ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 50693

externally nonverified version

PRODUCT NAME

LEAN METERS

SITE

Iskraemeco, d.d., Savska loka 4, 4000 Kranj, Slovenia

CREATED BY	VERIFIED BY	APPROVED BY	DATE	REV
Nives Gregorc	Dalija Delić	Aleš Dobnikar	12.05.2026	1

GENERAL INFORMATION

EPD OWNER	
Name of the company	Iskraemeco, d.d.
Registered office	Savska loka 4, 4000 Kranj, Slovenia
Contacts for information on the EPD	Nives Gregorc, Environmental Specialist E-mail: nives.gregorc@iskraemeco.com Dalija Delić, Sustainability Specialist E-mail: dalija.delic@iskraemeco.com

INFORMATION ON THE EPD	
Product name (s)	LEAN meters
Site (s)	Iskraemeco, d.d., Savska loka 4, 4000 Kranj, Slovenia
Short description and technical information of the product (s)	Products are built on a modular and scalable architecture, offering flexibility for various applications from residential to industrial use. Designed for both direct and transformer-connected setups, the LEAN meters meet the highest standards in accuracy and operational performance, offering reliable solutions for diverse energy management needs.
Field of application of the product (s)	The products covered in the EPD are an integral part of the smart grid infrastructure, whether in a power substation or residential setting, enabling the real-time measurements needed to monitor equipment health, grid congestion and stability, and system control.
Product (s) reference standards / PCR (title, version, date of publication or update)	PCR EPDItaly 007 Electronic and electrical products and systems (Rev.3.1 12/11/2024). PCR EPDItaly 011 Electronic and electrical products and systems – meters (Rev.1.0 01/07/2024) EN 50693:2019 Product category rules for life cycle assessments of electronic and electrical products and systems
CPC Code (number) https://unstats.un.org/unsd/classifications/Econ	4621 “Electricity distribution or control apparatus”

Project Report LCA	Life Cycle Assessment Report “LEAN METERS” 2025
Comparability Statement	Environmental statements published within the same product category, but from different programs, may not be comparable.

1. Introduction

The Environmental Product Declaration (EPD) for the LEAN meter produced in Slovenia in 2025 for the German market is prepared according to ISO 14025 standard. It is a product specific EPD. It complies with the product category rules PCR EPD Italy 007 Electronic and electrical products and systems and PRC EPD Italy 011 Meters. The results are based on the Life cycle assessment (LCA) report conducted in accordance with the EN ISO 14040 and EN ISO 14044 standards.
The meters covered by this EPD are devices used to monitor and measure electricity consumption with a service life of 20 years and are not defined as construction products, therefore EN 50693 is applied.

2. Information about the manufacturer

Iskraemeco, d.d. (Iskraemeco) manufactures energy and water management solutions. The production and final assembly plant is in Kranj, Slovenia.
The company adheres to strict environmental and sustainability policies, aiming to mitigate climate impact and improve energy efficiency. Environmental and energy policy is available at Iskraemeco-Environmental-and-Energy-Policy.pdf.
Iskraemeco is certified for ISO 14001, ISO 50001, ISO 9001, ISO 45001 and ISO 27001/27017/27018, ISO 33061, ISO 28000, ISO 22031 standards. Its laboratories are accredited under ISO 17025 and ISO 17020.

3. EPD scope

For the EPD a cradle-to-grave approach was used, and all life cycle stages mentioned in the table below were included in the assessment. Specifically raw materials and components in upstream module, energy (electricity, heat, compressed air), water, chemicals, packaging, generated waste and wastewater in core module were considered. In downstream module transportation from production facility to installation site, waste generated during installation, electricity consumption during use stage and treatment of waste meter were considered.

Phase	Manufacturing stage	Distribution stage	Installation stage	Use and Maintenance stage	End-of-life stage – de-installation
Phase declared	X	X	X	X	X

Table 1 – LEAN meter's system boundaries LCA study according to EN 50693:2019

The functional unit for the assessment was one single meter. Specific data was collected for the year 2025 (January – December). Mainly primary data were collected. If they were not available, secondary - general data were used. In cases where allocation was unavoidable, allocation to a single meter based on number of produced meters was applied.
The potential benefits like re-use, recycling and potential energy recovery were not included in the environmental impact evaluation.

