



ENVIRONMENTAL PRODUCT DECLARATION

PRODUCT NAME:

1. E2M Meter
2. E2M Outdoor Meter

PRODUCTION SITE:

Via Pindaro, 19, 20128
Milano (MI)

in compliance with ISO 14025 and EN 50693

Program operator	EPDItaly
Publisher	EPDItaly
Declaration number	EPD-COL-TW- E2ME2MO_2023_REV. 1.0
Registration number	EPDITALY1262
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Valid to	22/07/2031



1. GENERAL INFORMATION

www.epditaly.it

GENERAL INFORMATION

EPD OWNER	
Company name	Col Giovanni Paolo S.p.A. (www.colgp.it)
Registered office	Via Antonio Chiribiri, 1, 10028 Trofarello (TO)
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PROGRAM OPERATOR	
EPDItaly	EPDItaly – info@epditaly.it Via Gaetano De Castillia n° 10 - 20124 Milan, Italy

EPD INFORMATION	
Product Name(s)	E2M meter and E2M Outdoor meter
Production site(s)	TW-TeamWare SRL Via Pindaro, 19, 20128 Milano (MI)
Brief description and technical information of the product(s)	The E2M and E2M Outdoor meters are multi-function electronic meters for measuring and recording electrical quantities on three-phase lines. The most important technical specification of the products required when declaring the functional unit for the LCA study as per PCR011 are stated in Table 1 on Page 4 of 16 of this EPD report
Scope of application of the product(s)	The E2M and E2M Outdoor meters are electronic energy meters manufactured at the COL GROUP production site in Milan (TEAMWARE) in 2023 for installation (both indoor and outdoor) and use as multi-function electronic meter for measuring and recording electrical quantities on three-phase lines within sites in Italy

Type of EPD	Product-specific EPD based on a qualified TOOL “LCA-COL GROUP Tool 3.0” of 29/06/2026.
Product reference standards (if any)	This information is available in Table 1 on Page 4 of 16 of this EPD report
CPC Code (number) https://unstats.un.org/unsd/classifications/Econ	4621 “Electricity distribution or control apparatus”

VERIFICATION INFORMATION	
PCR – Product Category Rules (title, version, publication or update date)	Core PCR: EPDItaly007 – PCR for Electronic and Electrical Products and Systems, REV 3.2, Issue date 10/12/2025 Sub-category PCR: EPDItaly011, Electronic and electrical products and systems – Meters, REV. 1, Issue date 01/07/2024
EPDItaly Regulation (version, publication date or update)	Regulations of the EPDItaly Programme. Revision 7.1. Issue date 05/09/2025
LCA Project Report	The LCA Project Report submitted consists of the Input Resume, Plant Resume, EPD Results and R&D Results for the E2M and E2M Outdoor meters automatically generated on 13/07/2026 using the LCA TOOL “LCA-COL GROUP Tool 3.0” of 29/06/2026.
Independent verification statement	This declaration has been developed in accordance with the regulations of EPDItaly; further information and the same regulations are available at: www.epditaly.it Independent verification of the declaration and data carried out in accordance with ISO 14025: 2010 ☐ Internal ☒ External Third party verification done by: ICMQ S.p.A. (www.icmq.it), Via Gaetano De Castillia, 10, 20124 Milano (MI) – Italia. Accredited by ACCREDIA, Accreditation number 00064 Validation and Verification REV. 007, review date 28/01/2026
Comparability statement	EPDs published within the same product category though originating from different programs may not be comparable. Full conformance with a PCR allows EPD

	comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible.
Responsibility statement	The EPD owner relieves EPDItaly from any non-compliance with the environmental legislations. The holder of the declaration will be responsible or liable for the supporting information and evidence. EPDItaly disclaims any liability regarding the manufacturer's information, data, and results provided by the EPD Owner for the life cycle assessment.

MORE INFORMATION	
Reference documents	EN ISO 14025:2010, Environmental labels and declarations – Type III environmental declarations – Principles and procedures EN 50693:2019 - Product category rules for life cycle assessments of electronic and electrical products and systems.

