Method **EF 3.1** and Cumulative Energy Demand (**CED**) for impact assessment.

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

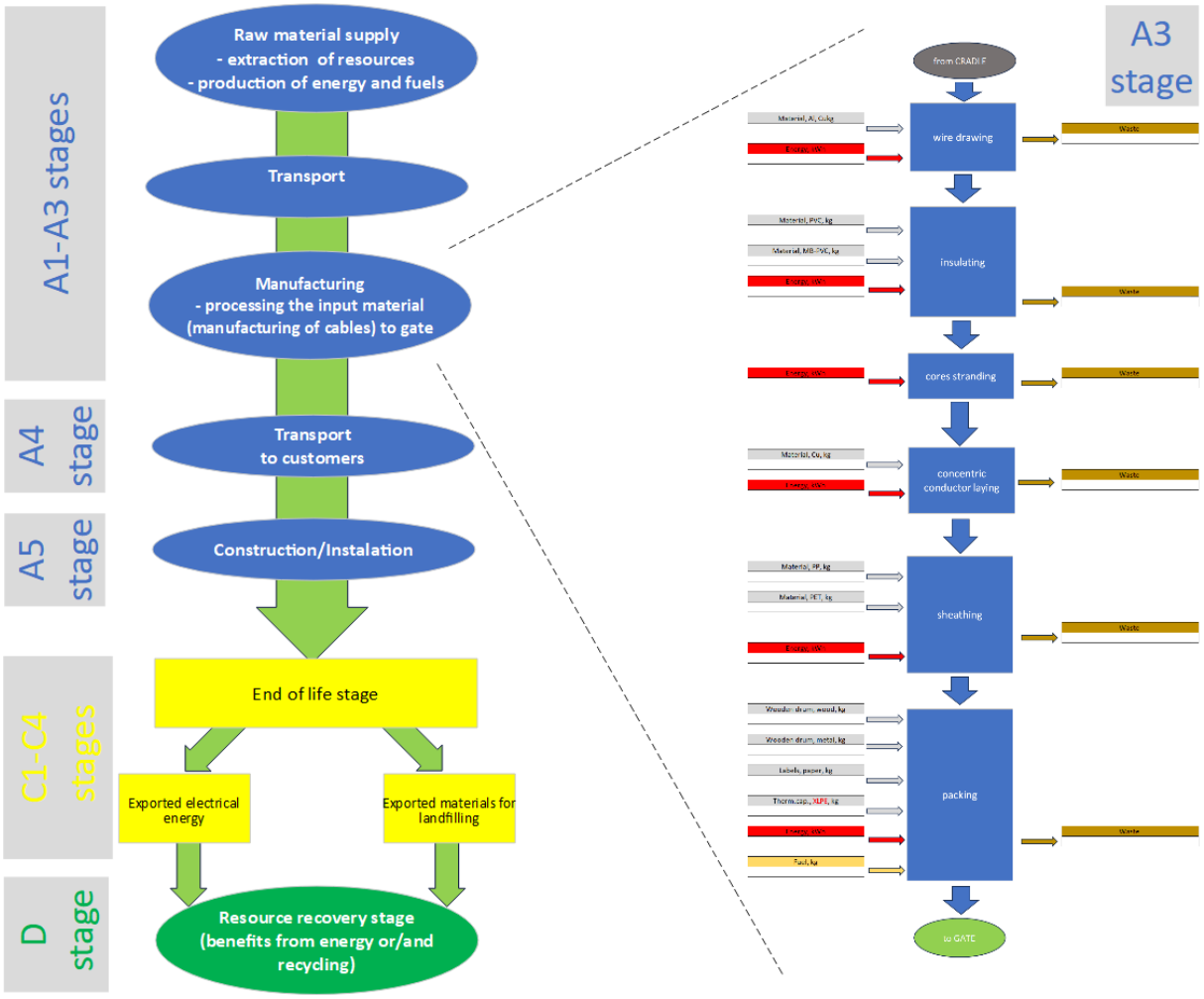
Transport of raw materials for production purposes is mostly brought by road vehicles (trucks) and to a lesser extent as water traffic.

