Zucchetti Centro Sistemi S.p.A.

ENVIRONMENTAL PRODUCT DECLARATION



PRODUCTS NAME

Charging station
Azzurro ZV3-22K-CARO-CAB

SITES

Floor 2-3, Building 6, No.1026 Songbai Road, Nanshan District, Shenzhen, China, 518055

In accordance with ISO 14025 and EN 50693

Program Operator	EPDItaly
Publisher	EPDItaly

Declaration number	Azzurro ZCS 013
Registration Number	EPDITALY1386

Release Date	29/09/2026
Valid until	29/09/2031

GENERAL INFORMATION

EPD OWNER

Company Name	Zucchetti Centro Sistemi S.p.A. (https://www.zcscompany.com/it/)
Registered office	Via Lungarno, 305 52028 Terranuova Bracciolini (AR)
Contact for EPD information	Samanta Marzielli • e-mail: s.marzielli@zcscompany.com, • Tel: 0559197422

PROGRAM OPERATOR

EPDItaly	Via Gaetano De Castillia n° 10 - 20124 Milano, Italy

ABOUT THE EPD

Products Name	Azzurro ZV3-22K-CARO-CAB
Sites	Floor 2-3, Building 6, No.1026 Songbai Road, Nanshan District, Shenzhen, China, 518055
Brief description and technical information of the product	The ZCS Azzurro ZV3-22K-CARO-CAB is an advanced three-phase home charging solution designed for high performance and maximum safety. With a maximum power output of 22 kW and a nominal current of 32A, it ensures rapid and efficient charging while integrating perfectly with photovoltaic systems for zero-emission energy use. This wallbox offers smart connectivity through Wi-Fi, Bluetooth, and Ethernet, allowing for easy management and charging scheduling via a dedicated app. It features dynamic load balancing and adjustable current to optimize the use of solar energy. Users can start charging sessions with maximum flexibility via Plug & Play, RFID cards, or the app. The system supports the OCPP 1.6 Json protocol for seamless integration with EMS systems. Built for durability, the station features a PC943 plastic structure with an IP65 protection rating against dust and water and an IK08 impact resistance rating. Safety is a priority, with advanced protection systems including 30 mA Type A + 6 mA DC residual current detection, as well as safeguards against over/under voltage, frequency, and overtemperature. Thanks to its compact dimensions of 374 x 226 x 164 mm and a net weight of 5.7 kg, it is easily installed on walls or poles to fit any residential or premium environment.
Product application area	The ZCS Azzurro Azzurro ZV3-22K-CARO-CAB is perfectly suited for domestic applications to recharge electric vehicles.
CPC Code https://unstats.un.org/unsd/classifications/Econ	CPC 4621 "Electricity distributor or control apparatus"
EPD generation	EPD generated by means of a validated tool: ZCS LCA-Tool, version 1.0, 10/03/2025

VERIFICATION INFORMATION

PCR	Core PCR: EPDItaly007 – PCR for Electronic and Electrical Products and Systems, REV. 3.2 Issue date 2025/12/10 c-PCR: EPDITALY017 "ELECTRONIC AND ELECTRICAL PRODUCTS AND SYSTEMS – CHARGING STATIONS " Rev. 1.1 del 16/10/2025
EPDItaly Regulation	Regulations of the EPDItaly Programme Revision 6.0. Issue date 03.10.2024
Project Report LCA	*Life Cycle Assessment Report* - LCA tool report
Independent Verification Statement	The PCR review was performed by ICMQ S.p.A. Independent verification of the declaration and data carried out in accordance with ISO 14025:2010. ☐ Internal ☑ External Third-party verification carried out by: ICMQ S.p.A., via Gaetano De Castillia n° 10 - 20124 Milan, Italy. Accredited by Accredia
Statement Comparability	Environmental claims published within the same product category, but from different programs, may not be comparable.
Statement Responsibility	The EPD Owner relieves EPDItaly from any non-compliance with environmental legislation. The holder of the statement will be responsible for the information and supporting evidence. EPDItaly declines all responsibility for the information, data and results provided by the EPD Owner for the life cycle assessment.