2. THE COMPANY

Col Giovanni Paolo S.p.A. (COL GROUP) is a leading Italian company owned by Oaktree Capital Management, L.P. in the fast-growing global energy transmission and distribution market. It specializes in the development and production of critical components and advanced solutions for smart grid applications in medium and high voltage electrical infrastructure with sustainability at the heart of all its activities. COL GROUP has been working to support the sustainable future of our planet and the long-term success of its customers as well as the company's own business. This is underpinned by the ambitions embodied in two of COL GROUP's Strategy 2030 goals i.e., to lead with low-carbon circular economy solutions, and to enhance sustainability across the value chain. The company possesses numerous certifications according to international standards, among which are UNI EN ISO 9001:2015, UNI EN ISO 14001:2015, UNI ISO 45001:2018, UNI EN ISO 50001:2018, and ISO 27001: 2013. Established in 1920, COL GROUP has accumulated valuable experience in the electro-technical and plant engineering fields for over a century, and it is among the few authorized suppliers for major utility companies in Europe, Middle East, South America, and Southeast Asia. The company has developed a highly innovative technology portfolio in medium voltage switchgear, substation automation, battery control systems and several other smart grid and high-voltage applications in collaboration with other dominant global utilities and industrial players. Over the years, COL GROUP has registered significant growth through the acquisition of several companies in the electronic, energy systems, railway, and electromechanical sectors. The ever-expanding

company now has modern production sites in Torino, Catania, Milano, Cremona, and Bergamo with over 500 highly specialized and efficient employees led by a brilliant management team.

3. THE PRODUCTS

E2M and E2M Outdoor

The E2M and E2M Outdoor are multi-function electronic meters for measuring and recording electrical quantities on three-phase lines. It is possible to integrate a GSM/GPRS module, an Ethernet 10/100BaseT interface, a local RS232 serial port, a RS485 field serial bus and use TCP-IP-based protocols. The E2M (**left photograph on the cover page**) is the ideal tool both for creating complex and geographically distributed energy monitoring and accounting networks, and for creating stand-alone applications where it is necessary to have a reliable and precise measurement device. E2M can be equipped with specific application modules for interfacing with pulse emitters, with field technological devices (PLC, air conditioning systems, alarms) and for the acquisition of process data to be correlated with energy data. The E2M Outdoor (**right photograph on the cover page**) consists of a fully assembled E2M device plus some accessories housed in a rectangular box made of fibreglass for protection against harsh weather conditions. The E2M and E2M Outdoor devices are extremely easy to use. The user has at his disposal not only a complete monitoring device, but also a real measuring instrument and electricity meter in class 1. Typical applications are: SUB METERING: measurement in parallel to primary energy meters for real-time recovery of consumption, pending official data provided by the energy distributor, PHOTOVOLTAIC SYSTEMS: measurement and balance of the energy produced, PUBLIC LIGHTING: measurement of absorbed energy with diagnostics of light points, COMPENDIUM: industrial monitoring for the analysis of energy measures and costs and their consequent optimization; measurement campaigns for the verification of the efficiency of electrical machines.

Technical specifications

The most important technical specification of the products required when declaring the functional unit for the LCA study as per PCR011 are stated in **table 1**. More detailed technical requirements are available in the product datasheets.

Table 1. The mandatory technical requirements of the products declared in accordance with PCR011

Product name	E2M	E2M Outdoor
TEAMWARE product code	070S4190	070S4174
Nominal voltage	3 x 230/400 Vac for direct or semi-direct connection, 3 x 100 Vac for indirect connection	
Frequency	50/60 Hz	
Performance class	Class 1 for active energy (class 0.5 on request), Class 2 for reactive energy	
Reference standards	IEC 62053-21 – Class 1 active energy IEC 62053-23 – Class 2 reactive energy IEC 62053-31 – Pulse output devices	

	IEC 62053-61 – Power consumption and voltage requirements Electromagnetic compatibility: • Immunity: EN61000-6-2 • Emission: EN61000-6-4	
Current intensity	Direct insertion on LV networks: • Basic current Ib: 10 Aac • Maximum current Imax: 60 Aac Semi-direct or indirect insertion: • Basic current Ib: 1 Aac • Maximum current Imax: 5 Aac	
Product net weight (kg)	1,570	9,219

Material composition

The declaration on the content of materials for the fully assembled products was done by the manufacturer in accordance with EN IEC 62474. The material class name, unique ID, and percentage mass share of all the materials and declarable substances contained in the fully assembled product plus its packaging are shown in **table 2**.

