Environmental Product Declaration

In accordance with ISO 14025:2006, EN 15804:2012+A2:2019 / AC:2021 and c-PCR-018 Ventilation components (Adopted from NPCR 030:2021) for:

DECENTRALIZED ENERGY RECOVERY

TURAIS



EPD of multiple products, based on a representative product.

Products included:

- TURAIS
- TURAIS E

The two models represented in this EPD are the only existing models in the series.

From:

S&P Sistemas de Ventilación, S.L

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD	EPD of multiple products, from a company
EPD registration number:	EPD-IES-0034549
Version date:	2026-09-09
Valid until:	2031-09-09

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com.

ECO PLATFORM EPD VERIFIED

EPD® THE INTERNATIONAL EPD® SYSTEM

General information

Programme information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): PCR 2019:14 Construction products, version 2.0.1 published on 2025.06.05 and c-PCR-018 Ventilation components (Adopted from NPCR 030:2021).

PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via the Secretariat www.environdec.com/contact

Third-party Verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☒ Individual EPD verification without a pre-verified LCA/EPD tool.

Third-party verifier: Elisabet Amat Guasch (Greenize Projects) (eamat@greenize.es)

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:
☐ Yes ☒ No

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

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.

For further information about comparability, see EN 15804 and ISO 14025.

Information about EPD owner

- **Owner of the EPD:** S&P SISTEMAS DE VENTILACIÓN, SL.
- **Address:** Calle Llevant, 4 - Polígono Industrial Llevant; 08150 Parets del Vallès (Barcelona).
- **Contact and LCA practitioner**: Martí Roig Rabadà (mroig@solerpalau.com), Product Sustainability Manager.
- **Description of the organisation:** Committed to improving indoor air quality and making it accessible to everyone, S&P develops highly energy-efficient, reliable, and durable ventilation solutions that benefit both our customers and the planet. Easy installation is a key pillar of our innovation, ensuring our products meet the needs of both users and installers. We also prioritize human well-being, which is why we are dedicated to designing exceptionally quiet equipment.



- **Product-related or management system-related certifications:** ISO 9001 (ES-257/2001) and ISO 14001 (ES-2001/0052).

Soler&Palau Ventilation Group

Product information

- **Product name:** DECENTRALIZED ENERGY RECOVERY: TURAIS.
- **Product identification:** TURAIS is a decentralized ventilation unit designed for residential and commercial applications, suitable both for renovations and new buildings.
- **UN CPC code:** Ventilation and air-conditioning equipment installation services (CPC 54632, version 2.1 dated 2015).
- **Product description:** TURAIS is a high-efficiency decentralized ventilation unit designed for residential and commercial applications, ideal for both new buildings and renovations. The range includes two product versions, with the main difference being the type of heat exchanger used. TURAIS features a sensible heat exchanger, delivering up to 94% thermal efficiency, while TURAIS E uses an enthalpy heat exchanger, providing up to 89% thermal efficiency together with moisture recovery.
- **Name and location of production site(s):** The product is manufactured in one site of the S&P SISTEMAS DE VENTILACIÓN, SL group, located in the province of Barcelona.
- **Included products:** This EPD covers the two products in the TURAIS range, which differ only in the type of heat exchanger. The representative model, TURAIS, was selected based on its high sales volume. In addition, TURAIS E, featuring an enthalpy heat exchanger, is considered the “best-case” configuration due to its lower environmental impacts.

Content declaration

None of the components present in the final product and included in the “Candidate List of Substances of Extreme Concert in the authorization procedure” of the REACH regulation has a percentage higher than 0,1%.

The wooden pallet used for transport is assigned individually to each unit and is considered in a single-use cycle.

- **Product mass:** The mass of the products (including packaging) is listed below.

Product Case**	Product name	Mass (Kg)*
Ref. Product	TURAIS	10,80
Best case	TURAIS E	12,29

* Including cardboard packaging.