1. THE COMPANY

Zucchetti Centro Sistemi Spa (ZCS), founded in 1985 in the heart of Tuscany, Italy, is a leader in technological innovation, specializing in software development, robotics, automation, and renewable energy solutions. Under the visionary leadership of its founder and current CEO, Fabrizio Bernini, the company has expanded its presence in international markets, offering solutions that integrate advanced technologies. In 2000, ZCS became part of the Zucchetti Group, a prominent Italian and European leader in Information and Communication Technology (ICT). This integration has bolstered ZCS's capabilities, enabling it to develop vertically-oriented, cloud-based solutions for businesses of all sizes, aiming to enhance efficiency and effectiveness in business processes.

ZCS operates through five main business units:

- **Software**: Developing cloud-based solutions to improve business process efficiency.
- **Healthcare**: Designing integrated IT systems for healthcare facilities, including analysis labs and hospital services.
- **Automation**: Creating systems for traceability and security across various industries.
- **Robotics**: Producing innovative robots for gardening and pool maintenance, such as the Ambrogio Robot, an eco-friendly, autonomous lawn mower.
- **Green Innovation**: Distributing energy-saving solutions, including smart photovoltaic inverters and storage systems, to promote energy independence in residential, commercial, and industrial settings.

The Green Innovation Division is at the forefront of ZCS's commitment to sustainable development. It focuses on designing and delivering advanced energy solutions, including photovoltaic inverters, intelligent energy storage systems, and electric vehicle charging stations. These innovations empower residential, commercial, and industrial sectors to reduce energy consumption and enhance energy independence.

The company's mission focuses on improving quality of life and supporting business development through intelligent, eco-friendly technology, combining creativity with technological innovation. ZCS is committed to sustainability, emphasizing economic, environmental, and social responsibility in its operations. With a strong emphasis on research and development, ZCS's Idealab incubates innovative ideas, transforming them into market-ready solutions. The company has received numerous awards and recognitions for its commitment to innovation and social responsibility, including the prestigious "Award of Awards for Innovation" and the knighthood title "Cavaliere del Lavoro" awarded to Fabrizio Bernini in 2017.

2. THE PRODUCT

The ZCS Azzurro ZV3-22K-CARO-CAB is a premium three-phase home charging solution designed for high performance and sustainable energy management. With a maximum power output of 22 kW and a nominal current of 32A, it provides rapid and reliable charging for residential applications. This charger features intelligent energy management capabilities, integrating seamlessly with photovoltaic systems to optimize renewable energy usage and support zero-emission charging. It supports Plug & Play, RFID cards (Mifare ISO), and App-controlled charging modes, ensuring flexibility and user convenience. The system allows for smart connectivity and monitoring via Wi-Fi, Ethernet, or Bluetooth. Designed for versatile installation on walls or poles, the wallbox is robust with a PC943 plastic structure, an IP65 protection rating, and IK08 impact resistance. Its compact dimensions of 374mm x 226mm x 164mm and a net weight of 5.7 kg make it easy to install in any environment. Safety is prioritized through comprehensive protections, including 30

mA Type A + 6 mA DC residual current detection, as well as safeguards against over/under voltage, frequency, and overtemperature.

Data	Value
Output power	22 kW
Nominal voltage	400 V AC
Nominal current	32 A
Frequency range	50/60 Hz

2.1. COMPOSITION

The Azzurro ZV3-22K-CARO-CAB, whose total weight is approximately 5.7 kg, is composed of different materials, including steel, aluminium and other metals for rigid parts that make up the structure and for the internal parts. There are also other materials like electronic components, plastics and more.

IEC62474 Classname	IEC62474 ID	% by weight of total
Stainless steel	M-100	0.53
Other ferrous alloys, non-stainless steels	M-119	0.34
Copper and its alloys	M-121	0.86
PolyVinylChloride (PVC)	M-200	0.04
PolyCarbonate (PC)	M-204	8.50
PolyAmide (PA)	M-208	2.25
Other unfilled thermoplastics	M-249	9.12
Silicone	M-321	1.30
Electronic components	-	77.05

No substance in the product greater than 0,10% by weight is present on the "List of Potentially Hazardous Substances" candidates for authorization under the REACH legislation.

