S&C ELECTRIC COMPANY
Excellence Through Innovation

Environmental Product Declaration

In accordance with
ISO 14025 and EN 50693

Vista Underground Distribution Switchgear

Registration Number
EPDITALY0424

Declaration Number
EPD S&C 001

Manufacturing site
6601 N Ridge Blvd,
Chicago, IL 60626,
United States

Date of publication (first issue)
12/04/2023

Date of revision
n/a

Date of validity
12/04/2028

CPC Code
46214 - Boards, consoles, cabinets and other bases, equipped with electrical switching etc. apparatus, for electric control or the distribution of electricity, for a voltage exceeding 1000 V

Program operator & EPD publisher
EPDITALY

EPD ITALY

INFORMATION ON THE PROGRAMME AND VERIFICATION PROCESS

PROGRAMME OPERATOR

EPDItaly

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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.
EN 50693:2019 establishes the framework reference for PCR.

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

S&C Electric Company
6601 N Ridge Blvd, Chicago, IL 60626, United States
www.sandc.com

YEAR OF REPORTED PRIMARY DATA

2021

MARKET APPLICABILITY

Brazil

CPC CODE

46214 - BOARDS, CONSOLES, CABINETS AND OTHER BASES, EQUIPPED WITH ELECTRICAL SWITCHING ETC. APPARATUS, FOR ELECTRIC CONTROL OR THE DISTRIBUTION OF ELECTRICITY, FOR A VOLTAGE EXCEEDING 1000 V

APPLICATION FIELD

Primary distribution transformer cabins

REFERENCE PCR - PROJECT DOCUMENTS

EPDITALY007 (core PCR, rev2 21/10/2020) and EPDItaly 015, rev 1.5 23/02/2022
Regolamento del Programma EPDItaly - v. 5.2 - 16/02/2022
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

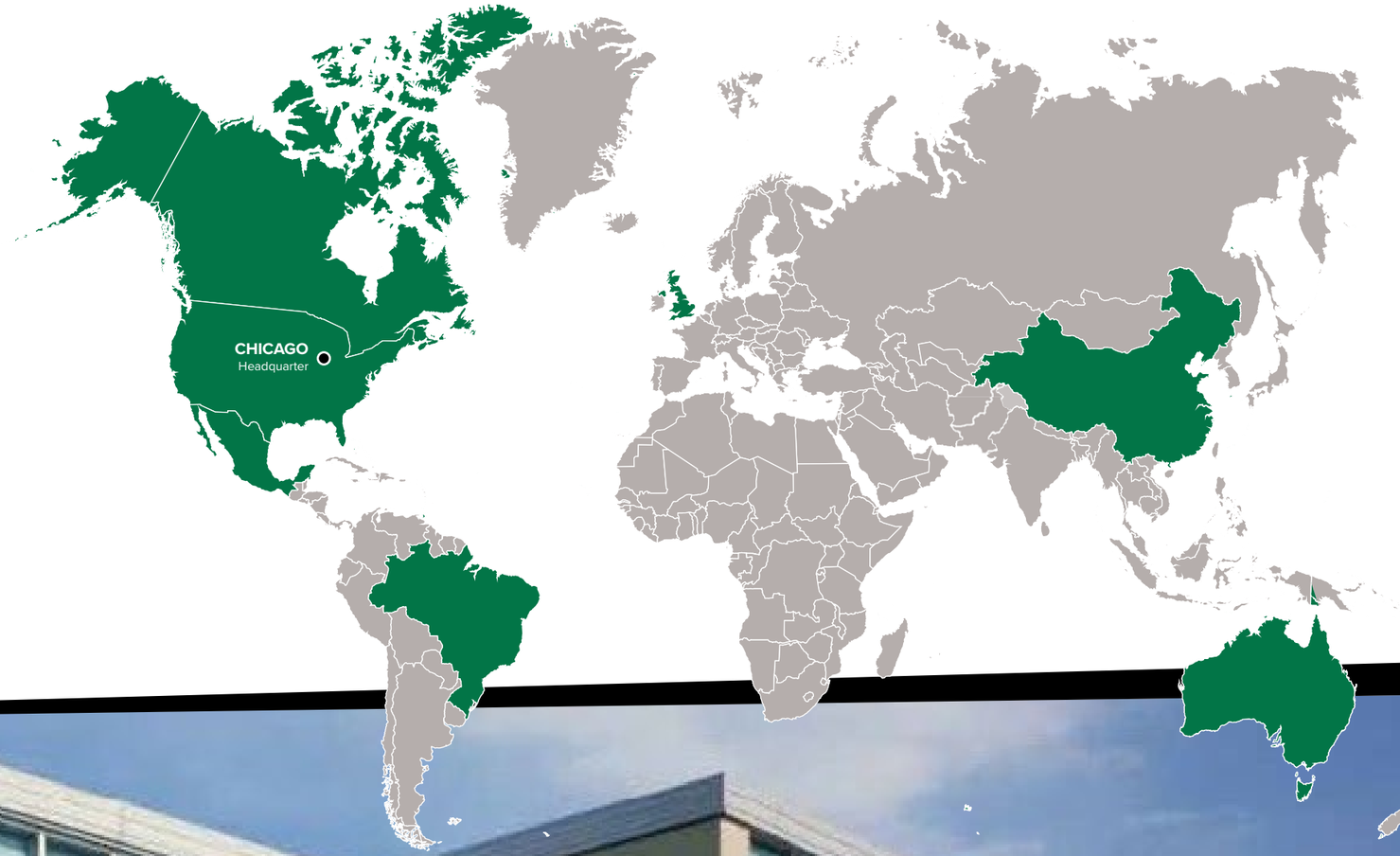
LCE - Life Cycle Engineering SpA
www.lcengineering.eu