4. Description of the products and manufacturing process

The LEAN series meter family includes MT175 D1/D2, MT361 D1/D2, MT631 T1 and MT691 D4. The meters support communication with Smart Meter Gateway via LMN port, enabling seamless integration into modern energy measuring systems. Paired with Smart Meter Gateway, these meters represent the future of metering by enabling smart grid functionality, improving energy efficiency, and supporting the development of smart cities and communities. Designed for both direct and transformer-connected setups, the German meters meet the highest standards in accuracy and operational performance, offering reliable solutions for diverse energy management needs.

Meters are designed and manufactured in compliance with the standards and ISO 9001 (International Organization for Standardization) as well as more severe Iskraemeco standards.
With a focus on sustainability, these devices have minimized power consumption, and some metal parts are made from recycled metals. The devices have an option with a minimum of 51% of plastics used in meters to come from recycled sources, ensuring continued alignment with circular economy principles.

Meter technical specification	MT175 D1 meter	MT631 D1 meter	MT631 T1 meter	MT691 D4 meter
Nominal voltage	3x 230/400 V or 230 V	3x 230/400 V or 230 V	3x 230/400 V	3x 230/400 V or 230 V
Frequency	50 Hz	50Hz	50 Hz	50 Hz
Performing class	Class A	Class A	Class B	Class A
Current intensity	60 / 5 A	60 / 5 A	6 / 1 A	60 A
Mass (kg)	1,0	1,3	1,2	0,6

Table 2 – LEAN meters technical specification

The products are compliant with RoHS directive and REACH Regulation. LEAN meters do not contain a lithium battery.

The material composition of LEAN meters and packaging according to IEC 62474 are presented in the tables below.

MT175 D1 meter composition Material – class name	**ID**	**Cat2**	**Mass (g)**	**Mass (%)**
Polycarbonate (PC)	M-254	M-25 Filled thermoplastics resin	354,4	35
Electronic components	/	/	64,5	6
Stainless steel	M-100	M-10 Steels and ferrous materials	255,9	25
Polycarbonate (PC)	M-204	M-20 Unfilled thermoplastics resin	183,2	18
Copper alloy	M-121	M-12 Non-ferrous metals and alloys	86,7	9
Printed circuit board (PCB)	/	/	61,0	6
Paper	M-341	M-34 Natural materials	1,1	0
Rubber	M-321	M-32 Elastomers	0,6	0
			1.007	

MT175 D1 packaging EL63 Material – class name	ID	Cat2	Mass (g)
Wood	M-340	M-34 Natural materials	81,4
Paper	M-341	M-34 Natural materials	72,0

Table 3 – MT175 D1 Meter and packaging composition according to IEC 62474

MT631 D1 meter composition Material – class name	**ID**	**Cat2**	**Mass (g)**	**Mass (%)**
Polycarbonate (PC)	M-254	M-25 Filled thermoplastics resin	598,4	48
Electronic components	/	/	78,9	6
Stainless steel	M-100	M-10 Steels and ferrous materials	172,2	14
Polycarbonate (PC)	M-204	M-20 Unfilled thermoplastics resin	238,3	19
Copper alloy	M-121	M-12 Non-ferrous metals and alloys	107,3	9
Printed circuit board (PCB)	/	/	36,4	3
Polyamide	M-208	M-20 Unfilled thermoplastics resin	0,8	0
Paper	M-341	M-34 Natural materials	1,1	0
			1.233	

MT631 D1 packaging EL128 Material – class name	ID	Cat2	Mass (g)
Wood	M-340	M-34 Natural materials	244,2
Paper	M-341	M-34 Natural materials	189,6

Table 4 – MT631 D1 Meter and packaging composition according to IEC 62474

MT631 T1 meter composition Material – class name	**ID**	**Cat2**	**Mass (g)**	**Mass (%)**
Polycarbonate (PC)	M-254	M-25 Filled thermoplastics resin	628,6	56
Electronic components	/	/	97,1	9
Stainless steel	M-100	M-10 Steels and ferrous materials	68,7	6
Printed circuit board (PCB)	/	/	35,1	3
Copper alloy	M-121	M-12 Non-ferrous metals and alloys	47,7	4
Polycarbonate (PC)	M-204	M-20 Unfilled thermoplastics resin	238,3	21
Paper	M-341	M-34 Natural materials	2,1	0
Polyamide	M-208	M-20 Unfilled thermoplastics resin	0,8	0
			1.120	

