



ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Metal profiles for drywall systems, including UD, CD, UW, CW, and UA types
Kovostroj SRL



EPD HUB, HUB-5927

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



Created with One Click LCA



GENERAL INFORMATION

MANUFACTURER

Manufacturer	Kovostroj SRL
Address	7 Principala Street, Locality: Mihai Viteazu Village County: Cluj County, Postal Code: 407405, Country: Romania
Contact details	office@kovostroj.ro
Website	www.kovostroj.ro

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Stefan Cosuta - Envirocert SRL
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☒ External verification
EPD verifier	Vera Durão, as an authorised verifier acting for EPD Hub Limited

PRODUCT

Product name	metal profiles for drywall systems, including UD, CD, UW, CW, and UA types
Additional labels	-
Product reference	-
Place(s) of raw material origin	Turkey, Ukraine, Romania
Place of production	Romania, Mihai Viteazu Village, Cluj County
Place(s) of installation and use	Romania
Period for data	november 2024 - october 2025
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	<10%
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	4,33

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kilogram
Declared unit mass	1 kg
Mass of packaging	0,008987 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	2,25
GWP-total, A1-A3 (kgCO ₂ e)	2,24
Secondary material, inputs (%)	54,5
Secondary material, outputs (%)	85
Total energy use, A1-A3 (kWh)	8,92
Net freshwater use, A1-A3 (m ³)	0,06

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Kovostroj SRL is a regional leader in the production of metal profiles for drywall systems, representing a benchmark of engineering precision and industrial responsibility. With consolidated expertise and a forward-looking vision, the company delivers essential structural solutions for the modern construction sector, focused on efficiency, durability, and seismic performance.

Technology and Quality Kovostroj's production is based on state-of-the-art cold-roll forming processes, using premium raw materials—galvanized steel with superior anti-corrosive protection. Every profile (from CD 60 and UD 28 to CW and UW studs) is manufactured with minimal dimensional tolerances, ensuring rapid installation and impeccable structural integrity for the finished wall or ceiling.

This Environmental Product Declaration (EPD) highlights Kovostroj SRL's transparency and dedication to the circular economy. The company actively monitors the carbon footprint of its products, implementing strategies to optimize resource consumption:

Recyclability: All metal profiles produced are 100% recyclable at the end of their life cycle, contributing to the reduction of construction waste.

Internal production processes are calibrated to minimize material loss (scrap rate), with all technological off-cuts being fully reintegrated into the metal recycling stream.

Through constant investment in research and development, Kovostroj SRL offers more than just structural elements; it provides strategic partnerships for developers, architects, and contractors aiming for green building certifications (such as LEED, BREEAM, or DGNB). Choosing Kovostroj profiles guarantees a safe construction, compliant with European environmental and quality standards.

PRODUCT DESCRIPTION

This EPD covers the professional range of cold-formed steel profiles manufactured by Kovostroj SRL, designed for high-performance interior partitions and ceiling systems. The product group includes various types such as UD, CD, UW, CW, and UA profiles. These components provide the essential structural framework for modern drywall construction.

All products in this group share the same fundamental environmental profile due to:

- Raw Material: every profile is manufactured from the same grade of galvanized steel sourced from the same suppliers.
- Production process: all products undergo an identical cold-roll forming process at the same manufacturing facility in Romania.
- Life cycle: they share identical scenarios for transport (A4), installation (A5), and end-of-life (C1-C4 and D)

The environmental impacts are declared per 1 kg of galvanized steel profile. Since the manufacturing energy and raw material consumption are directly linked to the amount of steel processed, the Global Warming Potential (GWP) and other environmental indicators are consistent across the entire product range when measured by mass. The results presented in this study reflect the average production data for the entire product group, as all profiles share the same galvanized steel grade and undergo the same cold-rolling manufacturing process. To assist users in calculating the environmental impact per linear meter for specific profiles, a technical data table providing the specific mass per meter (kg/m) for each product in the group is provided in Annex 1.

Product Range

Standard Profiles: CD 60 and UD 28 for ceiling grids and wall linings.

Partition Profiles: CW (studs) and UW (tracks) in 50/75/100/125/150 mm widths.

Reinforced Profiles: UA high-load stiffening profiles for door frames and structural reinforcement.

Technical Specifications

Material: Galvanized steel (DX51D - Z100/Z140), ensuring superior corrosion resistance.

Thickness: ranging from 0.4 mm up to 2.0 mm.

Fire Safety: Classified as Class A1 (Non-combustible) according to EN 13501-1.