THE COMPANY

S&C, with global **headquarters in Chicago**, is leveraging its heritage of innovation to address the challenges and shape the future of the world's **electrical grid**. Our mission is to continually develop new solutions for customers, fostering the improved reliability and resilience required for an increasingly intelligent and modernized power grid. Operating with a people-first mentality, S&C is an employee-owned company that cultivates an inclusive workplace with career growth opportunities to support our team members as we transform the grid.

S&C's 3,500-plus team members, through a network of offices and manufacturing facilities in the U.S. and around the globe, **support more than 1,000 worldwide utility, commercial, and industrial customers** in delivering reliable and resilient power. We also offer a range of life cycle services to customers as part of our comprehensive offerings.

With more than 300 active patents, we continue to leverage more than a century of industry expertise to serve the evolving needs of our global customer base while solving the challenges of today and tomorrow's power grid.



*S&C fonded in **1911***

*S&C operations in the **U.S.**, **Australia**, **Brazil**, **Canada**, **China**, **Mexico**, and the **U.K.***

SCOPE AND TYPE OF EPD

The approach used in this EPD is “Cradle to grave”, according to reference PCR

TABLE OF MODULES

MANUFACTURING STAGE		DISTRIBUTION STAGE	INSTALLATION STAGE	USE AND MAINTENANCE STAGE	END-OF-LIFE STAGE DE-INSTALLATION
UPSTREAM MODULE	**CORE MODULE**	**DOWNSTREAM MODULE**			

TYPE OF EPD

Product specific EPD related to Vista product, catalog number 854224, nominal voltage 38 kV

SOFTWARE

SimaPro ver. 9.4.0.2 (www.pre.nl)

MAIN DATABASE

Ecoinvent 3.8

REPORT LCA

Report LCA S&C_postaudit

GEOGRAPHICAL SCOPE OF THE EPD

Brazil

REFERENCE YEAR

2021

FUNCTIONAL UNIT

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

Environmental declarations published within the same product category, though originating from different programs, may not be comparable.

THE PRODUCT

VISTA UNDERGROUND DISTRIBUTION SWITCHGEAR

- S&C’s underground distribution switchgear products are designed for the ease and safety of crews and to minimize overall maintenance. With a variety of insulation options, these products also address environmental challenges that are arising with the evolution of the modern grid.
- Vista Underground Distribution Switchgear provides a suite of solutions to address challenges electric utilities and C&I facilities face. S&C designed these solutions to provide reliable protection, regardless of location or environmental conditions, including in areas that experience flooding. Vista switchgear is designed to simplify operating tasks and enhance safety while minimizing the traditional switchgear footprint. Vista switchgear introduces a new level of safety and simplicity by eliminating the need for cable-handling during routine operation. Just one person is needed to operate Vista switchgear, and there’s no necessary exposure to medium voltage.
- The Vista switchgear in this EPD uses SF6 insulation gas in a hermetically sealed gear. It is elbow connected and enclosed in a submersible, welded steel tank, and supports 4 load-interrupter switch and resettable fault interrupter “ways” and has complete protective coordination that minimizes outages.

BENEFITS FROM S&C'S VISTA UNDERGROUND DISTRIBUTION SWITCHGEAR

RELIABILITY

- Withstands harsh environments.
- Fully submersible, sealed and protected, can withstand flooding and extreme weather, mitigating damage and replacements.
- Improves reliability over oil-insulated switchgear, reducing maintenance costs.
- Sealed design that prevents leaking, rusting, or contamination.