MT631 T1 packaging EL128 Material – class name	ID	Cat2	Mass (g)
Wood	M-340	M-34 Natural materials	244,2
Paper	M-341	M-34 Natural materials	189,6

Table 5 – MT631 T1 Meter and packaging composition according to IEC 62474

MT691 D4 meter compositic Material – class name	**ID**	**Cat2**	**Mass (g)**	**Mass (%)**
Polycarbonate (PC)	M-254	M-25 Filled thermoplastics resin	240,0	38
Electronic components	/	/	68,6	11
Copper alloy	M-121	M-12 Non-ferrous metals and alloys	65,0	10
Printed circuit board (PCB)	/	/	43,5	7
Polycarbonate (PC)	M-204	M-20 Unfilled thermoplastics resin	20,6	3
Stainless steel	M-100	M-10 Steels and ferrous materials	183,2	29
Polyamide	M-208	M-20 Unfilled thermoplastics resin	6,6	1
Paper	M-341	M-34 Natural materials	0,1	0
			628	

MT691 D4 packaging EL125 Material – class name	ID	Cat2	Mass (g)
Wood	M-340	M-34 Natural materials	50,0
Paper	M-341	M-34 Natural materials	51,3

Table 6 – MT691 D4 Meter and packaging composition according to IEC 62474

Electronic components, some semi-finished parts are in general purchased from European suppliers, most of metal and plastic parts and chemicals are purchased in Slovenia. Manufacturing includes assembling of PCB on SMT and THT lines, PCB testing, meter assembling, acceptance testing and packing (see Figure 1).

In Iskraemeco manufacturing process, several different types of meters are manufactured simultaneously. Therefore, it is not possible to determine the exact amount of energy and water consumed in production for each meter. Consequently, the total energy and water consumption is allocated proportionally across the total production output of produced meters - based on number of produced meters. We did this, by dividing the total energy and water consumption by the number of produced meters.

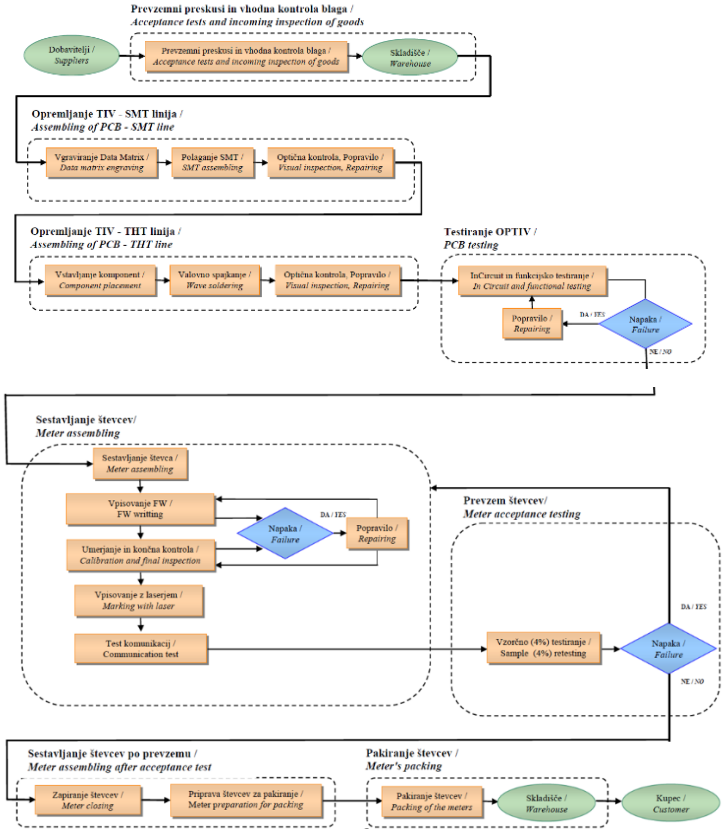

Figure 1 – LEAN meter's main manufacturing processes

5. Transportation and installation

For transportation type of packed product to installation location following scenario was adopted: lorry EURO 6, distance from Kranj to German market 1.200km.