Quality Standards

The production and testing processes strictly adhere to the following European benchmarks:

- EN 14195: The governing standard for metal framing components in gypsum board systems.
- EN 10346: Standard for continuously hot-dip coated steel flat products.
- EN ISO 6892-1:2010: Standard for metallic materials tensile testing, ensuring precise mechanical properties and yield strength.

These profiles are engineered for high structural rigidity and precise assembly, offering a 100% recyclable solution that supports sustainable building certifications such as LEED or BREEAM.

Further information can be found at:

www.kovostroj.ro



PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	100%	Turkey, Ukraine, Romania
Minerals	-	-
Fossil materials	-	-
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0,0055

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kilogram
Mass per declared unit	1 kg
Functional unit	-
Reference service life	-

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

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

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

Not declared = ND.

MANUFACTURING AND PACKAGING (A1-A3)

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

A market-based approach is used in modelling the electricity mix utilized in the factory.

A1 – Raw Material Supply

This stage includes the extraction, processing, and delivery of the primary materials that form the Kovostroj galvanized steel profiles. For these products, the main raw materials include:

- Galvanized steel coils (primary material).
- Packaging materials (steel strapping, timber skids, PP stripes).

Supplier-specific data, together with appropriate background data derived primarily from the Ecoinvent database, are used to model these flows. The quantities and environmental burdens of all material inputs are tracked and allocated to the declared unit.

A2 – Transport to Factory

This stage covers the transportation of raw materials from the suppliers to the Kovostroj manufacturing plant. It includes inbound logistics for steel coils and auxiliary packaging components. Transport distances reflect actual recorded logistics data from suppliers to the manufacturing site. Transport emissions calculations are based on these real distances, typical heavy-duty vehicle types, estimated load factors, and fuel consumption, including assumptions on empty-return trips.

A3 – Manufacturing, Finishing and Packaging

In this stage, the galvanized steel coils are transformed into finished profiles for drywall structures. Key processes at Kovostroj include:

- cold roll forming: galvanized steel coils are decoiled and passed through a series of rollers to achieve the specific profile geometry (e.g., CD, UD, CW, UW types).
- cutting and punching: profiles are cut to standard or custom lengths and perforated for installation requirements.
- quality control: dimensional checks and zinc coating thickness verification to ensure compliance with applicable standards (e.g., EN 14195).
- internal handling: handling within the factory and storage of finished bundles until dispatch.

Production losses (metal scrap and off-cuts) generated during the roll-forming process are included in the inventory. A loss rate of 1% was taken into account in this study, according to production-specific data.

Packaging and preparation for transport: includes the bundling of profiles and loading onto pallets or supports. Packaging materials are included, and any losses from production (e.g., strapping scrap, packaging waste) are recorded.

Waste management: waste materials generated during manufacturing (primarily steel scrap and packaging waste) are collected and sent for recycling or disposal in accordance with internal procedures. Steel scrap is typically 100% recyclable, reducing the demand for virgin material. These wastes are transported to authorized facilities located at an average distance of ~50 km from the site.

Electricity mix and modeling approach

In the absence of supplier-specific contractual instruments (such as Guarantees of Origin), and in line with the requirements of EN 15804:2012+A2:2019. The energy profile of the manufacturing process includes multiple sources to ensure a precise assessment:

- Electricity: the facility utilizes a combination of on-site renewable energy produced via a photovoltaic (PV) system and electricity from the national grid. For the grid-purchased portion, a residual electricity mix representative of the Romanian geographic market is used, in line with EN 15804+A2.
- Thermal energy and fuels: the modeling also accounts for the consumption of natural gas for heating and specific fuels used for internal logistics and facility operations during the production stage.*

System boundary and cut-off criteria

The system boundary for modules A1–A3 follows the 'Cradle-to-Gate' approach, including raw material extraction, transport to the manufacturing site, and all production energy and processes under Kovostroj's control. Cut-off criteria: All major raw materials (galvanized steel coils), energy consumption (electricity, fuels), and packaging materials are included in the inventory.

The study applies a cut-off rule where neglected flows do not exceed 1% of the total mass or energy of a specific unit process, and the total of excluded flows per module does not exceed 5%. In practice, minor materials such as lubricants for the roll-forming machines, equipment maintenance parts, and office-related activities have been excluded as their environmental impact is estimated to be well below the significance threshold. No hazardous substances or materials with high environmental relevance have been intentionally omitted.

Data Quality and Representativeness

The data used reflect the actual production period (november 2024 - october 2025) for Kovostroj's manufacturing operations. Foreground data (plant energy consumption, material usage, waste data) are collected from internal monitoring. Background data (e.g., upstream material production, transport emissions) are derived primarily from the Ecoinvent database and/or One Click LCA database, consistent with EN 15804.

