

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 50693 for:

Home Gateway

From

Huawei Technologies Co., Ltd.



Declared product:



Programme operator:	EPD China
Registration number:	EPD-CN-00058
Issued date:	2026-07-06
Valid until:	2031-07-05



Programme Information

EPD Owner	Huawei Technologies Co., Ltd. Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, Guangdong, 518129, P.R.C
Product Name	Home Gateway
Production Site	Mianyang, China
Identification of product	UNCPC code: 47223
Field of Application	Internet Connection
Programme Operator	EPD China Address of Headquarter: Tianping Road, Xuhui District, Shanghai Website: www.epdchina.cn Email: info@epdchina.cn secretary@epdchina.cn
LCA Practitioner	TÜV SÜD Certification and Testing (China) Co., Ltd.
Responsibility	The EPD owner has the sole ownership, liability, and responsibility for the EPD
Comparability	EPDs within same category of product in different programme operator are not suggested to be compared. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible even applying the same PCR.
Liability	The EPD owner has the sole ownership, liability, and responsibility for the EPD.
Validity	The EPD is published on 2026-07-06 and valid to 2031-07-05
LCA Software (version)	SimaPro 10.2.0.0
LCI Dataset (version)	Ecoinvent 3.11
Year(s) of Primary Data	01/2024-12/2024
PCR	EPDItaly007:PCR for electronic and electrical products and systems, Rev. 3.2
Other Reference Document	EN 50693:2019 Product category rules for life cycle assessments of electronic and electrical products and systems
Verification statement according ISO 14025	
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐ internal ☒ external Third-party institution verification: < Juelun Wang, WIT > is an approved certification body accountable for third-party verification Approved by: EPD China	
Procedure for follow-up of data during EPD validity involves a third-party certification body: ☐ Yes ☒ No	





General Information

1.1 Company information

Owner of the EPD:

Huawei Technologies Co., Ltd.

Address:

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, Guangdong, 518129, P.R.C

Description of the company:

Founded in 1987, Huawei is a leading global provider of information and communications technology (ICT) infrastructure and smart devices. Huawei is serving more than three billion people around the world and is committed to bringing digital to every person, home and organization for a fully connected, intelligent world.

Name and location of production site:

Sichuan Jiuzhou Electronic Technology Co., Ltd.

No.259 Jiuzhou Road, 621000 Mianyang, Sichuan, P.R.C.

1.2 Scope and type of EPD

The EPD type referring to this LCA report is Manufacturer's EPD (Declaration of a specific product from a specific manufacturer's plant).

According to EN 50693:2019 and EPDItaly007, the product life cycle system boundary assessed in this report is cradle to grave, i.e., Manufacturing stage, Distribution stage, Installation stage, Use & Maintenance stage and End-of-life stage for a total of five life cycle stages. The Manufacturing stage includes raw material extraction and processing, transport to the production site and manufacturing processes. The Distribution stage covers the transportation of the product from the production site to the installation site. The Installation stage includes the end-of-life process of the packaging. The Use & maintenance stage includes energy consumption within the RSL associated with the product. Finally, the End-of-life stage, which includes de-installation, collection & transport, end-of-life treatment, is also considered.

Table: Process stages and EPD modules.

PHASES	MANUFACTURING STAGE	DISTRIBUTION STAGE	INSTALLATION STAGE	USE & MAINTENANCE STAGE	END-OF-LIFE STAGE	BENEFITS & LOADS
	IN ACCORDANCE TO EN 50693					
Phases declared	X	X	X	X	X	MND
Note: X =Declared Module; MND = Module not declared in this LCA study						