6. Use Stage

Electricity consumed during the product's service life is presented in the table below, using the following formula for calculating and primary data of power used. No extraordinary maintenance operations are requested during entire reference service life of 20 years.

$$E_{use}\ [kWh] = \frac{P_{use} * 8760 * RSL}{1000}$$

Meter type	**MT175D1 meter**	**MT631D1** meter	**MT631T1** meter	**MT691 meter**
P_{use} (W)	2	2	2	2
E_{use} (kWh)	350	350	350	350

Table 7 – Electricity consumed during the use stage for LEAN meters

7. LCA results

OpenLCA 2.4. was the software used to develop the model for calculating the environmental impacts of different indicators. The database used for model analysis was Ecoinvent 3.11. The database was used to make calculations for all stages.

The assessed potential environmental impacts through an LCA of the LEAN meters produced in Slovenia are given in tables below. They were determined using the characterization factors and impact assessment methods specified in EN 15804:2012+A2:2019.

7.1. Environmental impact – Descriptive parameters

MT175 D1 METER CORE ENVIRONMENTAL IMPACT INDICATORS

Impact category	Impact indicators	UNIT	Manufacturing	Distribution	Installation	Use Maintenance	End of life	Total
Climate change – total	GWP-total	kg CO_2 eq.	4,00E+01	2,60E-01	1,61E-03	5,75E+01	3,71E-02	9,79E+01
Climate change – fossil	GWP-fossil	kg CO_2 eq.	4,20E+01	2,60E-01	1,61E-03	5,75E+01	3,71E-02	9,98E+01
Climate change – biogenic	GWP-biogenic	kg CO_2 eq.	-1,98E+00	1,81E-04	1,18E-06	-1,09E-02	2,50E-05	-1,99E+00
Climate change – Land use and change in land use	GWP-luclu	kg CO_2 eq.	4,36E-02	8,75E-05	5,85E-07	9,31E-03	2,71E-05	5,30E-02
Ozone Depletion	ODP	kg CFC-11 eq.	8,53E-07	5,66E-09	3,51E-11	1,43E-06	2,68E-10	2,29E-06
Acidification	AP	moles H^+ eq.	2,18E-01	5,58E-04	7,48E-06	1,68E-01	9,23E-05	3,87E-01
Eutrophication aquatic freshwater	EP – freshwater	kg P eq.	2,09E-02	1,80E-05	1,21E-07	9,35E-03	2,52E-06	3,02E-02
Eutrophication aquatic marine	EP - marine	kg N eq.	4,30E-02	1,34E-04	2,93E-06	2,77E-02	3,38E-05	7,08E-02
Eutrophication terrestrial	EP - terrestrial	mol N eq.	4,41E-01	1,45E-03	3,19E-05	3,12E-01	3,56E-04	7,55E-01
Photochemical ozone formation	POCP	kg NMVOC eq.	1,52E-01	8,85E-04	1,12E-05	1,75E-01	1,15E-04	3,27E-01
Depletion of abiotic resources – minerals and materials	ADP MINERALS & METALS	kg Sb eq.	3,20E-03	9,13E-07	5,38E-09	1,38E-03	5,05E-08	4,58E-03
Depletion of abiotic resources - fossil resources	ADP FOSSIL	MJ, net calorific value	4,54E+02	3,69E+00	2,32E-02	8,66E+02	2,24E-01	1,32E+03
Water consumption	WDP	m^3	1,16E+01	1,96E-02	1,34E-04	6,06E+00	2,45E-03	1,77E+01

