Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Compact Panel radiators (WR4, WRP4, WRH4, WRS, WRP, WRH, WRM)

from

Watt Heating AB

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0006059
Publication date:	2024-12-23
Valid until:	2029-12-22

EPD of multiple products based on average products and the material composition per kg does not change within the range. The included products are described in production information.

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

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:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *Construction Products PCR 2019:14 version 1.3.4*
PCR review was conducted by: *The Technical Committee of the International EPD@ System*
Life Cycle Assessment (LCA)
LCA accountability: *Fanni Végvári, CarbonZero AB*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: *Vladimír Kočí, LCA Studio* 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 registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same 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 equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:
Watt Heating AB
Transportvägen 7, 241 38 Eslöv, Sweden

E-mail: info@watt.se
Tel: +46 413 664 60
Website: www.watt.se

Responsible person: Mikael Andersson, mikael.andersson@watt.se

Description of the organisation:
Watt is a privately owned company within Climate Brand Group. Watt is a complete supplier of products for indoor climate supplied by water. Main customer focus is on installation companies like plumbers but also building companies and DIY. Watt's focus is on the Swedish market but also active in other Nordic countries. Watt products is always CE marked and tested according to EN442. We focus on good quality products to a very competitive price with high function and low environmental impact.

Name and location of production site: Bursa, Turkey

Product information

Product name: Compact Panel radiator

Product description:
This EPD presents detailed results for the compact radiator WR4 22-510. The WR4 panel radiator is representative of the full range of Watt Heating compact radiators. Panel radiators are mostly made of low-alloyed steel, which can be reused countless times. They have a lifespan of at least 50 years and, therefore, make a great product to use in both new buildings and buildings facing renovations. The radiators meet all the requirements and standards within the EU and within industry, such as EN-442-1:2014.

The thermostat on the radiators is excluded from calculations.

Description of production process: The entire production of the radiators occurs in Bursa, Turkey and the finished products are delivered to Eslöv before delivery to Watt costumers. The production process involves pressing, welding, and painting (preparing treatment, painting and drying), before the products are packed for delivery to Sweden.

UN CPC code: 44823 – Radiators for central heating, not electrically heated, of iron or steel

Geographical scope: Sweden

Products included:

This EPD covers the full range of compact panel radiators manufactured in Turkey. The EPD presents detailed results for the compact radiator WR4 22-510. The WR4 panel radiator is representative of the full range of Watt Heating compact panel radiators since the material composition per kg of product is the same over the entire product range.

The included variants are presented in the table below.

Product name (Swedish)	Abbreviation	Link to website
Watt Radiator 4	WR4	https://watt.se/produkter/radiatorer/wr4
Watt Radiator Hygien 4	WRH4	https://watt.se/produkter/radiatorer/wrh4
Watt Radiator Plan 4	WRP4	https://watt.se/produkter/radiatorer/wrp4
Watt Radiator Standard	WRS	https://watt.se/produkter/radiatorer/wrs
Watt Radiator Plan	WRP	https://watt.se/produkter/radiatorer/wrp
Watt Radiator Mittkopplad	WRM	https://watt.se/produkter/radiatorer/wrm
Watt Radiator Hygien	WRH	https://watt.se/produkter/radiatorer/wrh

