ENVIRONMENTAL PRODUCT DECLARATION

COL GROUP

DY 900/4 24 KV EQUIPMENT IN METAL FRAME, SF6 INSULATED, WITH CIRCUIT BREAKER

In accordance with ISO 14025 and EN 50693

Registration Number
EPDITALY0225

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EPD COL 03

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Manufacturing site
Strada Provinciale 14 93/95 - 95032 Belpasso (Catania)

Program operator & EPD publisher: EPDITALY

INFORMATION ON THE PROGRAMME AND VERIFICATION PROCESS

PROGRAMME OPERATOR

EPDItaly

Via Gaetano De Castillia, 10; 20124 – MILANO; E-mail: www.epditaly.it

EPDs within the same product category but from different programmes may not be comparable.

The EPD owner has the sole ownership, liability and responsibility of the EPD.

INDEPENDENT VERIFICATION OF THE DECLARATION AND DATA, ACCORDING TO ISO 14025:2010

☐ Internal ☑ External

THIRD PARTY VERIFIER

ICMQ S.p.A

ACCREDITED OR APPROVED BY

Accredia

GENERAL INFORMATION

EPD OWNER

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YEAR OF REPORTED PRIMARY DATA - MARKET APPLICABILITY - CPC CODE - APPLICATION FIELD

2020 - Italy - 4621 - secondary substation of distribution networks

REFERENCE PCR - PROJECT DOCUMENTS

EPDITALY007 (core PCR, rev2 2020/10/21) and EPDITALY015 rev 1.4 2020/09/24
Regolamento del Programma EPDItaly - v. 05 - 2020/07/01
EN 50693:2019 Product category rules for life cycle assessments of electronic and electrical products and systems (2019/08/30)

COMPANY REFERENCE CONTACT

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TECHNICAL SUPPORT PROVIDED BY

