Zucchetti Centro Sistemi S.p.A.

ENVIRONMENTAL PRODUCT DECLARATION



PRODUCTS NAME

INVERTERS

Azzurro 3PH HYD 40000 ZSR
Azzurro 3PH HYD 50000 ZSR
Azzurro 3PH HYD 60000 ZSR

SITES

No.1 Shiquanling West Road, Chenjiang Street,Zhongkai High-Tech Zone, 516006, Huizhou City, Guangdong Province, P.R. China

In accordance with ISO 14025 and EN 50693

Program Operator	EPDItaly
Publisher	EPDItaly

Declaration number	Azzurro ZCS 015
Registration Number	EPDITALY1473

Release Date	01/10/2026
Valid until	01/10/2031

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 3PH HYD 40000 ZSR Azzurro 3PH HYD 50000 ZSR Azzurro 3PH HYD 60000 ZSR
Sites	No.1 Shiquanling West Road, Chenjiang Street, Zhongkai High-Tech Zone, 516006, Huizhou City, Guangdong Province, P.R. China
Brief description and technical information of the products	The ZCS Azzurro 3PH HYD 40000 ZSR, 50000 ZSR, and 60000 ZSR are high-performance three-phase hybrid inverters designed for commercial and industrial solar systems. With a maximum efficiency of 98.2%, four MPPTs, and a wide input voltage range (160–950 V) , they ensure optimal performance and support up to 200% PV oversizing. They feature advanced protection including integrated DC Type I+II SPDs and AC Type II SPDs –forced convection cooling, and an IP66 protection rating. Additionally, these models support up to 100% three-phase unbalanced loads, offer a fast backup switching time of just 4 ms, and provide RS485 connectivity with optional Wi-Fi, 4G, or LAN, making them ideal solutions for large-scale energy independence.
Product application area	The ZCS Azzurro 3PH HYD 40000 ZSR, 50000 ZSR, and 60000 ZSR inverters are perfectly suited for industrial applications and are natively integrated with energy storage systems to ensure complete energy independence.
CPC Code https://unstats.un.org/unsd/classifications/Econ	CPC 4612: "Electrical transformers, static converters and inductors"
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 Sub-category PCR: EPDItaly032 "Power Inverter", (Rev. 0), 22/12/2022
EPDItaly Regulation	Regulations of the EPDItaly Programme Revision 6.0. Issue date 30.10.2023
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 3PH HYD (Azzurro 3PH HYD 40000 ZSR, Azzurro 3PH HYD 50000 ZSR, Azzurro 3PH HYD 60000 ZSR) are efficient three-phase hybrid inverters designed for commercial and industrial photovoltaic systems. With a maximum efficiency of 98.2% and four independent MPPT inputs, they ensure optimal energy harvesting even under varying environmental conditions. Their wide input voltage range (160–950V) and support for up to 200% PV oversizing make them adaptable to large-scale solar installations. These transformerless inverters support advanced safety features, including anti-islanding protection, residual current detection, and integrated DC switches, ensuring reliable and secure operation. Equipped with communication options such as RS485 and optional Wi-Fi, 4G, or LAN, these inverters offer convenient system monitoring and diagnostics via LCD and App. They operate with forced convection cooling for efficient heat management. The IP66-rated enclosure ensures durability in outdoor environments, while the support for 100% three-phase unbalanced loads and a fast backup switching time of 4 ms support precise energy management. The ZCS Azzurro 3PH HYD inverters deliver reliable performance and sustainability,

making them an ideal choice for commercial and industrial applications. They are perfectly suited for large-scale solar energy solutions and are natively integrated with energy storage systems, being compatible with LFP batteries supplied by Zucchetti and specifically designed for the ZCB battery cabinets.

