



1. GENERAL INFORMATION

EPD OWNER

Company name	DUCATI Energia S.p.a
Registered office	Via Marco Emilio Lepido, 182, 40132 - Bologna (BO)
Contact for information on the EPD	Ing. Giovanni Tombesi, Quality Assurance, g.tombesi@ducatienergia.com

PROGRAM OPERATOR	
EPDItaly	Via Gaetano De Castillia no. 10 - 20124 Milan, Italy

EPD INFORMATION	
Product Name	LVM
Production site	Chengdu Hi-tech Industrial Development Zone - No. 99 Tianquan Rd., Hi-Tech Development Zone, Chengdu, P.R.C. Ducati Energia Ploiesti - Soseaua Ploiesti Targoviste, km. 8 , zona Est trup II, ZIP 100213
Summary description and technical information of product	The product is a MV/LV cabin concentrator. It manages low voltage line communications and aggregates measurement data, alarms and network parameters. It transmits information to central systems. It supports remote management, time synchronisation, diagnostics and firmware updates of meters. It also integrates voltage quality and service continuity monitoring logics. It is the collection and routing element that enables centralised management of the low-voltage network.
Scope of product(s)	It is used in MV/LV substations as a communication node of the LV network.
Type of EPD	Product-specific EPD
Product reference standard(s) (if any)	This declaration was developed following the EPDItaly Programme Regulation (rev. 7.1 of 05/09/2025) available at www.epditaly.it . The standard EN 50693:2019 is the framework reference for the PCR "Electronic and electrical products and systems" (PCR EPDItaly007). PCR EPDItaly011 (Products and systems - meters) complements PCR EPDItaly007 and provides additional technical and regulatory requirements to be applied for the category of products classified as "concentrators".
CPC Code (number)	4621 "Electricity distribution or control apparatus".

VERIFICATION/VALIDATION INFORMATION	
PCR	Core-PCR: EPDItaly007 "Electronic and electrical - products and systems" (rev. 3.2 of 10/12/2025);



	Sub-PCR: EPDItaly011 "Electronic and electrical - products and systems - meters" (rev. 1 of 01/07/2024).
EPDItaly Regulations	EPDItaly Programme Regulation (rev. 7.1 of 05/09/2025)
LCA Project Report	Life Cycle Assessment study aimed at obtaining an environmental product declaration for the LVM concentrator marketed by Ducati Energia Spa. Rev.2 of 25/05/2026
Independent Statement Verification/Validation	This declaration has been developed according to the EPDItaly Regulation; further information and the Regulation itself are available at www.epditaly.it Independent verification of the declaration and data carried out according to ISO 14025:2010 ☐ Internal ☒ External Third-party verification performed by: ICMQ SpA, via De Castilia, 10 - 20124 - Milan (www.icmq.it); accredited by Accredia (accreditation number 00064rev001)
Statement Comparability	Environmental Declarations published within the same product category, but from different programmes, may not be comparable. In particular, EPDs of similar products may not be comparable if they do not comply with the relevant technical standard.
Statement Responsibility	DUCATI Energia S.p.A. releases EPDItaly from any non-compliance with environmental legislation. The holder of the declaration shall be responsible for the supporting information and evidence; EPDItaly disclaims any responsibility for the manufacturer's information, data and results of the life cycle assessment.

2. COMPANY INFORMATION

DUCATI Energia was born from an idea of the Ducati brothers who in 1926 started the industrial activity DUCATI which was followed 22 years later by the division into DUCATI Elettrotecnica and DUCATI Meccanica (today DUCATI Motor). DUCATI Energia was born in 1985 from the union of DUCATI Elettrotecnica and Zanussi Elettromeccanica-Generator Division and represents one of the historical industrial realities of the Bologna area. Today DUCATI Energia Group has more than 1,000 employees spread over 9 plants worldwide and operates in various business sectors, including: capacitors, industrial power factor correction and power electronics, alternators and ignition systems for endothermic engines, electric vehicles and recharging stations, energy analysers, systems for remote control of power grids, railway signalling, motorway and public transport systems and equipment.



3. SCOPE AND TYPOLOGY OF THE STUDY

The study considers the entire life cycle of products according to a 'from cradle to grave' application. In accordance with the PCR, the following study is divided into different phases: manufacturing, distribution, installation, use, and end of life of the product.