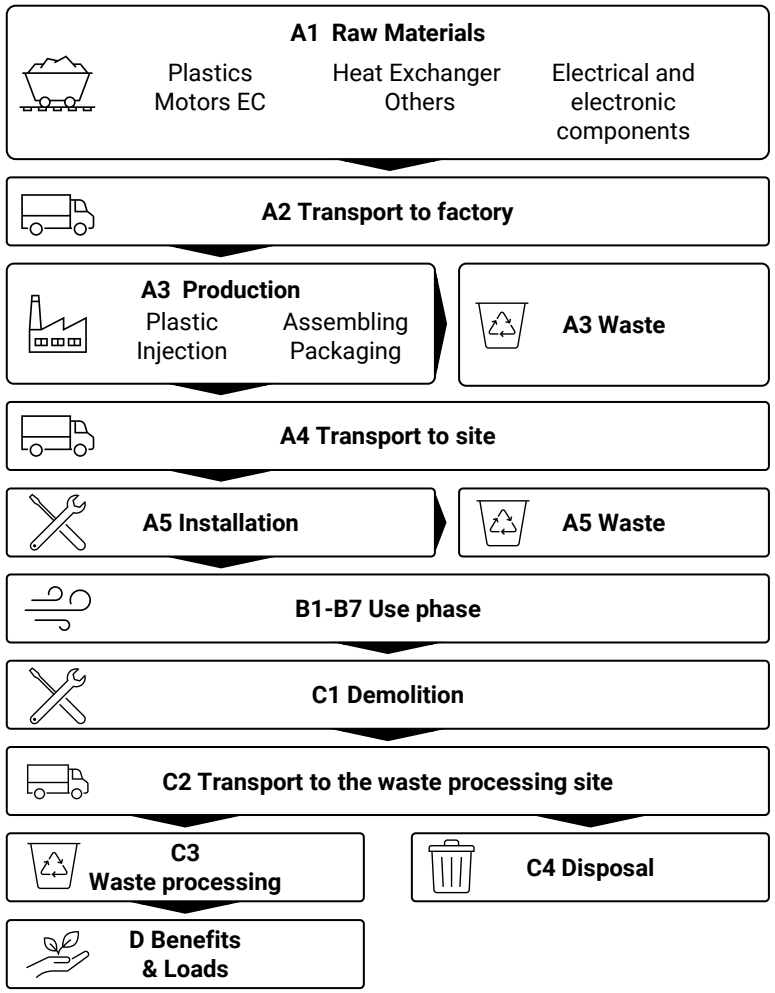
Product components	Reference Product Mass, kg	Best case Product Mass, kg	Post-consumer material Mass - %	Biogenic material, Mass, kg C/kg
Steel	0,08	2,44	0,00%	-
Aluminium	1,11	0,03	0,00%	-
Copper	0,12	0,12	0,00%	-
Plastics	7,00	7,16	0,00%	-
Motors	0,29	0,29	0,00%	
Electronic components	0,47	0,47	0,00%	-
TOTAL	**9,02**	**10,51**	**0,00%**	-

Packaging materials	Reference Product Mass, kg	Best case Product Mass, kg	Mass-% (versus the reference product)	Mass biogenic carbon, kg C/kg
Cardboard and paper	1,78	1,78	20,0%	0,55
Wood	1,66	1,66	18,0%	0,45
TOTAL	**3,45**	**3,45**	**38,0%**	**0,50**

LCA information

- **Declared unit:** 1 unit of TURAIS.
- **Reference service life:** The product is maintained for 17 years. The period has been selected to seek present and future harmonization with other international environmental product declaration programs as for example PEP Ecopassport.
- **Technical service life:** 25 years.
- **Time representativeness:** All specific data related to the production plants and use, used for the study date from 2025
- **Geographical scope:** The product is manufactured in Spain. LCA downstream scenario considered is Europe, however product can be used globally.
- **Database(s) and LCA software used:**
  - **Primary data**: Extracted directly from S&P's SAP system, organised by substructures. Each substructure includes a detailed Bill of Materials (BOM) with codified components (e.g., screws, electronics, cabling, galvanized sheet). Data were grouped by material families within each substructure (e.g., total galvanized steel, total aluminium).
  - **Secondary data**: Selected from Ecoinvent v3.12 (via OneClick LCA), prioritising datasets specific to Spain; when unavailable, representative European datasets were used.
- **EPD/LCA Tool used:** OneClick LCA.
- **Description of system boundaries:** Cradle to gate with options, modules A4-A5, modules B1-B7, modules C1–C4, and module D.

- **System diagram:**



- **Hypothesis and considerations applied:**

  PRODUCT STAGE (A1-A3): This stage covers the extraction and supply of raw materials, their transport to the production sites, and the manufacturing of the product.

  - **Raw materials supply (A1):** Includes all materials and semi-finished parts used in the unit. Industrial processes associated with purchased materials are included. A conservative production loss of approximately 9% is applied to all plastic injection-moulded parts during manufacturing.
  - **Transport (A2):** This stage accounts for the transport of all materials and pre-assembled components from suppliers to Barcelona for final assembly. It has been modelled as road freight (16–32 t EURO 5), with one-way distances based on supplier locations.
  - **Manufacturing (A3):** The TURAIS is manufactured and assembled in-house. This stage includes the plastic injection of some parts, the assembly of all components, and the quality testing performed on each product.

    Mass allocation has been applied to accurately determine the share of resources.

    Electricity used during the manufacturing process is backed by a certificate of origin issued by the National Commission on Markets and Competition (CNMC), ensuring that it is 100% sourced from renewable energy — specifically hydro power. The modelled energy mix for A3 module has an emission factor of 0,0061 kg CO_{2eq}/kWh. The transformation losses have been included.