The table below highlights the principal technical data for the inverters:

DATA		3PH HYD 40000 ZSR	3PH HYD 50000 ZSR	3PH HYD 60000 ZSR
DC input (PV)	Recommended maximum PV power	80 kWp	100 kWp	120 kWp
	Maximum DC power per MPPT	30 kW (750 – 910 V)		
	Max input voltage	1000 V		
	Start-up voltage	200 V		
	Nominal input voltage	600 V		
	MPPT voltage range	160 – 950 V		
	Full-load DC voltage	310 – 950 V	340 – 950 V	380 – 950 V
	Number of MPPTs	4		
	Max input strings per MPPT	2/2/2/2		
	Max input current	40/40/40/40 A		
	Absolute max input current	50/50/50/50 A		
Battery	Voltage range	600 – 1000 V d.c.		
	Number of battery input channels	1		
	Max charge power	30 kW	60 kW	60 kW
	Max discharge power	40 kW	50 kW	60 kW
	Max charge current	50 A	100 A	100 A
	Max discharge current	64 A	80 A	100 A
	Compatible battery	LFP (supplied by Zucchetti)		
	Depth of Discharge (DoD)	90%		
	BMS communication	CAN		
AC Backup (EPS)	Nominal output voltage	3 / N / PE, 380/400/415 V		
	Output frequency	50/60 Hz		
	Max output power	40 kW	50 kW	60 kW
	Nominal output current	60.8/57.7/55.6 A	76.0/72.2/69.6 A	91.2/86.6/83.5 A
	Nominal apparent power	40 kVA	50 kVA	60 kVA
	Max apparent power	44 kVA	55 kVA	66 kVA
	Max output current	66.9/63.5/61.2 A	83.6/79.4/76.5 A	100/95.3/91.8 A
	Peak apparent output power	1.5 × nominal power, 10 s		
	Total harmonic distortion	< 3%		

DATA		3PH HYD 40000 ZSR	3PH HYD 50000 ZSR	3PH HYD 60000 ZSR
	Switch time	4 ms		
	Asymmetric load support	Yes, 100% three-phase unbalanced load		
AC Generator	Nominal input voltage	3 / N / PE, 380/400/415 V		
	Nominal input frequency	50/60 Hz		
	Nominal input power	40 kW	50 kW	60 kW
	Nominal input current	60.8/57.7/55.6 A	76.0/72.2/69.6 A	91.2/86.6/83.5 A
	Nominal apparent power	40 kVA	50 kVA	60 kVA
	Max apparent power	44 kVA	55 kVA	66 kVA
	Max input current	66.9/63.5/61.2 A	83.6/79.4/76.5 A	100/95.3/91.8 A
AC output (grid)	Nominal voltage	3 / N / PE, 380/400/415 V		
	Nominal frequency	50/60 Hz		
	Max output power	40 kW	50 kW	60 kW
	Nominal output current	60.8/57.7/55.6 A	76.0/72.2/69.6 A	91.2/86.6/83.5 A
	Nominal apparent power	40 kVA	50 kVA	60 kVA
	Max apparent power	44 kVA	55 kVA	66 kVA
	Max output current	66.9/63.5/61.2 A	83.6/79.4/76.5 A	100/95.3/91.8 A
	Max input current	100 A		
	Total harmonic distortion	< 3%		
	Power factor	1 default (programmable +/- 0.8)		
Efficiency	Max MPPT efficiency	99.9%		
	Max efficiency	98.2%		
	European efficiency	97.5%		
	Max charge/discharge efficiency	98.2%		
Protections	DC switch, PV/battery reverse polarity, output short-circuit, overcurrent, overvoltage	Yes		
	Insulation impedance detection	Yes		
	Residual current detection	Yes		
	Anti-islanding protection	Yes		
	Overvoltage protection	PV: Type I+II — AC: Type II		
General	Inverter topology	Transformerless, non-isolated		
	Protection class	Category I		
	Ingress protection (IP)	IP66		
	Overvoltage category	AC III, DC II		

DATA		3PH HYD 40000 ZSR	3PH HYD 50000 ZSR	3PH HYD 60000 ZSR
	Operating temperature	-30 °C to +60 °C (derating above +45 °C)		
	Relative humidity	5% – 95%		
	Max operating altitude	4000 m (derating above 2000 m)		
	Standby self-consumption	< 15 W		
	Installation	Wall mounting		
	Dimensions (W×H×D)	850 × 660 × 305 mm		
	Cooling	Forced convection		
	Weight	75 kg		
	Communication	RS485; optional: WiFi / 4G / LAN		
	Display	LCD & APP		

2.1. COMPOSITION

All the products share the same hardware. They weight 81,4 kg. They are all 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 others.