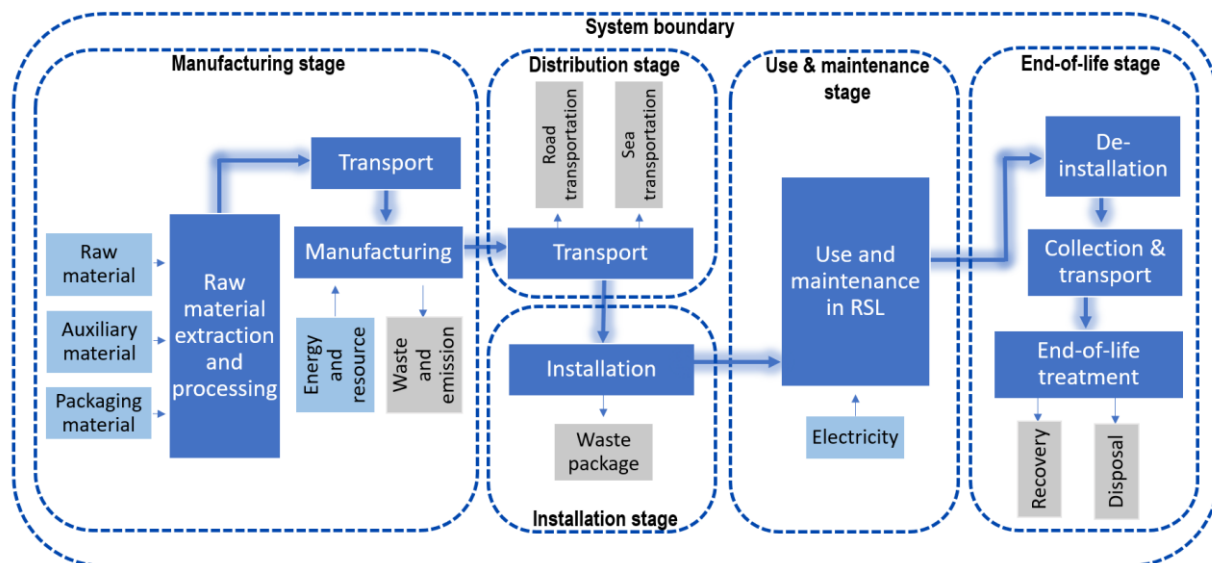


Figure: System diagram.

2 Detailed Product Description

2.1 Product information

The DN8245X6-8X Home Gateway product is a SuperVector home gateway used in the ultra-broadband copper line solution. It uses the high-performance dual-core chip, supports dual-bands Wi-Fi (2.4G Wi-Fi +5G Wi-Fi). The total weight of product per declared unit is 1.46 kg including packaging.

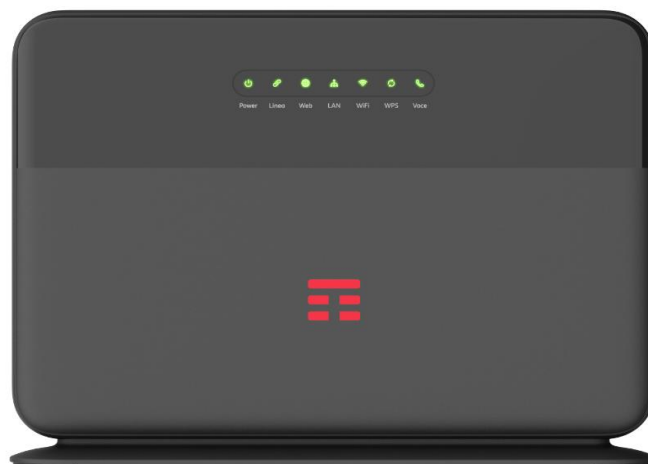


Figure: Picture of the declared product.

Hardware parameters

Interfaces	WAN port	ADSL/ADSL2/ASDL2+/VDSL2 GE(LAN4 auto-sensing)
	LAN port	4 GE LAN ports
	FXS port	2 FXS ports
	USB port	1 USB 2.0 port and 1 USB 3.0 port
	WLAN port	2.4G Wi-Fi: 4*4 IEEE 802.11b/g/n/ax 5G Wi-Fi: 4*4 IEEE 802.11a/n/ac/ax
Buttons	On/Off 、 Reset、 WPS、 Wlan	
LEDs	Power, Linea, Web, LAN, Wi-Fi, WPS, Voce	
Antenna	Internal antennas	

2.2 Production processes

The flowchart depicting the production processes of DN8245X6-8X Home Gateway product is shown in figure below.

