

# Environmental Product Declaration

 **EPD**  
INTERNATIONAL EPD SYSTEM



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

## **U1000R2V / N2XY/ Cu-XLPE-PVC / EXVB power cables with XLPE insulation and PVC sheath**

From TT Kabeli d.o.o.



|                          |                                                                                          |
|--------------------------|------------------------------------------------------------------------------------------|
| Programme:               | The International EPD System, <a href="http://www.environdec.com">www.environdec.com</a> |
| Programme operator:      | EPD International AB                                                                     |
| Type of EPD:             | EPD of multiple products, based on representative product                                |
| EPD registration number: | EPD-IES-0032446                                                                          |
| Version date:            | 2026-05-29                                                                               |
| Validity date:           | 2031-05-29                                                                               |

*An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see [www.environdec.com](http://www.environdec.com)*



## GENERAL INFORMATION

| Programme Information |                                                                     |
|-----------------------|---------------------------------------------------------------------|
| <b>Programme:</b>     | The International EPD System                                        |
| <b>Address:</b>       | EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden |
| <b>Website:</b>       | <a href="http://www.environdec.com">www.environdec.com</a>          |
| <b>E-mail:</b>        | <a href="mailto:support@environdec.com">support@environdec.com</a>  |

| Product Category Rules (PCR)                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CEN standard EN 15804 serves as the Core Product Category Rules (PCR)</b>                                                                                                                                                                                                                                                                                                            |
| <b>Product Category Rules (PCR):</b> <i>PCR 2019:14 Construction products (EN 15804+A2) (version 2.0.1) (2.0.1), UN CPC code - 46 - Electrical machinery and apparatus, 4634 - Other electric conductors, for a voltage not exceeding 1000 V</i>                                                                                                                                        |
| <b>PCR review was conducted by:</b> <i>The Technical Committee of the International EPD System. See <a href="http://www.environdec.com">www.environdec.com</a> for a list of members. Review chair: C Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via the Secretariat <a href="http://www.environdec.com/contact">www.environdec.com/contact</a>.</i> |
| <b>c-PCR:</b> <i>PCR 2019:14-c-PCR-019 Electrical cables and wires (for construction sector) (c-PCR to PCR 2019:14) (Adopted from EPD Norway) (2022-03-01)</i>                                                                                                                                                                                                                          |
| <b>c-PCR review was conducted by:</b> <i>The PCR (version 2.0) was adopted 2022-10-12 as a c-PCR under PCR 2019:14, after being reviewed and accepted by the Technical Committee of EPD International acting as PCR Review Panel for the adoption process. Review chair was Nasser Ayoub, DCarbon Egypt.</i>                                                                            |

| Third-party Verification                                                                                   |
|------------------------------------------------------------------------------------------------------------|
| Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:        |
| <input checked="" type="checkbox"/> <b>Individual EPD verification without a pre-verified LCA/EPD tool</b> |
| Third-party verifier: Mari Kirss, Meetripuu OÜ                                                             |
| Approved by: International EPD System                                                                      |
| Procedure for follow-up of data during EPD validity involves third party verifier:                         |
| <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                        |

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

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

## INFORMATION ABOUT EPD OWNER

Owner of the EPD: TT Kabeli d.o.o.

Address: Knešpolje bb, Široki Brijeg, Bosnia and Herzegovina

Contact: Eugen Šušak, [info@ttcables.com](mailto:info@ttcables.com)

Address and contact information of the LCA practitioner commissioned by the EPD owner:  
Urté Valdavičė, UAB Vesta Consulting, [info@vestaconsulting.lt](mailto:info@vestaconsulting.lt)

Description of the organization: TT Kabeli d.o.o., operating as TT Cables, is a leading producer of low-voltage cables in Southeast Europe. Established in 2007, the company has expanded its reach to supply major wholesalers and cable specialists across Europe, Africa, the Middle East, and North America. Headquartered in Široki Brijeg, Bosnia and Herzegovina, TT Cables has established subsidiaries in Lithuania, Serbia, Croatia, Austria, Germany, the United Kingdom, Turkey, Italy, North Macedonia and Romania to enhance market coverage and customer service. TT Cables offers a diverse product range, including power cables up to 1kV, armoured cables, installation cables, and solar cables, exporting to over 50 countries worldwide.

Product-related or management system-related certifications: TT Kabeli d.o.o. (TT Cables) holds several important certifications related to quality, environmental management, occupational health and safety, and energy management:

- **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 27001** - Information Security Management System, ensuring the confidentiality, integrity, and availability of information and protecting sensitive data.
- **ISO 45001** – Occupational Health and Safety Management System, ensuring a safe working environment and reducing workplace risks.
- **ISO 50001** – Energy Management System, aimed at improving energy efficiency and reducing energy consumption.

## PRODUCT INFORMATION

Product name: U1000R2V / N2XY/ Cu-XLPE-PVC / EXVB power cables with XLPE insulation and PVC sheath

Product group: This EPD covers multiple products of power cables with XLPE insulation and PVC sheath. Series of cables that falls into the product group is listed in Annex 1

Representative product: The reference product **U-1000 R2V 1x240** was chosen to represent the product group, because of the highest share in the production quantities by mass within the cables in the group in 2025.

UN CPC code: 46 - Electrical machinery and apparatus, 4634 - Other electric conductors, for a voltage not exceeding 1000 V

Product description: Power cables with XLPE insulation and PVC sheath are suitable for all types of low voltage industrial-type connection, in urban grids, building installations, etc. Particularly suited in cases of high operating temperature and when high resistance to solar radiation and atmospheric agents is required. Good resistance to low temperature and chemical agents.

Products application: These cables are intended for low-voltage power distribution in building installations, industrial facilities, urban grids and other fixed electrical installations. Typical applications include protected installation routes such as raceways, cable trays, technical rooms, indoor walkways, wall-mounted installations and cable constructions in general. Depending on project-specific installation conditions, the cables may also be used outdoors or laid underground with appropriate mechanical protection, such as slabs, tiles or bricks. They are not recommended to be laid in ground flooded for more than two months per year. With appropriate mechanical protection, they can be used in areas subject to risk of explosion; in such cases, the permitted current load is reduced by 15%. The cables can be used at ambient temperatures down to -25°C.

Reference product technical specification:

| Technical Characteristics             | Standards              | U-1000 R2V Cables |
|---------------------------------------|------------------------|-------------------|
| CPR class                             | -                      | Eca               |
| <b>Test voltage</b>                   | HD 604 5D, IEC 60502-1 | 4 kV              |
| <b>Rated voltage</b>                  | HD 604 5D, IEC 60502-1 | 0.6/1 kV          |
| <b>Bending radius (Min)</b>           | HD 604 5D, IEC 60502-1 | Multi-core 8D     |
| <b>Min. laying temperature</b>        | HD 604 5D, IEC 60502-1 | -10°C             |
| <b>Max. conductor temperature</b>     | HD 604 5D, IEC 60502-1 | 90°C              |
| <b>Max. short-circuit temperature</b> | HD 604 5D, IEC 60502-1 | 250°C             |

Name and location of production site(s): Knešpolje bb, Široki Brijeg, Bosnia and Herzegovina

References to any relevant websites for more information or explanatory materials: Visit <https://www.ttcables.com/> to learn more.