The following steps are not included in the study:

- maintenance and operation of support equipment;
- transport to warehouse and to final customer;
- product use.

It is assumed that by end-of-life stage (C1-C4) 60% of polymer material will be incinerated for electric energy and aluminium & copper wires will be recycled with the rate of 90%. In C1 stage manual disassembly without operations relevant to LCA is assumed. Transport distance to the incineration plant was assumed to be 100 km. In C4 stage 40% of polymer material goes to landfilling. Wooden drums and pallets after installation (A5) will be incinerated for electric energy.
Module D comprises energetic recovery potentials resulting from end-of-life recycling.

Description of the system boundaries: *Cradle to gate (A1–A3) with modules End of life (C1-C4), module D and optional modules A4-A5.*




System diagram: (left – system boundaries, right – insight into the production process, i.e. “gate to gate”, A3 stage

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation: (***X*** – included, ***ND*** – Not declared)

| | Product stage | | | Construction process stage | | Use stage | | | | | | | End of life stage | | | | Resource recovery stage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Raw material supply | Transport | Manufacturing | Transport | Construction installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| **Module** | **A1** | **A2** | **A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| Modules declared | ***X*** | ***X*** | ***X*** | ***X*** | ***X*** | ***ND*** | ***ND*** | ***ND*** | ***ND*** | ***ND*** | ***ND*** | ***ND*** | ***X*** | ***X*** | ***X*** | ***X*** | ***X*** |
| Geography | GLO | EU | BA | EU | EU | | | | | | | | EU | EU | EU | EU | EU |
| Specific data used | <20% | | | | | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – products | >10% | | | | | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – sites | Not relevant | | | | | - | - | - | - | - | - | - | - | - | - | - | - |

Even though the environmental impacts are divided in LCA stages, we are discouraging the use of the results of modules A1-A3 (A1-A5 for services) without considering the results of module C.

The EPD framework includes a 3-step allocation procedure, but system expansion according to the ISO14044 is not allowed in the EPD due to the nature of the framework being strictly attributional, not consequential.
The 3-step allocation procedure:

- When possible, allocation shall be avoided through sub-dividing the processes, so that the input and output data related to the sub-processes can be obtained.
- When allocation cannot be avoided, a partitioning of input and output to different products or services shall be done based on their underlying physical relationship.
- If allocation based on a physical relationship cannot be applied, partitioning based on another relationship is also possible. A sensitivity analysis needs to be performed when economic value is used as a basis for allocation.

For this study, there are no major co-products during the cable manufacturing process with separate energy and materials flows.
Energy allocation for the production machines in the factory is based on measuring the amount of energy used by electrical equipment during the machine's normal operation.

By-products of waste treatment processes are cut-off, as are all by-products classified as recyclable.

The general rules for cut-off of inputs and outputs follow the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and

1 % of energy usage and mass for unit processes. The pigments and catalysts for the isolation materials of the cables (share less than 1%) as well as infrastructure and capital goods - facility buildings (including warehaus) and offices, machinery and equipment in facility, software and tools are excluded from the calculation process.

## Content information

*Table 1. Basic information about product components and packaging materials per functional unit*

| Product components | Weight, kg/m | Post-consumer material, weight-% | Biogenic material, weight-% |
|---|---|---|---|
| | AXCMK 4x185 | | |
| Material, Al, kg | 1.89E+00 | 0% | 0% |
| Material, Cu, kg | 4.85E-01 | 0% | 0% |
| Material, XLPE, kg | 3.40E-01 | 0% | 0% |
| Material, MB-XLPE+cat. (all), kg | 2.17E-02 | 0% | 0% |
| Material, HFFR, kg | 6.36E-01 | 0% | 0% |
| Material, PP tape, kg | 1.01E-02 | 0% | 0% |
| Material, PET tape, kg | 1.41E-02 | 0% | 0% |
| Material, Cu tape, kg | 9.69E-03 | 0% | 0% |
| Material MB-EVA, kg | 1.90E-01 | 0% | 0% |
| TOTAL | 3.41E+00 | 0% | 0% |
| **Packaging materials** | **Weight, kg/m** | **Weight-% (versus the product)** | |
| | **AXCMK 4x185** | | |
| Wooden drum, wood, kg | 7.89E-01 | 23.13% | |
| Wooden drum, metal, kg | 8.03E-02 | 2.35% | |
| Labels, paper, kg | 2.00E-05 | 0.00% | |
| Thermal cap., PP, kg | 2.00E-04 | 0.01% | |
| TOTAL | 8.70E-01 | 25.49% | |

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The product does not contain any REACH SVHC substances.