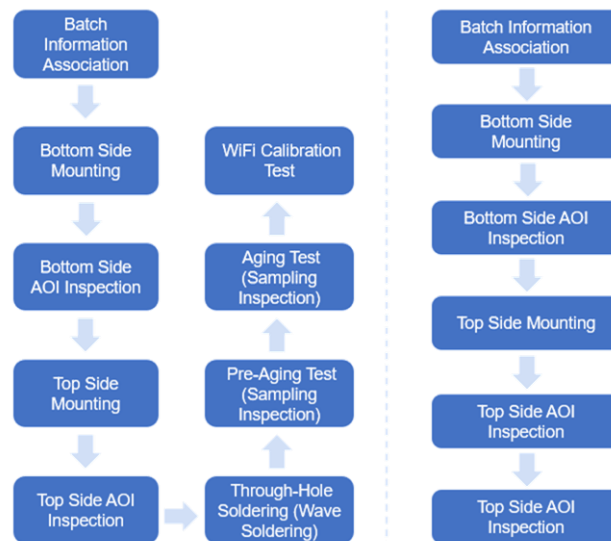


Figure: The production processes

The raw material and packaging composition of per unit of Home Gateway product is listed below.

Table: Main product components and packaging materials per unit

Product components	Material Classes*	Weight (g)	Weight (% , versus the product)
Plastic	M-231	3.27E+02	35.15
PCB	M-449	1.28E+02	13.76
Electronic component	M-449	8.93E+01	9.60
Iron / steel	M-199	6.28E+00	0.68
Silicone	M-321	6.00E+00	0.65
Aluminium alloy	M-120	1.49E+02	16.02
Cable	M-449	6.44E+01	6.92
Power adapter	M-449	1.49E+02	16.02
Solder	M-126	4.20E+00	0.45
Flux	M-399	7.00E+00	0.75
TOTAL	-	9.30E+02	100.00
Packaging materials	Material Classes*	Weight (g)	Weight (% , versus the packaging)
Paper	M-341	5.00E+00	0.94
Corrugated cardboard	M-341	4.42E+02	83.18
Plywood	M-340	8.44E+01	15.88
TOTAL	-	5.31E+02	100.00

*According to IEC 62474 - Material Declaration for Products of and for the Electrotechnical Industry

These products contain no substances of very high concern (SVHC) on the REACH Candidate List published by the European Chemicals Agency.

3 LCA results

3.1 Environmental Impacts

The results of the underlying LCA are provided in this section as environmental impacts, resource use, and waste production. The life cycle assessment results are reported per declared unit of Home Gateway product.

Table: Environmental impacts

RESULTS OF THE LCA - Environmental impacts per declared unit							
Impact Categories	Unit	Total	Manufacturing Stage	Distribution Stage	Installation Stage	Use & maintenance Stage	End-of-life Stage
Global Warming Potential total (GWP-total)	[kg CO2 eq.]	1.84E+02	2.47E+01	8.48E-01	9.13E-01	1.55E+02	2.10E+00
Global Warming Potential fossil fuels (GWP-fossil)	[kg CO2 eq.]	1.82E+02	2.50E+01	8.48E-01	1.17E-01	1.54E+02	2.03E+00
Global Warming Potential biogenic (GWP-biogenic)	[kg CO2 eq.]	1.16E+00	-3.71E-01	2.79E-04	7.96E-01	6.59E-01	7.06E-02
Global Warming Potential land use and land use change (GWP-luluc)	[kg CO2 eq.]	8.12E-02	6.09E-02	3.70E-04	1.33E-05	1.98E-02	1.47E-04
Depletion potential of the stratospheric ozone layer (ODP)	[kg CFC 11 eq.]	4.99E-06	1.52E-06	1.48E-08	1.36E-09	3.45E-06	3.39E-09
Acidification potential, Accumulated Exceedance (AP)	[mol H+ eq.]	7.44E-01	2.25E-01	8.49E-03	5.37E-04	5.08E-01	1.62E-03
Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	[kg P eq.]	7.16E-02	2.44E-02	6.40E-05	5.24E-06	4.71E-02	5.77E-05
Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	[kg N eq.]	1.35E-01	3.23E-02	2.43E-03	2.61E-04	9.96E-02	7.20E-04
Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	[mol N eq.]	1.41E+00	3.44E-01	2.68E-02	2.54E-03	1.03E+00	6.58E-03
Formation potential of tropospheric ozone (POCP)	[kg NMVOC eq.]	4.97E-01	1.08E-01	8.36E-03	9.16E-04	3.78E-01	2.20E-03
Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	[kg Sb eq.]	5.73E-03	4.66E-03	2.02E-06	8.05E-08	1.06E-03	1.17E-06
Abiotic depletion potential for fossil resources (ADP-fossil)	MJ, net calorific value	2.54E+03	3.30E+02	1.19E+01	1.09E+00	2.20E+03	3.14E+00
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	[m3 world eq. Deprived]	2.48E+01	8.50E+00	6.38E-02	2.61E-02	1.62E+01	6.27E-02

3.2 Resource use and waste categories

Table: Resource use and waste categories

RESULTS OF THE LCA - Resource use and waste categories per declared unit							
Core indicator	Unit	Total	Manufacturing Stage	Distribution Stage	Installation Stage	Use & maintenance Stage	End-of-life Stage
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)	MJ	2.00E+02	4.98E+01	1.58E-01	9.20E-03	1.50E+02	1.47E-01
Use of renewable primary energy resources used as raw materials (PERM)	MJ	6.97E+00	6.97E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT) (primary energy and primary energy resources used as raw materials)	MJ	2.07E+02	5.68E+01	1.58E-01	9.20E-03	1.50E+02	1.47E-01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)	MJ	2.54E+03	3.30E+02	1.19E+01	1.09E+00	2.20E+03	3.14E+00
Use of non-renewable primary energy resources used as raw materials (PENRM)	MJ	1.18E+01	1.18E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources (PENRT) (primary energy and primary energy resources used as raw materials)	MJ	2.55E+03	3.42E+02	1.19E+01	1.09E+00	2.20E+03	3.14E+00
Use of secondary material (SM)	kg	8.58E-01	4.88E-01	5.13E-03	3.27E-04	3.64E-01	8.64E-04
Use of renewable secondary fuels (RSF)	MJ	5.99E-02	5.69E-02	5.48E-05	4.16E-06	2.86E-03	3.97E-05
Use of non-renewable secondary fuels (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (FW)	m3	6.15E-01	2.19E-01	1.56E-03	6.12E-04	3.92E-01	1.54E-03
Hazardous waste disposed (HWD)	kg	1.17E+01	3.11E+00	2.01E-02	1.19E-02	8.45E+00	1.21E-01
Non-hazardous waste disposed (NHWD)	kg	3.30E+02	8.99E+01	3.79E-01	5.93E-01	2.38E+02	1.11E+00
Radioactive waste disposed (RWD)	kg	2.82E-03	5.62E-04	2.59E-06	1.29E-07	2.25E-03	2.26E-06
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling(MFR)	kg	5.01E-01	1.36E-01	2.36E-03	5.93E-04	2.51E-01	1.10E-01
Materials for energy recovery (MER)	kg	1.34E-04	9.40E-05	4.77E-07	3.40E-08	3.93E-05	1.67E-07
Exported electricity energy (EEE)	MJ	3.23E+01	2.44E-01	1.39E-03	2.50E-02	3.20E+01	8.41E-02
Exported thermal energy (ETE)	MJ	3.50E-01	8.61E-02	1.45E-03	2.64E-02	1.54E-01	8.23E-02



4 Supplementary information

4.1 Calculation rules

Declared unit

In this report, a declared unit is defined as a piece of Home Gateway product. And the mass of the product per the declared unit is 1.46 kg including packaging.

Reference Service Life (RSL)

The Reference Service Life (RSL) of the Home Gateway product is declared as 3 years, in accordance with the EPD owner's specifications (24 hours per day, 365 days per year, with 5 hours per day in active mode and 19 hours per day in ready mode).

Software and database

The life cycle assessment software used in this project is SimaPro 10.2.0.0, using Ecoinvent 3.11 database.

Time boundary

Time boundary of data for product declared in the report is 2024-01-01 to 2024-12-31.

Assumptions

All key assumptions are shown in the below table.

Table: Key assumptions

Modules	Items	Assumptions
Manufacturing / Distribution stage	Transportation vehicle type	Assuming, >32 metric ton, EURO4 type lorry vehicle is used in distribution.
Installation stage	Transportation distance	The transport distance is assumed to be 100 km according to the PEFCR guidance.
	Transportation vehicle type	The transport vehicle type is assumed to be a municipal waste collection service by 21 metric ton lorry.
	Recovery rate, disposal rate and disposal scenario	The default proportions of recovery rate and disposal rate are based on EN 50693:2019 (Annex G.4) and IEC/TR 62635:2012 (Annex D). The residual waste is assumed to be disposed of by incineration without energy recovery
Use & maintenance stage	Use scenario	Assuming 24 hours per day, 365 days per year, with 5 hours per day in active mode and 19 hours per day in ready mode.
End-of-life stage	Transportation distance	The transport distance is assumed to be 100 km according to the PEFCR guidance.
	Transportation vehicle type	The transport vehicle type is assumed to be a municipal waste collection service by 21 metric ton lorry.
	Recovery rate, disposal rate and disposal scenario	The default proportions of recovery rate and disposal rate are based on EN 50693:2019 (Annex G.4) and IEC/TR 62635:2012 (Annex D). The residual waste is assumed to be disposed of by incineration without energy recovery

Cut off rules

According to the PCR EPDItaly007 and EN 50693:2019, the cut-off criteria are set to a maximum of 5% of the overall environmental impact of the analyzed product system. The following flows and operations may be cut-off:

- Production, use and disposal of the packaging of components and semi-finished intermediates;
- Materials making up the Home Gateway product itself whose total mass does not exceed 1% of the total weight of the product;
- Material and energy flows related to the dismantling phase, where it is reasonable to assume that dismantling is performed manually
- Devices external to the product itself required for installation;
- Maximum 5% of the overall environmental impact of the analysed product system;

In this report, all inputs and outputs are analyzed or cut-off. Based on the practice, in manufacturing stage, less than 1% of total mass input of materials making up the product in this LCA is cut-off. The production, use and disposal of the raw materials packaging is cut-off. In installation stage, material and energy flows and the devices external to the product required for installation are cut off. In use & maintenance stage, the flows and operations in maintenance are cut-off, as the usage scenario is a stable indoor environment, no maintenance or replacement is required within the reference service life. In end-of-life stage, the de-installation operations are cut off.

In addition, the impacts related to production, transportation and installation of capitals goods (buildings, infrastructure, machinery, internal transport packaging) and general operations (staff travel, marketing and communication actions) are excluded from the LCA study according to the PCR EPDItaly007.

Data quality

According to the EN 50693, The quality of the data used to perform a life cycle assessment shall be documented in the LCA report according to EN ISO 14044:2006, 4.2.3.6. The data quality assessment shall address the following aspects: precision, completeness, representativeness, consistency. In this EPD, datasets used for calculations is based on 1-year averaged data, they have been updated within the past 10 years for generic data and within the past 5 years for producer specific data, and the time period over which inputs to and outputs from the system is accounted for is 100 years from the year for which the data set is deemed representative.