    Water consumption during manufacturing is negligible, as the process uses a closed-loop system.

  CONSTRUCTION PROCESS STAGE (A4-A5): The construction process stage covers both the transportation of the TURAIS to the installation site (A4) and the installation activities (A5).

  - **Transportation to site (A4):** Transportation to the installation site is based on the 2025 sales distribution of TURAIS units. Since all deliveries took place within Europe, transport has been modelled exclusively by lorry (16–32 metric tons, EURO 5) over an average distance of 1,838 km from the manufacturing plant in Barcelona to the customer. Both the product weight (9,02 kg) and packaging weight (3,45 kg) have been considered, resulting in a transported mass of 12,47 kg per unit.
  - **Installation (A5):** The installation process considered in this EPD involves drilling, positioning, and installing the unit on the exterior wall. Low voltage electricity is consumed by electrical tools (3 kWh), and a limited amount of water (30 L) is required for cooling during drilling. Additional PVC ducts (1 meter) are needed for proper installation. Packaging waste (wood, cardboard) and residues from drilling (concrete cores and slurry) are generated during this phase. Their treatment has been modelled using average European data for recycling, recovery, and disposal (EUROSTAT, 2023).

    Electricity consumption has been modelled using a European average low-voltage electricity market dataset, with an emission factor of 0,34 kg CO_2e/kWh.

  USE STAGE (B1- B7): Includes all impacts associated with the operation, maintenance, and repair of the product throughout its lifespan.

  - **Use (B1):** This submodule is negligible, as the product does not generate additional impacts during its normal use.
  - **Maintenance (B2):** Preventive maintenance consists of replacing the two air filters once per year. Over the 17-year service life, this represents a total of approximately 0,872 kg of filters replaced.

New filters have been modelled using representative market datasets, including production and transport, while used filters have been modelled according to average European waste treatment scenarios. No other periodic maintenance activities are required.

- **Repair, Replacement, and Refurbishment (B3-B5):** These submodules are considered negligible, as no repairs, replacements or refurbishments are expected during the product's service life.
- **Operational Energy Use (B6):** The TURAIS is an active product that consumes electricity during its use phase. It is equipped with a humidity (RH) sensor that automatically regulates the airflow according to the indoor relative humidity.

  For the LCA, a residential use scenario has been considered, with the unit operating 24 hours per day over a 17-year service life. During operation, ventilation demand varies throughout the day, alternating between lower and higher airflow rates, resulting in a variable electricity consumption profile.

  Both products included in this EPD have the same daily energy consumption of 0,39 kWh, equivalent to an annual consumption of 142,35 kWh.

  Electricity consumption has been modelled using a European average low-voltage electricity market dataset, with an emission factor of 0,34 kg CO_2e/kWh.
- **Operational Water Use (B7):** This submodule is negligible, as the product does not require water for its operation.

END OF LIFE STAGE (C1-C4): The end-of-life stage includes all processes related to the deconstruction, transport, waste processing, and final disposal of the TURAIS unit, together with the auxiliary installation elements (duct sleeves, grilles, dampers, and anchoring parts).

- **Deconstruction (C1):** Deconstruction impacts have been modelled according to the PCR, considering the default diesel consumption per tonne during dismantling. The total mass considered includes the equipment itself and the auxiliary installation materials.
- **Transport (C2):** A default transport distance of 80 km to recycling/landfill and 130 km to incineration facilities has been assumed. Transport is assumed to be carried out using 16–32 t EURO 5 freight lorries in Europe.
- **Waste processing and disposal (C3-C4):** Waste management has been modelled using a conservative and realistic scenario, although the recyclability potential of the equipment is higher than stated in the LCA. The percentages for recycling, incineration (with or without energy recovery), and landfill disposal have been defined based on EN 50693. For the entire product: 19% is recycled, 56% is incinerated (with or without energy recovery), and 26% is landfilled.

  Additionally, as stated in the PCR, exclusive waste management scenarios (100% landfilled, 100% recycled, and 100% incinerated) have been included as Additional LCA results.

BENEFITS AND LOADS (D): Accounts for the potential environmental benefits and loads associated with the reuse, recycling, or energy recovery of materials after the product's end-of-life. These benefits are reported beyond the system boundaries.

- **Benefits and loads (D):** To ensure a realistic and evidence-based approach in modelling the impacts of Module D, data points generated by OneClick LCA and based on ECOINVENT data have been used. The quantities assigned to the different data points correspond only to waste that does not go to landfill.