SECURE AND EASY OPERATION

- Unit access and operation without cable-handling, fuse handling, or high-voltage exposure.
- No external grounds; ground medium-voltage cables using a standard internal ground switch.
- Certified arc-resistant for safe operation and maintenance without high premiums.
- Visible open gap to easily confirm closed, open, and grounded positions through large viewing windows.
- Low Maintenance with minimal mechanical maintenance required once a unit is installed; only an annual visual inspection is recommended.
- Cable-free grounding – ground medium-voltage cables using a standard internal ground switch.

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; in this EPD, eeconomic allocation was adopted to allocate annual manufacturing data to the Vista family, and then within the product family the allocation to the single device was done based on the number of devices produced.

Data quality has been assessed and validated during data collection process. No cutoff has been performed on product Bill of Materials (BOM) besides packaging of semifinished products and components bought by the company from suppliers (due to the combination of low relevance on the final results and high difficulty of data collection).

Use phase scenario is modelled considering 20 years of Reference Service Life (PCR-based scenario) and a nominal power adsorption of 250 W (value calculated by S&C). Based on these assumptions, 43 800 kWh of energy are consumed during product life cycle.

CONTENT DECLARATION

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

MATERIAL	MASS SHARE %	IEC62474 code (where applicable)
Stainless steel	47	M-100
Other ferrous alloys, non-stainless steels	25	M-119
Copper and its alloys	8	M-121
Aluminium and its alloys	5	M-120
Cypoxy components	4	N/A
Plastic components (fiberglass)	4	M-259
Wire	3	N/A
Plastic components (ABS)	2	M-206
Refrigerant gases and cryogens and other greenhouse gases (SF6)	2	M-400

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	MANUFACTURING PACKAGING PRODUCTION END-OF-LIFE TREATMENT OF GENERATED WASTE	TRANSPORT TO DISTRIBUTOR TRANSPORT TO PLACE OF USE	INSTALLATION END-OF-LIFE TREATMENT OF PACKAGING WASTE	ENERGY USED DURING OPERATION SF6 LEAKAGE	DE-INSTALLATION COLLECTION AND TRANSPORT TO END OF LIFE SITE END-OF-LIFE TREATMENT

ENVIRONMENTAL PERFORMANCE

Vista Underground Distribution Switchgear

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ENVIRONMENTAL IMPACTS

IMPACT CATEGORY	UNITS / D.U.	UPSTREAM	CORE	DOWNSTREAM				TOTAL
		MANUFACTURING		DISTRIBUTION	INSTALLATION	USE & MAINTENANCE	END-OF-LIFE	
GWP-fossil	kg CO_2 eq	4,93E+03	1,06E+03	7,15E+01	2,29E+00	1,26E+04	6,98E+01	**1,87E+04**
GWP-biogenic	kg CO_2 eq	3,94E+01	3,06E+01	4,02E-03	2,05E+00	1,34E+03	1,02E+01	**1,42E+03**
GWP-luluc	kg CO_2 eq	7,04E+00	3,41E-01	1,14E-03	1,53E-04	6,70E+02	7,51E-04	**6,77E+02**
GWP total	kg CO_2 eq	4,98E+03	1,09E+03	7,15E+01	4,33E+00	1,46E+04	8,00E+01	**2,08E+04**
ODP	kg CFC-11 eq	1,83E-04	6,05E-05	1,50E-05	4,19E-07	7,28E-04	1,20E-06	**9,88E-04**
AP	mol H+ eq	6,06E+01	1,43E+00	2,26E+00	1,46E-02	5,73E+01	4,01E-02	**1,22E+02**
EP-freshwater	kg P eq	3,11E-01	1,48E-02	5,22E-05	1,09E-05	1,30E-01	1,01E-04	**4,56E-01**
EP-marine*	kg N eq	4,81E+00	5,86E-01	5,57E-01	6,89E-03	9,12E+00	3,71E-02	**1,51E+01**
EP-terrestrial*	mol N eq	5,97E+01	4,07E+00	6,19E+00	6,61E-02	9,88E+01	1,74E-01	**1,69E+02**
POCP	kg NMVOC eq	1,85E+01	1,35E+00	1,58E+00	1,72E-02	2,17E+01	4,79E-02	**4,32E+01**
ADP-min&met	kg Sb eq	1,13E+00	1,19E-04	1,27E-06	4,43E-07	5,77E-04	1,55E-06	**1,13E+00**
ADP-fossil	MJ	5,48E+04	1,06E+04	9,10E+02	2,89E+01	1,31E+05	8,02E+01	**1,97E+05**
WDP	m^3 eq	1,79E+03	9,49E+01	-1,14E-01	-6,61E-01	2,23E+03	2,91E+00	**4,11E+03**