TRANSPORT AND INSTALLATION (A4-A5)

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

A4 – Transport to Building Site: This module covers the transport of finished profiles from the Kovostroj factory to the installation site. Profiles are bundled, secured, and loaded onto heavy-duty trucks for an average transport distance of 277 km, based on distribution records from analyzed period. Emissions and fuel consumption are modeled using typical vehicle profiles and load factors derived primarily from the Ecoinvent database, in accordance with actual logistics data.

A5 – Installation into the Building: This stage includes the integration of profiles into the building structure. A 5% product loss (off-cuts) is assumed and modeled as waste generated on-site. In line with cut-off criteria, energy for assembly and auxiliary materials like screws or tapes are excluded. Waste management for A5 is based on regional practices: steel profile off-cuts are 85% recycled, cardboard packaging is 83% recycled and 8% incinerated, and steel strapping is 81% recycled. For other materials, wood pallets are 32% recycled, 30% incinerated, and 38% landfilled, while plastic film is 40% recycled, 37% incinerated, and 23% landfilled. All A5 waste is assumed to be transported ~50 km to authorized regional treatment facilities.

System Boundary and Data Quality: The boundary includes all activities from the factory gate until the product is installed, excluding non-related commissioning. Neglected flows do not exceed the 5% cut-off threshold for mass or energy. Foreground data are based on Kovostroj records, while background data and emission factors are derived primarily from the Ecoinvent database, compliant with EN 15804.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

C1 – Deconstruction / Disassembly: At the end of their service life, the steel profiles are mechanically removed from the drywall structures. This process is straightforward, requiring only basic manual or low-power electric tools with negligible energy demand. The environmental impact of Module C1 is considered minimal, primarily associated with handling and the removal of fastening elements.

C2 – Transport to Waste Processing: Disassembled profiles are transported to metal scrap collection and recycling facilities. An average transport distance of ~50 km via standard heavy-duty trucks is assumed. Emissions and fuel consumption are calculated based on this distance and typical load factors for metal waste, using background data primarily from the Ecoinvent database.

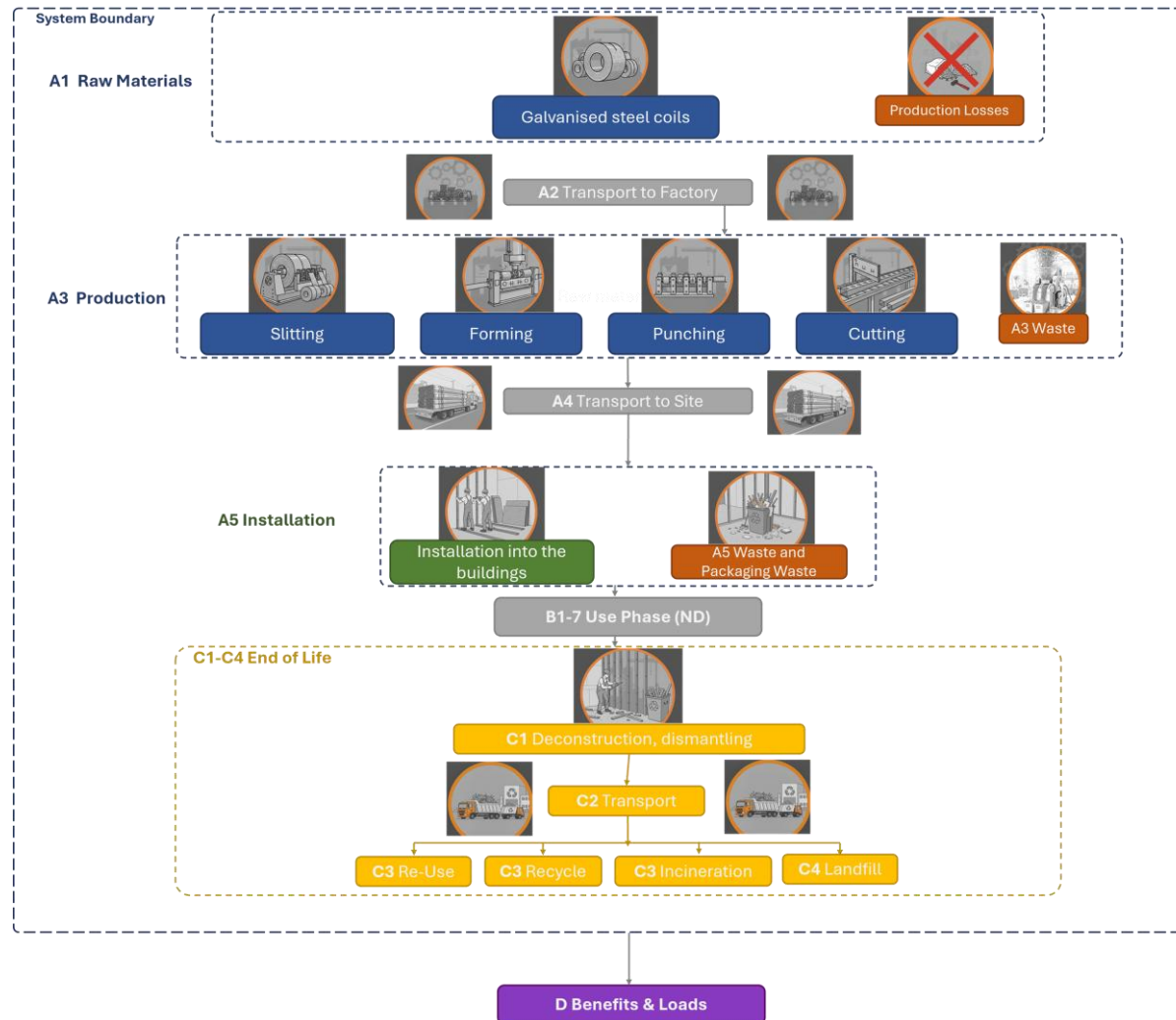
C3 – Waste Processing / Recovery: The galvanized steel profiles undergo mechanical processing, including sorting and baling, to enter the recycling stream. In this model, 85% of the steel profile mass is assumed to be successfully recycled and sent to the secondary metal market, reflecting representative recovery rates for construction steel. Energy consumption for sorting and shredding is accounted for using recognized industrial waste-processing datasets.