Table 2. Material composition for the fully assembled product together with its packaging

Material class name	ID	Percentage mass share	
		E2M	E2M Outdoor
Other ferrous alloys, non-stainless steels	M-119	2,5089%	2,6468%
Copper and its alloys	M-121	36,9478%	17,5349%
Other inorganic materials	M-199	24,5991%	4,7067%
PolyVinylChloride (PVC)	M-200	0,8610%	25,4852%
PolyCarbonate (PC)	M-204	2,1734%	0,4070%
Acrylonitrile-Butadiene-Styrene (ABS)	M-206	26,1283%	4,5914%
Other duromers	M-319	-	40,8277%
Paper	M-341	6,7815%	3,8004%

Reference service life

The reference service life (RSL) of the product was taken as 20 years according to PCR EPDItaly011 – Meters.

4. SCOPE AND TYPE OF EPD

This is a product-specific EPD in compliance with ISO 14025 and EN 50693 under the EPDItaly regulations for the E2M and E2M Outdoor that are multi-function electronic meters for measuring and recording electrical quantities on three-phase lines, manufactured at TEAMWARE for installation and use as indoor and outdoor equipment within the Italian territory. It is based on a cradle to grave life cycle assessment

(LCA) methodology in accordance with the ISO 14040 and 14044 standards considering the current technological level worldwide. The geographical and temporal scope for the data considered in this study are summarized in **table 3**. The environmental performance results from the LCA were automatically generated using the excel-based LCA tool “LCA-COL GROUP Tool 3.0” of 29/06/2026., and they were intended for internal research and development (R&D), as well as external B2B and B2C communication to facilitate accurate sustainability-oriented business choices through product comparisons.

Table 3. The geographical and temporal scope considered at the current global level of technology

Representativeness	Scope
Geographical	Italy
Timeframe	2023

Functional unit

The functional unit (FU) for this LCA was a fully assembled, tested, and packaged E2M and E2M Outdoor devices, as described earlier under **section 3** of this document with the technical specifications reported in **table 1**, manufactured at TEAMWARE in 2023, distributed and installed for use as multi-function electronic meters for measuring and recording electrical quantities on three-phase lines within the Italian territory, functioning nonstop during a RSL of 20 years.

System boundary

The system boundary adopted in this LCA followed the cradle-to-grave perspective i.e., covering the entire lifecycle of the final products as shown in **table 4** with the life cycle stages for all the major activities involved, grouped into three distinct modules i.e., upstream, core, and downstream with reference to EN 50693. The product life cycle and inventory analysis describing all the activities conducted at each of the lifecycle stages, simplifying assumptions, and modelling scenarios used in the LCA has been thoroughly performed in **section 5** of this document.

Table 4. The life cycle stages, geographical scope, and modules declared in the system boundary

Manufacturing			Distribution	Installation	Use	End of life
CN	IT	IT	IT	IT	IT	IT
Upstream		Core	Downstream			
✓		✓	✓	✓	✓	✓

CN = China, IT = Italy, ✓ = Lifecycle stages and modules declared in the LCA

Cut-off criteria

The mandatory cut-off for mass and energy flows in this LCA study was set at 1% as defined and modelled in the LCA TOOL “LCA-COL GROUP Tool 3.0” of 29/06/2026. All the material and energy flows within the system boundary known to have potential to cause significant impacts on the LCA results have been accounted for. However, cut-off was applied to the potential impacts that could have resulted from production and disposal of the packaging materials of all the semi-finished products included in the BOMs (e.g., plastics, electronics, screws, fibre glass, etc.) transported to TEAMWARE for processing and later

assembling of the final product as it was assumed that such impacts were negligible. On top of that, a cut-off was similarly applied to the impacts associated with the skilled labour required during installation and dismantling of the products at their end-of-life. Potential impacts that could have arisen from ordinary or extraordinary maintenance were ignored since the products were assumed to be maintenance free for the entire expected service life.