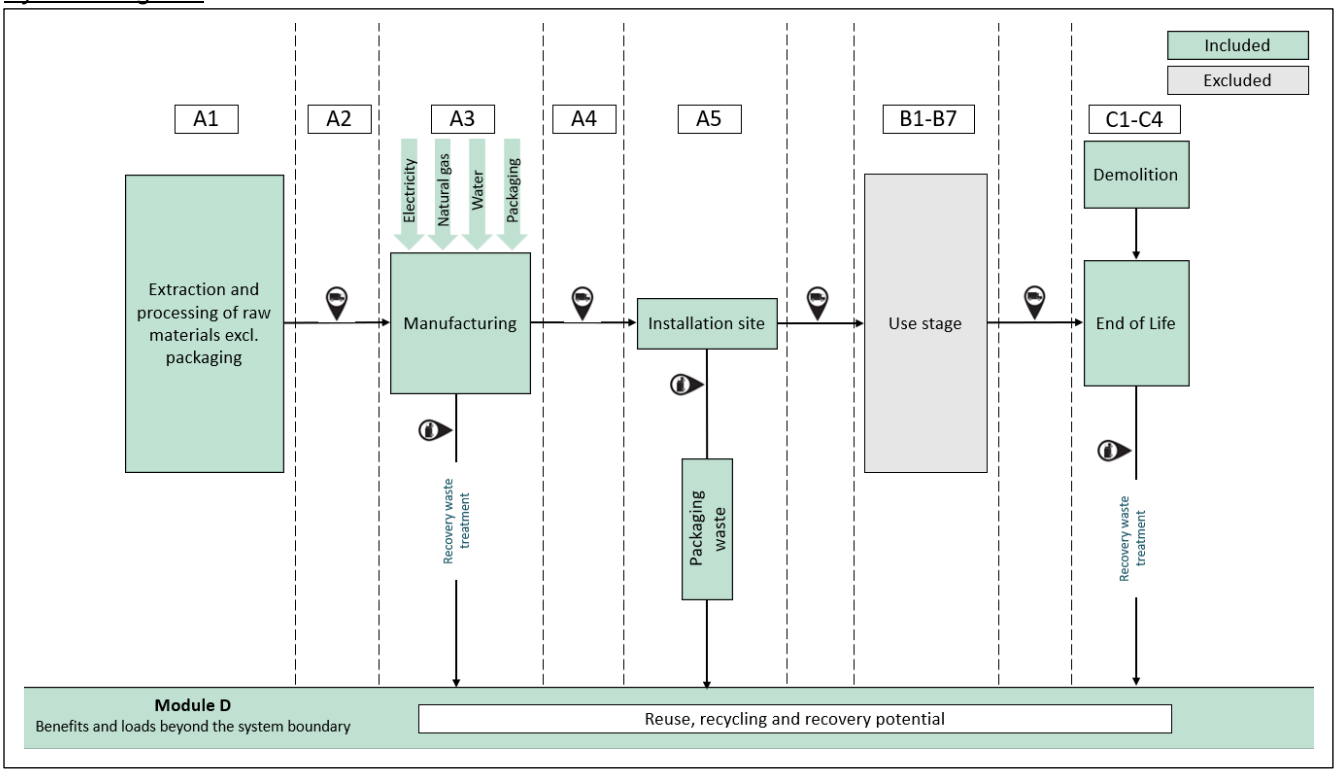
All the products have the same material composition per kg, hence no variations between the products.

LCA information

Declared unit: 1 kg of compact panel radiator
Reference service life: Not applicable
Time representativeness: 2023
Database(s) and LCA software used: Calculation completed in LCA for Experts v.10.7, with the database version 2024.1 and with some ecoinvent datasets (version 3.8). The characterization factors used in this study refer to PCR 2019:14 and EN 15804+A2 (based on EF 3.1).

Description of system boundaries:
Cradle to gate with options, modules C1–C4, module D, and optional modules (A1–A3 + C + D and additional modules A4+A5).

System diagram:



More information – methodology and assumptions:

A1 – Raw material supply
This module considers the extraction and processing of all raw materials, energy, and transportation that occur upstream of the studied manufacturing process. The products are made from steel and covered with powder paint.

A2 – Transport to the manufacturer
This module includes the transportation of raw materials to the manufacturing site. Specific information from the manufacturer was obtained regarding the transportation distance between the suppliers to the manufacturing factory

A3 - Manufacturing
This module includes all resources used during the production of the radiators, mainly electricity and natural gas and it also includes the production of packaging material in which the products are transported to costumers. The manufacturer has collected data from the production year of 2023. As there's only one manufacturing site, no variation in production sites occurs.

A4 – Transport
This stage includes transportation from the manufacturing site in Bursa, Turkey, to Watt Heating in Eslöv, which corresponds to 2860 km by truck (50% of the cases) and 6645 km by boat (50% of the cases). An additional 500 km, is considered for transport to the building site or costumers who are located within Sweden.

Transport to the building site

Scenario information	Unit per declared unit
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long-distance truck, boat, etc.	Truck-trailer, Euro 0 - 6 mix, < 40t gross weight
Distance	3 360 km
Capacity utilisation (including empty returns)	61%
Volume capacity utilisation factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaged products)	Not applicable

A5 – Construction installation
The product's installation is taking place with an electric drilling machine and the impact from this action is expected to be below the cut-off boundary, so it is excluded. In addition to the installation, the packaging waste treatment is included here since this is where the packaging leaves the product system.