Printed circuit boards used in this product weight 199 grams and are modelled through the Ecoinvent 3.9 process "Printed wiring board, for surface mounting, Pb free surface {GLO}| printed wiring board production, for surface mounting, Pb free surface | Cut-off, S".

2.2. REFERENCE SERVICE LIFE (RSL)

The reference service life of the product has been assumed to be 20 years.

3. SCOPE AND TYPE OF EPD

This is a product-specific EPD, compliant with ISO 14025 and EN 50693 standards, as part of the EPDItaly program, for the ZCS Azzurro ZV3-22K-CARO-CAB. It is a charging station for domestic applications that can be integrated with photovoltaic production and energy storage. The study is based on a "cradle to grave" LCA methodology, in accordance with ISO 14040 and 14044 standards. The geographical scope of the data is referred to Italy as the product is mainly sold and used in Italy. The reference year is set at 2024, considering the current technological level. The results were generated using SimaPro 9.6 modeling software.

Representativeness	Scope
Spatial	Italy
Year	2024

3.1. FUNCTIONAL UNIT

The functional unit identified for the LCA study is a single charging station, defined as an assembly of electric and electronic devices delivering electric power from the grid to an electric vehicle for charging purposes.

3.2. PRINCIPLE OF MODULARITY AND ENVIRONMENTAL RESPONSIBILITY (PPP)

In the LCA study, the principle of modularity was adopted, which allows the product life cycle to be broken down into different phases, assigning specific environmental impacts to each of them. This approach facilitates a clear attribution of environmental responsibilities at every stage of the production process, ensuring greater transparency and traceability of data.

In addition, the PPP (Polluter Pays Principle) has been complied with, according to which the entity causing an environmental impact is also the one responsible for the related mitigation or repair costs. This principle ensures that environmental costs are not passed on to the community, but are correctly attributed to those who generated them, promoting greater responsibility and incentivizing the adoption of more sustainable practices throughout the supply chain.

3.3. SYSTEM BOUNDARIES

The system boundary implemented in this LCA covered the entire product life cycle, i.e. from "cradle to grave", with the life cycle phases and geographical areas for all the main activities involved, grouped into five distinct modules: upstream, core and downstream, according to EN 50693. These modules have further been divided into sub-modules: manufacturing, distribution, installation, use and maintenance and end-of-life. In the context of life cycle analysis (LCA), the terms upstream, core, and downstream refer to different stages of a product's lifecycle:

- **Upstream:** It includes the initial stages of production, such as extracting raw materials, processing them, and transporting them to the production site. It therefore concerns everything that happens before the manufacture of the product.
- **Core:** This is the middle stage of the life cycle, which includes the production of the product itself, assembly, and manufacturing operations. It is the part of the process where the product is created or built.
- **Downstream:** Involves post-production stages, such as transportation to the customer, end-user use, and end-of-life disposal or recycling. It focuses on what happens to the product after it is made and distributed.

These three modules cover the entire life cycle of a product, from initial production to disposal. The product lifecycle and inventory analysis, which describe all the activities, simplified assumptions, and modeling scenarios used in LCA, have been covered exhaustively in the next section.

Manufacturing	Distribution	Installation	Use and maintenance	End of Life
Upstream - Core	Downstream	Downstream	Downstream	Downstream
√	√	√	√	√