The data quality analysis of this EPD is based on Data Quality Rating (DQR) methodology in Suggestions for Updating the Product Environmental Footprint Methodology (PEF). The unit processes contributing most of the product's life cycle assessment were selected for DQR analysis, which meets the methodology's requirement of selecting the top 80% of the unit processes contributing to the Pareto analysis and can be representative of the product's DQR for GWP-total indicator. The ratings of completeness (C), methodological appropriateness and consistency (M), technical representativeness (TeR), geographic representativeness (GeR), time-related representativeness (TiR), and precision (P) and weights of each unit process are all under consideration.

Allocations

According to EN 50693:2019, in the case of parallel production of different product versions on a line or at a location where only the level of inputs and outputs is known however, "Multi-Output" shall be applied as an allocation rule in order to calculate the environmental impact of the product under study. "Multi-Output" means the allocation is based on a quantitative calculation of the resource consumption and the emissions, for example in relation to the distribution of functions, physical properties or economic aspects. Physical properties, such as mass, net calorific values, etc., shall be preferred, otherwise economic aspects, such as man-hours, operating hours or manufacturing cost may be used.

In this EPD, the manufacturer produces more than single model product, and the production process is similar for

all products, mainly assembly, testing and packaging. So, the “Multi-Output” is applied as an allocation in this report. In this report, raw materials and packaging materials consumption did not involve allocations. However, according to the above information, energy and resource consumption, along with emissions and waste, are allocated to the product based on product yield during the manufacturing stage.

If a waste flow does not reach the point of substitution, and thus does not cross the system boundary, all waste treatment processes including those of disposal shall be assigned to the product system generating the waste. If it is unknown whether the point of substitution is reached, a conservative assumption shall be made. This means that in case the product under study has generated waste, the point of substitution shall be assumed not to be fulfilled, and the further waste processing and waste incineration/disposal shall be assigned to the product. If material or energy is recovered from waste, this presumably results in benefits because of substituted production of primary material/energy. These benefits may be calculated and declared in the EPD. If the benefits are not declared, the rules in Section G.2 of Annex G of EN 50693:2019 shall be followed.

In this EPD, the benefits of product waste in end-of-life stage are not declared, So the rules in Section G.2 of Annex G of EN 50693:2019 are followed, and the waste processing, including collection, transportation, processing before the point of substitution, disposal, are set within the system boundary.

4.2 Scenarios and additional technical information

Manufacturing Stage

This stage covers raw material extraction and processing (including auxiliary materials and packaging materials), their transportation processes from suppliers to the production site, the resource and energy consumption of production as well as the waste and emissions generated during the manufacturing process at the production site. Specific data for material inputs and energy consumption are provided by the manufacturer.

In manufacturing processes, the data for generation of electricity applied in this stage is the State Grid Southwest China Branch mix, namely Electricity, low voltage {CN-SWG}| market for electricity, low voltage | EN15804, U in the Ecoinvent 3.11 database. As residual mix data for the Chinese power grid is not available, market-based electricity data was selected. The electricity consumption during the manufacturing stage is minimal, resulting in a very low impact on the overall results from a sensitivity analysis perspective. The electricity profiles are presented below.

Table: Electricity profiles

Country	Production mix	Reference year
China	Electricity, low voltage {CN-SWG} market for electricity, low voltage EN15804, U	2024

The waste generated from the manufacturing process, including solid waste and hazardous waste, is all assumed to be disposed of by incineration without material and energy recovery.

Distribution Stage

This stage relates to transportation of products from the production site to the installation site. The installation site of the product evaluated in this report is Rome, Italy. The transportation mode is: production site - distributor (road transport), distributor - port of exporting country (road transport), port of exporting country - port of importing country (sea transport), port of importing country - installation site (road transport). For detailed information, please refer to following table.