Table 8 – Core environmental impact indicators

MT631 D1 METER CORE ENVIRONMENTAL IMPACT INDICATORS

Impact category	Impact indicators	UNIT	Manufacturing	Distribution	Installation	Use Maintenance	End of life	Total
Climate change – Total	GWP-total	kg CO_2 eq.	4,55E+01	3,74E-01	4,53E-03	5,75E+01	4,66E-02	1,03E+02
Climate change – fossil	GWP-fossil	kg CO_2 eq.	5,27E+01	3,73E-01	4,53E-03	5,75E+01	4,65E-02	1,11E+02
Climate change – biogenic	GWP-biogenic	kg CO_2 eq.	-7,26E+00	2,60E-04	3,35E-06	-1,09E-02	2,49E-05	-7,27E+00
Climate change – Land use and change in land use	GWP-luclu	kg CO_2 eq.	6,80E-02	1,26E-04	1,65E-06	9,31E-03	3,00E-05	7,74E-02
Ozone Depletion	ODP	kg CFC-11 eq.	1,53E-06	8,14E-09	9,89E-11	1,43E-06	3,58E-10	2,97E-06
Acidification	AP	moles H^+ eq.	3,19E-01	8,02E-04	2,11E-05	1,68E-01	1,14E-04	4,87E-01
Eutrophication aquatic freshwater	EP – freshwater	kg P eq.	3,84E-02	2,59E-05	3,43E-07	9,35E-03	2,67E-06	4,78E-02
Eutrophication aquatic marine	EP - marine	kg N eq.	6,06E-02	1,93E-04	8,25E-06	2,77E-02	4,30E-05	8,86E-02
Eutrophication terrestrial	EP - terrestrial	mol N eq.	6,35E-01	2,08E-03	9,00E-05	3,12E-01	4,55E-04	9,50E-01
Photochemical ozone formation	POCP	kg NMVOC eq.	2,11E-01	1,27E-03	3,15E-05	1,75E-01	1,48E-04	3,87E-01
Depletion of abiotic resources – minerals and materials	ADP MINERALS & METALS	kg Sb eq.	8,81E-03	1,31E-06	1,52E-08	1,38E-03	6,58E-08	1,02E-02
Depletion of abiotic resources - fossil resources	ADP FOSSIL	MJ, net calorific value	6,12E+02	5,31E+00	6,54E-02	8,66E+02	2,82E-01	1,48E+03
Water consumption	WDP	m^3	1,68E+01	2,81E-02	3,78E-04	6,06E+00	2,88E-03	2,29E+01

Table 9 – Core environmental impact indicators

MT631 T1 METER CORE ENVIRONMENTAL IMPACT INDICATORS

Impact category	Impact indicators	UNIT	Manufacturing	Distribution	Installation	Use Maintenance	End of life	Total
Climate change - total	GWP-total	kg CO_2 eq.	4,14E+01	3,48E-01	4,53E-03	5,75E+01	4,49E-02	9,93E+01
Climate change - fossil	GWP-fossil	kg CO_2 eq.	4,88E+01	3,48E-01	4,53E-03	5,75E+01	4,49E-02	1,07E+02
Climate change - biogenic	GWP-biogenic	kg CO_2 eq.	-7,49E+00	2,42E-04	3,35E-06	-1,09E-02	2,16E-05	-7,50E+00
Climate change - land use and change in land use	GWP-luclu	kg CO_2 eq.	6,07E-02	1,17E-04	1,65E-06	9,31E-03	2,45E-05	7,02E-02
Ozone Depletion	ODP	kg CFC-11 eq.	1,47E-06	7,59E-09	9,89E-11	1,43E-06	3,36E-10	2,91E-06
Acidification	AP	moles H^+ eq.	2,99E-01	7,47E-04	2,11E-05	1,68E-01	1,03E-04	4,67E-01
Eutrophication aquatic freshwater	EP - freshwater	kg P eq.	3,63E-02	2,41E-05	3,43E-07	9,35E-03	2,45E-06	4,57E-02
Eutrophication aquatic marine	EP - marine	kg N eq.	5,65E-02	1,80E-04	8,25E-06	2,77E-02	3,91E-05	8,44E-02
Eutrophication terrestrial	EP - terrestrial	mol N eq.	5,98E-01	1,94E-03	9,00E-05	3,12E-01	4,12E-04	9,12E-01
Photochemical ozone formation	POCP	kg NMVOC eq.	1,98E-01	1,19E-03	3,15E-05	1,75E-01	1,35E-04	3,74E-01
Depletion of abiotic resources - minerals and materials	ADP MINERALS & METALS	kg Sb eq.	8,53E-03	1,22E-06	1,52E-08	1,38E-03	6,09E-08	9,91E-03
Depletion of abiotic resources - fossil resources	ADP FOSSIL	MJ, net calorific value	5,58E+02	4,95E+00	6,54E-02	8,66E+02	2,59E-01	1,43E+03
Water consumption	WDP	m^3	1,23E+01	2,62E-02	3,78E-04	6,06E+00	2,73E-03	1,84E+01