# Environmental Information

## Potential environmental impact – mandatory indicators according to EN 15804

*Table 2. Potential environmental impact aggregated for A1-A3, C1-C4 and D modules per functional unit*

| Indicator | Unit | Total A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| **AXCMK 4x185** | | | | | | | | | |
| GWP-fossil | kg $CO_2$ eq. | 2.24E+01 | 1.96E+00 | 1.60E+00 | 0.00E+00 | 6.48E-02 | 7.23E-01 | 2.60E-02 | -1.70E+01 |
| GWP-biogenic | kg $CO_2$ eq. | -1.30E+00 | 0.00E+00 | 1.30E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| GWP-luluc | kg $CO_2$ eq. | 2.33E+01 | 1.96E+00 | 2.97E-01 | 0.00E+00 | 6.48E-02 | 7.23E-01 | 2.60E-02 | -1.66E+01 |
| GWP-total | kg $CO_2$ eq. | 3.56E-01 | 6.19E-04 | 1.36E-03 | 0.00E+00 | 2.15E-05 | 1.34E-04 | 2.66E-05 | -3.16E-01 |
| ODP | kg CFC 11 eq. | 1.52E-06 | 3.92E-08 | 2.91E-09 | 0.00E+00 | 1.29E-09 | 1.53E-09 | 4.91E-10 | -2.34E-07 |
| AP | mol $H^+$ eq. | 1.49E-01 | 3.86E-03 | 1.67E-03 | 0.00E+00 | 1.35E-04 | 5.07E-04 | 1.47E-04 | -2.29E-01 |
| EP-freshwater | kg P eq | 1.01E-02 | 1.29E-04 | 1.61E-04 | 0.00E+00 | 4.39E-06 | 1.08E-05 | 3.70E-06 | -1.75E-02 |
| EP-marine | kg N eq. | 2.12E-02 | 9.09E-04 | 7.03E-04 | 0.00E+00 | 3.24E-05 | 2.14E-04 | 6.15E-05 | -2.02E-02 |
| EP-terrestrial | mol N eq. | 2.10E-01 | 9.81E-03 | 5.24E-03 | 0.00E+00 | 3.50E-04 | 2.09E-03 | 5.73E-04 | -2.20E-01 |
| POCP | kg NMVOC eq. | 8.80E-02 | 6.51E-03 | 2.13E-03 | 0.00E+00 | 2.24E-04 | 6.51E-04 | 1.85E-04 | -7.87E-02 |
| ADP-minerals&metals* | kg Sb eq. | 2.16E-04 | 6.45E-06 | 8.45E-07 | 0.00E+00 | 2.16E-07 | 2.43E-07 | 7.18E-08 | -1.75E-03 |
| ADP-fossil* | MJ | 3.62E+02 | 2.74E+01 | 3.90E+00 | 0.00E+00 | 9.12E-01 | 1.32E+00 | 4.32E-01 | -2.31E+02 |
| WDP* | $m^3$ | 2.67E+01 | 1.32E-01 | 2.14E-01 | 0.00E+00 | 4.46E-03 | 3.52E-02 | 8.47E-03 | -2.35E+01 |
| Acronyms | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator (according to [3], Table 5).*

## Potential environmental impact – additional mandatory and voluntary indicators

*Table 3. Additional mandatory and voluntary indicators per functional unit*

| Indicator | Unit | Tot. A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| **AXCMK 4x185** | | | | | | | | | |
| GWP-GHG[1] | kg $CO_2$ eq. | 2.37E+01 | 1.96E+00 | 3.28E-01 | 0.00E+00 | 6.49E-02 | 7.23E-01 | 2.61E-02 | -1.70E+01 |
| *Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017 -N.D.* | | | | | | | | | |