Allocation rules

The allocation criteria adopted for the LCA model was guided by the reference PCR of the product being studied. Since many other products are produced at the reference site, the “multi-output” allocation rule was applied to distribute the environmental burden among these multiple products. The primary data relating to waste generation, water consumption, and energy consumption (petrol, natural gas, and electricity) used was provided for the reference year, and these were allocated based on economic aspects (revenue generated in millions of euros) to obtain the allocation factor for the product under study, computed using the total annual revenue of the company production site (TEAMWARE), annual revenue from selling the products being studied, and the number of the studied products sold in the reference year.

Data quality

The most recent and verifiable site-specific data collected in the reference year 2023 was used in this study, and the International System of Units (SI) was adopted while recording the data. The initial primary data forming the basis for the LCA were the production specifications i.e., BOMs (having net weights), mechanical drawings, and technical standards provided by TEAMWARE to its external suppliers for each sub-assembly of the final product, and these were analyzed using Microsoft excel. The structural and electronic components were manually weighed using a well calibrated weighing scale, photographs taken and recorded in an excel spreadsheet. Additional primary data used included the water and energy (petrol, electricity, and natural gas) consumption for the core activities at TEAMWARE premises during the reference year, and these were downloaded from the company’s reference production site account on the website of the service providers. A similar approach was applied to download annual data for fuel consumption by company vehicles that use electronic fuel cards. In addition to that, the distances from external suppliers to TEAMWARE were evaluated with the aid of Google Maps. The same technique was applied to determine the distributing distance across the various reference installation sites within Italy, and justification was provided for all the simplifying assumptions stated. In terms of secondary data, databases from legitimate sources already embedded in the LCA TOOL “LCA-COL GROUP Tool 3.0” of 29/06/2026 were used to obtain generic data for some up- and down-stream processes in the life cycle of the products.

5. PRODUCT LIFE CYCLE AND INVENTORY ANALYSIS

The life cycle inventory (LCI) lists and quantifies all the flows entering and leaving all the declared life cycle stages of the product within the system boundary considered in relation to the scope of the study. The

reference flow for the LCI is 1 piece of a fully assembled and packaged E2M and E2M Outdoor devices, whose individual weights are as indicated in **table 5**.

Table 2. Weights of the fully assembled and packaged E2M and E2M Outdoor devices

Product	E2M	E2M Outdoor
Total weight (kg)	1,684	9,583

Manufacturing

This first life cycle stage covers all the activities categorized under the upstream and core modules. The supply chain processes commence with the extraction of raw materials to produce sub-assemblies comprising of electronic and structural components which are constituents of the final products, and the packaging materials for the final products. The electronic components are ordinarily comprised of cables in compartments, connectors, capacitors, inductors, and resistors, whereas the structural component consists of plastics (and fibreglass made in Italy for E2M Outdoor), bolts, and screws. The production of these various components was done by external suppliers on their manufacturing sites whose distances from TEAMWARE were obtained using Google Maps. The electronic and structural components for the E2M were made in China and assumed to be shipped to the port of Genova and then transported by road in a 16 - 32 tonne EURO5 lorry to TEAMWARE where the core activities of assembling, testing, and final packaging of the products were done. The fully assembled products were then packaged by placing them in a cardboard box to minimize any potential damage during distribution. All but packaging wastes generated from all activities on-site (not limited to only production) are documented by category in the production site register and declared annually in the MUD *“Modello Unico di Dichiarazione ambientale”* following the applicable regulations and deadlines. Furthermore, these wastes were assumed to be transported in a 16 - 32 tonne ACI mix lorry to a waste treatment plant **50 km** away.

Distribution

From this point forth, all the activities are classified under the downstream module. The fully assembled and packaged products is loaded onto a 16 - 32 tonne EURO5 lorry for final delivery to the various installation sites throughout the Italian territory. All the sites where each of the products was distributed and installed during the reference year were considered and their distances (in kilometres) from TEAMWARE considering the fastest route were obtained from Google Maps. However, since the distribution each of the products was not homogeneous across the entire Italian territory, these distances were weighted against the quantity of the product distributed in each of the installation sites, and the sum of the various weighted distances (**table 6**) was taken as the distribution distance for each of the fully assembled and packaged products.