C4 – Final Disposal: The remaining 15% of the material (consisting of technical losses, non-recovered fractions, or contaminated scrap) is directed to final disposal in non-hazardous landfills, in compliance with regional environmental regulations.

Module D – Benefits and Loads Beyond the System Boundary

Module D accounts for the net environmental benefits resulting from material recovery at the end of life, avoiding double counting in accordance with EN 15804+A2. Recycling Benefits (Steel): Since 85% of the steel is recovered and used as secondary raw material, it substitutes the production of an equivalent amount of primary steel. These avoided impacts are reported as negative flows. To prevent double counting, Module D includes benefits only for the primary share of steel originally used in the product, ensuring that the environmental benefit of any recycled content already present in Module A1 is not duplicated. Packaging Benefits: Cardboard (83% recycled), steel strapping (81% recycled), and wooden packaging materials that are recovered or incinerated with energy recovery also generate avoided burdens by displacing virgin resource production or fossil fuel consumption. This ensures that Module D reflects only the net environmental benefits beyond the system boundary.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

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

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

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

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

Data type	Allocation
Raw materials	Allocated by mass or volume
Packaging material	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on average results of product group - by total mass
Variation in GWP-fossil for A1-A3, %	<10%

Because all profiles are made from the same galvanized steel grade and produced via the same roll-forming process, the environmental impact is directly proportional to the product's mass. A mass-based allocation was used to distribute factory-level energy and waste data. To allow for the declaration of the entire product family, a scaling factor is provided at the end of the document.

To assist users in calculating the impact per linear meter for specific profiles, a conversion table providing the weight per meter (kg/m) for each profile is included at the end of the document.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.4. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

The life cycle assessment for Kovostroj galvanized steel profiles utilizes a combination of high-quality data sources to ensure representativeness, transparency, and compliance with EN 15804:2012+A2 and the applicable PCR. These sources include:

Background LCA Database: The majority of upstream and downstream processes—including raw material extraction (galvanized steel), transport emissions, energy mixes, and waste treatment—are modeled primarily using the Ecoinvent database. This ensures robust, geographically appropriate, and EN 15804-compatible life cycle inventory datasets.