IEC62474 Classname	IEC62474 ID	% by weight all products
Stainless steel	M-100	2.6
Other ferrous alloys, non-stainless steels	M-119	13.3
Alluminium and its alloys	M-120	25.5
Copper and its alloys	M-121	1.2
Other inorganic materials	M-199	0.02
PolyVinylChloride (PVC)	M-200	0.02
PolyEthylene (PE)	M-204	0.1
PolyCarbonate (PC)	M-204	0.1
PolyAmide (PA)	M-208	0.4
Other unfilled thermoplastics	M-249	0.2
Epoxy resin	M-302	0.04
Silicone	M-321	1.0
Paper	M-341	0.3
Electronic components	-	55.2

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 all the inverters weight approx. 3.97 kg 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 25 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 3PH HYD family. They are power inverters 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 products are mainly sold and used in Italy. The reference year is set at

2025, considering the current technological level. The results were generated using SimaPro 9.6 modeling software.

Representativeness	Scope
Spatial	Italy
Year	2025

3.1. FUNCTIONAL UNIT

The functional unit identified for the LCA study is a single power inverter produced, defined as an assembly of electric and electronic devices converting the variable DC voltage generated by a photovoltaic (PV) solar panel into a commercial frequency alternating current (AC).

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 products.
- **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 products are 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 products after they are built 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

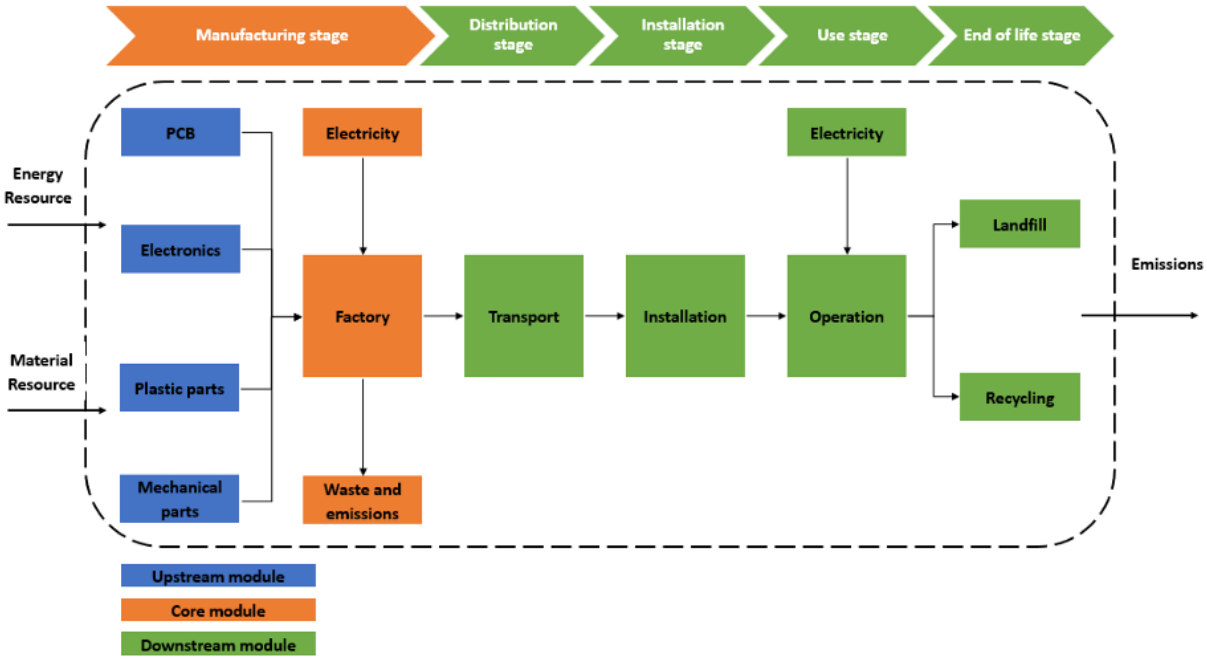
An allocation was made for the waste production based on the functional unit. This calculation was based on the 2023 annual production of inverters in GW and the amount of waste generated in 2023 from the inverters production line.