The following disposal routes were used for packaging, based on Swedish statistics (2020).

Material	Recycling rate	Incineration rate	Landfill rate
Cardboard	0%	100%	0%
Plastic	26%	74%	0%
Wood	0%	100%	0%

B1-B7 – Use stage

This stage is not declared.

C1 Deconstruction/Demolition

This stage includes deconstructing the product when it is no longer in use. In this study the deconstruction happens by hand using an electric drill machine, and the impact is considered negligible.

C2 Transport

This module represents the transport distance to the waste processing facility. It is assumed that the transportation distance to the waste processing facility is 50 km.

C3 Waste processing

This module includes any waste treatment needed. Swedish statistics assign the different materials to the appropriate waste treatment process.

The following waste treatment rates were used. The powder coating is assumed to be incinerated within the steel recycling process.

Material	Recycling rate	Incineration rate	Landfill rate
Steel	95%	0%	5%
Powder coating	0%	100%	0%

C4 Disposal

This module includes any material that is landfilled. For this product, it is the non-recyclable part of the steel.

Process	Unit (expressed per declared unit)
Collection process specified by type	1 kg collected separately
	0 kg collected with mixed construction waste
Recovery system specified by type	0 kg for re-use
	0.936 kg steel for recycling
	0.015 kg powder coating for energy recovery
Disposal specified by type	0.0493 kg steel for final deposition

Assumptions for scenario development, e.g. transportation	The transportation is modelled with the same specification as the truck transportation in module A2, except for the transportation distance that is set to 50 km.

D Benefits and loads beyond the system boundary

This module includes loads and benefits obtained from energy recovery and or recycling materials. For this product, it is mainly the recycling of metals that leads to recovered metals so that the production of virgin metal is avoided, or the energy recovered from incineration removes electricity and heat being produced elsewhere.

Swedish electricity grid mix and process steam from natural gas is used for crediting the heat produced.

Infrastructure

Plants, machine production and transportation systems are excluded from the calculations. However, electricity is one such input for which it is not possible to exclude the impact from infrastructure already included in the dataset, but no data on infrastructure has been manually added to the product system.

Cut-off criteria

The following procedures were followed for the exclusion of inputs and outputs

- All input and output flows in a unit process were considered i.e., taking into account the value of all flows in the unit process and the corresponding LCI where data was available
- Processes of infrastructure or capital goods are excluded from this study (except when it is already included in a dataset used)
- Generic national data was used for modules C1-C4 and D as no specific data was able to be collected
- The use of cut-off criterion on mass inputs and primary energy at the unit process level (1%) and at the information module level (5%) was applied

No hazardous and toxic materials or Substances of Very High Concern (SVHC) according to REACH is included in the inventory and the cut-off rules do not apply.

Allocation

Allocation criteria are based on mass. It was assumed that the manufacturing data is evenly distributed throughout the products, therefore all the inputs and outputs in module A3 are divided by the total weight of the products produced during the reference year.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	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
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	TR	TR	TR	SE	SE	-	-	-	-	-	-	-	SE	SE	SE	SE	SE
Specific data used	7%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/ declared unit
Steel	9.85E-01	0	0 resp. 0
Powder coating	1.50E-02	0	0 resp. 0
TOTAL	1.00E+00	0	0 resp. 0
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/ declared unit**
PE	8.34E-03	0.8	0 resp. 0
Cardboard	3.00E-03	0.3	1,33E-03
Wood	1.69E-02	1.7	7,01E-03
TOTAL	2.82E-02	2.8	8.35E-03

The content declaration shows the content of the representative product, as suggested in PCR.

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Mass-% per functional or declared unit
Not relevant.			

Results of the environmental performance indicators

The estimated impact results in this section are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. Furthermore, the results of the end-of-life stage (module C) should be considered when using the results of the production stage (modules A1-A3).