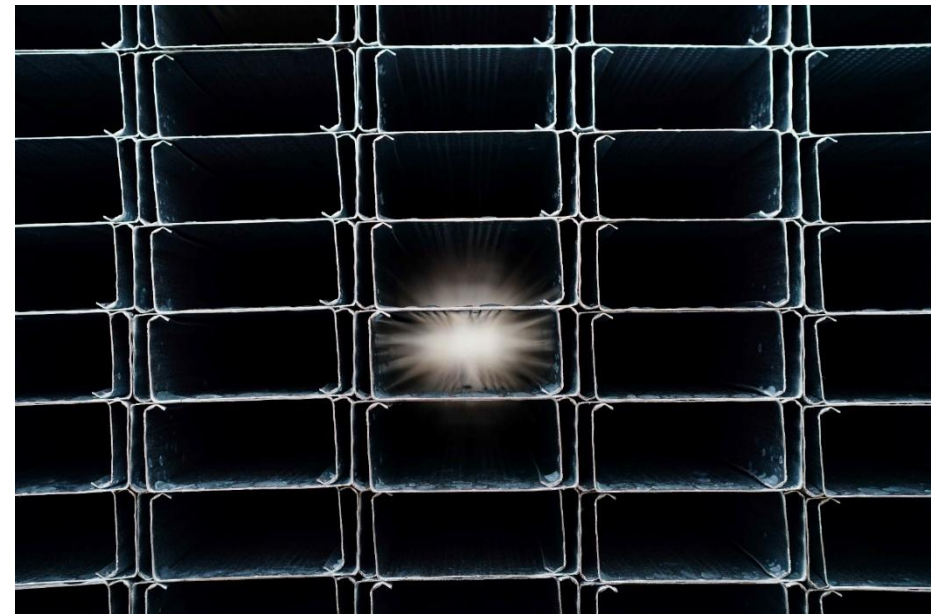
Manufacturer Operational Records: Foreground data for the steel profile manufacturing process (e.g., specific steel usage, electricity consumption, production scrap rates, and actual logistics data for raw material delivery) are based on internal Kovostroj operational and monitoring records. These data reflect actual site performance for the reference production period.

Scaling and Technical Specifications: Product-specific technical data, including dimensions and weight per linear meter (kg/m) used for the scaling table, are

derived from Kovostroj's official technical catalogues and quality control records to ensure accurate mass-balance modeling across the entire product range.

Statistical Data and Assumptions: Where specific measured data are unavailable, official statistics (e.g., national energy profiles, Eurostat, or transport statistics) are used to support background modeling assumptions, such as vehicle fuel consumption and regional waste management infrastructure.

All assumptions and data selections are documented and verified for representativeness. This combined approach ensures that the LCA results reflect actual industrial practice, are consistent with recognized methodologies, and support robust, transparent EPD results.



ENVIRONMENTAL IMPACT DATA

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

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

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO ₂ e	2,17E+00	8,64E-02	-1,00E-02	2,24E+00	5,41E-02	1,43E-01	ND	ND	ND	ND	ND	ND	ND	ND	5,39E-03	1,89E-02	9,39E-04	-7,67E-01
GWP – fossil	kg CO ₂ e	2,15E+00	8,64E-02	1,47E-02	2,25E+00	5,41E-02	1,17E-01	ND	ND	ND	ND	ND	ND	ND	ND	5,38E-03	1,91E-02	9,38E-04	-7,64E-01
GWP – biogenic	kg CO ₂ e	1,38E-02	1,95E-05	-2,48E-02	-1,10E-02	1,07E-05	2,58E-02	ND	ND	ND	ND	ND	ND	ND	ND	1,22E-06	-2,75E-04	4,21E-07	-3,00E-03
GWP – LULUC	kg CO ₂ e	3,60E-03	3,57E-05	2,15E-05	3,66E-03	1,91E-05	1,85E-04	ND	ND	ND	ND	ND	ND	ND	ND	2,41E-06	2,36E-05	5,38E-07	-2,85E-04
Ozone depletion pot.	kg CFC-11e	1,74E-07	1,67E-09	5,14E-10	1,77E-07	1,08E-09	8,91E-09	ND	ND	ND	ND	ND	ND	ND	ND	7,95E-11	2,54E-10	2,61E-11	-3,04E-09
Acidification potential	mol H ⁺ e	7,90E-02	3,79E-04	7,35E-05	7,94E-02	1,69E-04	3,99E-03	ND	ND	ND	ND	ND	ND	ND	ND	1,84E-05	2,28E-04	6,57E-06	-3,34E-03
EP-freshwater ²⁾	kg Pe	6,27E-05	6,34E-06	2,12E-06	7,12E-05	3,58E-06	4,24E-06	ND	ND	ND	ND	ND	ND	ND	ND	4,19E-07	1,27E-05	8,21E-08	-3,69E-04
EP-marine	kg Ne	4,56E-03	1,20E-04	2,40E-05	4,70E-03	5,70E-05	2,44E-04	ND	ND	ND	ND	ND	ND	ND	ND	6,03E-06	5,06E-05	2,52E-06	-7,54E-04
EP-terrestrial	mol Ne	3,26E-01	1,31E-03	2,55E-04	3,27E-01	6,20E-04	1,64E-02	ND	ND	ND	ND	ND	ND	ND	ND	6,56E-05	5,72E-04	2,76E-05	-8,22E-03
POCP (“smog”) ³⁾	kg NMVOCe	1,02E-02	5,19E-04	8,88E-05	1,08E-02	2,65E-04	5,63E-04	ND	ND	ND	ND	ND	ND	ND	ND	2,70E-05	1,70E-04	9,95E-06	-2,70E-03
ADP-minerals & metals ⁴⁾	kg Sbe	1,06E-02	2,33E-07	1,04E-07	1,06E-02	1,77E-07	5,31E-04	ND	ND	ND	ND	ND	ND	ND	ND	1,50E-08	1,35E-06	1,40E-09	-4,00E-05
ADP-fossil resources	MJ	2,81E+01	1,24E+00	2,70E-01	2,96E+01	7,59E-01	1,54E+00	ND	ND	ND	ND	ND	ND	ND	ND	7,81E-02	2,58E-01	2,30E-02	-7,24E+00
Water use ⁵⁾	m ³ e depr.	1,34E+00	6,72E-03	5,83E-03	1,35E+00	3,73E-03	6,81E-02	ND	ND	ND	ND	ND	ND	ND	ND	3,86E-04	5,03E-03	1,01E-03	-1,93E-01