## CONTENT DECLARATION

The tables below represent the product and packaging material content information for 1 meter of the representative product **U-1000 R2V 1x240**.

| Product content             | Mass, kg        | Post-consumer recycled material, mass-% of product | Biogenic material, mass-% of product | Biogenic material, kg C / product |
|-----------------------------|-----------------|----------------------------------------------------|--------------------------------------|-----------------------------------|
| Copper (conductor)          | 2,27E+00        | 0                                                  | 0                                    | 0                                 |
| PVC (sheath)                | 1,97E-01        | 0                                                  | 0                                    | 0                                 |
| XLPE (insulation)           | 1,07E-01        | 0                                                  | 0                                    | 0                                 |
| XLPE (catalyst)             | 5,72E-03        | 0                                                  | 0                                    | 0                                 |
| MB-PVC (colour insulation)  | 3,04E-03        | 0                                                  | 0                                    | 0                                 |
| MB-XLPE (colour insulation) | 1,14E-03        | 0                                                  | 0                                    | 0                                 |
| <b>TOTAL</b>                | <b>2,58E+00</b> | <b>0</b>                                           | <b>0</b>                             | <b>0</b>                          |

Note. According to the manufacturer data, scrap copper accounts for 33% of the copper input, which corresponds to 28,98% of the total product mass. As the origin of the scrap copper is not specified, this value is reported as recycled/scrap material content and not specifically as post-consumer recycled content.

| Packaging materials | Weight, kg      | Weight-% (versus the product) | Biogenic material, kg C / product |
|---------------------|-----------------|-------------------------------|-----------------------------------|
| <sup>1</sup> Drum   | 1,70E-01        | 6,58                          | 8,16E-02                          |
| <b>TOTAL</b>        | <b>1,70E-01</b> | <b>6,58</b>                   | <b>8,16E-02</b>                   |

<sup>1</sup> Global Warming Potential biogenic: -1,76 kg CO<sub>2e</sub> / kg

Note. 1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO<sub>2</sub>.

The product does not contain any substances from the SVHC candidate list in concentrations exceeding 0,1% of its weight.

## LCA INFORMATION

Declared unit: the declared unit of the study is 1 meter of the product supplied to the client. The mass of the product per declared unit is 2,58 kg.

Reference service life: The reference service life of the product is assumed to be 30 years.

Time representativeness: primary data was collected internally. The production data refers to the time period of January 2025 – December 2025.

Geographical scope: Europe

Database(s) and LCA software used: The used databases are Ecoinvent 3.11 and One click LCA 7.6. The Ecoinvent database provides the life cycle inventory data for the raw and processed materials obtained from the background system. The LCA software used is One Click LCA version 0.52.3.

Description of system boundaries: Cradle to gate with options, modules C1-C4, module D and with additional modules A4-A5.

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

|                      | Product stage       |           |               | Constructio<br>n process<br>stage |                           | Use stage |             |        |             |               |                        |                       |                            | End of life stage |                  |          |                                        | Resource<br>recovery<br>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-<br>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            | EU                  | EU        | BA            | EU                                | EU                        | -         | -           | -      | -           | -             | -                      | -                     | EU                         | EU                | EU               | EU       | EU                                     |                               |
| Primary data used    | 2,43%               |           |               | -                                 | -                         | -         | -           | -      | -           | -             | -                      | -                     | -                          | -                 | -                | -        | -                                      |                               |
| Variation – products | -190 % / + 117%     |           |               | -                                 | -                         | -         | -           | -      | -           | -             | -                      | -                     | -                          | -                 | -                | -        | -                                      |                               |
| Variation – sites    | ND                  |           |               | -                                 | -                         | -         | -           | -      | -           | -             | -                      | -                     | -                          | -                 | -                | -        | -                                      |                               |

Description of the system boundary (X = Included in LCA; ND = Module Not declared)

*Note. Based on PCR 2019:14 Construction products section 2.2.2.4. Table 2 for type b) EPD B modules are optional to declare, therefore excluded due to lack of relevance.*

Data quality: The EPD covers products manufactured in one factory in Široki Brijeg (Bosnia and Herzegovina) which provided data for the period of January 2025 – December 2025. The data collection has been done internally and thoroughly. The data is based on yearly production amounts and extrapolations of measurements on specific machines and plants. The EPD covers raw material supply and transport, product manufacturing, transportation to the customer, installation at the construction site, and end-of-life on a European scale. During the manufacturing process, copper is processed through wire drawing and conductor stranding, followed by insulation extrusion (e.g. XLPE) and application of the outer sheath (e.g. PVC). The cable is then tested to ensure compliance with electrical and mechanical requirements, after which it is packaged and prepared for distribution. The site is powered

by electricity from renewable sources, additionally diesel and LPG for mobile machinery is used. Background data was sourced from the ecoinvent 3.11 and One click LCA 7.6 databases. No poor or very poor data was found during the assessment of relevant data using PEF method (EN 15804:2012+A2:2019, Annex E, only E.2). The data quality assessment is done in accordance with EN 15941:2024. Overall, the data quality can be described as good. The EN 15804 reference package used is based on EF 3.1.

**Share of primary data used:** The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories. Declaration of data sources, reference years, data categories, and share of primary data is presented below.

| Process                                                          | Source type | Source            | Reference year | Data category  | Share of primary data, of GWP-GHG results for A1-A3 |
|------------------------------------------------------------------|-------------|-------------------|----------------|----------------|-----------------------------------------------------|
| Production of raw materials (A1)                                 | Database    | Ecoinvent v. 3.11 | 2000-2024      | Secondary data | -                                                   |
| Transport of raw materials to manufacturing site (A2)            | Database    | Ecoinvent v. 3.11 | 2009-2024      | Primary data   | 2,32%                                               |
| Production of packaging (A3)                                     | Databases   | Ecoinvent v. 3.11 | 2022-2024      | Secondary data | -                                                   |
| Energy used in manufacturing of product (A3)                     | Database    | Ecoinvent v. 3.11 | 1996-2024      | Primary data   | 0,11%                                               |
| Waste treatment (A3)                                             | Database    | Ecoinvent v. 3.11 | 2006-2024      | Secondary data | -                                                   |
| <b>Total share of primary data, of GWP-GHG results for A1-A3</b> |             |                   |                |                | <b>2,43%</b>                                        |

*Note. Ecoinvent datapoints are based on older background flows, but updated in 2024 (v.3)*

**Cut-off criteria:** The study does not exclude any modules or processes that are mandatory according to the applicable standards and PCR. No hazardous materials or substances are excluded. All major raw materials and energy inputs, as well as emissions and outputs from the unit processes for which data is available, are included in the calculation. In line with the PCR requirements, the total excluded input and output flows do not exceed 5% of the total mass or energy across the life cycle. The excluded flows represent approximately 1,02% of the total mass across the life cycle and consist of minor auxiliary materials and operational inputs, including thermal cap, drum label, waste oil, and water.

#### **Allocation, estimates and assumptions:**

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. In this study, as per EN 15804:2012+A2:2019, allocation is conducted in the following order:

1. Allocation should be avoided
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small
3. Allocation should be based on economic values

The allocations used in this study follow the system model 'Allocation, cut-off, 15804:2012+A2:2019'.