Material	End of Life Stage (C1-C4) Scenario	Benefits and Loads (D) Scenario
Steel	80% is recycled 20% is landfilled	Generation of steel scrap
Copper	60% is recycled 40% is landfilled	Generation of copper scrap
Aluminium	70% is recycled 30% is landfilled	Generation of aluminium scrap
ABS	20% is recycled 40% is incinerated with energy recovery 20% is incinerated without energy recovery 20% is landfilled	Generation of recycled ABS Energy recovery
Insulating material	7,5% is recycled 65,5% is incinerated with energy recovery 27% is incinerated without energy recovery 20% is landfilled	Generation of recycled Insulating material Energy recovery
Rubber	50% is incinerated with energy recovery 25% is incinerated without energy recovery 25% is landfilled	Energy recovery
Polypropylene	20% is recycled 40% is incinerated with energy recovery 40% is landfilled	Generation of recycled Polypropylene Energy recovery
Other Plastics	50% is incinerated with energy recovery 25% is incinerated without energy recovery 25% is landfilled	Energy recovery
Electric Components	100% is landfilled	



- **Cut-off rules:** In accordance with the provisions of the PCR 2019:14 construction products, version 2.0.1 and the standard UNE-EN 15804:2012+A2:2020, at least 95% of total inflows and outflows (mass and energy) per module have been included. The "polluter pays" principle has been applied. Additionally, the following processes have been excluded from the study scope:
  - Manufacture of equipment used in production.
  - Business trips.
  - Maintenance activities at the production plants.
  - Transportation of personnel to and within the plants.
  - Diffuse particle emissions during the transport and storage of raw materials.

- **Data Quality Assessment:** All process-specific data was collected for the 2025 operating year and is therefore up to date.

  Manufacturing-related data is based on factory averages, and mass allocation factors have been applied.

  Primary data accounts for 1,5% of the overall dataset. The credibility and consistency of the collected data were verified using primary records; where these were unavailable, secondary sources were used.

  Dataset selection considered geographic relevance, prioritizing regional and country-specific data where available to best reflect actual operational locations. From a technical perspective, when specific data was not available, the most representative proxy datasets were used, selected based on technological equivalence and process similarity. The overall data quality is good.

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Share of primary data, of GWP-GHG results for A1					**0%**
Raw materials	Database + Collected data	Ecoinvent v3.12	2025	Secondary data	0%
Share of primary data, of GWP-GHG results for A2					**1,0%**
Transport of raw materials to manufacturing site	Database + Collected data	Ecoinvent v3.12	2025	Primary data	100%
Share of primary data, of GWP-GHG results for A3					**0,5%**
Manufacturing of the product	Database + Collected data	Ecoinvent v3.12	2025	Primary data and secondary data	25%
Total share of primary data, of GWP-GHG results for A1-A3					**1,5%**

* Disclaimer: The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Modules Declared

The variation in GWP-GHG between the representative product, TURAIS, and the other version TURAIS E in stages A1–A3 is 0,2%, mainly due to the different mass and materials on the heat exchanger.

Module	Product stage			Construction Process stage		Use stage							End of Life stage				Resource Recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Geography	GLO	GLO	ES	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27
Share of primary data	1,5% (GWP-GHG)			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-0,2% (GWP-GHG)			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Environmental performance

Mandatory impact category indicators according to EN 15804

A declared unit of one TURAIS, with a mass of 10,80 kg (including packaging), is considered. The impact assessment is based on EF3.1. The estimated results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding thresholds, safety margins and/or risks. The results of the end-of-life stage (C1–C4) should be considered when using the results of the product stage (A1–A3). When comparing results from different Environmental Product Declarations (EPDs), exercise caution due to varying methodologies and uncertainties across programs.