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

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

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	5,97E-07	8,33E-09	1,60E-09	6,07E-07	4,25E-09	3,07E-08	ND	ND	ND	ND	ND	ND	ND	ND	5,39E-10	3,12E-09	1,51E-10	-4,92E-08
Ionizing radiation ⁶⁾	kBq 11235e	1,15E-01	1,78E-03	3,77E-03	1,20E-01	9,68E-04	6,18E-03	ND	ND	ND	ND	ND	ND	ND	ND	6,80E-05	2,22E-03	1,38E-05	1,58E-02
Ecotoxicity (freshwater)	CTUe	1,11E+02	1,51E-01	1,42E-01	1,11E+02	9,97E-02	5,73E+00	ND	ND	ND	ND	ND	ND	ND	ND	1,10E-02	1,26E+00	1,54E-02	-1,10E+01
Human toxicity, cancer	CTUh	9,92E-09	1,47E-11	3,74E-12	9,94E-09	9,21E-12	4,98E-10	ND	ND	ND	ND	ND	ND	ND	ND	8,88E-13	1,69E-11	1,70E-13	-3,39E-10
Human tox. non-cancer	CTUh	1,48E-07	7,88E-10	9,15E-11	1,49E-07	4,77E-10	7,52E-09	ND	ND	ND	ND	ND	ND	ND	ND	5,06E-11	1,16E-09	3,83E-12	-1,25E-08
SQP ⁷⁾	-	6,64E+00	1,20E+00	3,85E-02	7,88E+00	4,52E-01	4,63E-01	ND	ND	ND	ND	ND	ND	ND	ND	7,87E-02	4,95E-01	4,52E-02	-2,45E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy ⁸⁾	MJ	2,35E+00	2,33E-02	1,14E-01	2,48E+00	1,31E-02	1,18E-02	ND	ND	ND	ND	ND	ND	ND	ND	1,07E-03	4,73E-02	2,15E-04	-5,37E-01
Renew. PER as material	MJ	0,00E+00	0,00E+00	2,23E-01	2,23E-01	0,00E+00	-2,23E-01	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	3,30E-02
Total use of renew. PER	MJ	2,35E+00	2,33E-02	3,37E-01	2,71E+00	1,31E-02	-2,11E-01	ND	ND	ND	ND	ND	ND	ND	ND	1,07E-03	4,73E-02	2,15E-04	-5,04E-01
Non-re. PER as energy	MJ	2,81E+01	1,24E+00	2,43E-01	2,96E+01	7,59E-01	1,54E+00	ND	ND	ND	ND	ND	ND	ND	ND	7,81E-02	2,58E-01	2,30E-02	-7,24E+00
Non-re. PER as material	MJ	0,00E+00	0,00E+00	1,81E-02	1,81E-02	0,00E+00	-1,81E-02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	9,00E-03
Total use of non-re. PER	MJ	2,81E+01	1,24E+00	2,61E-01	2,96E+01	7,59E-01	1,52E+00	ND	ND	ND	ND	ND	ND	ND	ND	7,81E-02	2,58E-01	2,30E-02	-7,23E+00
Secondary materials	kg	5,45E-01	5,73E-04	3,86E-04	5,46E-01	3,48E-04	2,73E-02	ND	ND	ND	ND	ND	ND	ND	ND	3,32E-05	3,14E-04	5,72E-06	4,19E-01
Renew. secondary fuels	MJ	0,00E+00	6,54E-06	2,33E-05	2,98E-05	4,39E-06	2,82E-06	ND	ND	ND	ND	ND	ND	ND	ND	4,22E-07	1,47E-05	1,19E-07	-5,88E-05
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m ³	6,34E-02	1,93E-04	1,36E-04	6,37E-02	1,02E-04	3,19E-03	ND	ND	ND	ND	ND	ND	ND	ND	1,15E-05	1,15E-04	2,38E-05	-3,26E-03