The methodological choices for allocation for reuse, recycling and recovery have been set according to the polluter pays principle (PPP).

Scenarios included in the LCA are based on realistic scenarios which are currently in use and are representative for one of the most likely scenario alternatives.

The environmental impacts of capital goods (e.g., production equipment, recycling machinery) and infrastructure (e.g., recycling facilities, transportation systems) have not been included in this assessment.

### Calculation rules for averaging data:

The EPD is an EPD of multiple products, based on a representative product. **U-1000 R2V 1x240** cable was chosen as representative product for the product group, because of the highest share in the production quantities by mass within the cables in the group in the analysed period. 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. The calculations are based on the production mass.

## Product life cycle

### Product stage (A1-A3)

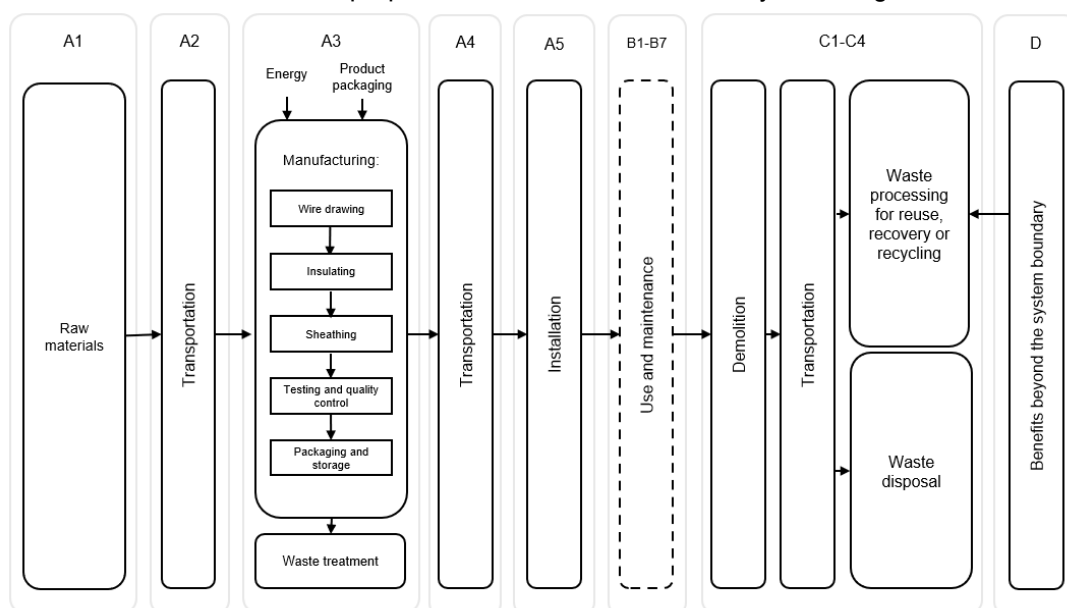
A1: This module considers the extraction and processing of raw materials.

A2: The raw materials are transported to the manufacturing plant. In this case the model includes road and sea transportation of each raw material.

A3: This module includes the manufacture of products and packaging. It has considered all the energy consumption and waste generated in the production plant.

### Manufacturing process

The manufacturing of the U-1000 R2V 1x240 cable is designed to ensure high electrical performance, mechanical durability, and suitability for fixed installations. The process begins with the production of a solid or stranded copper conductor (typically Class 1 or 2, according to EN 60228), providing reliable electrical conductivity and mechanical stability for power transmission. The conductor is then insulated using a cross-linked polyethylene (XLPE) compound, which offers excellent dielectric properties, thermal resistance, and long-term performance under electrical and thermal stress. Following insulation, the cable is equipped with an outer sheath made of polyvinyl chloride (PVC), which provides mechanical protection against impacts, abrasion, and environmental factors such as moisture and chemicals. After extrusion of insulation and sheath layers, the cable undergoes quality control procedures, including dimensional checks, electrical testing, and mechanical performance verification. Finally, the finished cables are wound onto drums and prepared for distribution. See the system diagram below.



*Note. The dashed lines indicated that use stage (B1–B7 modules) were not assessed, as their inclusion is not applicable for this type of EPD (as specified in PCR 2019:14 Construction products (EN 15804+A2), version 2.0.1).*

#### Manufacturing energy scenario documentation

| Scenario parameter                    | Value                             | Source                                                          |
|---------------------------------------|-----------------------------------|-----------------------------------------------------------------|
| Electricity generated from hydropower | 0,0236 kg CO <sub>2</sub> e / kWh | Data sources: ecoinvent 3.11<br>Country: Bosnia and Herzegovina |
| Diesel                                | 0,3600 kg CO <sub>2</sub> e / kWh | Data sources: ecoinvent 3.11<br>Country: World                  |
| LPG                                   | 0,3323 kg CO <sub>2</sub> e / kWh | Data sources: ecoinvent 3.11<br>Country: World                  |

#### Construction process stage (A4-A5)

A4: 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.

#### Transportation scenario documentation

| Scenario parameter                       | Value                                                    |
|------------------------------------------|----------------------------------------------------------|
| Vehicle type used for transport          | EURO 6 truck with a trailer with an average load of >32t |
| Distance                                 | 1936 km                                                  |
| Capacity utilization (inc. empty return) | 100 %                                                    |
| Bulk density of transported products     | Not declared                                             |

A5: Environmental impacts from installation into the building (A5) include the product installation losses, emissions of energy use in installation and generation of waste at the construction site. Wood packaging waste is assumed to be collected and treated according to typical European waste management scenarios, with 32% recycled, 30% incinerated, and 38% disposed of in landfill. Installation is assumed to be carried out manually; therefore, no energy use is included. No product losses during installation are assumed based on manufacturer information, as cables are installed to required lengths and material wastage is considered negligible (<1%).

#### Installation of the product in the building scenario documentation

| Scenario parameter                                                                                          | Value    |
|-------------------------------------------------------------------------------------------------------------|----------|
| Ancillary materials for installation, kg                                                                    | -        |
| Water use, m <sup>3</sup>                                                                                   | -        |
| Other resource use, kg                                                                                      | -        |
| Quantitative description of energy type (regional mix) and consumption during the installation process, kWh | -        |
| Waste materials on the building site before waste processing, generated by the product's installation, kg   | -        |
| <i>Drum</i>                                                                                                 | 0,17 kg  |
| Output materials as result of waste processing at the building site), kg                                    | -        |
| <i>Recycling</i>                                                                                            | 0,054 kg |
| <i>Incineration with energy recovery</i>                                                                    | 0,051 kg |
| <i>Disposal</i>                                                                                             | 0,065 kg |
| Direct emissions to ambient air, soil, and water, kg                                                        | -        |

### **Use stage (B1-B7)**

B1-B7: This EPD does not cover the Use stage.

### **End of life stage (C1-C4, D)**

C1: Deconstruction, dismantling, demolition

Machinery operations related to de-installation are assumed to be zero, indicating manual execution.

C2: Transport of the discarded product to the processing site

It is assumed that no mass loss occurs during the use phase; therefore, the product at end of life has the same weight as the declared product. All end-of-life products are considered to be transported to the nearest available waste management facilities, such as recycling, incineration or landfill sites. The transport distances to the nearest recycling or disposal facility (80 km) or incineration plant (130 km) and the transport mode (lorry) are based on the reference values provided in PCR 2019:14, Table 4.