Table 10 – Core environmental impact indicators

MT691 D4 METER CORE ENVIRONMENTAL IMPACT INDICATORS

Impact category	Impact indicators	UNIT	Manufacturing	Distribution	Installation	Use Maintenance	End of life	Total
Climate change - total	GWP-total	kg CO_2 eq.	3,59E+01	1,64E-01	1,07E-03	5,75E+01	3,82E-02	9,36E+01
Climate change - fossil	GWP-fossil	kg CO_2 eq.	3,70E+01	1,63E-01	1,07E-03	5,75E+01	3,81E-02	9,47E+01
Climate change - biogenic	GWP-biogenic	kg CO_2 eq.	-1,16E+00	1,14E-04	7,72E-07	-1,09E-02	1,86E-05	-1,17E+00
Climate change - land use and change in land use	GWP-luclu	kg CO_2 eq.	3,58E-02	5,50E-05	3,87E-07	9,31E-03	2,27E-05	4,52E-02
Ozone Depletion	ODP	kg CFC-11 eq.	7,13E-07	3,56E-09	2,33E-11	1,43E-06	1,85E-10	2,14E-06
Acidification	AP	moles H^+ eq.	1,89E-01	3,51E-04	4,95E-06	1,68E-01	7,15E-05	3,58E-01
Eutrophication aquatic freshwater	EP - freshwater	kg P eq.	1,79E-02	1,13E-05	8,00E-08	9,35E-03	2,07E-06	2,72E-02
Eutrophication aquatic marine	EP - marine	kg N eq.	3,82E-02	8,45E-05	1,94E-06	2,77E-02	2,66E-05	6,60E-02
Eutrophication terrestrial	EP - terrestrial	mol N eq.	3,91E-01	9,12E-04	2,12E-05	3,12E-01	2,75E-04	7,05E-01
Photochemical ozone formation	POCP	kg NMVOC eq.	1,34E-01	5,56E-04	7,40E-06	1,75E-01	8,67E-05	3,09E-01
Depletion of abiotic resources - minerals and materials	ADP MINERALS & METALS	kg Sb eq.	2,98E-03	5,74E-07	3,57E-09	1,38E-03	3,79E-08	4,36E-03
Depletion of abiotic resources - fossil resources	ADP FOSSIL	MJ, net calorific value	3,73E+02	2,32E+00	1,54E-02	8,66E+02	1,62E-01	1,24E+03
Water consumption	WDP	m^3	9,44E+00	1,23E-02	8,84E-05	6,06E+00	2,23E-03	1,55E+01

Table 11 – Core environmental impact indicators

7.2. Parameters describing resource use

MT175 D1 METER - PARAMETERS DESCRIBING RESOURCES USE

PARAMETERS	UNIT	Manufacturing	Distribution	Installation	Use Maintenance	End of life	Total
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material (PENRE)	MJ, net calorific value	4,54E+02	3,69E+00	2,32E-02	8,66E+02	2,24E-01	1,32E+03
Use of renewable primary energy excluding renewable primary energy resources used as raw material (PERE)	MJ, net calorific value	9,28E+01	6,09E-02	4,26E-04	1,22E+03	7,30E-03	1,31E+03
Use of non-renewable primary energy resources used as raw material (PENRM)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable primary energy resources used as raw material (PERM)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) (PENRT)	MJ, net calorific value	4,54E+02	3,69E+00	2,32E-02	8,66E+02	2,24E-01	1,32E+03
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) (PERT)	MJ, net calorific value	9,28E+01	6,09E-02	4,26E-04	1,22E+03	7,30E-03	1,31E+03
Net use of fresh water (FW)	m^3	2,90E-01	4,52E-04	3,09E-06	1,41E-01	5,48E-05	4,32E-01
Use of secondary raw materials (MS)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels (NRSF)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 12 - Parameters describing resources use