3.3.1. ALLOCATION RULES

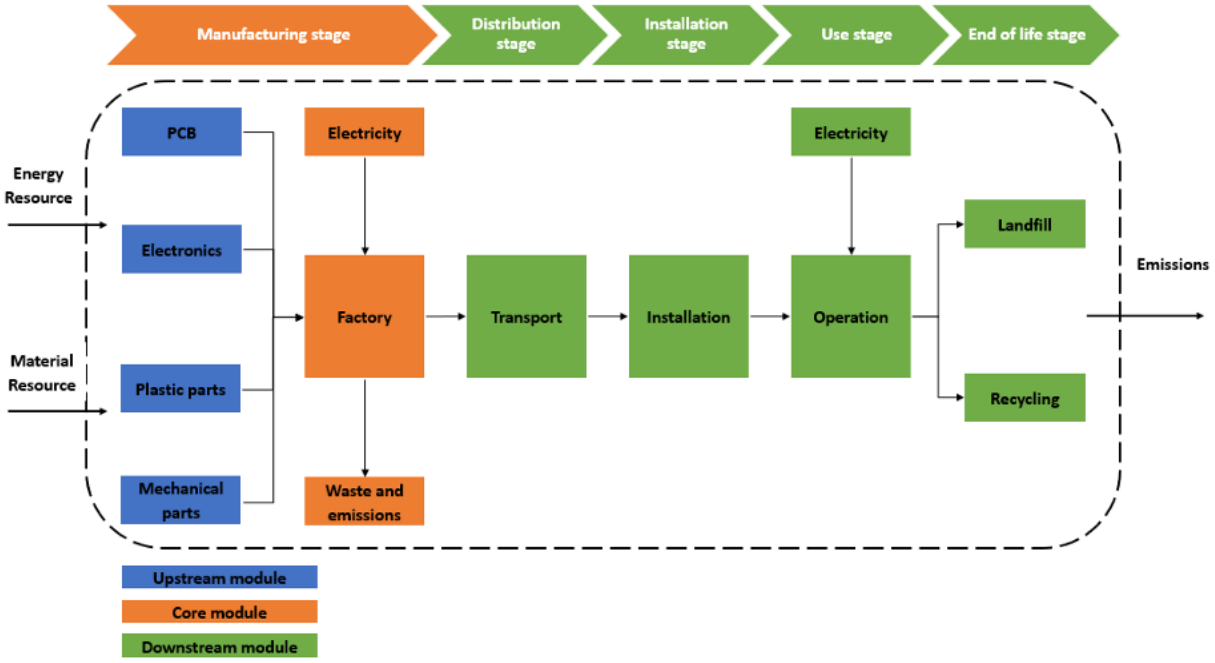
An allocation was made to calculate electricity consumption and waste generation per functional unit. This allocation was based on the total number of units produced annually, as well as the annual electricity consumption and waste generation.

3.4. DATA QUALITY

The data used in the LCA study include both primary and secondary data. The primary data were obtained directly from Zucchetti Centro Sistemi S.p.A. and from the external manufacturing plant. This data is under the control and management of the company (e.g., bills, invoices, transport documents, weighing records). Secondary data comes from a variety of sources, including selected generic data from international databases; Proxy data: sourced from sources other than databases, used to create scenarios and fill in any information gaps. In the present study, secondary data were modeled using the Ecoinvent 3.9 database (2021), with citation of origin in the case of data from different sources.

4. LIFE CYCLE INVENTORY ANALYSIS (LCIA)

The Life Cycle Inventory (LCI) lists and quantifies all inflows and outflows at all declared life cycle stages of the product within the system boundary considered in relation to the scope of the study.



4.1. MANUFACTURING STAGE

The Life Cycle Study (LCA) includes both the "Upstream" phase, and the "Core" processes related to production. The Upstream phase includes the semi-finished products, the materials used in the production system and the manufacturing of the product by the external supplier in China (Shenzhen, Guangdong Province). It also includes the transportation of the raw materials and semi-finished products to the external manufacturing plant as well as the transportation of the final product from the Chinese manufacturer to Zucchetti Centro Sistemi premises, where the product is then shipped to the customer.

The core processes concern all the internal processes to which the product and its components are subjected within Zucchetti Centro Sistemi's plant. However, given that there is no manufacturing process taking place at Zucchetti Centro Sistemi's premises, the impacts considered in the core phase are related to the energy consumption of the building where the Green Innovation Division operates. These data, extracted from the ERP and bills of the company, were entered into the SimaPro software to calculate the environmental impact of the production cycle of the product.

4.2. DISTRIBUTION STAGE

This stage includes the transportation of the product to the final customer. Based on the main country of shipment, in this case Italy, an assumed mean fixed value of 300 km has been chosen as distance to calculate the ton*km value. The transportation takes place only within the European Union and is assumed to be carried by truck, EURO 4, 16-32 ton.