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 products 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 products by the external supplier in China (Huizhou City, Guangdong Province). It also includes the transportation of raw materials and semi-finished products to the external manufacturing plant as well as the transportation of the final products from the Chinese manufacturer to Zucchetti Centro Sistemi premises, where the products are then shipped to the customer.

The core processes concern all the internal processes to which the products and their 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 products.

4.2. DISTRIBUTION STAGE

This stage includes the transportation of the products 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 for all the inverters. 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 products. In this case, the products are manually installed, so there is no impact associated, while the impact comes 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 products, 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 c-PCR.

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

$$E_{use}\,[kWh] = Output\ rated\ AC\ active\ power * average\ local\ annual\ sunshine * (1 - average\ energy\ efficiency) * RSL$$

To model this phase, a process from Ecoinvent describing the production of electric energy from photovoltaic (to which the inverters are connected, in this case in the "slanted roof" configuration) has been used:

"Electricity, low voltage {IT}| electricity production, photovoltaic, 3kWp slanted-roof installation, single-Si, panel, mounted | Cut-off, S"

The relevant geographic area for the use phase is Italy.

The output rated AC active power refers to the maximum continuous power that the inverter can deliver to the electrical grid or the connected load under standard conditions. It is measured in kilowatts (kW) and represents the usable AC power output after conversion from DC (direct current) produced by the solar panels.

The average local sunshine has been calculated from the *photovoltaic geographical information system* (https://re.jrc.ec.europa.eu/pvg_tools/en/). In case of the Italian scenario, a value of 1500 hours of photovoltaic productivity has been considered.

4.5. END OF LIFE STAGE

This section examines products 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 for every inverter model 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 3PH HYD 40000 ZSR

				Upstream - Core	*Downstream*			
Impact indicators	**Nomenclatures**	**Unit**	**Total**	**Manufacturing**	**Distribution**	**Installation**	**Use & Maintenance**	**End of Life**
Global warming Potential - Total	GWP - Total	kg CO2 eq	6.12E+03	3.59E+03	5.76E+00	1.32E+01	2.51E+03	5.11E+01
Global warming Potential - Fossil	GWP - Fossil	kg CO2 eq	6.08E+03	3.58E+03	5.24E-03	1.66E-01	2.49E+03	5.04E+01
Global warming Potential – Biogenic	GWP - Biogenic	kg CO2 eq	2.80E+01	-1.40E+00	5.75E+00	1.44E+01	8.50E+00	7.78E-01
Global warming Potential - Land use and LU change	GWP - Luluc	kg CO2 eq	1.57E+01	1.10E+01	2.81E-03	1.57E-04	4.70E+00	2.51E-03
Ozone depletion Potential	ODP	kg CFC11 eq	2.79E-04	1.21E-04	1.26E-07	7.50E-09	1.57E-04	9.44E-08
Acidification Potential	AP	mol H+ eq	6.51E+01	4.64E+01	2.38E-02	2.46E-03	1.87E+01	2.21E-02
Eutrophication Potential, freshwater	EP - freshwater	kg P eq	3.78E+00	2.24E+00	4.05E-04	7.86E-05	1.54E+00	7.54E-04
Eutrophication Potential, marine	EP - marine	kg N eq	7.99E+00	5.11E+00	9.09E-03	2.12E-03	2.87E+00	1.18E-02
Eutrophication Potential, terrestrial	EP - terrestrial	mol N eq	8.79E+01	5.77E+01	9.70E-02	1.14E-02	3.00E+01	9.51E-02
Photochemical ozone formation Potential	POCP	kg NMVOC eq	3.27E+01	2.20E+01	3.49E-02	3.40E-03	1.07E+01	2.65E-02
Resource use Potential, minerals and metals	ADP - minerals&metals*	kg Sb eq	1.11E+00	9.58E-01	1.86E-05	9.37E-07	1.51E-01	6.77E-06
Resource use Potential, fossil	ADP – fossil*	MJ	7.73E+04	4.60E+04	8.21E+01	4.67E+00	3.12E+04	3.72E+01
Water deprivation Potential	WDP*	m3 depriv.	2.56E+03	7.55E+02	3.35E-01	-5.31E-02	1.80E+03	2.92E+00