MT631 D1 METER - PARAMETERS DESCRIBING RESOURCES USE

PARAMETERS	UNIT	Manufacturing	Distribution	Installation	Use Maintenance	End of life	Total
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material (PENRE)	MJ, net calorific value	6,12E+02	5,31E+00	6,54E-02	8,66E+02	2,82E-01	1,48E+03
Use of renewable primary energy excluding renewable primary energy resources used as raw material (PERE)	MJ, net calorific value	1,96E+02	8,75E-02	1,21E-03	1,22E+03	7,43E-03	1,41E+03
Use of non-renewable primary energy resources used as raw material (PENRM)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable primary energy resources used as raw material (PERM)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) (PENRT)	MJ, net calorific value	6,12E+02	5,31E+00	6,54E-02	8,66E+02	2,82E-01	1,48E+03
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) (PERT)	MJ, net calorific value	1,96E+02	8,75E-02	1,21E-03	1,22E+03	7,43E-03	1,41E+03
Net use of fresh water (FW)	m^3	4,02E-01	6,49E-04	8,71E-06	1,41E-01	6,40E-05	5,44E-01
Use of secondary raw materials (MS)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels (NRSF)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 13 - Parameters describing resources use

MT631 T1 METER - PARAMETERS DESCRIBING RESOURCES USE

PARAMETERS	UNIT	Manufacturing	Distribution	Installation	Use Maintenance	End of life	Total
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material (PENRE)	MJ, net calorific value	2,59E+00	5,10E-03	6,97E-05	1,15E+00	1,03E-03	3,74E+00
Use of renewable primary energy excluding renewable primary energy resources used as raw material (PERE)	MJ, net calorific value	3,96E+01	5,44E-02	7,11E-04	1,40E+01	3,11E-02	5,37E+01
Use of non-renewable primary energy resources used as raw material (PENRM)	MJ, net calorific value	9,03E-04	1,47E-06	2,30E-08	7,44E-05	1,18E-07	9,79E-04
Use of renewable primary energy resources used as raw material (PERM)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) (PENRT)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) (PERT)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water (FW)	m^3	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of secondary raw materials (MS)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF)	MJ	2,59E+00	5,10E-03	6,97E-05	1,15E+00	1,03E-03	3,74E+00
Use of non-renewable secondary fuels (NRSF)	MJ	3,96E+01	5,44E-02	7,11E-04	1,40E+01	3,11E-02	5,37E+01

Table 14 - Parameters describing resources use

MT691 D4 METER - PARAMETERS DESCRIBING RESOURCES USE

PARAMETERS	UNIT	Manufacturing	Distribution	Installation	Use Maintenance	End of life	Total
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material (PENRE)	MJ, net calorific value	3,73E+02	2,32E+00	1,54E-02	8,66E+02	1,62E-01	1,24E+03
Use of renewable primary energy excluding renewable primary energy resources used as raw material (PERE)	MJ, net calorific value	6,73E+01	3,83E-02	2,81E-04	1,22E+03	5,66E-03	1,29E+03
Use of non-renewable primary energy resources used as raw material (PENRM)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable primary energy resources used as raw material (PERM)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) (PENRT)	MJ, net calorific value	3,73E+02	2,32E+00	1,54E-02	8,66E+02	1,62E-01	1,24E+03
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) (PERT)	MJ, net calorific value	6,73E+01	3,83E-02	2,81E-04	1,22E+03	5,66E-03	1,29E+03
Net use of fresh water (FW)	m^3	2,34E-01	2,84E-04	2,04E-06	1,41E-01	4,87E-05	3,76E-01
Use of secondary raw materials (MS)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels (NRSF)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 15 - Parameters describing resources use