LCE - Life Cycle Engineering SpA
www.lcengineering.eu

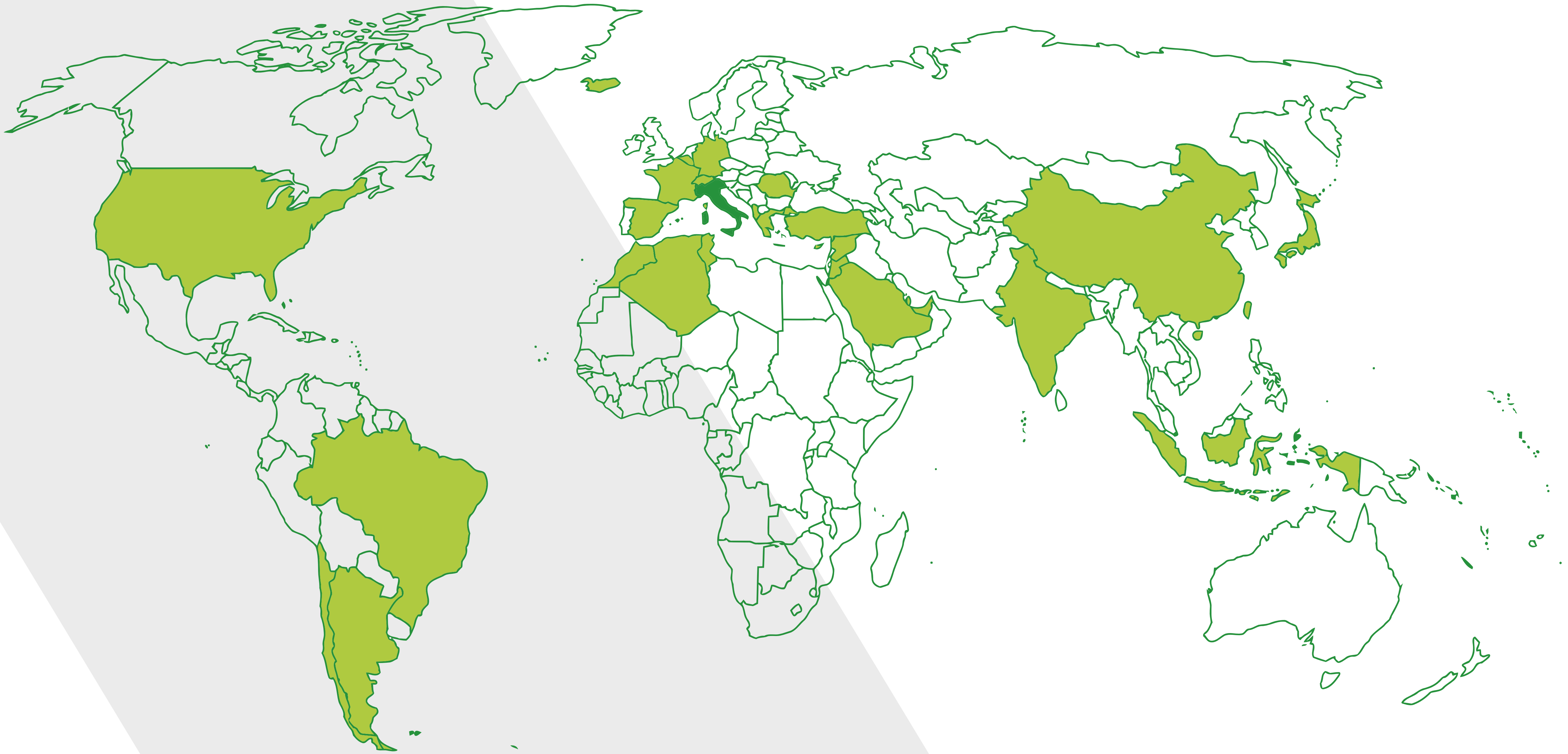
COL GIOVANNI PAOLO SPA

Established in 1920, Col Giovanni Paolo S.p.A. has achieved, over the years, **a prestigious position in the electro-technical and plant engineering fields.**

Having consolidated its position on the national and international market, but looking constantly for innovative developments able to drive the Company toward a global diversification, COL has implemented a growth policy, with the acquisition of companies in the electronic, environmental, systems, railway and electromechanical sectors.

The experience gained, the commitment of the technical team and the ongoing **investments in R&D**, where the 7% of turnover is invested, allow to put in place an highly skilled and specialised approach for the solution of the different sectors problems, and ensure the products quality.

COMMERCIAL PRESENCE IN THE WORLD



AMERICA
- U.S.A.
- BRAZIL
- CHILE
- ARGENTINA

AFRICA
- MOROCCO
- TUNISIA
- ALGERIA

MIDDLE EAST
- U.A.B.
- JORDAN
- EGYPT
- SYRIA
- ARABIA
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- CHINA
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- Enel Power Spa
- Terna Spa
- Valdis Spa
- Deval Spa
- Trenitalia Spa
- Ferrovie Nord Milano
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- Rfi Spa
- OM Pimespo Carrelli
- Elevatori Spa
- A.E.T. Spa
- ABB Energy Automation
- ABB Solution Spa
- ABB T&D Spa - divisione SAE
- AEM Milano - A2A Distribution Spa
- AEM Torino
- Daimler Chrystier Rail Italia Spa
- Sicomm Srl
- ACEA Spa
- Westinghouse
- Thytronic
- AMGA
- Astea Spa
- Enia Spa
- HERA Spa
- Iride Spa
- Sab Wabco Spa
- Set Dristribution Spa
- Schneider Electric
- Omnitel Vodafone
- Soc. Autostrade
- Aziende Municipalizzate
- Saint Gobain
- Rete Gas Italia
- Air Liquid
- Snam Progetti
- Ansaldo Trasporti
- Faiveley Transport Srl
- Biticino
- ENI
- ESSO
- Ferrari
- Fiat
- Pirelli
- Montedison
- ST Microelettronica
- Alitalia
- S.E.A.
- Zanussi

PRODUCTION PLANTS AND COMPANY STRUCTURE

COL Giovanni Paolo S.p.A. is located in a modern production plant in **Moncalieri** (Turin) with an extension of more than 9.000 m², of which 5470 are covered, in addition to a plant in **Barlessina** (Milan), where the Electronics and Systems Division is hosted , and in a wide plant in **Belpasso** (Catania), hosting the MV Department.