## Use of resources

*Table 4. Energy indicators per functional unit*

| Indicator | Unit | Tot. A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| **AXCMK 4x185** | | | | | | | | | |
| PERE | MJ | 1.03E+02 | 4.90E-01 | 2.38E+01 | 0.00E+00 | 1.45E-02 | 2.93E-02 | 1.07E-02 | -9.54E+01 |
| PERM | MJ | 1.34E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -3.58E+00 |
| PERT | MJ | 1.03E+02 | 4.90E-01 | 3.72E+01 | 0.00E+00 | 1.45E-02 | 2.93E-02 | 1.07E-02 | -9.90E+01 |
| PENRE | MJ | 3.56E+02 | 2.70E+01 | 3.83E+00 | 0.00E+00 | 8.97E-01 | 1.31E+00 | 4.27E-01 | -9.51E+01 |
| PENRM | MJ. | 1.02E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.08E+02 | 0.00E+00 | -6.95E+01 |
| PENRT | MJ | 4.59E+02 | 2.70E+01 | 3.83E+00 | 0.00E+00 | 8.97E-01 | 1.10E+02 | 4.27E-01 | -1.65E+02 |
| SM | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NRSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW | $m^3$ | 1.97E+02 | 5.02E-01 | 5.21E-01 | 0.00E+00 | 1.51E-02 | 2.99E-02 | 1.10E-02 | -1.87E+02 |

[1] The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

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

## Waste production and output flows

### Waste production

*Table 5. Waste production per functional unit*

| Results per functional unit for AXCMK 4x185 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **Tot. A1-A3** | **A4** | **A5** | **C1** | **C2** | **C3** | **C4** | **D** |
| Hazardous waste disposed | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 8.11E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.55E-01 | -7.36E-01 |
| Radioactive waste disposed | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

### Output flows

*Table 6. Output flows per functional unit*

| Results per functional unit | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **Tot. A1-A3** | **A4** | **A5** | **C1** | **C2** | **C3** | **C4** | **D** |
| **AXCMK 4x185** | | | | | | | | | |
| Components for re-use | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Material for recycling | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Materials for energy recovery | kg | 0.00E+00 | 0.00E+00 | 7.89E-01 | 0.00E+00 | 0.00E+00 | 6.25E-01 | 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 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Exported energy, thermal | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

### Information on biogenic carbon content

*Table 7. Biogenic carbon content in product and in packaging per functional unit*

| Results per functional unit | | |
|---|---|---|
| **BIOGENIC CARBON CONTENT** | **Unit** | **QUANTITY** |
| **AXCMK 4x185** | | |
| Biogenic carbon content in product | kg C | 0.0 |
| Biogenic carbon content in packaging | kg C | 3.55E-01 |

*Note: 1 kg biogenic carbon is equivalent to 44/12 kg $CO_2$.*

## Additional information

### Variation of core environmental performance indicators

In accordance with the regulations, the variation between the highest and lowest environmental impact indicator results (both mandatory and additional) for modules A to C is declared. The thickest cable within the product group is assumed to have the highest environmental impact results and the thinnest cable is assumed to have the lowest environmental impact results. The variation between products is mainly subjected to material weight (according to the 'Contribution Tree' analysis in the openLCA software, material-related components (wire and insulation) account for an average of 90% of the total environmental impact for all cables in the group). Consequently, the estimated impact parameters are higher than the values based solely with mass — due to an additional influence representing approximately 10% in the total contribution. Based on this, it is possible to identify any cable which exhibits a variation in impact assessment results exceeding 10% from those of the representative product.

| Variation of results | | | |
|---|---|---|---|
| **Cable** | **Mass o f cable per 1 m (wire + isolation), kg** | **Mass deviation from the representative cable** | **Estimated deviation from impact assessment parameters** |
| IFSI EMC 3x50* | 1.991 | -43.63% | -39.27% |
| IFSI EMC 3x95 | 3.698 | 4.70% | 4.23% |
| IFSI EMC 4x150* | 7.171 | 103.03% | 92.73% |
| IFSI EMC 4x240* | 11.473 | 224.83% | 202.35% |
| IFSI EMC 4x50* | 2.52 | -28.65% | -25.79% |
| IFSI EMC 4x95* | 4.686 | 32.67% | 29.41% |
| IFSI EMC 2x10* | 0.435 | -87.68% | -78.92% |
| IFSI EMC 2x16* | 0.629 | -82.19% | -73.97% |