7.3. Waste production descriptive parameters

MT175 D1 METER - WASTE PRODUCTION DESCRIPTIVE PARAMETERS-

Impact category	UNIT	Manufacturing	Distribution	Installation	Use Maintenance	End of life	Total
Hazardous landfill waste (HWD)	kg	3,99E+00	3,80E-03	2,47E-05	1,15E+00	9,01E-04	5,14E+00
Non-hazardous waste disposed (NHWD)	kg	4,83E+01	4,06E-02	2,52E-04	1,40E+01	2,49E-02	6,24E+01
Radioactive waste disposed (RWD)	kg	7,06E-04	1,10E-06	8,09E-09	7,44E-05	1,26E-07	7,82E-04
Materials for energy recovery (MER)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling (MFR)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for reuse (CRU)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (ETE)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electricity energy (EEE)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 16 – Waste production descriptive parameters

MT631 D1 METER - WASTE PRODUCTION DESCRIPTIVE PARAMETERS-

Impact category	UNIT	Manufacturing	Distribution	Installation	Use Maintenance	End of life	Total
Hazardous landfill waste (HWD)	kg	3,83E+00	5,47E-03	6,97E-05	1,15E+00	1,08E-03	4,98E+00
Non-hazardous waste disposed (NHWD)	kg	5,59E+01	5,84E-02	7,11E-04	1,40E+01	3,14E-02	6,99E+01
Radioactive waste disposed (RWD)	kg	1,03E-03	1,58E-06	2,30E-08	7,44E-05	1,25E-07	1,11E-03
Materials for energy recovery (MER)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling (MFR)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for reuse (CRU)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (ETE)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electricity energy (EEE)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 17 – Waste production descriptive parameters

MT631 T1 METER - WASTE PRODUCTION DESCRIPTIVE PARAMETERS

Impact category	UNIT	Manufacturing	Distribution	Installation	Use Maintenance	End of life	Total
Hazardous landfill waste (HWD)	kg	2,59E+00	5,10E-03	6,97E-05	1,15E+00	1,03E-03	3,74E+00
Non-hazardous waste disposed (NHWD)	kg	3,96E+01	5,44E-02	7,11E-04	1,40E+01	3,11E-02	5,37E+01
Radioactive waste disposed (RWD)	kg	9,03E-04	1,47E-06	2,30E-08	7,44E-05	1,18E-07	9,79E-04
Materials for energy recovery (MER)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling (MFR)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for reuse (CRU)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (ETE)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electricity energy (EEE)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 18 – Waste production descriptive parameters

MT691 D4 METER - WASTE PRODUCTION DESCRIPTIVE PARAMETERS

Impact category	UNIT	Manufacturing	Distribution	Installation	Use Maintenance	End of life	Total
Hazardous landfill waste (HWD)	kg	3,07E+00	2,39E-03	1,63E-05	1,15E+00	9,42E-04	4,22E+00
Non-hazardous waste disposed (NHWD)	kg	4,00E+01	2,55E-02	1,67E-04	1,40E+01	3,01E-02	5,40E+01
Radioactive waste disposed (RWD)	kg	5,72E-04	6,92E-07	5,32E-09	7,44E-05	9,48E-08	6,47E-04
Materials for energy recovery (MER)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling (MFR)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for reuse (CRU)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (ETE)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electricity energy (EEE)	MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 19 – Waste production descriptive parameters

8. Interpretation

The LCA revealed that the use stage contributes the most (56% to 62%) to the meter's global warming potential. Therefore, measures to minimize this impact should be considered during the design and development phase.

9. References

PCR EPDItaly011 Electronic and electrical products and systems – Meters (Rev 1.0 01/07/2024)
PCR EPDItaly007 Electronic and electrical products and systems (Rev 3.1. 12/11/2024)
General Program Instructions of EPDItaly REV 6.0 of 30/10/2023
EN 50693:2019 Product category rules for life cycle assessments of electronic and electrical products and systems
OpenLCA 2.4
Ecoinvent 3.11
ISO 14040 Environmental management – Life cycle assessment – Principles and framework
ISO 14044 Environmental management – Life cycle assessment – Requirements and guidelines
EN 15804:2012+A2:2019 Sustainability of construction rules - Environmental product declaration
IEC 62474 Material declaration for Products of and for the Electrotechnical Industry
ISO 14001 Environmental management systems
ISO 50001 Energy management systems
ISO 9001 Quality management systems
Life Cycle Assessment Report “LEAN” 2025
ISO 14025 Environmental labels and declarations — Type III environmental declarations — Principles and procedures