* 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

Azzurro 3PH HYD 50000 ZSR

				Upstream - Core	*Downstream*			
Impact indicators	**Nomenclatures**	**Unit**	**Total**	**Manufacturing**	**Distribution**	**Installation**	**Use & Maintenance**	**End of Life**
Global warming Potential - Total	GWP - Total	kg CO2 eq	6.75E+03	3.60E+03	5.76E+00	1.32E+01	3.13E+03	5.11E+01
Global warming Potential - Fossil	GWP - Fossil	kg CO2 eq	6.70E+03	3.58E+03	5.24E-03	1.66E-01	3.12E+03	5.04E+01
Global warming Potential – Biogenic	GWP - Biogenic	kg CO2 eq	3.01E+01	-7.44E-01	5.75E+00	1.30E+01	1.06E+01	7.78E-01
Global warming Potential - Land use and LU change	GWP - Luluc	kg CO2 eq	1.68E+01	1.10E+01	2.81E-03	1.57E-04	5.87E+00	2.51E-03
Ozone depletion Potential	ODP	kg CFC11 eq	3.18E-04	1.21E-04	1.26E-07	7.50E-09	1.96E-04	9.44E-08
Acidification Potential	AP	mol H+ eq	6.98E+01	4.64E+01	2.38E-02	2.46E-03	2.34E+01	2.21E-02
Eutrophication Potential, freshwater	EP - freshwater	kg P eq	4.16E+00	2.24E+00	4.05E-04	7.86E-05	1.92E+00	7.54E-04
Eutrophication Potential, marine	EP - marine	kg N eq	8.71E+00	5.11E+00	9.09E-03	2.12E-03	3.59E+00	1.18E-02
Eutrophication Potential, terrestrial	EP - terrestrial	mol N eq	9.54E+01	5.77E+01	9.70E-02	1.14E-02	3.75E+01	9.51E-02
Photochemical ozone formation Potential	POCP	kg NMVOC eq	3.54E+01	2.20E+01	3.49E-02	3.40E-03	1.33E+01	2.65E-02
Resource use Potential, minerals and metals	ADP - minerals&metals*	kg Sb eq	1.15E+00	9.58E-01	1.86E-05	9.37E-07	1.89E-01	6.77E-06
Resource use Potential, fossil	ADP – fossil*	MJ	8.51E+04	4.60E+04	8.21E+01	4.67E+00	3.90E+04	3.72E+01
Water deprivation Potential	WDP*	m3 depriv.	3.01E+03	7.55E+02	3.35E-01	-5.31E-02	2.25E+03	2.92E+00