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	3,92E-01	1,93E-03	8,85E-04	3,95E-01	1,09E-03	1,99E-02	ND	ND	ND	ND	ND	ND	ND	ND	1,32E-04	1,70E-03	2,62E-05	-2,36E-01
Non-hazardous waste	kg	8,86E+00	3,89E-02	4,36E-02	8,94E+00	2,30E-02	4,63E-01	ND	ND	ND	ND	ND	ND	ND	ND	2,45E-03	6,70E-02	6,05E-04	-2,02E+00
Radioactive waste	kg	8,13E-05	4,43E-07	1,23E-06	8,30E-05	2,41E-07	4,19E-06	ND	ND	ND	ND	ND	ND	ND	ND	1,67E-08	5,67E-07	3,35E-09	4,14E-06

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	1,05E-02	1,05E-02	0,00E+00	4,60E-02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,50E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,60E-02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,00E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,00E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ⁹⁾	kg CO ₂ e	2,15E+00	8,64E-02	1,48E-02	2,26E+00	5,41E-02	1,17E-01	ND	ND	ND	ND	ND	ND	ND	ND	5,38E-03	1,91E-02	9,39E-04	-7,64E-01

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

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity, medium voltage, residual mix, Romania supplied by NOVA POWER & GAS SRL; conventional sources 58.13%, renewable sources 41.87%; Electricity CO ₂ e/KWh: 0.28 kgCO ₂ e/kWh Electricity production, photovoltaic, slanted-roof installation, multi-Si, panel Romania, Ecoinvent Electricity CO ₂ e/KWh: 0.077 kgCO ₂ e/kWh Transformation and transmission losses 9% according to national estimations
Heat production, natural gas	natural gas, at boiler atm. low-NO _x condensing non-modulating <100kW, Romania, Ecoinvent, 0.0764 kgCO ₂ e/MJ
Diesel	Market for diesel, burned in building machine, World, Ecoinvent, 0.10 kgCO ₂ e/MJ

Transport scenario documentation - A4 (Transport resources)

Scenario parameter	Value
Fuel and vehicle type	EURO5 truck 16-32 ton, diesel 0.25 litri/km
Average transport distance, km	277 km
Capacity utilization (including empty return) %	85%
Bulk density of transported products (kg/m ³)	9,09E-03
Volume capacity utilization factor	<1

Installation scenario documentation - A5 (Installation waste)

Scenario information	Value			
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	Wood packaging	0.00825		
	Plastic packaging	0.000425		
	Paper/Cardboard packaging	0.000201		
	Steel / Metal scrap	0.05		
Output materials as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal / kg		Wood packaging	Plastic packaging	Steel
	Recycling	0.00264	0.00017	0.0405
	Energy recovery	0.00248	0.00016	0
	Disposal	0.00314	0.0001	0.0019
Direct emissions to ambient air, soil and water / kg	0			

End of Life – Scenario documentation – C1-C4

Scenario information	Value
Collection process – kg collected separately	0.95
Collection process – kg collected with mixed waste	0.062
Recovery process – kg for re-use	0
Recovery process – kg for recycling	0.8075
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	0.1425

Scenario assumptions:

All waste materials generated at the end-of-life stage (C3 and C4) are assumed to be transported over a distance of 50 km to their respective treatment facilities (recycling centers, incineration plants, or landfills). The transportation is modeled using a standard heavy-duty vehicle (Lorry, >16-32 tons, EURO 5/6) with an average load factor.