The company is made of **4 Units**, contributing to ensure the complete and reliable supply of equipment and accessories used in the MV and LV power distribution grids.

In particular, the production of switches and electrical panels for MV systems is located at the Moncalieri and Belspasso plants.

ENERGY UNIT

COL is specialised in the production of equipment and accessories used in the MV and LV power distribution grids, and works also in the electro-rail sector, particularly on signalling systems.

Among its products there are equipment for power production, transmission and distribution but also electrical panels, switches and signalling balls.

The **Engineering area** of the Energy Unit deals with

- Multidisciplinary design for HV-MV substations and plants
- Design of control systems and protections of substations and plants
- SCADA automation and control systems

The **Installation area** of the Energy Unit deals with

- Demolition and re-construction of power plants and substation
- HV substations and 380KV lines construction
- Primary and secondary substation construction
- Hydroelectric power plant construction
- Electro-instrumental erection for thermic power plants
- Signaling balls installation with heliborne system

ELECTRONICS AND SYSTEMS UNIT

Col Giovanni Paolo SpA, through its Electronics & Systems Unit, designs and manufactures under the brand **SEB** protection and measurement electronic devices for electricity production and distribution systems.

SEB begins its activity in 1952 as Electrotechnical Plants in Barlassina, with the production of index measuring equipment and electromechanical protection relay, at the plant site in Barlessina (Milan).

Bought in 2003 by Col Giovanni Paolo S.p.A., today SEB is part of the Electronics and Systems Unit and designs, manufacture and provide technical support for products as **production relays, transducers, measuring and protection panels and other equipment for electricity measurement and control**, in addition to being the exclusive agent for the commercialisation of Actaris electric meters in the Italian market.

CERTIFICATIONS

Always aware of the market trends and needs, in 1994 COL has implemented a challenging plan to obtain a Total Quality System, certified **UNI EN ISO 9001:2000**.

The company has decided to adopt an Organisation, Management and Control Model and a Code of Ethics in accordance with the dictates of the Legislative Decree n. 231/2001, introducing the companies accountability principle.

Over the years the company has completed remarkable transformations, improving continuously its processes and quality standards.

Overall, the company has obtained the following certifications:

- UNI EN ISO 9001:2000 CISQ/IQNET
- UNI EN ISO 14001:2004 CISQ/IQNET
- Qualification for public works: SOA alpi Professional for the following categories: OG1-OG10-OS9-OS16-OS23-OS27
- Certificazion TÜV SÜD. TÜV SÜD Certification Marks are issued to demonstrate compliance to international standards and to TÜV SÜD globally recognised own requirements. The achievement of the TÜV SÜD certification demonstrates a company commitment to safeguard the health of consumers and increases the products reliability.

ENVIRONMENTAL PRODUCT DECLARATION

REFERENCES

This declaration has been produced using the following reference norms:

- Product Category Rules EPDItaly 015 Switchboards - rev 1.4 - 2020/09/24
- Product Category Rules EPDItaly 007 Electronic and Electrical Products and Systems - rev 2 - 2020/10/21
- EN 50693:2019 Product category rules for life cycle assessments of electronic and electrical products and systems (2019/08/30)
- Regolamento del Programma EPDItaly - v. 05 - 2020/07/01
- UNI EN ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework
- UNI EN ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines
- UNI EN ISO 14025:2010, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- UNI EN ISO 14020:2000 Environmental labels and declarations - General principles
- LIFE CYCLE ASSESSMENT APPLICATA AD APPARECCHIATURE ELETTRICHE ED ELETTRONICHE A SCOPO EPD (report LCA)

TYPE OF EPD

PLANT LOCATION

Environmental impacts have been calculated for the plant located in Strada Provinciale 14 93/95 - 95032 Belpasso (Catania)

DATABASE

Ecoinvent 3.8 with integration from published EPDs and technical literature when needed

SOFTWARE

SimaPro 9.3.0.2

REFERENCE YEAR

The reference year used for primary data collection and processing is 2020.