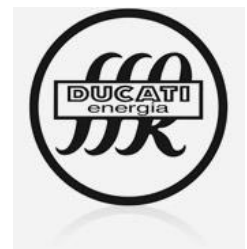
Criteria	Description																				
<i>Product</i>	Name: LVM; Power consumption in stand-by mode: 3.7 W. The product under study is a concentrator.																				
<i>Material</i>	<table> <tr> <th>Component</th><th>Weight [kg]</th></tr> <tr> <td>Plastics</td><td>1.523</td></tr> <tr> <td>Steel</td><td>0.048</td></tr> <tr> <td>Copper</td><td>0.011</td></tr> <tr> <td>Board</td><td>0.552</td></tr> <tr> <td>Switch</td><td>0.001</td></tr> <tr> <td>Polyurethane insulator</td><td>0.002</td></tr> <tr> <td>Lithium battery</td><td>0.009</td></tr> <tr> <td>Other</td><td>0.085</td></tr> <tr> <td>Total</td><td>2.231</td></tr> </table>	Component	Weight [kg]	Plastics	1.523	Steel	0.048	Copper	0.011	Board	0.552	Switch	0.001	Polyurethane insulator	0.002	Lithium battery	0.009	Other	0.085	Total	2.231
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<i>Objective</i>	The goal of this study is to assess the potential environmental impacts from a life cycle perspective associated with the LVM concentrator marketed by Ducati Energia.																				
<i>Object</i>	The study includes the entire life cycle of the analysed product, according to a 'from cradle to grave' application.																				
<i>Functional unit</i>	The functional unit is a single LVM concentrator with an service life of 20 years. Nominal voltage: 400/230 V; Frequency 50 Hz . Performance class: not available for the product under study. Current intensity: 0.25 A.																				



Criteria	Description
<i>System boundaries</i>	System boundaries include the entire life cycle of the analysed product, according to a 'from cradle to grave' perspective: ▪ Raw material extraction and processing; ▪ processing, assembly and final packaging of the product at the Chinese supplier, Chengdu Hi-tech Industrial Development Zone; ▪ transport of the final product from China to Romania, at the Ducati Energia Ploiesti plant, where various tests are carried out and the final components are assembled; ▪ transport of the finished product from the Ducati Energia Ploiesti plant to Ducati Energia Bologna and subsequent transport to the Enel SpA warehouses in Rome; ▪ transport of the finished product from the Enel SpA warehouses in Rome to the installation site; ▪ installation; ▪ use phase; ▪ end of life. The scheme of the system boundaries analysed in this study is shown in Figure 1.
<i>Manufacturing stage</i>	The 'manufacturing stage' includes the following process units: ▪ Extraction and processing of raw materials up to the production and pre-assembly of semi-finished products, including the production and disposal of waste generated by these processes; ▪ production processes of the materials used for the final packaging of the finished product, including the production and disposal of waste generated by these activities; ▪ transport of raw materials to the Chinese supplier where the manufacturing processes and product assembly take place. ▪ transport of the final product from China to Romania, at the Ducati Energia Ploiesti plant, where various tests and the assembly of the finished product with the final components are carried out.
<i>Distribution stage</i>	The 'distribution stage' includes the following process units: ▪ Transport of the finished product from the Ducati Energia Ploiesti plant to the Ducati Energia site in Bologna, followed by the transport to the Enel warehouse in Rome, followed by the transport to the installation site.
<i>Installation stage</i>	The 'installation stage' includes the following process unit: ▪ Installation of the product and generation of associated waste related to the product's packaging. The transport of waste to the final delivery and disposal facility is considered. The packaging end of life scenario are retrieved from ISPRA 2024.

Type of material	Recycling	Incineration	Landfill
Paper and cardboard	92.3%	5.8%	1.9%
Plastic	48%	42.8%	9.2%
Wood	64.9%	1.8%	33.3%