| | | | |
|---|---|---|---|
| IFSI EMC 2x6* | 0.279 | -92.10% | -82.89% |
| IFSI EMC 3x10* | 0.546 | -84.54% | -76.09% |
| IFSI EMC 3x16* | 0.801 | -77.32% | -69.59% |
| IFSI EMC 3x25* | 1.108 | -68.63% | -61.77% |
| IFSI EMC 3x6* | 0.349 | -90.12% | -81.11% |
| IFSI EMC 4x10* | 0.662 | -81.26% | -73.13% |
| IFSI EMC 4x6* | 0.422 | -88.05% | -79.25% |
| AXCMK 4x120* | 2.383 | -32.53% | -29.28% |
| AXCMK 4x150* | 2.838 | -19.65% | -17.68% |
| AXCMK 4x185-*representative cable* | 3.532 | 0.00% | 0.00% |
| AXCMK 4x240* | 4.697 | 32.98% | 29.69% |
| AXCMK 4x25* | 0.723 | -79.53% | -71.58% |
| AXCMK 4x300* | 5.518 | 56.23% | 50.61% |
| AXCMK 4x35* | 0.86 | -75.65% | -68.09% |
| AXCMK 4x50* | 1.092 | -69.08% | -62.17% |
| AXCMK 4x70* | 1.445 | -59.09% | -53.18% |
| AXCMK 4x95* | 1.989 | -43.69% | -39.32% |
| AXQJ 4x150* | 2.838 | -19.65% | -17.68% |
| AXQJ 4x185 | 3.532 | 0.00% | 0.00% |
| AXQJ 4x240* | 4.697 | 32.98% | 29.69% |
| AXQJ 4x50* | 1.092 | -69.08% | -62.17% |
| AXQJ 4x70* | 1.445 | -59.09% | -53.18% |
| AXQJ 4x95* | 1.989 | -43.69% | -39.32% |

***-cable with variation of impact assessment parameters more than 10% form the representative cable.**

## Information related to Sector EPD

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## Differences versus previous versions

*This version v.1.0 is the first version of EPD calculation for this group of the products for TT kabeli d.o.o. company.*

# References

[1] HRN EN ISO 14040:2008 - *Upravljanje okolišem – Procjena životnog ciklusa (LCA) – Načela i okvir rada* (ISO 14040:2006; EN ISO 14040:2006), Hrvatski zavod za norme, Zagreb, 2018.

[2] HRN EN ISO 14044:2008 - *Upravljanje okolišem – Procjena životnog ciklusa (LCA) – Zahtjevi i smjernice* (ISO 14044:2006; EN ISO 14044:2006), Hrvatski zavod za norme, Zagreb, 2020.

[3] HRN EN 15804:2019 - *Održivost građevina – Izjava zaštite okoliša – Osnovna pravila za kategorizaciju građevnih proizvoda* (EN 15804:2012+A2:2019 + EN 15804:2012 + A2:2019/AC:2021), Hrvatski zavod za norme, Zagreb, 2021.

[4] Product Category Rules (PCR) – CONSTRUCTION PRODUCTS, PCR 2019:14, v.1.3.4, EPD International AB, 2022.

[5] Product Category Rules PCR 2019:14-c-PCR-019 Electrical cables and wires (for construction sector) (c-PCR to PCR 2019:14) (Adopted from EPD Norway)

[6] Ljubas, D., Jurić, Ž., LCA study for A:MMJ/PFXP/EKK, B:EXQ light/IFXI/MMJ-HF/HMH/HMH Eca/NHXMH Dca, C:PFSP AL/AMCMK Eca, D:IFSI/AXCMK/AXQJ and E:PFSP Cu/MCMK product groups of the company TT Kabeli d.o.o., NET ZERO d.o.o., Zaprešić, V1.0, February 2025.

[7] EPD International AB, *General programme instructions for the international EPD system* **v. 4.0**., 2021-03-29

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