FUNCTIONAL UNIT

The functional unit used is a single piece of equipment operating for 20 years

THE PRODUCT

SWITCHGEAR DY 900 RMU VCB

24kV prefabricated equipment with internal arc-proof metal casing with switch compliant with the ENEL DY 900 specification. RMU VCBS is a compact SF6 insulated switchgear equipped with vacuum insulated circuit breakers on the line stalls and IMS with fuses on the transformer protection stall.

FIELD OF APPLICATION

RMU VCBS is an indoor device intended to be installed in the secondary substation to restore a normal condition, interrupting and re-establishing fault currents in selective coordination with the line circuit breaker installed in the primary substation, in both isolated neutral and compensated neutral systems.

MAIN FEATURES

Maximum insulation voltage	[kV]	24
Rated frequency	[Hz]	50
Industrial frequency sealing voltage	[kV]	50/60
Atmospheric pulse sealing voltage	[kV]	125/145
Rated current in continuous service for the bars	[A]	630
Permissible rated current of short duration(t_k = 1 s)	[kA]	16
Inner arc sealing*	[kA]-[s]	16 - 0,5
Rated auxiliary supply voltage	[Vcc]	24

*The device is arc-proof in accordance with CEI EN 62271-200 with accessibility class AFL type.

DEGREES OF PROTECTION

The compact RMU VCBS switchboard complies with the following degrees of protection::

- IP 3X degree of protection on the external casing, excluding the operating seats
- IP 2XC gdegree of protection of operating seats and control elements (even with operating lever engaged)
- IP 4X limited to fuse holders.

CALCULATION RULES

This declaration is a cradle to grave EPD type, based on the application of Life Cycle Assessment (LCA) methodology to the whole life-cycle system. In the whole LCA model, infrastructures and production equipments are not taken into account.
Electronic equipment production processes were described by using specific data from manufacturing facility.
Customized LCA questionnaires were used to gather in-depth information about all aspects of the production system (for example, raw materials contents and specifications, pre treatments, process efficiencies, air and water emissions, waste management), in order to provide a complete picture of the environmental burden of the system from raw materials supply to Transport and Manufacturing.

According to ISO 14040 and 14044, allocation is avoided whenever possible by dividing the system into sub-systems. Economic allocation has been adopted to split plant energy consumption among investigated products.
Data quality has been assessed and validated during data collection process. No cutoff has been performed on product Bill of Materials (BOM).

SCENARIOS AND ASSUMPTIONS

- Energy and material figures associated to whole plant operation have been allocated to EPD product based on economic allocation, considering the share of each product on the total revenue in the investigated year
- Transport of components and semifinished products is modelled considering an average distance based on the location of material suppliers. Most of Col suppliers are located in Northern Italy
- It is assumed that the product is distributed in Italy, with a representative distance radius of 350 km
- Transport of both materials and finished products is assumed to be performed via diesel truck, 16-32 t tonnage load
- Transport of manufacturing waste is assumed to be performed via small diesel lorry, 7,5-16 t tonnage load
- Electricity is modelled with the "residual mix" approach both for energy consumed in manufacturing stage and for energy consumed during use phase
- End of life of the product is modelled considering 90% of product mass is recycled and 10% is landfilled. This asssumption is due to the lack of specific information about product end of life, which is not handled by the product manufcturer
- SF6 leakage has been considered during use phase; the assumed value is based on tests performed on the product by the company
- Based on reference PCR calculation framework, about 215 kWh are consumed by the equipment during each operating year

CONTENT DECLARATION

Product covered by this EPD does not contain any substance of very high concern (SVHC)