Criteria	Description																
Use stage	The 'use stage' includes the following process unit: Use phase which includes the estimated electricity consumption of the equipment, according to the following formula, with a reference service life equal to 20 years and a P_{use} equal to 3.7 W: $E_{use} = \frac{P_{use} [W] \cdot 8760 \left[\frac{h}{y} \right] \cdot RSL [y]}{1000 \left[\frac{W}{kW} \right]} = 648,24 kWh$																
End of life stage	The 'end-of-life stage' includes the following process units: Product end-of-life, which includes the generation of waste during the concentrator's deinstallation activities, its transport to the disposal facility and final disposal. To model the end-of-life scenario, data were retrieved from Eurostat, which refer to the year 2022. The data taken to assess the various scenarios refer to Italy. <table><tr><th>Type of material</th><th>Recycling</th><th>Incineration</th><th>Landfill</th></tr><tr><td>Plastic</td><td>92%</td><td>5%</td><td>3%</td></tr><tr><td>Metal</td><td>99.96%</td><td>0%</td><td>0.04%</td></tr><tr><td>WEEE</td><td>0%</td><td>100%</td><td>0%</td></tr></table>	Type of material	Recycling	Incineration	Landfill	Plastic	92%	5%	3%	Metal	99.96%	0%	0.04%	WEEE	0%	100%	0%
Type of material	Recycling	Incineration	Landfill														
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Data Quality	Geographical area: China, Romania and Italy. China and Romania are specifically for the manufacturing stage. Instead, in Italy the installation, use and end of life stages are involved. Database: Ecoinvent v 3.10. Software: SimaPro v 10.2.0.3. Calculation method: method described in EN 15804:2019. Characterization factors: EF 3.1 Time scope: the study refers to the production of the concentrator in the year 2024 (January 2024-December 2024). The data quality assessment was applied to the most significant life-cycle processes identified, in line with the requirements of the PEFCR Guidance v. 6.3. In particular, each key process was assigned a score on a scale of 1 to 5 (where 1 corresponds to maximum representativeness) for the following quality parameters: technological representativeness, geographical representativeness, temporal representativeness and precision/uncertainty. For the product covered by the EPD, the final DQR obtained by combining weights and scores is equal to 1.85; this corresponds to a 'very good' quality level.																
Allocation procedure	In the case under study other products in addition to the studied concentrator are also produced and assembled in the plants involved during the production and assembly process. Therefore, it was necessary to adopt an allocation procedure in order to allocate the impacts related to plant consumption (electricity consumption). The Chinese supplier provided data on factory consumption already allocated to the time taken to produce the concentrator. For consumption related to Ducati Romania the allocation factor used was the time taken to carry out the tests for the individual concentrator.																



Criteria	Description
<i>Cut-off criteria</i>	The following phases were excluded in this study: construction, maintenance and decommissioning of infrastructure, understood as machinery and buildings, and occupation of industrial land (if this information was not already present within the dataset used). A cut-off thresholds equal to 1% has been considered.