Table 3. Weighted distribution distance for the E2M and E2M Outdoor products

Product	E2M	E2M Outdoor
Distribution distance (km)	392,813	381,375

Installation

Upon arrival at any of the installation sites, the products are unloaded, carefully removed from the packaging, and installed together with batteries by skilled technicians for use as indoor and outdoor equipment within the Italian territory. The useful life of the Li-ion battery spans 3 to 5 years and it was assumed to be replaced after every of 4 years. It is exactly after installation of the product that the wooden pallets previously used for packaging are returned for reuse i.e., subsequent deliveries. At the end of life of the packaging materials, they are assumed to be transported in a 7 - 16 tonne EURO5 lorry to a waste treatment plant **50 km** away.

Use

Each of the perfectly installed E2M and E2M Outdoor products consume **525,6** and **700,8 kWh** of electricity, E_{use} , respectively, during a **RSL** of 20 years, operating constantly, and this was computed using **Equation 1** with **8760** representing the number of hours in a year; and **1000** is the conversion factor that allows the energy consumed in kWh over the products' service life to be expressed. The nominal power of the device (in Watts), P_{use} was obtained from the product datasheets of the E2M and E2M Outdoor devices.

$$E_{use}[\text{kWh}] = \frac{P_{use} * 8760 * \text{RSL}}{1000} \quad (1)$$

Each of the two devices have a small battery inside weighing **0,0059 kg**, which was assumed to be replaced every 4 years i.e., 4 times during the RSL of the product. An additional environmental information is that during the installation and use stages, both products do not emit any pollutants or substances which are dangerous for the environment and health.

End of life

At the end of the RSL of the products, the dismantling process and separation of the product components is done following guidelines given by the manufacturer, and the resulting wastes were assumed to be transported using a 7,5 - 16 tonne EURO5 lorry to a waste treatment plant located **50 km** away from the installation site.

6. LCA RESULTS

The environmental performance results of the products for the different lifecycle stages per FU accounting for all the mandatory environmental impact indicators (**Tables 7 and 10**) and descriptive parameters for resource use (**Tables 8 and 11**) and waste production (**Tables 9 and 12**) calculated as per Core PCR: EPDItaly007 and EN 50693 were automatically generated using the LCA TOOL "LCA-COL GROUP Tool 3.0" of 29/06/2026.

Environmental impacts for the E2M

Table 7. LCA results for the environmental impact indicators

Impact indicators	Unit of measurement	Manufacturing	Distribution	Installation	Use	End of life	TOTAL
GWP-total	kg CO ₂ eq.	5,13E+01	1,01E-01	6,02E-01	1,85E+02	1,51E+00	2,39E+02
GWP-fossil	kg CO ₂ eq.	5,12E+01	1,01E-01	4,10E-01	1,85E+02	1,51E+00	2,38E+02
GWP-biogenic	kg CO ₂ eq.	-6,53E-02	3,19E-06	1,92E-01	4,82E-01	1,55E-04	6,08E-01
GWP-luluc	kg CO ₂ eq.	1,05E-01	1,60E-06	4,56E-04	1,31E-02	2,04E-04	1,19E-01
ODP	kg CFC-11 eq.	2,09E-06	2,30E-09	6,30E-09	4,48E-06	1,58E-09	6,59E-06
AP	mol H ⁺ eq.	6,39E-01	2,62E-04	4,73E-03	5,67E-01	8,38E-04	1,21E+00
EP-freshwater	kg P eq.	9,15E-03	6,26E-08	2,89E-05	4,66E-03	4,35E-06	1,38E-02
EP-marine	kg N eq.	7,49E-02	9,98E-05	5,27E-04	9,57E-02	3,04E-04	1,72E-01
EP-terrestrial	mol N eq.	8,92E-01	1,09E-03	5,93E-03	1,09E+00	3,16E-03	1,99E+00
POCP	kg NMVOC eq.	2,79E-01	4,33E-04	1,84E-03	4,60E-01	8,53E-04	7,43E-01
ADP-min & met*	kg Sb eq.	1,80E-02	2,64E-09	4,39E-05	3,79E-05	1,70E-08	1,80E-02
ADP-fossil*	MJ	7,00E+02	1,35E+00	5,35E+00	3,15E+03	1,59E+00	3,86E+03
WDP*	m ³ eq. deprived	2,05E+01	4,41E-04	1,05E-01	9,26E+01	3,25E-02	1,13E+02