MATERIAL	MASS SHARE %	IEC 62474 code (where applicable)
Steel	53.0	M-101
Hot dip galvanized steel	26.8	M-119
Copper	11.3	M-121
Epoxy resin	4.3	M-302
Packaging - wood	3.0	M-340
Sulfur Hexafluroide - SF6	0.6	M-400
Polycarbonate	0.4	M-254
Aluminium	0.2	M-120
Packaging - plastic film	0.2	M-201
Brass	0.1	M-149
Bronze	0.1	M-149

SYSTEM BOUNDARIES

UPSTREAM	CORE	DOWNSTREAM			
MANUFACTURING STAGE		**DISTRIBUTION STAGE**	**INSTALLATION STAGE**	**USE STAGE**	**END-OF-LIFE STAGE**
AQUISITION OF RAW MATERIALS ----- TRANSPORT TO MANUFACTURING SITE ----- END-OF-LIFE TREATMENT OF GENERATED WASTE ----- SEMI-FINISHED PRODUCTS ----- PACKAGING	MANUFACTURING, INCLUDING METAL WORKING ----- ASSEMBLY PACKAGING ----- END-OF-LIFE TREATMENT OF GENERATED WASTE	TRANSPORT TO DISTRIBUTOR ----- RECONDITIONING AT DISTRIBUTOR ----- TRANSPORT TO PLACE OF USE	INSTALLATION ----- END-OF-LIFE TREATMENT OF GENERATED WASTE	USAGE ----- MAINTENANCE ----- END-OF-LIFE TREATMENT OF GENERATED WASTE	DE-INSTALLATION ----- COLLECTION AND TRANSPORT ----- END-OF-LIFE TREATMENT

INDICATORS

ENVIRONMENTAL IMPACT

INDICATOR	ACRONYM	UNIT
Global Warming Potential TOTAL	GWP	kg CO_2 eq
Ozone Depletion Potential	ODP	kg CFC-11 eq
Acidification Potential	AP	mol H+ eq
Eutrophication Potential - FRESHWATER	EP	kg P eq
Photochemical Oxidation POTENTIAL	POCP	kg NMVOC eq
Abiotic Depletion Potential - MINERALS AND METALS	ADP-minerals&metals	kg Sb eq
Abiotic Depletion Potential - FOSSIL FUELS	ADP-fossil	MJ
Water Scarcity	WDP	m^3 eq

RESOURCES CONSUMPTION

INDICATOR	ACRONYM	UNIT
Renewable Primary Energy Excluding Primary Energy Used As Raw Material	PERE	MJ
Renewable Primary Energy Used As Raw Material	PERM	MJ
Total Use Of Renewable Primary Energy	PERT	MJ
Non-Renewable Primary Energy Excluding Primary Energy Used As Raw Material	PENRE	MJ
Non-Renewable Primary Energy Used As Raw Material	PENRM	MJ
Total Use Of Non-Renewable Primary Energy	PENRT	MJ
Use of secondary raw materials	SM	kg
Use of renewable secondary fuels	RSF	MJ
Use of non-renewable secondary fuels	NRSF	MJ
Net Use Of Fresh Water	FW	m^3

OUTPUT FLOWS AND WASTE

INDICATOR	ACRONYM	UNIT
Hazardous Waste Disposed	HWD	kg
Non-Hazardous Waste Disposed	NHWD	kg
Radioactive Waste Disposed	RWD	kg
Components for re-use	CFR	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported Energy	EE	MJ