4.3. INSTALLATION STAGE

This module calculates the environmental impacts associated with the installation of the product. In this case, the product is manually installed, so there is no impact associated with it, while the impact come from the discarding of the packaging. For the impact modeling of this phase, the treatment percentage guidelines from EN 56693 and EUROSTAT were used. The distance from the recycler is assumed to be 50 km, according to the relevant PCR.

4.4. USE & MAINTENANCE STAGE

This module analyses the environmental impacts associated with the use and maintenance of the product, by excluding energy carriers used in maintenance, such as spare parts and materials specified by the manufacturer, due to the lack of reliable data on failure times and maintenance frequencies. The analysis

of emissions during the use phase of the module is based on the information available from the product data sheet and the formulas reported in the relevant PCR and c-PCR.

In particular, the total energy consumption value (expressed in kWh per RSL) is calculated using this formula:

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

The Puse is assumed as the power of the charging station during stand-by. Stand-by power is 2,599 W.

To model this phase, a process from Ecoinvent describing the Italian consumption mix has been used to calculate the total emissions regarding the electric energy withdrawal of the charging station during the time of RSL:

"Electricity, medium voltage {IT}| market for electricity, medium voltage | Cut-off, S"

The relevant geographic area for the use phase is Italy.

4.5. END OF LIFE STAGE

This section examines product end-of-life, for which Zucchetti Centro Sistemi does not have primary data that can be used in the LCA study. End-of-life has been calculated according to the end-of-life scenarios outlined in the EN 50693 and EUROSTAT (the only exception is for electronic components, for which a specific process from Ecoinvent was directly applied), estimating a distance from the recycler of 50 km by truck, EURO 4, 16-32 ton. For the environmental impact of the different waste treatments, the EcoInvent database has been used.

5. RESULTS

In this section, the results of the study are presented, divided by different impact parameters and by the phases of the study that constituted the LCA.

Environmental impacts were calculated using the EN 15804 + A2, Cumulative Energy Demand (LHV), Selected LCI results, additional, and EDIP 2003 methodologies, as indicated in the SimaPro Methods library. These methodologies are used to calculate environmental impact categories, resource use and waste produced, as required by the PCR: EPDItaly007-PCR for electronic and electrical products and systems (Stand-alone) – Rev 3.2.

5.1. ENVIRONMENTAL IMPACTS

Azzurro ZV3-22K-CARO-CAB

				Upstream - Core	*Downstream*			
Impact indicators	**Nomenclatures**	**Head**	**Total**	**Manufacturing**	**Distribution**	**Installation**	**Use & Maintenance**	**End of Life**
Global warming Potential - Total	GWP - Total	kg CO2 eq	3.19E+02	1.20E+02	3.81E-01	2.67E-01	1.97E+02	7.10E+00
Global warming Potential - Fossil	GWP - Fossil	kg CO2 eq	3.02E+02	1.19E+02	3.47E-04	2.46E-01	1.80E+02	7.05E+00
Global warming Potential – Biogenic	GWP - Biogenic	kg CO2 eq	1.73E+01	3.72E-01	3.81E-01	2.14E-02	1.64E+01	5.64E-02
Global warming Potential - Land use and LU change	GWP - Luluc	kg CO2 eq	3.39E-01	3.10E-01	1.86E-04	5.87E-06	2.84E-02	2.43E-04
Ozone depletion Potential	ODP	kg CFC11 eq	9.33E-06	5.27E-06	8.34E-09	3.93E-10	4.04E-06	1.09E-08
Acidification Potential	AP	mol H+ eq	3.07E+00	2.41E+00	1.58E-03	7.48E-05	6.52E-01	2.49E-03
Eutrophication Potential, freshwater	EP - freshwater	kg P eq	1.95E-01	1.66E-01	2.68E-05	1.27E-06	2.87E-02	7.49E-05
Eutrophication Potential, marine	EP - marine	kg N eq	3.28E-01	2.15E-01	6.01E-04	4.64E-05	1.11E-01	1.97E-03
Eutrophication Potential, terrestrial	EP - terrestrial	mol N eq	3.89E+00	2.62E+00	6.42E-03	3.33E-04	1.27E+00	1.11E-02
Photochemical ozone formation Potential	POCP	kg NMVOC eq	1.32E+00	7.78E-01	2.31E-03	1.01E-04	5.43E-01	3.00E-03
Resource use Potential, minerals and metals	ADP - minerals&metals*	kg Sb eq	5.45E-02	5.41E-02	1.23E-06	3.74E-08	3.21E-04	6.72E-07
Resource use Potential, fossil	ADP – fossil*	MJ	4.47E+03	1.63E+03	5.43E+00	1.59E-01	2.84E+03	3.56E+00
Water deprivation Potential	WDP*	m3 depriv.	1.59E+02	4.55E+01	2.21E-02	1.09E-02	1.14E+02	3.87E-01