Results per declared unit																
Indicator	**Unit**	**A1 - A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	Kg $CO_{2eq.}$	8,92E+01	4,41E+00	1,17E+01	0,00E+00	6,64E+00	0,00E+00	0,00E+00	0,00E+00	9,22E+02	0,00E+00	3,64E-03	2,62E-01	1,15E+01	5,75E+00	-3,41E+00
GWP-biogenic	Kg $CO_{2eq.}$	-4,41E+00	8,74E-04	4,41E+00	0,00E+00	1,65E-01	0,00E+00	0,00E+00	0,00E+00	2,95E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,26E-02
GWP-luluc	Kg $CO_{2eq.}$	4,40E-01	1,56E-03	1,17E-02	0,00E+00	1,32E-02	0,00E+00	0,00E+00	0,00E+00	1,57E+00	0,00E+00	3,73E-07	1,16E-04	2,34E-04	1,71E-04	-5,37E-03
GWP-total	Kg $CO_{2eq.}$	8,52E+01	4,41E+00	1,61E+01	0,00E+00	6,82E+00	0,00E+00	0,00E+00	0,00E+00	9,53E+02	0,00E+00	3,64E-03	2,62E-01	1,15E+01	5,75E+00	-3,44E+00
ODP	kg $CFC11_{eq.}$	2,78E-06	8,77E-08	4,09E-06	0,00E+00	7,58E-06	0,00E+00	0,00E+00	0,00E+00	1,49E-05	0,00E+00	5,57E-11	3,44E-09	4,50E-09	3,84E-09	-2,99E-08
AP	mol $H^{+}_{eq.}$	5,72E-01	1,38E-02	5,75E-02	0,00E+00	3,11E-02	0,00E+00	0,00E+00	0,00E+00	5,13E+00	0,00E+00	3,29E-05	8,92E-04	3,49E-03	1,97E-03	-3,26E-02
EP-freshwater	kg $P_{eq.}$	6,34E-02	2,92E-04	1,79E-03	0,00E+00	2,23E-03	0,00E+00	0,00E+00	0,00E+00	1,03E+00	0,00E+00	1,05E-07	2,82E-05	7,87E-05	3,67E-05	-1,27E-02
EP-marine	kg $N_{eq.}$	9,60E-02	4,65E-03	1,20E-02	0,00E+00	5,78E-03	0,00E+00	0,00E+00	0,00E+00	8,21E-01	0,00E+00	1,52E-05	2,84E-04	2,15E-03	6,44E-03	-7,12E-03
EP-terrestrial	mol $N_{eq.}$	9,86E-01	5,05E-02	1,13E-01	0,00E+00	5,82E-02	0,00E+00	0,00E+00	0,00E+00	6,88E+00	0,00E+00	1,67E-04	3,08E-03	1,59E-02	8,13E-03	-9,06E-02
POCP	kg $NMVOC_{eq.}$	3,70E-01	2,16E-02	3,63E-02	0,00E+00	2,09E-02	0,00E+00	0,00E+00	0,00E+00	2,18E+00	0,00E+00	4,98E-05	1,22E-03	4,08E-03	2,35E-03	-2,05E-02
ADP-minerals&metals*	kg $Sb_{eq.}$	1,31E-02	1,44E-05	2,49E-04	0,00E+00	4,06E-05	0,00E+00	0,00E+00	0,00E+00	1,14E-02	0,00E+00	1,31E-09	8,80E-07	3,37E-06	5,31E-07	-2,05E-04
ADP-fossil*	MJ	1,43E+03	6,19E+01	2,35E+02	0,00E+00	9,19E+01	0,00E+00	0,00E+00	0,00E+00	1,85E+04	0,00E+00	4,76E-02	3,63E+00	3,16E+00	3,06E+00	-4,70E+01
WDP*	m^3	4,91E+01	3,04E-01	8,22E+00	0,00E+00	1,63E+00	0,00E+00	0,00E+00	0,00E+00	3,96E+02	0,00E+00	1,19E-04	1,93E-02	7,63E-01	3,94E-01	-1,17E+00

Acronyms: GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; 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-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

* Disclaimer: 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

Additional mandatory and voluntary impact category indicators

Results per declared unit															
Indicator	**Unit**	**A1 - A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG (1)	Kg $CO_{2eq.}$	8,96E+01	4,41E+00	1,17E+01	0,00E+00	6,65E+00	0,00E+00	0,00E+00	0,00E+00	9,24E+02	0,00E+00	3,64E-03	2,62E-01	1,15E+01	5,75E+00	-3,41E+00
PM	Disease inc.	5,02E-06	3,46E-07	4,70E-07	0,00E+00	3,36E-07	0,00E+00	0,00E+00	0,00E+00	1,75E-05	0,00E+00	9,34E-10	2,03E-08	6,17E-08	1,67E-08	-2,89E-07
IRP (2)	kBq U-235_{eq}	6,89E+00	7,89E-02	8,90E-01	0,00E+00	8,00E-01	0,00E+00	0,00E+00	0,00E+00	4,29E+02	0,00E+00	2,11E-05	3,00E-03	9,50E-03	6,38E-03	-8,03E-01
ETP-fw (3)	CTUe	1,20E+03	8,13E+00	2,11E+02	0,00E+00	1,91E+01	0,00E+00	0,00E+00	0,00E+00	3,25E+03	0,00E+00	2,62E-03	4,11E+00	4,54E+01	3,08E+03	-1,06E+03
HTP-c (3)	CTUh	5,01E-08	7,51E-10	5,77E-09	0,00E+00	1,45E-09	0,00E+00	0,00E+00	0,00E+00	2,64E-07	0,00E+00	3,74E-13	4,41E-11	1,27E-09	1,17E-09	-8,98E-10
HTP-nc (3)	CTUh	2,28E-06	3,89E-08	1,89E-07	0,00E+00	6,56E-08	0,00E+00	0,00E+00	0,00E+00	1,46E-05	0,00E+00	5,93E-12	2,25E-09	3,66E-08	2,30E-08	-4,31E-08
SQP (3)	Pt	5,47E+02	3,68E+01	3,12E+01	0,00E+00	1,06E+02	0,00E+00	0,00E+00	0,00E+00	3,70E+03	0,00E+00	3,34E-03	2,15E+00	2,40E+00	2,37E+00	-2,46E+01