Caption: **GWP-total** = Global Warming Potential – total; **GWP-fossil** = Global Warming Potential – fossil; **GWP-biogenic** = Global Warming Potential – biogenic; **GWP-luluc** = Global Warming Potential – land use and land use change; **ODP** = Ozone Depletion Potential; **AP** = Acidification Potential; **EP-freshwater** = Eutrophication potential, aquatic freshwater; **EP-marine** = Eutrophication potential, marine; **EP-terrestrial** = Eutrophication potential, terrestrial; **POCP** = Photochemical ozone formation; **ADP-min & met** = Depletion of abiotic resources – minerals and metals; **ADP-fossil** = Depletion of abiotic resources – fossil fuels; **WDP** = Water deprivation potential

* The LCA results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or there is limited experienced with the indicator

Resource use for the E2M

Table 8. LCA results for the environmental parameters describing resource use

Parameters	Unit of measurement	Manufacturing	Distribution	Installation	Use	End of life	TOTAL
PERE	MJ	8,65E+01	3,31E-03	4,73E-01	1,08E+03	1,35E-01	1,16E+03
PERM	MJ	6,85E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,85E-01
PERT	MJ	8,71E+01	3,31E-03	4,73E-01	1,08E+03	1,35E-01	1,17E+03
PENRE	MJ	6,80E+02	1,35E+00	5,35E+00	3,15E+03	1,59E+00	3,84E+03
PENRM	MJ	2,06E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,06E+01
PENRT	MJ	7,00E+02	1,35E+00	5,35E+00	3,15E+03	1,59E+00	3,86E+03
MS	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	6,16E-01	2,61E-05	2,87E-03	2,58E+00	1,19E-03	3,20E+00

Caption: **PERE** = Use of renewable primary energy excluding renewable primary energy resources used as raw material; **PERM** = Use of renewable primary energy resources used as raw material; **PERT** = Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material; **PENRM** = Use of non-renewable primary energy resources used as raw material; **PENRT** = Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); **MS** = Use of secondary materials; **RSF** = Use of renewable secondary fuels; **NRSF** = Use of non-renewable secondary fuels; **FW** = Net use of fresh water

Waste production for the E2M

Table 9. LCA results for the environmental parameters describing waste production

Parameters	Unit of measurement	Manufacturing	Distribution	Installation	Use	End of life	TOTAL
HWD	kg	4,72E+00	2,41E-02	7,03E-02	7,93E-01	2,89E-02	5,63E+00
NHWD	kg	4,99E+01	1,93E+00	3,08E-01	1,33E+01	3,67E+01	1,02E+02
RWD	kg	1,58E-03	8,13E-05	5,81E-06	7,12E-03	1,50E-05	8,80E-03
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	9,18E-01	0,00E+00	8,57E-02	2,36E-02	3,05E+01	3,16E+01
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,23E+01	1,23E+01
ETE	MJ	4,68E-07	0,00E+00	2,35E-01	1,87E-06	0,00E+00	2,35E-01
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Caption: **HWD** = Hazardous waste disposed; **NHWD** = Non-hazardous waste disposed; **RWD** = Radioactive waste disposed; **CRU** = Components for reuse; **MFR** = Material for recycling; **MER** = Materials for energy recovery; **ETE** = Exported thermal energy; **EEE** = Exported electricity energy