THIRD-PARTY VERIFICATION STATEMENT

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

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

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

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

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

Verified tools

Tool verifier: Magaly Gonzalez Vazquez

Tool verification validity: 27 March 2025 - 26 March 2028

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

03.04.2026



ANNEX 1 – SCALLING FACTORS

Name	MATERIAL	Mass (kg/ml)	Global Warming Potential total kg CO2e
CD60/UE2	0.5 mm	0.414	0.928
CD60/RGP	0.65 mm	0.584	1.308
CD60/UE1	0.6 mm	0.509	1.139
UD28/MP	0.5 mm	0.242	0.542
UD28/RGP	0.6 mm	0.312	0.698
CW100/RGP	0.65 mm	0.956	2.142
CW75/RGP	0.65 mm	0.838	1.878
UD28/UE1	0.6 mm	0.300	0.672
CW50/RGP	0.65 mm	0.721	1.614
CW100/UE1	0.6 mm	0.848	1.899
CW75/UE1	0.6 mm	0.742	1.662
CW75/UE2	0.5 mm	0.546	1.222
UA100/UA	2.0 mm	2.536	5.680
CW50/UE2	0.5 mm	0.459	1.029
UW100/RGP	0.6 mm	0.750	1.681
UW75/RGP	0.6 mm	0.644	1.443
UA75/UA	2.0 mm	2.163	4.844
CW50/UE1	0.6 mm	0.636	1.424
CW100/UE2	0.5 mm	0.632	1.416
UW100/UE1	0.6 mm	0.742	1.662
UW50/RGP	0.6 mm	0.538	1.206
UA50/UA	2.0 mm	1.790	4.009
UW75/UE1	0.6 mm	0.636	1.424
UW75/MP	0.5 mm	0.459	1.029
CD60/ECO	0.4 mm	0.330	0.739
UW50/MP	0.5 mm	0.373	0.836

Name	MATERIAL	Mass (kg/ml)	Global Warming Potential total kg CO2e
UD28/UE2	0.45 mm	0.245	0.549
UW100/MP	0.5 mm	0.546	1.222
CW100/MP	0.5 mm	0.611	1.369
UW50/UE1	0.6 mm	0.530	1.187
CW75/MP	0.5 mm	0.525	1.176
CW75/UE2	0.6 mm	0.670	1.500
CW100/RGP	0.6 mm	0.848	1.899
CW50/MP	0.5 mm	0.439	0.983
CW75/RGP	0.6 mm	0.755	1.690
CW50/UE2	0.6 mm	0.564	1.263
CD60/MP	0.45 mm	0.377	0.844
UD28/ECO	0.40 mm	0.176	0.395
CW100/UE2	0.6 mm	0.776	1.738
UW75/UE2	0.6 mm	0.593	1.329
UD28/MP	0.45 mm	0.220	0.492
UD28/UE2	0.5 mm	0.269	0.603
CW50/RGP	0.6 mm	0.649	1.453
UW50/UE2	0.6 mm	0.487	1.092
UW100/UE2	0.5 mm	0.570	1.277
UD28/UE2	0.6 mm	0.297	0.665
UW100/60/UE1	0.6 mm	0.924	2.070
UW100/UE2	0.6 mm	0.699	1.567
UW50/UE2	0.5 mm	0.397	0.890
UW75/UE2	0.5 mm	0.484	1.083
UW50/UE2	0.45 mm	0.361	0.809
UW75/UE2	0.45 mm	0.440	0.985
UW75/80/UE1	1.0 mm	1.800	4.032
UW100/UE2	0.45 mm	0.518	1.161

Name	MATERIAL	Mass (kg/ml)	Global Warming Potential total kg CO2e
UW100/80/UE1	0.6 mm	1.229	2.754
UA75/UA	1.5 mm	1.707	3.825
UW100/80/UE1	1.0 mm	2.033	4.554
CW125/70/UE1	0.7 mm	1.236	2.769
CW150/UE1	0.6 mm	1.060	2.374
UW75/60/UE1	0.6 mm	0.818	1.833
UA50/UA	1.5 mm	1.413	3.165
CW100/UE1	0.5 mm	0.691	1.547
CW50/UE1	0.5 mm	0.518	1.161
UW50/80/UE1	0.6 mm	0.984	2.205
CW75/UE1	0.5 mm	0.604	1.354
UW50/80/UE1	1.0 mm	1.641	3.675
UA50/UA	1.75 mm	1.649	3.693
UW150/UE1	0.6 mm	0.962	2.155
UW50/UE1	0.5 mm	0.432	0.967
UW75/UE1	0.5 mm	0.518	1.161
UW100/UE1	0.5 mm	0.604	1.354
CW125/UE1	0.6 mm	0.865	1.939
UW75/80/UE1	0.6 mm	1.097	2.458
UA100/UA	1.5 mm	2.002	4.484
UW125/70/UE1	0.7 mm	1.110	2.486
UW125/UE1	0.6 mm	0.856	1.918
CW100/UE2	0.45 mm	0.575	1.287
CW75/UE2	0.45 mm	0.496	1.111
CW50/UE2	0.45 mm	0.418	0.935
UA100/UA	1.75 mm	2.335	5.231
UA75/UA	1.75 mm	1.992	4.462