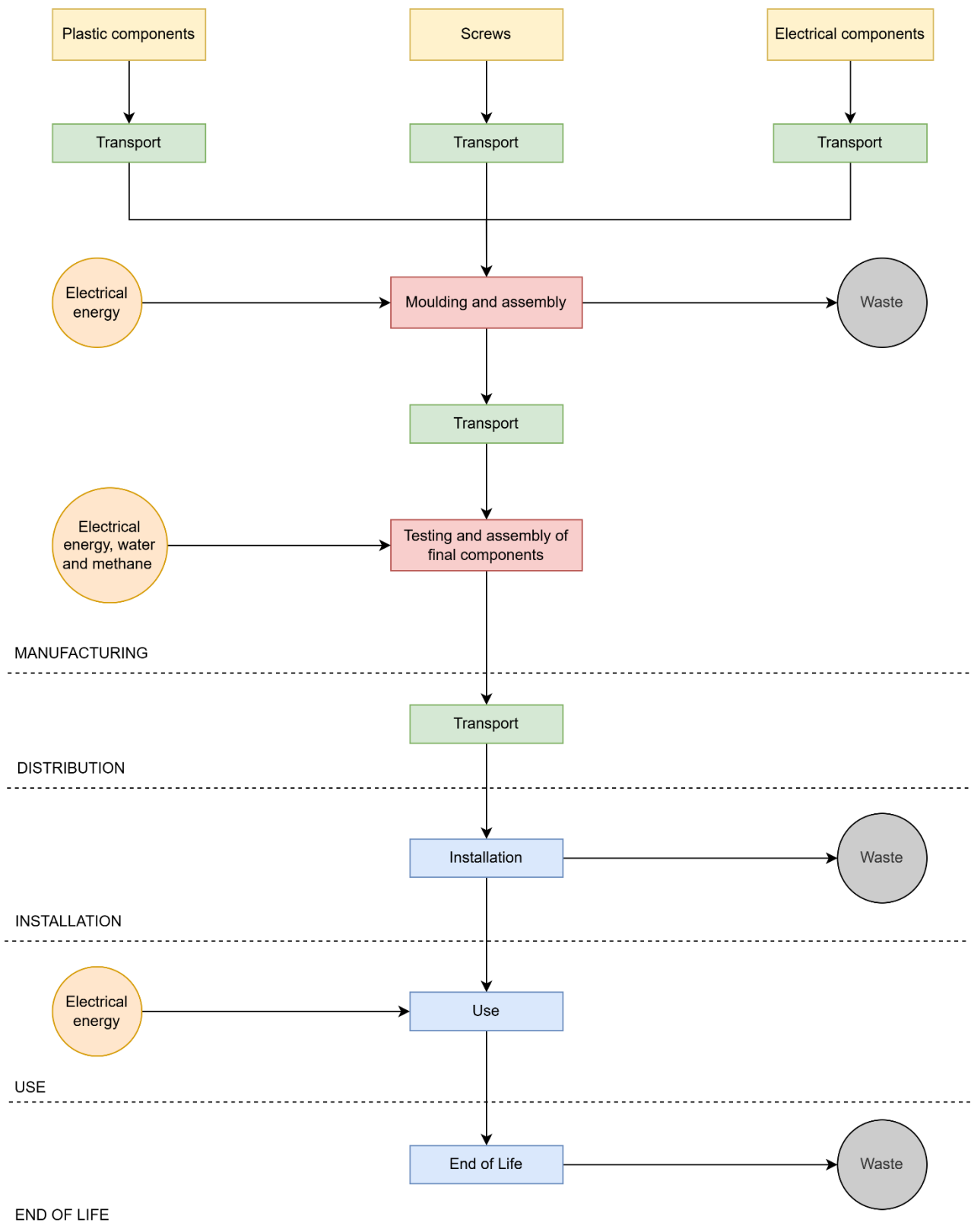
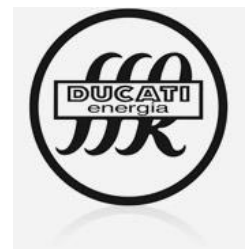


Figure 1 Diagram of the system boundaries relating to the production of the concentrator under study



4. LCA RESULTS

ENVIRONMENTAL IMPACT INDICATORS

Table 1 Impact assessment for LVM product

Impact category	Unit of measurement	Total	Manufacturing stage	Distribution stage	Installation stage	Use stage	End of Life stage
GWP-total	kg CO2 eq	2.96E+02	6.30E+01	2.35E+00	5.03E-02	2.30E+02	5.99E-01
GWP - fossil	kg CO2 eq	2.95E+02	6.27E+01	2.34E+00	3.62E-02	2.29E+02	5.99E-01
GWP-biogenic	kg CO2 eq	1.07E+00	-9.63E-01	4.06E-04	1.00E+00	1.03E+00	8.11E-05
GWP - land use and transform.	kg CO2 eq	1.17E-01	7.21E-02	8.94E-04	4.90E-06	4.35E-02	6.63E-05
ODP	kg CFC11 eq	6.73E-06	1.40E-06	4.10E-08	2.81E-10	5.28E-06	1.58E-09
AP	mol H+ eq	1.94E+00	9.53E-01	1.81E-02	6.66E-05	9.66E-01	5.89E-04
EP freshwater	kg P eq	1.17E-01	6.58E-02	1.54E-04	1.80E-06	5.11E-02	4.77E-05
EP marine	kg N eq	2.40E-01	9.04E-02	5.51E-03	7.00E-05	1.44E-01	3.22E-04
EP terrestrial	mol N eq	2.66E+00	1.02E+00	6.05E-02	2.78E-04	1.57E+00	2.18E-03
POCP	kg NMVOC eq	1.04E+00	3.48E-01	1.94E-02	1.00E-04	6.73E-01	6.55E-04
ADP - mineral and metals	kg Sb eq	2.10E-02	1.82E-02	6.79E-06	4.27E-08	2.87E-03	4.96E-07
ADP - fossil	MJ	1.44E+03	4.51E+02	2.68E+00	1.84E-02	9.86E+02	3.81E-01
WDP	m3 depriv.	1.83E+02	1.68E+01	1.30E-01	-1.41E-02	1.66E+02	3.54E-02
Key: GWP = 100-year global warming potential; ODP = 100-year ozone depletion potential; AP = acidification potential; EP = eutrophication potential; POCP = photochemical ozone depletion potential; ADP = resource depletion potential; WDP = water consumption							