Acronyms: **GWP-fossil = GWP-GHG**: Global warming potential-Greenhouse gas; **PM**= particulate matter; **IRP** =Ionizing radiation, human health; **ETP-fw**=Ecotoxicity tap water-organic; **HTP-c**= human health, carcinogenic effects; **HTP-nc**= human health , non-carcinogenic effects; **SQP** = Land use related impacts/ Soil quality.

1)This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero.

2)This impact category refers to the eventual impacts of low amounts of ionizing radiation on human health from the nuclear fuel cycle. It does not consider the effects due to possible nuclear accidents or occupational exposure due to possible nuclear accidents or occupational exposure due to radon or from some construction materials.

3)The results of this environmental impact category must be used wisely, as the uncertainties in the results are elevated and the results are elevated and the experience with this parameter is limited.

Resource use indicators

Results per declared unit																
Indicator	**Unit**	**A1 - A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1,58E+02	1,07E+00	-3,13E+01	0,00E+00	2,66E+01	0,00E+00	0,00E+00	0,00E+00	4,73E+03	0,00E+00	3,02E-04	5,08E-02	-2,73E+00	1,36E-01	-1,13E+01
PERM	MJ	4,06E+01	0,00E+00	-4,06E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,99E+02	1,07E+00	-7,19E+01	0,00E+00	2,66E+01	0,00E+00	0,00E+00	0,00E+00	4,73E+03	0,00E+00	3,02E-04	5,08E-02	-2,73E+00	1,36E-01	-1,13E+01
PENRE	MJ	1,15E+03	6,19E+01	1,63E+02	0,00E+00	9,19E+01	0,00E+00	0,00E+00	0,00E+00	1,85E+04	0,00E+00	4,76E-02	3,63E+00	-2,14E+02	-1,65E+02	-4,65E+01
PENRM	MJ	2,50E+02	0,00E+00	-1,45E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,35E+02	-1,14E+02	4,00E+01
PENRT	MJ	1,40E+03	6,19E+01	1,62E+02	0,00E+00	9,19E+01	0,00E+00	0,00E+00	0,00E+00	1,85E+04	0,00E+00	4,76E-02	3,63E+00	-3,49E+02	-2,78E+02	-6,47E+00
SM	kg	1,97E+00	2,84E-02	5,78E-02	0,00E+00	1,94E-02	0,00E+00	0,00E+00	0,00E+00	3,15E+00	0,00E+00	1,98E-05	1,60E-03	6,01E-03	1,46E-03	3,01E-01
RSF	MJ	8,69E-01	3,58E-04	8,84E-05	0,00E+00	5,68E-04	0,00E+00	0,00E+00	0,00E+00	3,42E-02	0,00E+00	5,17E-08	2,07E-05	1,14E-04	4,26E-05	-3,71E-04
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,16E+00	8,33E-03	5,53E-02	0,00E+00	4,26E-02	0,00E+00	0,00E+00	0,00E+00	9,23E+00	0,00E+00	3,15E-06	4,84E-04	1,30E-02	-3,92E-03	-2,62E-02

Acronyms: 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.

Waste indicators

Results per declared unit																
Indicator	**Unit**	**A1 - A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,23E+02	1,03E+00	1,54E+01	0,00E+00	3,02E+00	0,00E+00	0,00E+00	0,00E+00	3,26E+02	0,00E+00	9,61E-04	5,23E-02	4,35E-01	5,02E-02	-7,67E+01
Non-hazardous waste disposed	kg	2,35E+03	2,17E+01	4,30E+02	0,00E+00	1,47E+02	0,00E+00	0,00E+00	0,00E+00	5,14E+03	0,00E+00	1,31E-02	1,10E+00	1,22E+01	2,13E+01	1,85E+03
Radioactive waste disposed	kg	2,22E+01	2,27E-04	1,71E-03	0,00E+00	3,26E-03	0,00E+00	0,00E+00	0,00E+00	1,41E-01	0,00E+00	9,38E-08	1,15E-05	8,53E-05	1,37E-06	1,48E-04

Output flow indicators

Results per declared unit																
Indicator	**Unit**	**A1 - A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	1,81E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,31E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	1,36E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,92E+01	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	1,89E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,95E+01	0,00E+00	0,00E+00

Additional LCA results

Variability analysis

The table below shows the variation in results between the declared reference product (TURAIS) and the other configuration (TURAIS E). Percentage differences are presented for the combined impacts of modules A1–A3 and A–C. The differences between the two products are minimal and mainly result from the heat exchanger. Although the TURAIS E version has a heavier heat exchanger, it is manufactured with lower-impact materials. As both versions have identical energy consumption, module B6 remains the main contributor to the life cycle impacts, making the overall differences between the products insignificant.