* 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

Azzurro 3PH HYD 60000 ZSR

				Upstream - Core	*Downstream*			
Impact indicators	**Nomenclatures**	**Unit**	**Total**	**Manufacturing**	**Distribution**	**Installation**	**Use & Maintenance**	**End of Life**
Global warming Potential - Total	GWP - Total	kg CO2 eq	7.38E+03	3.60E+03	5.76E+00	1.32E+01	3.76E+03	5.11E+01
Global warming Potential - Fossil	GWP - Fossil	kg CO2 eq	7.33E+03	3.59E+03	5.24E-03	1.66E-01	3.74E+03	5.04E+01
Global warming Potential – Biogenic	GWP - Biogenic	kg CO2 eq	3.23E+01	-9.15E-02	5.75E+00	1.30E+01	1.27E+01	7.78E-01
Global warming Potential - Land use and LU change	GWP - Luluc	kg CO2 eq	1.80E+01	1.10E+01	2.81E-03	1.57E-04	7.05E+00	2.51E-03
Ozone depletion Potential	ODP	kg CFC11 eq	3.57E-04	1.21E-04	1.26E-07	7.50E-09	2.36E-04	9.44E-08
Acidification Potential	AP	mol H+ eq	7.45E+01	4.64E+01	2.38E-02	2.46E-03	2.81E+01	2.21E-02
Eutrophication Potential, freshwater	EP - freshwater	kg P eq	4.54E+00	2.24E+00	4.05E-04	7.86E-05	2.30E+00	7.54E-04
Eutrophication Potential, marine	EP - marine	kg N eq	9.43E+00	5.11E+00	9.09E-03	2.12E-03	4.30E+00	1.18E-02
Eutrophication Potential, terrestrial	EP - terrestrial	mol N eq	1.03E+02	5.77E+01	9.70E-02	1.14E-02	4.50E+01	9.51E-02
Photochemical ozone formation Potential	POCP	kg NMVOC eq	3.81E+01	2.20E+01	3.49E-02	3.40E-03	1.60E+01	2.65E-02
Resource use Potential, minerals and metals	ADP - minerals&metals*	kg Sb eq	1.19E+00	9.58E-01	1.86E-05	9.37E-07	2.27E-01	6.77E-06
Resource use Potential, fossil	ADP - fossil*	MJ	9.29E+04	4.60E+04	8.21E+01	4.67E+00	4.68E+04	3.72E+01
Water deprivation Potential	WDP*	m3 depriv.	3.46E+03	7.55E+02	3.35E-01	-5.31E-02	2.70E+03	2.92E+00

* 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

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				Upstream - Core	*Downstream*			
Parameter	**Nomenclatures**	**Unit**	**Total**	**Manufacturing**	**Distribution**	**Installation**	**Use & Maintenance**	**End of Life**
Renewable primary energy as energy carrier	PERE	MJ	1.26E+05	5.34E+03	1.28E+00	8.58E-02	1.21E+05	1.91E+00
Renewable primary energy resource as material utilization	PERM	MJ	3.12E+02	3.12E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	PERT	MJ	1.27E+05	5.65E+03	1.28E+00	8.58E-02	1.21E+05	1.91E+00
Non-renewable primary energy as energy carrier	PENRE	MJ	7.69E+04	4.56E+04	8.21E+01	4.67E+00	3.12E+04	3.72E+01
Non-renewable primary energy as material utilization	PENRM	MJ	4.53E+01	4.53E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	PENRT	MJ	7.70E+04	4.57E+04	8.21E+01	4.67E+00	3.12E+04	3.72E+01
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	9.64E+01	2.91E+01	1.17E-02	-5.91E-04	6.72E+01	1.09E-01

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				Upstream - Core	*Downstream*			
Parameter	**Nomenclatures**	**Unit**	**Total**	**Manufacturing**	**Distribution**	**Installation**	**Use & Maintenance**	**End of Life**
Renewable primary energy as energy carrier	PERE	MJ	1.56E+05	5.34E+03	1.28E+00	8.58E-02	1.51E+05	1.91E+00
Renewable primary energy resource as material utilization	PERM	MJ	3.12E+02	3.12E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	PERT	MJ	1.57E+05	5.65E+03	1.28E+00	8.58E-02	1.51E+05	1.91E+00
Non-renewable primary energy as energy carrier	PENRE	MJ	8.47E+04	4.56E+04	8.21E+01	4.67E+00	3.90E+04	3.72E+01
Non-renewable primary energy as material utilization	PENRM	MJ	4.53E+01	4.53E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	PENRT	MJ	8.48E+04	4.57E+04	8.21E+01	4.67E+00	3.90E+04	3.72E+01
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	1.13E+02	2.91E+01	1.17E-02	-5.91E-04	8.41E+01	1.09E-01