C3: Waste processing for reuse, recovery, and/or recycling

At the end of life, it is assumed that 90% of copper wire is collected and sent to recycling, while 60% of polymer materials are collected and treated via incineration with energy recovery (R1, >60%). These assumptions are based on typical European waste treatment practices and literature data on material-specific recovery rates, reflecting established recycling systems for metals and common treatment routes for polymer fractions.

C4: Discharge (disposal)

It is assumed that 40% of polymer material, 10 % of copper wire is not suitable for recycling (e.g. cannot be separated) and are sent for disposal in landfill.

### **End of life scenario documentation**

| Scenario parameter                                 | Value                                                                                             |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Collection process – kg collected separately       | 2,58                                                                                              |
| Collection process – kg collected with mixed waste | 0                                                                                                 |
| Recovery process – kg for re-use                   | 0                                                                                                 |
| Recovery process – kg for recycling                | 2,04                                                                                              |
| Recovery process – kg for energy recovery          | 0,19                                                                                              |
| Disposal (total) – kg for final deposition         | 0,35                                                                                              |
| Scenario assumptions e.g. transportation           | Transported 80 km to recycling / disposal and 130 km to incineration plant with an average lorry. |

*Note. Yield factor = 0,9 (assuming 10% of material is lost in the recovery process)*

Benefits and loads beyond the system boundary (D):

In accordance with EN 15804, Module D reflects the benefits beyond the system boundary associated with material recovery and energy substitution from waste streams generated in modules A3, A5 and at end-of-life (C3). Metals are assumed to be recovered and recycled, resulting in avoided primary material production. Polymer materials are assumed to be partially incinerated with energy recovery (R1 >60%), generating heat and electricity that substitute average European energy mixes. In addition, wood packaging waste contributes to energy recovery and material substitution through downcycling (e.g. mulch), avoiding conventional production.

A yield factor of 0,9 is applied, assuming 10% losses during recovery processes.

## ENVIRONMENTAL PERFORMANCE

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

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

A comma (",") is used as the decimal separator throughout this report. ND = Module Not declared.

The results are presented for 1 meter of reference product **U-1000 R2V 1x240**. The mass of the representative product per declared unit is 2,58 kg/m.

#### Core environmental impact indicators – EN 15804:2012+A2:2019, EF 3.1

| Impact category         | Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | A1-A3     | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| GWP – total             | kg CO <sub>2</sub> e                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1,37E+01  | 5,43E-01 | 3,05E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,20E-02 | 4,95E-01 | 8,74E-02 | -6,62E+00 |
| GWP – fossil            | kg CO <sub>2</sub> e                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1,39E+01  | 5,43E-01 | 5,85E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,20E-02 | 4,95E-01 | 7,15E-03 | -6,61E+00 |
| GWP – biogenic          | kg CO <sub>2</sub> e                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -1,96E-01 | 3,20E-04 | 2,99E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,30E-05 | 2,92E-05 | 8,02E-02 | 0,00E+00  |
| GWP – LULUC             | kg CO <sub>2</sub> e                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2,52E-02  | 2,02E-04 | 9,07E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 8,20E-06 | 6,02E-05 | 2,19E-06 | -1,34E-02 |
| Ozone depletion pot.    | kg CFC <sub>11</sub> e                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8,90E-07  | 1,23E-08 | 8,57E-11 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,99E-10 | 7,52E-10 | 7,52E-11 | -5,37E-08 |
| Acidification potential | mol H <sup>+</sup> e                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 9,81E-01  | 1,32E-03 | 3,15E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,35E-05 | 6,51E-04 | 2,69E-05 | -5,89E-01 |
| EP-freshwater           | kg Pe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4,48E-03  | 3,97E-05 | 1,71E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,61E-06 | 3,21E-05 | 9,17E-06 | -5,09E-02 |
| EP-marine               | kg Ne                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4,59E-02  | 3,47E-04 | 3,32E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,41E-05 | 1,80E-04 | 1,18E-04 | -2,94E-02 |
| EP-terrestrial          | mol Ne                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6,68E-01  | 3,75E-03 | 1,24E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,52E-04 | 1,87E-03 | 9,27E-05 | -4,17E-01 |
| POCP ("smog")           | kg NMVOCe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1,90E-01  | 2,21E-03 | 4,17E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 8,94E-05 | 5,32E-04 | 5,51E-05 | -1,15E-01 |
| ADP-minerals & metals*  | kg Sbe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2,35E-02  | 1,62E-06 | 1,54E-08 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 6,55E-08 | 3,28E-06 | 5,27E-09 | -7,58E-03 |
| ADP-fossil resources*   | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1,80E+02  | 8,23E+00 | 8,51E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,34E-01 | 7,04E-01 | 6,91E-02 | -8,00E+01 |
| Water use*              | m <sup>3</sup> e depr.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1,13E+01  | 4,78E-02 | 2,94E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,94E-03 | 4,19E-02 | 2,99E-03 | -5,93E+00 |
| Acronyms                | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption |           |          |          |    |    |    |    |    |    |    |          |          |          |          |           |

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

### Additional (optional) environmental impact indicators – EN 15804:2012+A2:2019, EF 3.1

| Impact category                             | Unit      | A1-A3    | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|---------------------------------------------|-----------|----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| Particulate matter                          | Incidence | 2,27E-06 | 5,38E-08 | 6,07E-10 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,18E-09 | 8,03E-09 | 4,79E-10 | -1,36E-06 |
| Ionizing radiation*                         | kBq U235e | 1,52E+00 | 9,22E-03 | 2,03E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,74E-04 | 5,48E-03 | 6,85E-05 | -5,18E-01 |
| Ecotoxicity (freshwater)                    | CTUe      | 8,72E+03 | 7,08E+00 | 1,23E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,87E-01 | 4,08E+00 | 6,36E+00 | -5,65E+03 |
| Human toxicity, cancer                      | CTUh      | 1,77E-07 | 9,04E-11 | 2,77E-12 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,66E-12 | 7,90E-11 | 2,40E-12 | -5,74E-08 |
| Human tox. non-cancer                       | CTUh      | 1,30E-05 | 5,29E-09 | 1,52E-10 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,15E-10 | 4,13E-09 | 3,48E-10 | -5,86E-06 |
| SQP (Land use related impacts/soil quality) | -         | 3,51E+02 | 8,27E+00 | 8,88E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,35E-01 | 1,21E+00 | 1,42E-01 | -1,83E+02 |

\* Disclaimer: 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

### Resource use indicators

| Impact category          | Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | A1-A3    | A4       | A5        | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3        | C4        | D         |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|-----------|----|----|----|----|----|----|----|----------|----------|-----------|-----------|-----------|
| Renew. PER as energy     | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4,73E+01 | 1,27E-01 | 2,50E+00  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,14E-03 | 1,17E-01  | 1,15E+00  | -2,37E+01 |
| Renew. PER as material   | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2,91E+00 | 0,00E+00 | -2,91E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00  | 0,00E+00  | 0,00E+00  |
| Total use of renew. PER  | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 5,02E+01 | 1,27E-01 | -4,10E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,14E-03 | 1,17E-01  | 1,15E+00  | -2,37E+01 |
| Non-re. PER as energy    | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1,68E+02 | 8,23E+00 | 8,52E-02  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,34E-01 | 6,16E+00  | 6,88E-01  | -8,00E+01 |
| Non-re. PER as material  | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1,02E+01 | 0,00E+00 | 0,00E+00  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | -6,09E+00 | -4,06E+00 | 0,00E+00  |
| Total use of non-re. PER | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1,78E+02 | 8,23E+00 | 8,52E-02  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,34E-01 | 7,00E-02  | -3,37E+00 | -8,00E+01 |
| Secondary materials      | kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6,16E-01 | 3,47E-03 | 5,45E-05  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,41E-04 | 8,33E-04  | 2,00E-05  | -1,63E+00 |
| Renew. secondary fuels   | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3,70E-03 | 4,59E-05 | 5,79E-07  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,86E-06 | 3,78E-05  | 4,00E-07  | -2,08E-03 |
| Non-ren. secondary fuels | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0,00E+00 | 0,00E+00 | 0,00E+00  | 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   | m³                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3,92E-01 | 1,11E-03 | -2,18E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,51E-05 | 7,83E-04  | -4,38E-04 | -2,03E-01 |
| 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 |          |          |           |    |    |    |    |    |    |    |          |          |           |           |           |

Note: Option A was chosen for the calculations of the primary energy indicators. according to on Annex 3 of PCR 2019:14

## Waste indicators

| Impact category     | Unit | A1-A3    | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|---------------------|------|----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| Hazardous waste     | kg   | 4,01E+00 | 1,20E-02 | 5,56E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,86E-04 | 1,10E-02 | 1,16E-04 | -2,70E+00 |
| Non-hazardous waste | kg   | 2,86E+02 | 2,45E-01 | 2,30E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 9,93E-03 | 3,69E-01 | 3,41E-01 | -1,77E+02 |
| Radioactive waste   | kg   | 5,49E-04 | 2,26E-06 | 5,05E-08 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 9,18E-08 | 1,40E-06 | 1,66E-08 | -1,36E-04 |

## Output flow indicators

| Impact category              | Unit | 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 | 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   | 1,89E-01 | 0,00E+00 | 5,40E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 2,04E+00 | 0,00E+00 | 0,00E+00 |
| Materials for energy rec     | kg   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 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   | 3,58E-01 | 0,00E+00 | 2,70E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 1,97E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy, electricity | MJ   | 1,21E-01 | 0,00E+00 | 1,10E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 6,70E-01 | 0,00E+00 | 0,00E+00 |
| Exported energy, thermal     | MJ   | 2,37E-01 | 0,00E+00 | 1,60E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 1,30E+00 | 0,00E+00 | 0,00E+00 |

## Additional indicator – GWP-GHG

| Impact category | Unit                 | A1-A3    | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|-----------------|----------------------|----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| GWP-GHG*        | kg CO <sub>2</sub> e | 1,39E+01 | 5,43E-01 | 5,86E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,20E-02 | 4,95E-01 | 7,15E-03 | -6,62E+00 |

\* Disclaimer: This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO<sub>2</sub> is set to zero.

## Additional LCA results (other environmental performance results) of the product(s)

### Additional results for end-of-life 100% scenarios for modules C1-C4, D

#### End-of-life scenario documentation

| Scenario parameter                                 | Value (100% recycling) | Value (100% incineration) | Value (100% disposal) |
|----------------------------------------------------|------------------------|---------------------------|-----------------------|
| Collection process – kg collected separately       | 2,58 kg                | 2,58 kg                   | 2,58 kg               |
| Collection process – kg collected with mixed waste | -                      | -                         | -                     |
| Recovery process – kg for re-use                   | -                      | -                         | -                     |
| Recovery process – kg for recycling                | 2,58 kg                | -                         | -                     |
| Recovery process – kg for energy recovery          | -                      | 2,58 kg                   | -                     |
| Disposal (total) – kg for final deposition         | -                      | -                         | 2,58 kg               |
| Scenario assumptions e.g. transportation           | 80 km                  | 130 km                    | 80 km                 |

Note. Yield factor = 0.9 (assuming 10% of material is lost in the recycling process)

#### Mandatory impact category indicators according to EN 15804 (corresponding scenario 100% recycling)

| Results per declared unit |                        |          |          |          |          |           |
|---------------------------|------------------------|----------|----------|----------|----------|-----------|
| Indicator                 | Unit                   | C1       | C2       | C3       | C4       | D         |
| GWP- total                | kg CO <sub>2</sub> eq. | 0,00E+00 | 2,11E-02 | 7,08E-03 | 0,00E+00 | -7,23E+00 |
| GWP-fossil                | kg CO <sub>2</sub> eq. | 0,00E+00 | 2,10E-02 | 7,07E-03 | 0,00E+00 | -7,13E+00 |
| GWP-biogenic              | kg CO <sub>2</sub> eq. | 0,00E+00 | 1,24E-05 | 0,00E+00 | 0,00E+00 | -1,02E-01 |
| GWP- luluc                | kg CO <sub>2</sub> eq. | 0,00E+00 | 7,84E-06 | 8,73E-06 | 0,00E+00 | -2,12E-03 |
| ODP                       | kg CFC 11 eq.          | 0,00E+00 | 4,77E-10 | 9,39E-11 | 0,00E+00 | -2,40E-07 |
| AP                        | mol H+ eq.             | 0,00E+00 | 5,11E-05 | 8,44E-05 | 0,00E+00 | 5,68E-03  |
| EP-freshwater             | kg P eq.               | 0,00E+00 | 1,54E-06 | 4,71E-06 | 0,00E+00 | -3,59E+00 |
| EP- marine                | kg N eq.               | 0,00E+00 | 1,34E-05 | 1,87E-05 | 0,00E+00 | -4,41E-03 |
| EP-terrestrial            | mol N eq.              | 0,00E+00 | 1,46E-04 | 2,12E-04 | 0,00E+00 | -4,16E-02 |
| POCP                      | kg NMVOC eq.           | 0,00E+00 | 8,55E-05 | 6,27E-05 | 0,00E+00 | -2,84E-02 |
| ADP-minerals & metals     | kg Sb eq.              | 0,00E+00 | 6,26E-08 | 5,01E-07 | 0,00E+00 | -9,00E-05 |
| ADP-fossil                | MJ                     | 0,00E+00 | 3,19E-01 | 9,55E-02 | 0,00E+00 | -1,84E+02 |
| WDP                       | m <sup>3</sup>         | 0,00E+00 | 1,86E-03 | 1,86E-03 | 0,00E+00 | -1,16E+00 |