Variation (%) of Results per Declared Unit			
Indicator	**Unit**	**TURAIS E**	
		A1 - A3	**A - C**
GWP-fossil	Kg $CO_{2eq.}$	- 0,1%	+ 0,0%
GWP-biogenic	Kg $CO_{2eq.}$	+ 0,0%	+ 0,0%
GWP-luluc	Kg $CO_{2eq.}$	- 6,1%	- 1,0%
GWP-total	Kg $CO_{2eq.}$	- 0,1%	+ 0,0%
ODP	kg $CFC11_{eq.}$	- 4,0%	- 0,4%
AP	mol $H^{+}_{eq.}$	- 2,8%	- 0,4%
EP-freshwater	kg $P_{eq.}$	- 0,9%	- 0,1%
EP-marine	kg $N_{eq.}$	- 0,6%	- 1,1%
EP-terrestrial	mol $N_{eq.}$	- 0,6%	- 0,4%
POCP	kg $NMVOC_{eq.}$	- 0,8%	- 0,4%
ADP-minerals&metals*	kg $Sb_{eq.}$	+ 0,0%	0,0%
ADP-fossil*	MJ	+ 0,7%	+ 0,1%
WDP*	m^3	- 6,7%	- 0,8%

Acronyms: GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; 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-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

* EPD International Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

End of Life scenarios

Below, as indicated by the PCR, are the impacts associated with different waste management scenarios: 100% landfilling, 100% recycling, and 100% incineration. None of these scenarios is realistic, as the waste management of EEE equipment is typically carried out through a combination of methods, and some components cannot be feasibly recycled.

End of Life scenarios (Module C) results										
Indicator	**Unit**	**100% Landfilled**			**100% Recycled**			**100% Incinerated**		
		C2	**C3**	**C4**	**C2**	**C3**	**C4**	**C2**	**C3**	**C4**
GWP-fossil	Kg $CO_{2eq.}$	1,92E-01	0,00E+00	1,20E+00	1,92E-01	1,37E+00	0,00E+00	3,04E-01	2,63E+01	0,00E+00
GWP-biogenic	Kg $CO_{2eq.}$	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-luluc	Kg $CO_{2eq.}$	8,61E-05	0,00E+00	2,03E-04	8,61E-05	1,17E-03	0,00E+00	1,36E-04	2,19E-04	0,00E+00
GWP-total	Kg $CO_{2eq.}$	1,92E-01	0,00E+00	1,20E+00	1,92E-01	1,37E+00	0,00E+00	3,04E-01	2,63E+01	0,00E+00
ODP	kg $CFC11_{eq.}$	2,44E-09	0,00E+00	4,75E-09	2,44E-09	5,65E-09	0,00E+00	3,92E-09	9,55E-09	0,00E+00
AP	mol $H^{+}_{eq.}$	6,56E-04	0,00E+00	1,53E-03	6,56E-04	6,01E-03	0,00E+00	1,04E-03	6,60E-03	0,00E+00
EP-freshwater	kg $P_{eq.}$	2,11E-05	0,00E+00	3,21E-05	2,11E-05	2,47E-04	0,00E+00	3,33E-05	1,10E-04	0,00E+00
EP-marine	kg $N_{eq.}$	2,08E-04	0,00E+00	2,45E-02	2,08E-04	8,12E-03	0,00E+00	3,31E-04	3,90E-03	0,00E+00
EP-terrestrial	mol $N_{eq.}$	2,26E-03	0,00E+00	5,36E-03	2,26E-03	2,51E-02	0,00E+00	3,60E-03	3,23E-02	0,00E+00
POCP	kg NMVOC $_{eq.}$	8,89E-04	0,00E+00	2,11E-03	8,89E-04	6,78E-03	0,00E+00	1,42E-03	8,17E-03	0,00E+00
ADP-minerals&metals*	kg $Sb_{eq.}$	6,45E-07	0,00E+00	4,07E-07	6,45E-07	8,80E-06	0,00E+00	1,00E-06	1,92E-06	0,00E+00
ADP-fossil*	MJ	2,66E+00	0,00E+00	4,38E+00	2,66E+00	7,03E+00	0,00E+00	4,22E+00	5,84E+00	0,00E+00
WDP*	m^3	1,42E-02	0,00E+00	1,45E-01	1,42E-02	2,06E-01	0,00E+00	2,27E-02	1,68E+00	0,00E+00

Acronyms: GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; 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-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

* Disclaimer: 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

Geographical variability analysis

Below are the impacts of the TURAIS and TURIAS E module B6 when the product operates under the defined scenario across various countries and geographies. The dataset used corresponds to low-voltage electricity (market activity).

Results per declared unit - B6								
Indicator	**Unit**	**SPAIN**	**FRANCE**	**ITALY**	**GERMANY**	**BELGIUM**	**UNITED KINGDOM**	**MIDDLE EAST**
GWP-fossil	Kg $CO_{2eq.}$	5,91E+02	3,16E+02	9,45E+02	1,11E+03	4,87E+02	6,74E+02	2,21E+03
GWP-biogenic	Kg $CO_{2eq.}$	3,41E+00	8,71E+00	3,72E+01	8,96E+01	1,22E+01	3,12E+01	3,71E-01
GWP-luluc	Kg $CO_{2eq.}$	4,63E+00	3,67E-01	2,03E-01	1,93E+00	1,55E+00	9,42E-01	1,92E-01
GWP-total	Kg $CO_{2eq.}$	5,99E+02	3,25E+02	9,82E+02	1,20E+03	5,00E+02	7,05E+02	2,21E+03
ODP	kg $CFC11_{eq.}$	1,30E-05	9,25E-06	2,41E-05	1,40E-05	1,57E-05	3,14E-05	3,61E-05
AP	mol $H^{+}_{eq.}$	3,03E+00	1,81E+00	4,13E+00	3,18E+00	1,71E+00	2,40E+00	9,21E+00
EP-freshwater	kg $P_{eq.}$	1,50E-01	1,42E-01	3,21E-01	1,65E+00	1,90E-01	1,25E-01	9,81E-02
EP-marine	kg $N_{eq.}$	5,55E-01	3,57E-01	6,79E-01	8,63E-01	3,61E-01	4,94E-01	1,46E+00
EP-terrestrial	mol $N_{eq.}$	5,87E+00	3,18E+00	7,11E+00	6,34E+00	3,52E+00	5,45E+00	1,58E+01
POCP	kg NMVOC $_{eq.}$	2,06E+00	1,04E+00	2,57E+00	1,79E+00	1,06E+00	1,60E+00	6,80E+00
ADP-minerals&metals*	kg $Sb_{eq.}$	1,16E-02	1,05E-02	1,11E-02	1,25E-02	1,19E-02	1,07E-02	1,07E-02
ADP-fossil*	MJ	1,55E+04	2,60E+04	1,51E+04	1,41E+04	1,93E+04	1,64E+04	3,38E+04
WDP*	m^3	2,62E+02	3,31E+02	4,44E+02	2,65E+02	2,39E+02	1,86E+02	1,73E+02

Acronyms: GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; 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-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

* Disclaimer: 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

Abbreviations

All abbreviations used in the EPD are described below:

Abbreviation	Definition
CEN	European Committee for Standardization
CNMC	Comisión Nacional de los Mercados y la Competencia
CPC	Central Product Classification
EEE	Electrical and Electronic Equipment
EF	Environmental Footprint
EN	European Norm (Standard)
EPD	Environmental Product Declaration
GPI	General Programme Instructions
ISO	International Organization for Standardization
LCA	Life-Cycle Assessment
PCR	Product Category Rules
PEP	Product Environmental Profile
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals

References

- PCR 2019:14. Construction products. Version 2.0.1. Valid until 07/04/2030.
- c-PCR-018 Ventilation components (Adopted from NPCR 030:2021).
- ISO 14025:2010 Environmental labels and declarations-Type III Environmental Declarations-Principles and procedures.
- ISO 14040:2006 Environmental management-Life Cycle Assessment-Principles and framework.
- ISO 14044:2006/Amd 2:2020 Environmental management-Life Cycle Assessment-Requirements and guidelines.
- EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
- General Programme Instructions for international EPD System version 5.0.1 (2025-02-27).
- LCA Report DECENTRALIZED ENERGY RECOVERY: TURAIS. August 2026, Version 1.1.
- Product Environmental Footprint report. Representative product study for: Unidirectional Residential Ventilation Units (URVU), Bidirectional Residential Ventilation Units (BRVU), Non-residential Ventilation Units (NRVU), Fans (>125W); EVIA.
- Packaging waste by waste management operations; EUROSTAT; 2025.
- EN 50693:2020 - Product category rules for life cycle assessments of electronic and electrical products and systems

Version History

A. Original Version of the EPD, 2026-09-09.



Soler&Palau Ventilation Group

ECO PLATFORM EPD VERIFIED

EPD®
THE INTERNATIONAL EPD® SYSTEM

solerpalau.com