Table: Distribution information

Transportation mode	Production site - distributor (road transport)	Distributor -port of exporting country (Road transport)	Port of exporting country - port of importing country (Sea transport)	Port of importing country - installation site (Road transport)
Distance (km/p)	1750	70	13200	2334

Installation Stage

In Installation stage, the product is installed manually, without additional consumption of resources and energy. Packaging waste is generated during unpacking in this stage. The default recovery and disposal rates from Annex G of EN 50693:2019 in this stage and the transport distance from the installation site to the waste treatment facility is assumed to be 100 km in accordance with PEFCR guidance.

Use & maintenance Stage

Use & maintenance stage includes operational electricity use. Since the usage scenario is a stable indoor environment, no maintenance or replacement is required within the reference service life.

The Reference service life of the Home Gateway product is declared as 3 years, in accordance with the EPD owner's specifications (24 hours per day, 365 days per year, with 5 hours per day in active mode and 19 hours per day in ready mode). Detailed information is shown in the following table.

Table: Usage scenario

Ready mode hour (h/day)	Ready mode power (W)	Active mode hour (h/day)	Active mode power (W)	Reference service life (years)
19	8.94	5	9.59	3

The electricity mix data for the usage location (Italy) is based on residual mix from the Ecoinvent 3.11 database. The electricity profiles are shown below.

Table: Electricity profiles

Country	Production mix	Reference year
Italy	Electricity, low voltage {IT} electricity, low voltage, residual mix EN15804, U	2024

End-of-Life Stage

The End-of-life stage includes de-installation, collection & transport, and end-of-life treatment. Since de-installation is performed manually, no additional energy or resources are consumed. During the collection and transport process, shredding and sorting of waste processing are required, and the waste transport distance is assumed to be 100 km, in accordance with PEFCR guidance. For end-of-life treatment, the default recovery and disposal rates from Annex G of EN 50693:2019 and Annex D of IEC/TR 62635:2012 are applied to the materials of the disassembled product (see below table). The residual waste is assumed to be disposed of by incineration without energy recovery.

Table: Recovery Rate

Waste material	Material recovery rate (R2)	Energy recovery rate (R3)	Disposal rate
Printed wiring board with components	18%	43%	39%
Cable	24%	0%	76%
Battery	45%	0%	55%
Steel	80%	0%	20%
Aluminum	70%	0%	30%
Other Plastic	0%	50%	50%
ABS+PC	0%	0%	100%
Wood	0%	50%	50%

If material or energy is recovered from waste, this presumably results in benefits because of substituted production of primary material/energy. These benefits may be calculated and declared in the EPD. If the benefits are not declared, the rules in Section G.2 of Annex G of EN 50693 shall be followed. In this EPD, the benefits are not declared. For different waste material, material recovery operations and energy recovery have their substitution point, which is the point where the material ceases to be waste and enters the new product system as a substitute for virgin material, and inputs and output of the material recovery process and energy recovery process which are from Ecoinvent 3.11 database.

Additional technical information

EPDs relating to the same category of products but belonging to different programmes may not be comparable

References

- 1) ISO 14040:2006 Environmental management — Life cycle assessment — Principles and Framework.
- 2) ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines.
- 3) ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and procedures.
- 4) EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products.
- 5) EPDItaly007:PCR for electronic and electrical products and systems, Rev. 3.2.
- 6) EN 50693: 2019 Product category rules for life cycle assessments of electronic and electrical products and systems.
- 7) IEC/TR 62635: 2012 Guidelines for end-of-life information provided by manufacturers and recyclers and for recyclability calculation of electrical and electronic equipment
- 8) EPD China General Programme Instruction.
- 9) Product Environmental Footprint Category Rules Guidance, Version 6.3, May 2018.
- 10) Zampori, L. and Pant, R., Suggestions for updating the Product Environmental Footprint (PEF) method, EUR 29682 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76- 00654-1, doi:10.2760/424613, JRC115959.
- 11) IEC 62474: Material Declaration for Products of and for the Electrotechnical Industry



Programme operator EPD China
Registration number EPD -CN - 00058



EPD 中国项目 值得信赖

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