#### Mandatory impact category indicators according to EN 15804 (corresponding scenario 100% incineration)

| Results per declared unit |                        |          |          |          |          |           |
|---------------------------|------------------------|----------|----------|----------|----------|-----------|
| Indicator                 | Unit                   | C1       | C2       | C3       | C4       | D         |
| GWP- total                | kg CO <sub>2</sub> eq. | 0,00E+00 | 3,42E-02 | 6,14E+00 | 0,00E+00 | -2,57E+00 |
| GWP-fossil                | kg CO <sub>2</sub> eq. | 0,00E+00 | 3,41E-02 | 6,14E+00 | 0,00E+00 | -2,57E+00 |
| GWP-biogenic              | kg CO <sub>2</sub> eq. | 0,00E+00 | 2,01E-05 | 3,99E-04 | 0,00E+00 | -1,02E-01 |
| GWP- luluc                | kg CO <sub>2</sub> eq. | 0,00E+00 | 1,27E-05 | 4,82E-05 | 0,00E+00 | -2,26E-03 |
| ODP                       | kg CFC 11 eq.          | 0,00E+00 | 7,74E-10 | 1,94E-09 | 0,00E+00 | -2,08E-08 |
| AP                        | mol H+ eq.             | 0,00E+00 | 8,29E-05 | 1,40E-03 | 0,00E+00 | -3,45E-03 |
| EP-freshwater             | kg P eq.               | 0,00E+00 | 2,50E-06 | 2,02E-05 | 0,00E+00 | -1,35E+00 |
| EP- marine                | kg N eq.               | 0,00E+00 | 2,18E-05 | 7,97E-04 | 0,00E+00 | -2,23E-03 |
| EP-terrestrial            | mol N eq.              | 0,00E+00 | 2,36E-04 | 6,79E-03 | 0,00E+00 | -2,07E-02 |
| POCP                      | kg NMVOC eq.           | 0,00E+00 | 1,39E-04 | 1,71E-03 | 0,00E+00 | -6,10E-03 |
| ADP-minerals & metals     | kg Sb eq.              | 0,00E+00 | 1,02E-07 | 4,28E-07 | 0,00E+00 | -2,77E-05 |
| ADP-fossil                | MJ                     | 0,00E+00 | 5,18E-01 | 1,15E+00 | 0,00E+00 | -3,60E+01 |
| WDP                       | m <sup>3</sup>         | 0,00E+00 | 3,01E-03 | 4,08E-01 | 0,00E+00 | -4,19E-01 |

**Mandatory impact category indicators according to EN 15804 (corresponding scenario 100% disposal)**

| Results per declared unit |                        |          |          |          |          |           |
|---------------------------|------------------------|----------|----------|----------|----------|-----------|
| Indicator                 | Unit                   | C1       | C2       | C3       | C4       | D         |
| GWP- total                | kg CO <sub>2</sub> eq. | 0,00E+00 | 2,11E-02 | 0,00E+00 | 2,29E-01 | -5,72E-01 |
| GWP-fossil                | kg CO <sub>2</sub> eq. | 0,00E+00 | 2,10E-02 | 0,00E+00 | 2,85E-02 | -4,70E-01 |
| GWP-biogenic              | kg CO <sub>2</sub> eq. | 0,00E+00 | 1,24E-05 | 0,00E+00 | 2,01E-01 | -1,02E-01 |
| GWP- luluc                | kg CO <sub>2</sub> eq. | 0,00E+00 | 7,84E-06 | 0,00E+00 | 1,16E-05 | 4,15E-04  |
| ODP                       | kg CFC 11 eq.          | 0,00E+00 | 4,77E-10 | 0,00E+00 | 4,85E-10 | 2,27E-09  |
| AP                        | mol H+ eq.             | 0,00E+00 | 5,11E-05 | 0,00E+00 | 1,42E-04 | 1,05E-02  |
| EP-freshwater             | kg P eq.               | 0,00E+00 | 1,54E-06 | 0,00E+00 | 2,39E-05 | -1,35E+00 |
| EP- marine                | kg N eq.               | 0,00E+00 | 1,34E-05 | 0,00E+00 | 3,24E-04 | -2,37E-04 |
| EP-terrestrial            | mol N eq.              | 0,00E+00 | 1,46E-04 | 0,00E+00 | 5,44E-04 | -8,69E-04 |
| POCP                      | kg NMVOC eq.           | 0,00E+00 | 8,55E-05 | 0,00E+00 | 2,51E-04 | 9,05E-05  |
| ADP-minerals & metals     | kg Sb eq.              | 0,00E+00 | 6,26E-08 | 0,00E+00 | 2,90E-08 | -2,55E-05 |
| ADP-fossil                | MJ                     | 0,00E+00 | 3,19E-01 | 0,00E+00 | 4,34E-01 | -4,19E+00 |
| WDP                       | m <sup>3</sup>         | 0,00E+00 | 2,11E-02 | 0,00E+00 | 2,29E-01 | -5,31E-01 |

**Variation of core environmental performance indicators**

In accordance with the regulations, the variation between the highest and lowest environmental impact indicator results (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, due to green energy in production.

| LCA result of one declared unit product (A-C) | Unit                   | Min   | Representative | Max  |
|-----------------------------------------------|------------------------|-------|----------------|------|
| GWP – total                                   | kg CO <sub>2</sub> eq. | -185% | 1,52E+01       | 120% |
| GWP – fossil                                  | kg CO <sub>2</sub> eq. | -186% | 1,50E+01       | 119% |
| GWP – biogenic                                | kg CO <sub>2</sub> eq. | -155% | 1,83E-01       | 136% |
| GWP – LULUC                                   | kg CO <sub>2</sub> eq. | -188% | 2,55E-02       | 114% |
| Ozone depletion pot.                          | kg CFC 11 eq.          | -172% | 9,04E-07       | 131% |
| Acidification potential                       | mol H+ eq.             | -195% | 9,83E-01       | 113% |
| EP-freshwater                                 | kg P eq.               | -190% | 4,56E-03       | 117% |
| EP-marine                                     | kg N eq.               | -193% | 4,66E-02       | 114% |
| EP-terrestrial                                | mol N eq.              | -194% | 6,74E-01       | 114% |
| POCP ("smog")                                 | kg NMVOC eq.           | -193% | 1,93E-01       | 114% |
| ADP-minerals & metals                         | kg Sb eq.              | -196% | 2,35E-02       | 113% |
| ADP-fossil resources                          | kg CO <sub>2</sub> eq. | -185% | 1,89E+02       | 120% |
| Water use                                     | kg CO <sub>2</sub> eq. | -192% | 1,14E+01       | 116% |
| Particulate matter                            | Incidence              | -192% | 2,34E-06       | 114% |
| Ionizing radiation                            | kBq U235e              | -189% | 1,54E+00       | 117% |
| Ecotoxicity (freshwater)                      | CTUe                   | -195% | 8,74E+03       | 114% |
| Human toxicity, cancer                        | CTUh                   | -195% | 1,77E-07       | 114% |
| Human tox. non-cancer                         | CTUh                   | -196% | 1,30E-05       | 113% |
| SQP                                           | -                      | -164% | 3,61E+02       | 110% |
| GWP-GHG                                       | kg CO <sub>2</sub> eq. | -186% | 1,50E+01       | 119% |

Note. For example, if the variation between the values 9 and 10 is calculated, the following calculation shall be made:  $1/9.5 \cdot 100 = 10.526... \% \approx 11\%$  (with two decimals).