Mandatory impact category indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-fossil	kg CO_2 eq.	2,45E+00	2,39E-01	2,05E-02	0,00E+00	1,14E-04	2,09E-02	1,02E-03	-1,32E+00
GWP-biogenic	kg CO_2 eq.	-7,27E-03	2,17E-05	8,38E-03	0,00E+00	1,18E-07	4,14E-06	3,43E-06	2,62E-04
GWP-luluc	kg CO_2 eq.	4,78E-04	1,11E-05	9,68E-07	0,00E+00	6,50E-09	1,62E-06	4,46E-06	-1,75E-04
GWP-total	kg CO_2 eq.	2,45E+00	2,39E-01	2,89E-02	0,00E+00	1,14E-04	2,09E-02	1,03E-03	-1,32E+00
ODP	kg CFC 11 eq.	1,17E-08	3,23E-08	6,21E-12	0,00E+00	1,76E-11	2,56E-11	3,19E-15	1,71E-12
AP	mol H^+ eq.	6,31E-03	3,77E-03	1,01E-05	0,00E+00	1,28E-06	2,59E-05	6,39E-06	-3,21E-03
EP-freshwater	kg P eq.	3,85E-05	1,50E-06	1,11E-07	0,00E+00	8,45E-10	5,84E-08	2,08E-09	-3,34E-07
EP-marine	kg N eq.	1,26E-03	9,11E-04	3,24E-06	0,00E+00	3,23E-07	1,12E-05	1,55E-06	-5,17E-04

EP-terrestrial	mol N eq.	1,35E-02	9,98E-03	4,15E-05	0,00E+00	3,55E-06	1,23E-04	1,70E-05	-4,64E-03
POCP	kg NMVOC eq.	4,88E-03	2,56E-03	8,92E-06	0,00E+00	9,01E-07	3,32E-05	4,87E-06	-2,10E-03
ADP-minerals&metals*	kg Sb eq.	1,56E-06	2,73E-08	2,92E-09	0,00E+00	1,58E-11	8,60E-10	6,87E-11	-7,40E-06
ADP-fossil*	MJ	2,94E+01	3,16E+00	1,90E-02	0,00E+00	1,60E-03	6,19E-02	1,70E-02	-1,33E+01
WDP*	m^3	3,95E-02	2,27E-03	5,44E-03	0,00E+00	3,47E-06	2,77E-03	1,25E-04	-8,93E-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 of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG[1]	kg CO_2 eq.	2,46E+00	2,39E-01	2,05E-02	0,00E+00	1,14E-04	2,09E-02	1,03E-03	-1,32E+00
PM	Disease incidence	2,28E-07	6,08E-08	1,77E-10	0,00E+00	1,93E-11	4,90E-10	7,40E-11	-3,01E-08
IRP**	kBq U235 eq.	2,99E-02	9,13E-03	1,05E-04	0,00E+00	9,49E-06	1,34E-03	3,17E-05	2,51E-02
ETP-fw*	CTUe	6,72E+00	1,40E+00	8,90E-03	0,00E+00	6,01E-04	1,61E-02	1,04E-02	-6,91E-01
HTTP-c*	CTUh	1,52E-09	2,43E-11	2,17E-12	0,00E+00	1,22E-14	1,81E-12	2,25E-13	5,29E-10
HTTP-nc*	CTUh	7,46E-09	6,57E-10	2,56E-11	0,00E+00	2,78E-13	3,39E-11	8,00E-12	2,50E-09
SQP*	Dimensionless	4,02E+00	2,45E-01	9,42E-03	0,00E+00	2,05E-04	2,58E-02	3,12E-03	-2,42E-01

** 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.*
*** This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.*

[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 CO_2 is set to zero.

Resource use indicators

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	3,12E+00	1,11E-02	3,28E-03	0,00E+00	1,30E-04	4,67E-02	2,52E-03	3,65E-01
PERM	MJ	3,78E-01	0,00E+00	-3,78E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	3,50E+00	1,11E-02	-3,75E-01	0,00E+00	1,30E-04	4,67E-02	2,52E-03	3,65E-01
PENRE	MJ	2,94E+01	3,16E+00	1,90E-02	0,00E+00	1,60E-03	6,19E-02	1,70E-02	-1,33E+01
PENRM	MJ	3,86E-01	0,00E+00	-3,86E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	2,98E+01	3,16E+00	-3,67E-01	0,00E+00	1,60E-03	6,19E-02	1,70E-02	-1,33E+01
SM	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
RSF	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
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
FW	m^3	2,37E-03	5,58E-05	1,28E-04	0,00E+00	1,25E-07	1,16E-04	3,80E-06	-1,32E-01
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

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	3,61E-09	3,68E-11	6,03E-12	0,00E+00	2,62E-13	7,48E-11	4,05E-12	-9,77E-08
Non-hazardous waste disposed	kg	1,05E-02	1,14E-04	7,50E-04	0,00E+00	1,77E-07	2,64E-03	4,93E-02	1,57E-01
Radioactive waste disposed	kg	1,02E-05	1,36E-06	5,55E-07	0,00E+00	2,81E-08	1,13E-05	2,31E-07	-3,48E-05