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				Upstream - Core	*Downstream*			
Parameter	**Nomenclatures**	**Unit**	**Total**	**Manufacturing**	**Distribution**	**Installation**	**Use & Maintenance**	**End of Life**
Renewable primary energy as energy carrier	PERE	MJ	1.87E+05	5.34E+03	1.28E+00	8.58E-02	1.81E+05	1.91E+00
Renewable primary energy resource as material utilization	PERM	MJ	3.12E+02	3.12E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	PERT	MJ	1.87E+05	5.65E+03	1.28E+00	8.58E-02	1.81E+05	1.91E+00
Non-renewable primary energy as energy carrier	PENRE	MJ	9.25E+04	4.56E+04	8.21E+01	4.67E+00	4.68E+04	3.72E+01
Non-renewable primary energy as material utilization	PENRM	MJ	4.53E+01	4.53E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	PENRT	MJ	9.26E+04	4.57E+04	8.21E+01	4.67E+00	4.68E+04	3.72E+01
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	1.30E+02	2.91E+01	1.17E-02	-5.91E-04	1.01E+02	1.09E-01

5.3. WASTE AND OUTPUT FLOWS

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				Upstream - Core	*Downstream*			
Parameter/indicator	**Nomenclatures**	**Unit**	**Total**	**Manufacturing**	**Distribution**	**Installation**	**Use & Maintenance**	**End of Life**
Hazardous waste disposed	HWD	Kg	2.95E+01	2.58E+00	2.03E-03	5.44E-02	2.32E+01	4.58E+00
Non-hazardous waste disposed	NHWD	Kg	8.04E+02	4.17E+02	4.01E+00	3.07E+00	3.74E+02	2.75E+01
Radioactive waste disposed	RWD	Kg	1.46E-01	8.97E-02	2.67E-05	1.50E-06	5.63E-02	3.67E-05
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	3.54E+01	0.00E+00	0.00E+00	9.69E+00	0.00E+00	2.57E+01
Materials for energy recovery	MER	Kg	6.52E+00	0.00E+00	0.00E+00	5.76E+00	0.00E+00	7.64E-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

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				Upstream - Core	*Downstream*			
Parameter/indicator	**Nomenclatures**	**Unit**	**Total**	**Manufacturing**	**Distribution**	**Installation**	**Use & Maintenance**	**End of Life**
Hazardous waste disposed	HWD	Kg	3.53E+01	2.63E+00	2.03E-03	5.44E-02	2.90E+01	4.58E+00
Non-hazardous waste disposed	NHWD	Kg	8.97E+02	4.17E+02	4.01E+00	3.07E+00	4.68E+02	2.75E+01
Radioactive waste disposed	RWD	Kg	1.60E-01	8.97E-02	2.67E-05	1.50E-06	7.04E-02	3.67E-05
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	3.54E+01	0.00E+00	0.00E+00	9.69E+00	0.00E+00	2.57E+01
Materials for energy recovery	MER	Kg	6.52E+00	0.00E+00	0.00E+00	5.76E+00	0.00E+00	7.64E-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

Azzurro 3PH HYD 60000 ZSR

				Upstream - Core	*Downstream*			
Parameter/indicator	**Nomenclatures**	**Unit**	**Total**	**Manufacturing**	**Distribution**	**Installation**	**Use & Maintenance**	**End of Life**
Hazardous waste disposed	HWD	Kg	4.12E+01	2.69E+00	2.03E-03	5.44E-02	3.48E+01	4.58E+00
Non-hazardous waste disposed	NHWD	Kg	9.91E+02	4.17E+02	4.01E+00	3.07E+00	5.61E+02	2.75E+01
Radioactive waste disposed	RWD	Kg	1.74E-01	8.97E-02	2.67E-05	1.50E-06	8.45E-02	3.67E-05
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	3.54E+01	0.00E+00	0.00E+00	9.69E+00	0.00E+00	2.57E+01
Materials for energy recovery	MER	Kg	6.52E+00	0.00E+00	0.00E+00	5.76E+00	0.00E+00	7.64E-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

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