INDICATORS

GWP, fossil Global Warming Potential, fossil fuel
GWP, biogenic Global Warming Potential, biogenic
GWP, luluc Global Warming Potential, land use & land use change
GWP, total Global Warming Potential, total
ODP Depletion potential of the stratospheric ozone layer
AP Acidification potential, Accumulated Exceedance
EP, freshwater Eutrophication Potential, fraction of nutrients reaching freshwater end compartment
EP, marine Eutrophication Potential, fraction of nutrients reaching marine end compartment
EP, terrestrial Eutrophication Potential, Accumulated Exceedance
POCP Formation potential of tropospheric ozone
ADP-min&met Abiotic depletion potential for non-fossil resources
ADP-fossil Abiotic depletion for fossil resources potential
WDP Water (user) deprivation potential, deprivation-weighted water consumption
***:** This marker identifies optional environmental KPIs which are not mandatory according to reference PCR

USE OF RESOURCES

IMPACT CATEGORY	UNITS / D.U.	UPSTREAM	CORE	DOWNSTREAM				TOTAL
		MANUFACTURING		DISTRIBUTION	INSTALLATION	USE & MAINTENANCE	END-OF-LIFE	
PERE	MJ	3,86E+03	1,27E+04	1,23E+00	1,30E-01	1,43E+05	6,76E-01	**1,59E+05**
PERM	MJ	3,27E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**3,27E+03**
PERT	MJ	7,12E+03	1,27E+04	1,23E+00	1,30E-01	1,43E+05	6,76E-01	**1,63E+05**
PENRE	MJ	5,30E+04	1,06E+04	9,38E+02	2,96E+01	1,31E+05	8,23E+01	**1,96E+05**
PENRM	MJ	2,35E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**2,35E+03**
PENRT	MJ	5,53E+04	1,06E+04	9,38E+02	2,96E+01	1,31E+05	8,23E+01	**1,98E+05**
SM	kg	0,00E+00	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	**0,00E+00**
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**
FW	m3	4,73E+01	2,43E+00	5,13E-03	-1,26E-02	8,57E+02	9,23E-02	**9,07E+02**

INDICATORS

PERE Use of renewable primary energy excluding renewable primary energy resources used as raw materials
PERM Use of renewable primary energy resources used as raw materials
PERT Total use of renewable primary energy resources
PENRE Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials
PENRM Use of non-renewable primary energy resources used as raw materials
PENRT Total use of non-renewable primary energy re-sources
SM Use of secondary material
RSF Use of renewable secondary fuels
NRSF Use of non-renewable secondary fuels
FW Use of net fresh water

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OUTPUT FLOWS AND WASTE PRODUCTION

IMPACT CATEGORY	UNITS / D.U.	UPSTREAM	CORE	DOWNSTREAM				TOTAL
		MANUFACTURING		DISTRIBUTION	INSTALLATION	USE & MAINTENANCE	END-OF-LIFE	
HWD	kg	3,50E-01	8,49E-03	7,48E-04	6,83E-05	7,72E-02	2,21E-04	**4,36E-01**
NHWD	kg	2,04E+03	1,52E+01	7,60E-02	2,66E+01	1,77E+02	1,59E+02	**2,42E+03**
RWD	kg	1,02E-01	5,86E-03	6,68E-03	1,68E-04	4,79E-01	4,97E-04	**5,95E-01**
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**
MFR	kg	0,00E+00	2,23E+02	0,00E+00	1,42E+02	0,00E+00	4,29E+02	**7,93E+02**
MER	kg	0,00E+00	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	**0,00E+00**
ETE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**

INDICATORS

HWD Hazardous landfill waste
NHWD Non-hazardous waste disposed
RWD Radioactive waste disposed
CRU Components for reuse
MFR Material for recycling
MER Materials for energy recovery
EEE Exported electricity energy
ETE Exported thermal energy

REFERENCES

This declaration has been produced using the following reference norms:

- EPDItaly Programme Rules - REV. 5.2 – 16/02/2022
- PCR EPDItaly 007 - REV. 2 21/10/2020: Electronic and electrical products and systems
- PCR EPDItaly 015 - REV. 1.5 23/02/2022: Switchboards
- EN 50693:2019 – 08/30/2019: Product category rules for life cycle assessments of electronic and electrical products and systems
- UNI EN ISO 14040:2021 Environmental management - Life cycle assessment - Principles and framework
- UNI EN ISO 14044:2021 Environmental management - Life cycle assessment - Requirements and guidelines
- UNI EN ISO 14025:2010, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- Report LCA S&C_postaudit

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