INDICATORS: USE OF RESOURCES

Table 2 Assessment of resource use indicators for LVM product

Impact category	Unit of measurement	Total	Manufacturing stage	Distribution stage	Installation stage	Use stage	End of Life stage
PERE	MJ	1.68E+03	9.65E+01	4.53E-01	3.48E-03	1.58E+03	7.37E-02
PERM	MJ	1.40E+01	1.40E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.69E+03	1.10E+02	4.53E-01	3.48E-03	1.58E+03	7.37E-02
PENRE	MJ	4.59E+03	8.79E+02	3.25E+01	2.01E-01	3.68E+03	1.31E+00
PENRM	MJ	4.78E+01	4.78E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	4.64E+03	9.27E+02	3.25E+01	2.01E-01	3.68E+03	1.31E+00
SM	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	m3	4.98E+00	5.37E-01	3.93E-03	-3.06E-04	4.43E+00	9.94E-04
Key: PERE = renewable primary energy use excluding renewable primary energy resources used as raw materials; PERM = renewable primary energy resource use as raw materials; PERT = total renewable primary energy resource use; PENRE = resource use							

INDICATORS: OUTPUT STREAMS



Table 3 Assessment of output streams indicators for the LVM product

Impact category	Unit of measurement	Total	Manufacturing stage	Distribution stage	Installation stage	Use stage	End of Life stage
HWD	kg	2.67E-02	8.12E-03	2.14E-04	1.40E-06	1.84E-02	7.82E-06
NHWD	kg	1.99E+01	3.36E+00	1.35E+00	1.10E-01	1.48E+01	2.49E-01
RWD	kg	9.69E-03	2.44E-03	8.21E-06	6.46E-08	7.23E-03	1.40E-06
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	2.14E+00	2.05E-01	0.00E+00	4.77E-01	0.00E+00	1.46E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Key: HWD = hazardous waste disposed of; NHWD = non-hazardous waste disposed of; RWD = radioactive waste disposed of; CRU = components for reuse; MFR = materials for recycling; MER = materials for energy recovery; ETE = thermal energy exported; EEE = electrical energy exported							

Table 4 Evaluation of biogenic carbon content for LVM product

Impact category	Unit of measurement	Total	Manufacturing stage	Distribution stage	Installation stage	Use stage	End of Life stage
BCPR	kg C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCPA	kg C	4.53E-01	4.53E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Legend: BCPR = biogenic carbon content in the product; BCPA = biogenic carbon content in the packaging							

ADDITIONAL ENVIRONMENTAL INDICATORS

Table 5 Evaluation of additional environmental indicators

Impact category	Unit of measurement	Total	Manufacturing stage	Distribution stage	Installation stage	Use stage	End of Life stage
PM - respiratory organics	Deaths /kgPM2.5em	1.77E+03	4.06E+02	1.72E+01	1.60E-01	1.34E+03	6.52E-01
IR, human health	kBq U-235 eq	8.62E-06	3.68E-06	1.73E-07	1.21E-09	4.76E-06	7.20E-09
LU	Pt	3.63E+01	8.95E+00	3.32E-02	2.60E-04	2.73E+01	5.69E-03
Key: PM = particulate matter emissions; IR = ionising radiation; LU = land consumption.							



5. REFERENCE

The following standards/guidelines were referred to when conducting this study:

- ISO 14040:2006+A1:2020 Environmental management - Life cycle assessment - Principles and framework;
- ISO 14044:2006+A2:2020 Environmental management - Life cycle assessment - Requirements and guidelines;
- EN 50693:2019 'Product category rules for life cycle assessments of electronic and electrical products and systems';
- EPDItaly programme regulations (rev. 7.1 of 05/09/2025);
- EPDItaly007 "Electronic and electrical - products and systems" (rev. 3.2 of 10/12/2025);
- EPDItaly011 "Electronic and electrical - products and systems - meters" (rev. 1 of 01/07/2024).
- Report "Life Cycle Assessment study aimed at obtaining an Environmental Product Declaration for the LVM concentrator marketed by Ducati Energia Spa" (rev.2, 25/05/2026)