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

5.2. USE OF RESOURCES

Azzurro ZV3-22K-CARO-CAB

				Upstream - Core	*Downstream*			
Parameter	**Nomenclatures**	**Head**	**Total**	**Manufacturing**	**Distribution**	**Installation**	**Use & Maintenance**	**End of Life**
Renewable primary energy as energy carrier	PERE	MJ	9.37E+02	2.18E+02	8.44E-02	3.56E-03	7.19E+02	1.90E-01
Renewable primary energy resource as material utilization	PERM	MJ	9.77E+00	9.77E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	PERT	MJ	9.47E+02	2.28E+02	8.44E-02	3.56E-03	7.19E+02	1.90E-01
Non-renewable primary energy as energy carrier	PENRE	MJ	4.39E+03	1.54E+03	5.43E+00	1.59E-01	2.84E+03	3.56E+00
Non-renewable primary energy as material utilization	PENRM	MJ	7.54E+01	7.54E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	PENRT	MJ	4.46E+03	1.62E+03	5.43E+00	1.59E-01	2.84E+03	3.56E+00
Use of secondary material	SM	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
Net use of fresh water	FW	m3	4.48E+00	1.41E+00	7.74E-04	3.45E-04	3.06E+00	1.38E-02

5.3. WASTE PRODUCED

Azzurro ZV3-22K-CARO-CAB

				Upstream - Core	*Downstream*			
Parameter/indicator	**Nomenclatures**	**Head**	**Total**	**Manufacturing**	**Distribution**	**Installation**	**Use & Maintenance**	**End of Life**
Hazardous waste disposed	HWD	Kg	1.93E-01	1.11E-01	1.34E-04	2.85E-03	4.79E-02	1.28E-01
Non-hazardous waste disposed	NHWD	Kg	2.55E+01	1.63E+01	2.65E-01	3.92E-02	8.46E+00	2.61E+00
Radioactive waste disposed	RWD	Kg	9.30E-03	3.17E-03	1.77E-06	6.00E-08	6.13E-03	3.59E-06
Components for re-use	CRU	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	Kg	8.29E-01	0.00E+00	0.00E+00	7.57E-01	0.00E+00	7.16E-02
Materials for energy recovery	MER	Kg	6.88E-01	0.00E+00	0.00E+00	6.27E-02	0.00E+00	6.25E-01
Exported thermal energy	EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electricity energy	EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

BIBLIOGRAPHY

1. Core PCR: EPDItaly007 – PCR for Electronic and Electrical Products and Systems, REV. 3.2 Issue date 2025/12/10
2. ISO 14040:2006 'Principles and framework' which contains the principles and framework for life cycle assessment and a description of the structure of an LCA analysis
3. ISO 14044:2006 "Requirements and guidelines" which is the main support for the practical application of a life cycle study.
4. UNI EN ISO 14025 :2010, Environmental labels and declarations – Type III environmental declarations – Principles and procedures (ISO 14025 :2006)
5. EN 50693:2019 "*Product category rules for life cycle assessments of electronic and electrical products and systems*"
6. Regulations of the EPDItaly Programme Revision 6.0. Issue date 30.10.2023
7. LCA tool report – Rev 1.0, 10/03/2025
8. Special Waste Report, 2023 Edition, ISPRA - https://www.isprambiente.gov.it/it/pubblicazioni/rapporti/rapporto-rifiuti-speciali-edizione-2023
9. Department for Environment, Food & Rural Affairs https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs