

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: NARAH 160

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 single product, from a company
EPD registration number:	EPD-IES-0031393
Version date:	2026-05-07
Valid until:	2031-05-07

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



General information

Programme information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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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).



Product information

- **Product name:** NARAH 160.
- **Product identification:** The NARAH is a decentralized ventilation unit with heat recovery, designed for single-room applications in residential or commercial settings.
- **UN CPC code:** Ventilation and air-conditioning equipment installation services (CPC 54632, version 2.1 dated 2015).
- **Product description:** The system operates using a reversing fan and a high-efficiency ceramic heat exchanger, achieving energy recovery rates of up to 95%. Airflow is automatically adjusted based on indoor humidity levels, ensuring optimal indoor air quality. Air filtration is provided by two ISO Coarse filters, positioned upstream and downstream of the ceramic exchanger. The electronically controlled motor ensures low energy consumption and quiet operation. NARAH enables high-performance air renewal without the need for ductwork or diffusers, making it ideal for renovation projects.
- **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 includes the product NARAH 160.



Content declaration

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

- **Product mass:** The NARAH 160 weighs 4,17 kilograms, excluding the packaging.

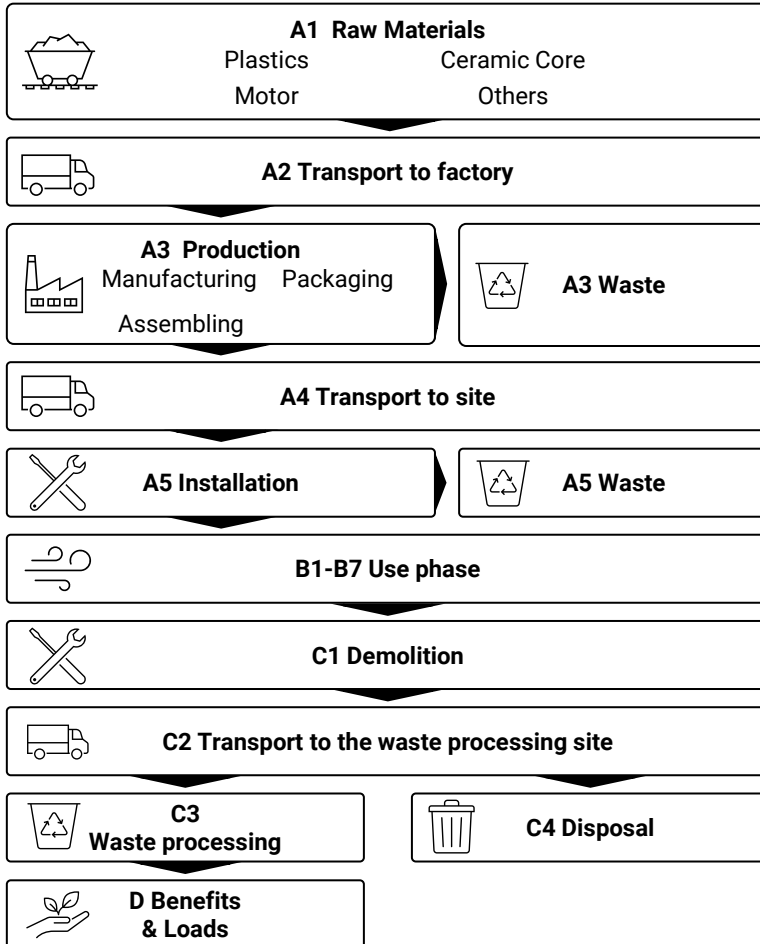
Product components	Mass, kg	Post-consumer material, Mass-%	Biogenic material, mass-% of product	Biogenic material, kg C/product
Plastic	1,65	0%	0%	-
Ceramic Heat exchanger	2,20	0%	0%	-
Others	0,11	0%	0%	-
Motor	0,19	0%	0%	-
Remote Control	0,02	0%	0%	-
TOTAL	4,17	0%	0%	-

Packaging materials	Mass, kg	Mass-% (versus the reference product)	Mass biogenic carbon, kg C/kg
Cardboard	0,54	13%	0,55
Paper	0,12	3%	0,55
Wood	0,36	9%	0,45
Plastic	0,01	0%	-
TOTAL	1,03	25%	0,50

LCA information

- **Declared unit:** 1 unit of NARAH 160.
Conversion factor to 1 Kg = 0,23.
- **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 2024.
- **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:** The primary inventory data has been obtained from S&P, corresponding to the references listed above, produced in 2024 at S&P production site in Barcelona province, Spain. The secondary data has been extracted from the Ecoinvent version 3.10.1 database, included in the OneClick LCA software and internationally recognized. Whenever possible, inventory data related to Spain has been selected; otherwise, data from Europe in general has been 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): Encompasses the manufacturing of raw materials, their transportation to the production facility, and all stages of the product manufacturing process.

- **Raw materials supply (A1):** This stage includes the procurement of raw materials and components used in the product's manufacturing.
- **Transport(A2):** This stage accounts for the transportation of raw materials and pre-assembled components from direct suppliers to S&P production site.
- **Manufacturing (A3):** The NARAH 160 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, wind power and hydro power. The modelled energy mix for A3 module has an emission factor of 0,021 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 includes the transportation of the product to the installation site and the processes required for its installation.

- **Transportation to site (A4):** Transportation to the installation site is calculated based on the product's sales distribution in 2024.

The distance to the site is estimated according to the geographic location of sales. Since the product is sold globally, transportation is assumed to cover 1.079 km by lorries (16–32 metric tons, EURO5) and 65 km by freight sea container ship.

- **Installation (A5):** The installation process of a decentralized energy recovery ventilation unit involves drilling through the building envelope (typically an external wall), inserting the through-wall duct, and securing the interior and exterior units. During this phase, 0,9kWh of electricity is consumed by power tools (e.g., drills and core drilling machines), as the product can be installed across Europe, an average market dataset for European low voltage electricity is used. Water use during drilling is not considered, as it is deemed insignificant. Packaging waste (wood, cardboard, and metals) is generated during installation. Their treatment has been modeled using average European data for recycling, recovery, and disposal (EUROSTAT, 2023).

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

- **Use, Maintenance, Repair, Replacement, and Refurbishment (B1-B5):** These submodules are considered negligible because the product does not generate additional impacts during its use, requires no maintenance, and is not expected to need repairs, replacements, or refurbishments during the specified operational life.
- **Operational Energy Use (B6):** Decentralized ventilation systems with heat recovery, such as NARAH, are installed at least in pairs. This ensures balanced airflow, with one unit extracting air and another supplying fresh air. Although the typical setup involves two units, the results for this module refer to a single unit. The operational energy consumption (B6)

has been calculated based on the following realistic scenario.

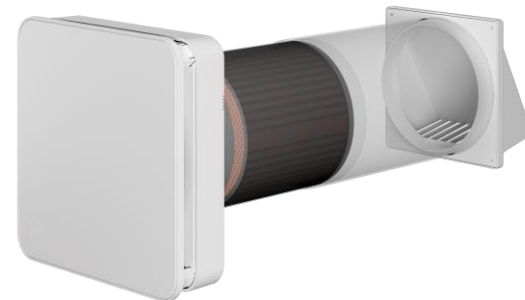
Use Scenario (B6)			
Speed	Absorbed power (W)	Hours	Energy consumption (Wh)
1	0,95	12,0	11,4
2	1,6	9,5	15,2
3	2,4	2,0	4,8
4	3,4	0,5	1,7
TOTAL		24	33,1

The equipment is assumed to operate continuously (24 hours per day) for 17 years. The annual energy consumption of one unit under these conditions is 12,08 kWh.

For more information on equipment consumption, please visit our website where you can find all the technical data. As the product is used across Europe, an average market dataset for European low voltage electricity is used. The emission factor for the used dataset is 0,33 KgCO_{2eq}/kWh.

Additional analysis of the impact of the B6 module in different countries and geographies has also been included in the Additional LCA results.

- **Operational Water Use (B7):** This submodule is negligible, as the product does not require water for its operation.



END OF LIFE STAGE (C1-C4): Includes all processes related to the product's disposal, such as deconstruction, transport, waste processing, and final disposal.

- **Deconstruction (C1):** The deconstruction scenario is defined in accordance with the PCR.
- **Transport(C2):** The default transport distance defined in the PCR has been assumed for the waste transported from the product deinstallation point to the waste management facility. Transport is assumed to be carried out using 16–32 metric ton 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 what is stated in the LCA. The percentages for recycling, incineration (with or without energy recovery), and landfill disposal have been defined based on the norm EN 50693. These are as follows for the entire product: 55% of the product is recycled, 30% of the equipment is incinerated (with or without energy recovery), and 14% of the equipment 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 imputed to the different

datapoints correspond only to waste that doesn't 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
Plastics	50% is incinerated with energy recovery 25% is incinerated without energy recovery 25% is landfilled	Energy recovery
Electric Components	100% is landfilled	-
Cardboard Paper	83% is recycled 8% is incinerated 9% is landfilled	Generation of recycled cardboard Energy recovery
Wood	32% is recycled 30% is incinerated 38% is landfilled	Generation of recycled wood Energy recovery



Soler&Palau encourages the proper management of the equipment's waste and to increase the recyclability ratio at the end of its useful life, as the **product's recyclability potential is >85%**.

- 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 2024 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% 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					0,0%
Raw materials	Database + Collected data	Ecoinvent v3.10.1	2024	Secondary data	0%
Share of primary data, of GWP-GHG results for A2					0,4%
Transport raw materials to manufacturing site	Database + Collected data	Ecoinvent v3.10.1 & EPD Owner	2024	Primary data	100%
Share of primary data, of GWP-GHG results for A3					0,8%
Manufacturing of the product	Database + Collected data	Ecoinvent v3.10.1 & EPD Owner	2024	Primary data and secondary data	22%
Total share of primary data, of GWP-GHG results for A1-A3					1,2%

Modules Declared

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	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% (GWP-GHG)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Environmental performance

Mandatory impact category indicators according to EN 15804

A declared unit of one unit of NARAH 160 with a mass of 4,17Kg is considered (excluding packaging). The impact assessment is based on EF3.1. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The results of the end-of-life stage (modules C) should be considered when using the results of the product stage (modules A1-A3). When comparing results from different Environmental Product Declarations, exercise caution due to varying methodologies and inherent 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.}	2,84E+01	1,93E-01	5,93E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,41E+01	0,00E+00	1,65E-03	4,42E-02	2,02E+00	1,04E+00	-1,27E+00
GWP-biogenic	Kg CO _{2eq.}	-1,59E+00	3,90E-05	1,59E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,58E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-luluc	Kg CO _{2eq.}	8,33E-02	9,29E-05	3,31E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,17E-01	0,00E+00	1,70E-07	1,96E-05	1,94E-05	1,12E-05	-1,48E-03
GWP-total	Kg CO _{2eq.}	2,69E+01	1,94E-01	1,65E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,45E+01	0,00E+00	1,65E-03	4,42E-02	2,02E+00	1,04E+00	-1,28E+00
ODP	kg CFC11 _{eq.}	1,26E-06	2,83E-09	4,61E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,22E-06	0,00E+00	2,53E-11	6,18E-10	7,73E-10	5,08E-10	-6,30E-09
AP	mol H ⁺ _{eq.}	1,76E-01	2,42E-03	1,72E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,66E-01	0,00E+00	1,49E-05	1,47E-04	4,91E-04	2,70E-04	-9,85E-03
EP-freshwater	kg P _{eq.}	2,80E-02	1,19E-05	8,88E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,37E-02	0,00E+00	4,78E-08	3,44E-06	7,95E-06	3,69E-06	-2,26E-03
EP-marine	kg N _{eq.}	7,04E-02	6,37E-04	2,36E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,70E-02	0,00E+00	6,93E-06	4,78E-05	2,68E-04	1,02E-03	-1,90E-03
EP-terrestrial	mol N _{eq.}	3,73E-01	7,04E-03	6,14E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,99E-01	0,00E+00	7,59E-05	5,20E-04	2,30E-03	1,28E-03	-2,32E-02
POCP	kg NMVOC _{eq.}	1,21E-01	2,12E-03	2,17E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,65E-01	0,00E+00	2,26E-05	2,05E-04	5,82E-04	3,45E-04	-5,78E-03
ADP-minerals&metals*	kg Sb _{eq.}	7,09E-03	4,16E-07	1,96E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,07E-04	0,00E+00	5,93E-10	1,45E-07	3,24E-07	8,32E-08	-3,59E-05
ADP-fossil*	MJ	4,13E+02	2,65E+00	4,08E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,49E+03	0,00E+00	2,16E-02	6,20E-01	4,28E-01	3,15E-01	-1,39E+01
WDP*	m ³	9,53E+00	1,13E-02	1,15E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,37E+01	0,00E+00	5,41E-05	2,88E-03	1,33E-01	6,64E-02	-2,24E-01

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.}	2,85E+01	1,93E-01	5,93E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,44E+01	0,00E+00	1,65E-03	4,42E-02	2,02E+00	1,04E+00	-1,28E+00
PM	Disease inc.	1,40E-06	1,46E-08	2,61E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,38E-06	0,00E+00	4,24E-10	3,51E-09	2,83E-09	2,13E-09	-1,27E-07
IRP (2)	kBq U-235 _{eq}	3,45E+00	1,96E-03	1,95E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,16E+01	0,00E+00	9,59E-06	5,02E-04	8,48E-04	4,73E-04	-9,47E-02
ETP-fw (3)	CTUe	6,96E+02	3,19E-01	8,58E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,37E+02	0,00E+00	1,19E-03	9,80E-02	3,95E+00	3,42E+00	-2,42E+01
HTP-c (3)	CTUh	2,10E-08	3,51E-11	2,48E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,25E-08	0,00E+00	1,70E-13	7,51E-12	1,74E-10	9,01E-11	-1,59E-10
HTP-nc (3)	CTUh	9,36E-07	1,38E-09	1,31E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,16E-06	0,00E+00	2,69E-12	3,88E-10	6,16E-09	3,94E-09	-2,27E-09
SQP (3)	Pt	2,65E+02	1,90E+00	3,40E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,59E+02	0,00E+00	1,52E-03	3,72E-01	1,81E-01	3,14E-01	-6,99E+00

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	4,37E+01	3,13E-02	-1,60E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,45E+02	0,00E+00	1,37E-04	8,51E-03	2,18E-02	9,88E-03	-2,21E+00
PERM	MJ	1,40E+01	0,00E+00	-1,40E+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	5,77E+01	3,13E-02	-3,00E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,45E+02	0,00E+00	1,37E-04	8,51E-03	2,18E-02	9,88E-03	-2,21E+00
PENRE	MJ	3,82E+02	2,65E+00	-3,23E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,49E+03	0,00E+00	2,16E-02	6,20E-01	-3,05E+01	-3,05E+01	-1,40E+01
PENRM	MJ	2,62E+01	0,00E+00	-1,15E+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	-1,53E+01	-9,77E+00	1,21E-01
PENRT	MJ	4,08E+02	2,65E+00	-1,47E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,49E+03	0,00E+00	2,16E-02	6,20E-01	-4,58E+01	-4,03E+01	-1,38E+01
SM	kg	6,80E-01	1,17E-03	5,12E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,57E-01	0,00E+00	8,99E-06	2,79E-04	4,11E-04	2,20E-04	7,93E-02
RSF	MJ	1,99E-01	1,07E-05	3,48E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,08E-03	0,00E+00	2,35E-08	3,55E-06	1,36E-05	6,57E-06	-4,17E-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	2,46E-01	3,26E-04	-5,97E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,39E+00	0,00E+00	1,43E-06	8,22E-05	2,27E-03	-4,46E-04	-1,01E-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; PE= 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; PEN= Total use of non-renewable primary energy resources; 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	5,89E+00	4,19E-03	5,12E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,40E+00	0,00E+00	2,41E-05	1,08E-03	3,49E-02	1,74E-02	-1,59E-01
Non-hazardous waste disposed	kg	8,97E+01	7,20E-02	1,27E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,12E+02	0,00E+00	3,28E-04	2,03E-02	9,46E-01	2,59E+00	-5,42E-01
Radioactive waste disposed	kg	1,80E-03	4,79E-07	4,94E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,08E-02	0,00E+00	2,35E-09	1,23E-07	2,14E-07	1,19E-07	-2,32E-05

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	1,21E-05	0,00E+00	6,81E-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	1,15E-01	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	9,52E-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	9,91E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	3,98E-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	5,74E+00	0,00E+00	0,00E+00

Additional LCA results

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	
		C3	C4	C3	C4	C3	C4
GWP-fossil	Kg CO _{2eq.}	0,00E+00	9,10E-01	3,23E-01	0,00E+00	5,03E+00	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
GWP-luluc	Kg CO _{2eq.}	0,00E+00	2,11E-04	5,80E-08	0,00E+00	5,96E-05	0,00E+00
GWP-total	Kg CO _{2eq.}	0,00E+00	9,10E-01	3,23E-01	0,00E+00	5,03E+00	0,00E+00
ODP	kg CFC11 _{eq.}	0,00E+00	5,02E-09	1,54E-09	0,00E+00	3,79E-09	0,00E+00
AP	mol H ⁺ _{eq.}	0,00E+00	2,09E-03	7,60E-04	0,00E+00	1,97E-03	0,00E+00
EP-freshwater	kg P _{eq.}	0,00E+00	2,23E-04	5,22E-05	0,00E+00	1,17E-04	0,00E+00
EP-marine	kg N _{eq.}	0,00E+00	4,12E-03	3,79E-04	0,00E+00	2,41E-03	0,00E+00
EP-terrestrial	mol N _{eq.}	0,00E+00	7,13E-03	2,45E-03	0,00E+00	9,53E-03	0,00E+00
POCP	kg NMVOC _{eq.}	0,00E+00	2,24E-03	7,62E-04	0,00E+00	2,44E-03	0,00E+00
ADP-minerals&metals*	kg Sb _{eq.}	0,00E+00	2,33E-06	1,39E-06	0,00E+00	5,57E-07	0,00E+00
ADP-fossil*	MJ	0,00E+00	4,81E+00	1,51E+00	0,00E+00	2,02E+00	0,00E+00
WDP*	m ³	0,00E+00	6,92E-02	5,50E-02	0,00E+00	4,07E-01	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 NARAH 160 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	GERMANY	BELGIUM	NORWAY	ITALY	GREAT BRITAIN
GWP-fossil	Kg CO _{2eq.}	4,01E+01	1,71E+01	7,63E+01	4,01E+01	4,69E+00	6,91E+01	5,10E+01
GWP-biogenic	Kg CO _{2eq.}	1,09E-01	3,35E-02	4,22E-01	6,46E-02	8,93E-02	3,12E-01	3,27E-02
GWP-luluc	Kg CO _{2eq.}	5,80E-01	1,88E-02	1,73E-01	1,19E-01	2,41E-02	1,65E-02	6,98E-02
GWP-total	Kg CO _{2eq.}	4,07E+01	1,72E+01	7,69E+01	4,03E+01	4,80E+00	6,95E+01	5,10E+01
ODP	kg CFC11 _{eq.}	8,45E-07	6,25E-07	1,01E-06	1,77E-06	1,31E-07	1,65E-06	2,67E-06
AP	mol H ⁺ _{eq.}	2,15E-01	1,16E-01	2,14E-01	1,24E-01	6,31E-02	2,84E-01	1,84E-01
EP-freshwater	kg P _{eq.}	1,02E-02	7,64E-03	1,11E-01	9,47E-03	5,28E-03	1,65E-02	9,77E-03
EP-marine	kg N _{eq.}	3,79E-02	2,19E-02	5,46E-02	2,56E-02	5,43E-03	4,20E-02	3,95E-02
EP-terrestrial	mol N _{eq.}	3,89E-01	1,77E-01	3,94E-01	2,55E-01	6,46E-02	4,46E-01	4,45E-01
POCP	kg NMVOC _{eq.}	1,40E-01	6,11E-02	1,28E-01	8,14E-02	1,98E-02	1,92E-01	1,25E-01
ADP-minerals&metals*	kg Sb _{eq.}	9,15E-04	8,61E-04	1,02E-03	9,65E-04	7,80E-04	9,12E-04	9,02E-04
ADP-fossil*	MJ	1,32E+03	2,22E+03	1,19E+03	1,58E+03	5,66E+01	1,11E+03	1,38E+03
WDP*	m ³	2,80E+01	3,02E+01	2,13E+01	2,01E+01	2,64E+02	4,58E+01	1,47E+01

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.

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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: Environmental management-Life Cycle Assessment-Principles and framework (2006).
- ISO 14044: Environmental management-Life Cycle Assessment-Requirements and guidelines (2006).
- 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: NARAH 160. May 2026
- 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

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- Original Version of the EPD, 2026-05-07.**



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