## ABBREVIATIONS

| Abbreviation                                      | Definition                                                                                                      |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <b>General Abbreviations</b>                      |                                                                                                                 |
| EN                                                | European Norm (Standard)                                                                                        |
| EPD                                               | Environmental Product Declaration                                                                               |
| EF                                                | Environmental Footprint                                                                                         |
| ISO                                               | International Organization for Standardization                                                                  |
| LCA                                               | Life Cycle Assessment                                                                                           |
| PCR                                               | Product Category Rules                                                                                          |
| c-PCR                                             | Complementary Product Category Rules                                                                            |
| CEN                                               | European Committee for Standardization                                                                          |
| CPC                                               | Central product classification                                                                                  |
| <b>Environmental Impact Indicators (EN 15804)</b> |                                                                                                                 |
| GHG                                               | Greenhouse gas                                                                                                  |
| GWP                                               | Global Warming Potential (kg CO <sub>2</sub> eq.)                                                               |
| GWP-fossil                                        | Global Warming Potential from fossil sources (kg CO <sub>2</sub> eq.)                                           |
| GWP-biogenic                                      | Global Warming Potential from biogenic sources (kg CO <sub>2</sub> eq.)                                         |
| GWP-luluc                                         | Global Warming Potential from land use and land use change (kg CO <sub>2</sub> eq.)                             |
| GWP-total                                         | Total Global Warming Potential (kg CO <sub>2</sub> eq.)                                                         |
| GWP-GHG                                           | Global Warming Potential for greenhouse gases (kg CO <sub>2</sub> eq.)                                          |
| ODP                                               | Ozone Depletion Potential (kg CFC-11 eq.)                                                                       |
| AP                                                | Acidification Potential (mol H <sup>+</sup> eq.)                                                                |
| EP                                                | Eutrophication Potential                                                                                        |
| EP-freshwater                                     | Freshwater eutrophication potential (kg P eq.)                                                                  |
| EP-marine                                         | Marine eutrophication potential (kg N eq.)                                                                      |
| EP-terrestrial                                    | Terrestrial eutrophication potential (mol N eq.)                                                                |
| POCP                                              | Photochemical Ozone Creation Potential (kg NMVOC eq.)                                                           |
| ADP                                               | Abiotic Depletion Potential                                                                                     |
| ADP-minerals&metals                               | Abiotic depletion potential for non-fossil resources (kg Sb eq.)                                                |
| ADP-fossil                                        | Abiotic depletion potential for fossil resources (MJ)                                                           |
| WDP                                               | Water Deprivation Potential (m <sup>3</sup> )                                                                   |
| <b>Resource Use Indicators</b>                    |                                                                                                                 |
| PERE                                              | Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)         |
| PERM                                              | Use of renewable primary energy resources used as raw materials (MJ)                                            |
| PERT                                              | Total use of renewable primary energy resources (MJ)                                                            |
| PENRE                                             | Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (MJ) |
| PENRM                                             | Use of non-renewable primary energy resources used as raw materials (MJ)                                        |
| PENRT                                             | Total use of non-renewable primary energy resources (MJ)                                                        |
| SM                                                | Use of secondary material (kg)                                                                                  |
| RSF                                               | Use of renewable secondary fuels (MJ)                                                                           |
| NRSF                                              | Use of non-renewable secondary fuels (MJ)                                                                       |
| FW                                                | Use of net fresh water (m <sup>3</sup> )                                                                        |
| <b>Waste Indicators</b>                           |                                                                                                                 |
| HW                                                | Hazardous Waste (disposed) (kg)                                                                                 |
| NHW                                               | Non-Hazardous Waste (disposed) (kg)                                                                             |
| RW                                                | Radioactive Waste (disposed) (kg)                                                                               |
| <b>Output Flow Indicators</b>                     |                                                                                                                 |
| CFR                                               | Components for Reuse (kg)                                                                                       |
| MR                                                | Material for Recycling (kg)                                                                                     |
| MER                                               | Materials for Energy Recovery (kg)                                                                              |
| EEE                                               | Exported Energy, Electricity (MJ)                                                                               |
| EET                                               | Exported Energy, Thermal (MJ)                                                                                   |
| <b>Lifecycle Stages / Modules</b>                 |                                                                                                                 |

| Abbreviation                | Definition                                                            |
|-----------------------------|-----------------------------------------------------------------------|
| A1                          | Raw material supply                                                   |
| A2                          | Transport                                                             |
| A3                          | Manufacturing                                                         |
| A4                          | Transport to site                                                     |
| A5                          | Construction/Installation                                             |
| B1                          | Use                                                                   |
| B2                          | Maintenance                                                           |
| B3                          | Repair                                                                |
| B4                          | Replacement                                                           |
| B5                          | Refurbishment                                                         |
| B6                          | Operational energy use                                                |
| B7                          | Operational water use                                                 |
| C1                          | Deconstruction/Demolition                                             |
| C2                          | Transport to waste processing                                         |
| C3                          | Waste processing                                                      |
| C4                          | Disposal                                                              |
| D                           | Reuse-Recovery-Recycling potential                                    |
| <b>Other Relevant Terms</b> |                                                                       |
| SVHC                        | Substances of Very High Concern                                       |
| EC No.                      | European Community Number                                             |
| MJ                          | Megajoule                                                             |
| kg                          | Kilogram                                                              |
| m <sup>3</sup>              | Cubic Meter                                                           |
| NM VOC                      | Non-Methane Volatile Organic Compounds                                |
| Sb eq.                      | Antimony Equivalents                                                  |
| P eq.                       | Phosphorus Equivalents                                                |
| N eq.                       | Nitrogen Equivalents                                                  |
| CFC-11 eq.                  | Chlorofluorocarbon-11 Equivalents                                     |
| CO <sub>2</sub> eq.         | Carbon Dioxide Equivalents                                            |
| kg C                        | Kilograms of Carbon                                                   |
| kg CO <sub>2</sub> eq.      | Kilograms of Carbon Dioxide Equivalent                                |
| ND                          | Not Declared                                                          |
| REACH                       | Registration, Evaluation, Authorisation, and Restriction of Chemicals |
| ppm                         | Parts per million                                                     |
| PEF                         | Product Environmental Footprint                                       |
| PPP                         | Polluter pays principle                                               |
| EU                          | Europe                                                                |
| GLO                         | Global                                                                |

## REFERENCES

- a) ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations Principles and procedures.
- b) ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.
- c) ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.
- d) General Programme Instructions of International EPD System (version 5.0.1) (2025-02-07)
- e) PCR 2019:14 Construction products (EN 15804+A2) (version 2.0.1) (2025-06-05)
- f) PCR 2019:14-c-PCR-019 Electrical cables and wires (for construction sector) (c-PCR to PCR 2019:14) (Adopted from EPD Norway) (2022-03-01)
- g) EN 15804+A2 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.
- h) EN 15941:2024. Sustainability of construction works – Data quality for environmental assessment of products and construction works – Selection and use of data.
- i) Life-cycle assessment background report "Power cables with XLPE insulation and PVC sheath"
- j) Ecoinvent v3.11 (2024) database.
- k) One Click LCA version 0.51.4. LCA software.

## VERSION HISTORY

**Original Version of the EPD, 2026-05-29**

## ANNEX 1

Series of cables that falls into the product group are presented below.