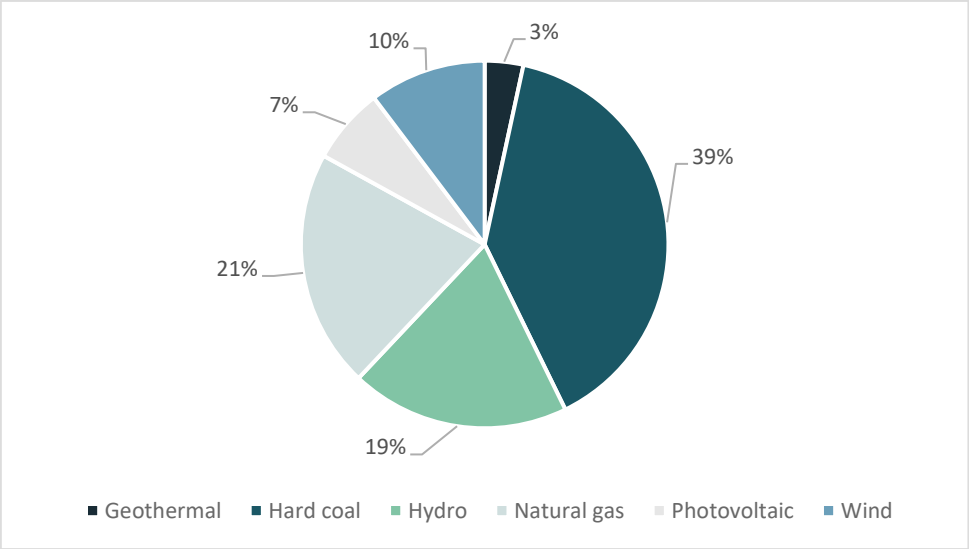
Output flow indicators

Indicator	Unit	A1-A3	A4	A5	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
Material for recycling	kg	2.64E-02	0.00E+00	2.17E-03	0.00E+00	0.00E+00	9.36E-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
Exported energy, electricity	MJ	0.00E+00	0.00E+00	8.58E-02	0.00E+00	0.00E+00	2.11E-02	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	1.54E-01	0.00E+00	0.00E+00	3.95E-02	0.00E+00	0.00E+00

Additional requirements

Electricity mix from the use of electricity in manufacturing.

In the manufacturing step, the supplier purchases no specific electricity mix. For Turkey, there is no residual electricity mix available and therefore the consumption mix for Turkey is used instead. The climate impact (GWP-GHG) of the used electricity mix is 0.54 kg CO_2-eq per kWh, the reference year is 2023, and the source is the Republic of Türkiye Ministry of Energy and Natural Resources[2]. This electricity is used together with photovoltaics for a share of the electricity consumption.



Turkish Energy mix

[2] Republic of Türkiye Ministry of Energy and Natural Resources - Electricity

References

Construction Products PCR 2019:14 version 1.3.4	EPD International (2024) PCR 2019:14 Construction products and construction services, version 1.3.4
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
GPI 5.0	General Programme Instructions of the International EPD® System. Version 5.
ISO 14020:2000	Environmental labels and declarations — General principles
ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
LCA report	LCA report for compact radiators (Végvári, Liljenroth, Stockwell), Dec 2024.
SCB – Swedish Statistics	(2020) Treated waste by treatment category and waste category. Every second year 2010 - 2020 https://www.statistikdatabasen.scb.se/pxweb/en/ssd/START__MI__MI0305/MI0305T003/ Assessed 2024-12-11.

Contact Information

EPD owner:	Email: info@watt.se Address: Transportvägen 7, 241 38 Eslöv, Sweden
LCA author:	Fanni Vegvhari Email: fanni.vegvari@carbonzero.se Address: Tåstrupsgatan 2, SE-262 63 Ängelholm, Sweden
Third-party verifier:	Vladimír Kocí Email: kociv@vscht.cz Address: LCA Studio, Šárecká 1962/5, 160 00 Praha 6, Czech Republic
Program operator:	EPD International AB Email: info@environdec.com Telephone: +46 (0)73 311 30 20 Address: SE-11427 Stockholm, Sweden

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