Environmental impacts for the E2M Outdoor

Table 10. LCA results for the environmental impact indicators

Impact indicators	Unit of measurement	Manufacturing	Distribution	Installation	Use	End of life	TOTAL
GWP-total	kg CO ₂ eq.	8,61E+01	5,60E-01	1,02E+00	2,47E+02	8,84E+00	3,43E+02
GWP-fossil	kg CO ₂ eq.	8,63E+01	5,60E-01	4,14E-01	2,46E+02	8,84E+00	3,42E+02
GWP-biogenic	kg CO ₂ eq.	-3,44E-01	1,76E-05	6,10E-01	6,42E-01	8,55E-04	9,10E-01
GWP-luluc	kg CO ₂ eq.	1,43E-01	8,85E-06	4,57E-04	1,73E-02	1,13E-03	1,62E-01
ODP	kg CFC-11 eq.	6,28E-06	1,27E-08	6,36E-09	5,97E-06	7,78E-09	1,23E-05
AP	mol H ⁺ eq.	1,20E+00	1,45E-03	4,75E-03	7,55E-01	4,74E-03	1,96E+00
EP-freshwater	kg P eq.	1,53E-02	3,46E-07	2,89E-05	6,20E-03	2,37E-05	2,16E-02
EP-marine	kg N eq.	1,28E-01	5,51E-04	5,51E-04	1,27E-01	1,75E-03	2,58E-01
EP-terrestrial	mol N eq.	1,56E+00	6,03E-03	6,02E-03	1,45E+00	1,82E-02	3,04E+00
POCP	kg NMVOC eq.	5,04E-01	2,39E-03	1,88E-03	6,13E-01	4,89E-03	1,13E+00
ADP-min & met*	kg Sb eq.	2,70E-02	1,46E-08	4,39E-05	3,88E-05	9,42E-08	2,71E-02
ADP-fossil*	MJ	1,27E+03	7,45E+00	5,39E+00	4,20E+03	8,90E+00	5,49E+03
WDP*	m ³ eq. deprived	3,96E+01	2,44E-03	1,05E-01	1,23E+02	1,81E-01	1,63E+02

Caption: **GWP-total** = Global Warming Potential – total; **GWP-fossil** = Global Warming Potential – fossil; **GWP-biogenic** = Global Warming Potential – biogenic; **GWP-luluc** = Global Warming Potential – land use and land use change; **ODP** = Ozone Depletion Potential; **AP** = Acidification Potential; **EP-freshwater** = Eutrophication potential, aquatic freshwater; **EP-marine** = Eutrophication potential, marine; **EP-terrestrial** = Eutrophication potential, terrestrial; **POCP** = Photochemical ozone formation; **ADP-min & met** = Depletion of abiotic resources – minerals and metals; **ADP-fossil** = Depletion of abiotic resources – fossil fuels; **WDP** = Water deprivation potential

* The LCA results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or there is limited experienced with the indicator

Resource use for the E2M Outdoor

Table 11. LCA results for the environmental parameters describing resource use

Parameters	Unit of measurement	Manufacturing	Distribution	Installation	Use	End of life	TOTAL
PERE	MJ	1,35E+02	1,83E-02	4,74E-01	1,44E+03	7,35E-01	1,57E+03
PERM	MJ	2,19E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,19E+00
PERT	MJ	1,38E+02	1,83E-02	4,74E-01	1,44E+03	7,35E-01	1,58E+03
PENRE	MJ	1,03E+03	7,45E+00	5,39E+00	4,20E+03	8,90E+00	5,25E+03
PENRM	MJ	2,35E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,35E+02
PENRT	MJ	1,27E+03	7,45E+00	5,39E+00	4,20E+03	8,90E+00	5,49E+03
MS	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	1,10E+00	1,44E-04	2,87E-03	3,44E+00	6,66E-03	4,55E+00

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw material; PERM = Use of renewable primary energy resources used as raw material; PERT = Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material; PENRM = Use of non-renewable primary energy resources used as raw material; PENRT = Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); MS = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

Waste production for the E2M Outdoor

Table 12. LCA results for the environmental parameters describing waste production

Parameters	Unit of measurement	Manufacturing	Distribution	Installation	Use	End of life	TOTAL
HWD	kg	7,87E+00	1,33E-01	7,07E-02	1,04E+00	1,68E-01	9,28E+00
NHWD	kg	9,51E+01	1,07E+01	4,63E-01	1,76E+01	2,43E+02	3,67E+02
RWD	kg	2,73E-03	4,49E-04	5,82E-06	9,49E-03	8,71E-05	1,28E-02
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	2,23E+00	0,00E+00	2,73E-01	2,36E-02	5,27E+01	5,52E+01
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,71E+02	1,71E+02
ETE	MJ	4,68E-07	0,00E+00	7,50E-01	1,87E-06	0,00E+00	7,50E-01
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for reuse; MFR = Material for recycling; MER = Materials for energy recovery; ETE = Exported thermal energy; EEE = Exported electricity energy

7. REFERENCES

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