### **Cu/XLPE/PVC**

- Cu/XLPE/PVC 1x240 flex 1,8/3 kV

- N2XY 3x95 RM+70 RM Eca
- N2XY 3x120 RM+70 RM Eca

### **EXVB**

- EXVB 4x10 RE Eca
- EXVB 4x120 SM Eca
- EXVB 4x150 SM Eca
- EXVB 4x16 RM Eca
- EXVB 4x25 RM Eca
- EXVB 4x35 RM Eca
- EXVB 5G10 RE Eca
- EXVB 5G16 RM Eca
- EXVB 5G4 RE Eca
- EXVB 5G6 RE Eca

### **N2XY – 4 core**

- N2XY 4G1,5 RE/Coil Eca
- N2XY 4G1,5 RE/ŠP Eca
- N2XY 4G2,5 RE/Coil Eca
- N2XY 4G2,5 RE/ŠP Eca
- N2XY 4G4 RE/ŠP Eca
- N2XY 4x2,5 RE Eca
- N2XY 4x4 RE Eca
- N2XY 4x6 RE Eca
- N2XY 4x10 RM Eca
- N2XY 4x16 RM Eca
- N2XY 4x25 RM Eca
- N2XY 4x25 RM+16 RM Eca
- N2XY 4x35 RM+16 RM Eca
- N2XY 4x50 RM Eca
- N2XY 4x50 RM+25 RM Eca
- N2XY 4x70 RM+35 RM Eca
- N2XY 4x95 RM+50 RM Eca
- N2XY 4x95 SM Eca
- N2XY 4x150 SM Eca
- N2XY 4x185 SM Eca
- N2XY 4x240 SM Eca

### **N2XY – single core**

- N2XY 1x95
- N2XY 1x120
- N2XY 1x120 RM Eca
- N2XY 1x150
- N2XY 1x150 RM Eca
- N2XY 1x185
- N2XY 1x240
- N2XY 1x240 RM Eca
- N2XY 1x240 2/2 kV

### **N2XY – 2 core**

- N2XY 2x6 RE/ŠP Eca
- N2XY 2x10 RM Eca
- N2XY 2x16 RM Eca
- N2XY 2x25 RM Eca
- N2XY 2x35 RM Eca

### **N2XY – 5 core**

- N2XY 5G1,5 RE/Coil Eca
- N2XY 5G1,5 RE/ŠP Eca
- N2XY 5G2,5 RE/Coil Eca
- N2XY 5G2,5 RE/ŠP Eca
- N2XY 5G10 RM Eca
- N2XY 5G16 RM Eca
- N2XY 5G50 RM Eca
- N2XY 5x2,5 RE Eca
- N2XY 5x4 RE Eca
- N2XY 5x10 RM Eca
- N2XY 5x16 RM Eca
- N2XY 5x35 SM Eca

### **N2XY – 3 core**

- N2XY 3G1,5 RE/Coil Eca
- N2XY 3G1,5 RE/ŠP Eca
- N2XY 3G2,5 RE/ŠP Eca
- N2XY 3x2,5 RE/Coil Eca
- N2XY 3x2,5 RE Eca
- N2XY 3x4 RE Eca
- N2XY 3x4 RE/ŠP Eca
- N2XY 3x6 RE Eca
- N2XY 3x10 RM Eca
- N2XY 3x16 RM Eca
- N2XY 3x50 RM+25 RM Eca

### **U-1000 R2V – single core**

- U-1000 R2V 1x10 RM Eca
- U-1000 R2V 1x16 RM Eca
- U-1000 R2V 1x25 RM Eca

- U-1000 R2V 1x35 RM Eca
- U-1000 R2V 1x50 RM Eca
- U-1000 R2V 1x70 RM Eca
- U-1000 R2V 1x95 RM Eca
- U-1000 R2V 1x120 RM Eca
- U-1000 R2V 1x150 RM Eca
- U-1000 R2V 1x185 RM Eca
- U-1000 R2V 1x240 RM Eca
- U-1000 R2V 1x300 RM Eca
- U-1000 R2V 1x400 RM Eca
- U-1000 R2V 1x630 RM Eca
- U-1000 R2V 1x800 RM Eca

#### **U-1000 R2V – 2 core**

- U-1000 R2V 2x1,5 RE/coil Eca
- U-1000 R2V 2x6 RM Eca
- U-1000 R2V 2x10 RM Eca
- U-1000 R2V 2x16 RM Eca
- U-1000 R2V 2x25 RM Eca
- U-1000 R2V 2x35 RM Eca
- U-1000 R2V 2x50 RM Eca
- U-1000 R2V 2x70 RM Eca
- U-1000 R2V 2x95 RM Eca

#### **U-1000 R2V – 3 core**

- U-1000 R2V 3G1,5 RE Eca
- U-1000 R2V 3G1,5 RE/100 m Eca
- U-1000 R2V 3G2,5 RE Eca
- U-1000 R2V 3G2,5 RE/coil Eca
- U-1000 R2V 3G4 RE Eca
- U-1000 R2V 3G6 RM Eca
- U-1000 R2V 3G10 RM Eca
- U-1000 R2V 3G16 RM Eca
- U-1000 R2V 3G35 RM Eca
- U-1000 R2V 3x10 RM Eca
- U-1000 R2V 3x16 RM Eca
- U-1000 R2V 3x95 RM Eca
- U-1000 R2V 3x150 RM Eca
- U-1000 R2V 3x185 RM Eca
- U-1000 R2V 3x240 RM Eca

#### **U-1000 R2V – 4 core**

- U-1000 R2V 4G1,5 RE Eca
- U-1000 R2V 4G1,5 RE/coil Eca
- U-1000 R2V 4G2,5 RE Eca
- U-1000 R2V 4G4 RE Eca
- U-1000 R2V 4G10 RM Eca
- U-1000 R2V 4G16 RM Eca

- U-1000 R2V 4G25 RM Eca
- U-1000 R2V 4G35 RM Eca
- U-1000 R2V 4G50 RM Eca
- U-1000 R2V 4G70 RM Eca
- U-1000 R2V 4G95 RM Eca
- U-1000 R2V 4x6 RM Eca
- U-1000 R2V 4x10 RM Eca
- U-1000 R2V 4x16 RM Eca
- U-1000 R2V 4x25 RM Eca
- U-1000 R2V 4x35 RM Eca
- U-1000 R2V 4x50 RM Eca
- U-1000 R2V 4x70 RM Eca
- U-1000 R2V 4x95 RM Eca
- U-1000 R2V 4x120 RM Eca
- U-1000 R2V 4x150 RM Eca
- U-1000 R2V 4x185 RM Eca
- U-1000 R2V 4x240 RM Eca

#### **U-1000 R2V – 5 core**

- U-1000 R2V 5G1,5 RE Eca
- U-1000 R2V 5G1,5 RE/coil Eca
- U-1000 R2V 5G2,5 RE Eca
- U-1000 R2V 5G2,5 RE/coil Eca
- U-1000 R2V 5G4 RE Eca
- U-1000 R2V 5G6 RM Eca
- U-1000 R2V 5G10 RM Eca
- U-1000 R2V 5G16 RM Eca
- U-1000 R2V 5G25 RM Eca
- U-1000 R2V 5G35 RM Eca
- U-1000 R2V 5G50 RM Eca
- U-1000 R2V 5G70 RM Eca
- U-1000 R2V 5G95 RM Eca

#### **U-1000 R2V – 7 core**

- U-1000 R2V 7G1,5 RE/ŞP Eca



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