RESULTS

ENVIRONMENTAL IMPACTS

		UPSTREAM CORE	DOWNSTREAM				
INDICATOR	**UNIT**	**MANUFACTURING**	**DISTRIBUTION**	**INSTALLATION**	**USE**	**END-OF-LIFE**	**TOTAL**
GWP - Global Warming Potential - TOTAL	kg CO_2 eq	5,69E+03	4,50E+01	6,01E+00	3,62E+03	9,06E+01	**9,45E+03**
GWP - Global Warming Potential - FOSSIL	kg CO_2 eq	5,68E+03	4,50E+01	5,96E+00	3,62E+03	9,05E+01	**9,44E+03**
GWP - Global Warming Potential - BIOGENIC	kg CO_2 eq	6,91E+00	2,65E-03	5,35E-02	5,47E-01	4,77E-02	**7,57E+00**
GWP - Global Warming Potential - LULUC (land use and land use change)	kg CO_2 eq	3,80E+00	3,67E-04	1,30E-04	1,19E-01	1,14E-02	**3,93E+00**
ODP - Ozone Depletion Potential	kg CFC-11 eq	2,10E-04	1,08E-05	1,37E-08	4,34E-04	9,62E-06	**6,64E-04**
AP - Acidification Potential	mol H+ eq	9,40E+01	2,61E-01	7,13E-02	1,08E+01	4,56E-01	**1,06E+02**
EP - Eutrophication Potential - FRESHWATER	kg P eq	3,25E-01	2,32E-05	6,24E-05	6,12E-02	3,33E-04	**3,86E-01**
POCP - Photochemical Oxidation Potential	kg NMVOC eq	2,02E+01	2,78E-01	9,11E-02	5,12E+00	5,14E-01	**2,62E+01**
ADP - Abiotic Depletion Potential - MINERALS AND METALS	kg Sb eq	2,11E+00	1,97E-06	8,85E-07	3,30E-05	6,26E-06	**2,11E+00**
ADP - Abiotic Depletion Potential - FOSSIL FUELS	MJ	6,06E+04	6,43E+02	7,48E+00	4,63E+04	6,53E+02	**1,08E+05**
WDP - Water Scarcity	m^3 eq	1,76E+05	-1,08E-01	1,52E-01	2,52E+02	1,62E+01	**1,77E+05**

RESULTS

RESOURCES CONSUMPTION

		UPSTREAM	CORE	DOWNSTREAM			
INDICATOR	UNIT	MANUFACTURING	DISTRIBUTION	INSTALLATION	USE	END-OF-LIFE	TOTAL
PERE - Renewable Primary Energy	MJ	7,65E+03	9,86E-01	6,20E+00	2,25E+03	1,73E+01	**9,93E+03**
PERM - Renewable Primary Energy - USED AS RAW MATERIAL	MJ	4,27E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**4,27E+02**
PERT - Total Renewable Primary Energy	MJ	8,08E+03	9,86E-01	6,20E+00	2,25E+03	1,73E+01	**1,04E+04**
PENRE - Non Renewable Primary Energy	MJ	6,89E+04	6,28E+02	7,82E+00	5,44E+04	6,64E+02	**1,25E+05**
PENRM - Non Renewable Primary Energy - USED AS RAW MATERIAL	MJ	2,01E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**2,01E+03**
PENRT - Non Renewable Primary Energy	MJ	7,09E+04	6,28E+02	7,82E+00	5,44E+04	6,64E+02	**1,27E+05**
SM - Use of secondary raw materials	kg	5,73E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**5,73E+01**
RSF - Use of renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**
NRSF - Use of non-renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**
FW - Net Use Of Fresh Water	m^3	4,11E+03	1,29E-02	2,40E-02	7,54E+00	5,36E-01	**4,11E+03**

RESULTS

OUTPUT FLOWS AND WASTE

		UPSTREAM	CORE	DOWNSTREAM			
INDICATOR	UNIT	MANUFACTURING	DISTRIBUTION	INSTALLATION	USE	END-OF-LIFE	TOTAL
HWD - Hazardous Waste Disposed	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**
NHWD - Non Hazardous Waste Disposed	kg	9,38E+00	0,00E+00	0,00E+00	0,00E+00	1,29E+02	**1,39E+02**
RWD - Radioactive Waste Disposed	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**
CRU - Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**
MFR- Materials for recycling	kg	9,32E+01	0,00E+00	2,98E+01	0,00E+00	7,75E+02	**8,98E+02**
MER - Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**
EE - Exported Energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**

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