ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	**Dantherm A/S**
Program operator	EPD Danmark
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	MD-23225-EN
Registration number	MR-DAN-EPD-DAN-20250469-EN
Issue date	24.03.2024
Valid to	12.03.2029

Dantherm HCV 300 PRO, Dantherm HVC 400 PRO P1/P2/E1, Dantherm HCV 460 PRO P2/E1

Dantherm A/S

Registered under the scope of mutual recognition between Institut Bauen und Umwelt e.V. (IBU) and EPD Danmark

www.ibu-epd.com | https://epd-online.com/

Owner of declaration
Dantherm A/S
Marienlystvej 65, 7800 Skive,
Denmark
CVR no: 20864591

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
- Dantherm HCV300 PRO
- Dantherm HCV400 PRO P1, P2 and E1
- Dantherm HCV460 PRO P2 and E1

Number of declared datasets: 3
Number of product variations: 6

The results for the 3 product groups included in this EPD is based on calculations for the 6 product variations.

Production site
Marienlystvej 65,
7800 Skive
Denmark

Product(s) use
The products are designed to effectively improve indoor air quality. Constant ventilation supplies fresh, filtered outdoor air and removes humid air from the residence. Through a heat exchanger, the energy from the air being extracted is transferred to the fresh outdoor air supplied to the dwelling.
Intelligent control ensures optimal performance, measures humidity levels, and its features contribute to a comfortable indoor environment.
These decentralised ventilation systems are particularly used for residential ventilation in either apartments or houses.

Functional unit
One decentralised ventilation unit with an operation time of 8,760 hours per year, a specific power input at 70% rated flow and 50 Pa, with an air capacity of:
- 126 m^3/h for unit HCV 300 PRO
- 175 m^3/h for unit HCV 400 PRO P1
- 168 m^3/h for unit HCV 400 PRO P2 and E1
- 252 m^3/h for unit HCV 460 PRO

Year of production site data (A3)
2022

EPD version
No. 1, March 2024

Issued: 12-03-2024
Valid to: 12-03-2029

Basis of calculation
This EPD is developed in accordance with the European standard EN 15804+A2 and cPCR EN50693:2019.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☐Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☒Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

Linda Høibye

Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Product information

Product description

The results for the three product groups of this EPD is included based on calculations conducted for the six product variations (further described in the paragraph 'Calculation of product groups').

The dimensions and weights of the six product variations can be seen below:

Unit	Dimension	Weight[kg]
HCV 300 PRO	600 x 430 x 1000 mm	34.7
HCV 400 PRO P1	540 x 549 x 1050 mm	42.2
HCV 400 PRO P2	540 x 549 x 1050 mm	42.5
HCV 400 PRO E1	540 x 549 x 1050 mm	43.3
HCV 460 PRO P2	540 x 549 x 1050 mm	42.5
HCV 460 PRO E1	540 x 549 x 1050 mm	43.5

The function of the HCV units is to improve indoor air quality. Constant ventilation supplies fresh, filtered air by circulating air through exhaust filters, and removes humid air from the residence.

The main product components are shown in the table below.

Material		Weight-% of declared product	
		HCV 300 PRO	HCV 400 PRO and HCV 460 PRO
Galvanised steel for the cabinet		59.5	56.9
Expanded polystyrene core		11.0	11.0
Exchanger	PS (HCV 400 PRP and HCV 460 PRO)	-	19.9
	Aluminium (HCV 300 PRO)	18.0	-
Ventilator		5.6	6.0
Electronics		3.0	3.3
Plastics		2.9	2.9

Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below. The HCV 300 PRO is modelled with 4.78 kg of packaging, and the HCV 400 PRO and HCV 460 PRO with 3.80 kg of packaging, which is valid for all the variations.

Material	Weight-% of packaging
LDPE film	2.57 – 3.00
PET band	1.57 – 2.80
SBR tape	0.87 – 0.10
Wooden pallet	79.00 – 83.70
Corrugated cardboard	11.50 – 14.50

Representativity

This declaration, including data collection and the modelled foreground system including results, represents the production, use and end-of-life of HCV 300 PRO, HCV 400 PRO P1, P2 and E1 and HCV 460 PRO P2 and E1 on the production site located in Denmark. Product specific data are based on average values collected in the period January to December 2022. Background data are based on LCA for Experts database and EcoInvent and are less than 10 years old except for the datasets regarding POM and PU plastic, where no newer datasets were available. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

Hazardous substances

HCV 300 PRO, HCV 400 PRO P1, P2, E1 and HCV 460 PRO P2 and E1 do not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation" (http://echa.europa.eu/candidate-list-table) in concentration above 0.1% (w/w).

Essential characteristics

HCV 300 PRO, HCV 400 PRO, and HCV 460 PRO are covered by harmonised technical specification EN 1886:2008 and EN 13414-7:2021. Additionally, the units comply with the following EU directives:

- 2014/35/EU Low Voltage Directive
- 2014/30/EU EMC-directive
- 2014/53/EU Radio Equipment Directive (RED)
- 2009/125/EC Eco Design-directive
- 2011/65/EU RoHS-directive (Restriction of hazardous substances)
- 1907/2006/EC REACH-Regulation

Further technical information can be obtained by contacting the manufacturer or on the manufacturer's website:

https://catalogue.dantherm.com/dantherm/dantherm-catalogue-residential-ventilation-dk/

Reference Service Life (RSL)

The results included in this EPD are calculated for one year of operation.

Expected fife span of the unit

The life span of the units covered by this EPD is estimated to be 25 years, based on BUILD Report 2021:32 by Department of the Built Environment (Aalborg University).

Picture of product(s)

Figure 1 HCV 300 PRO

Figure 2 HCV 400 PRO and HCV 460 PRO

LCA background

Functional unit

One decentralised ventilation unit with an operation time of 8,760 hours per year, a specific power input at 70% rated flow and 50 Pa, with an air capacity of:

- 126 m^3/h for unit HCV 300 PRO
- 175 m^3/h for unit HCV 400 PRO P1
- 168 m^3/h for unit HCV 400 PRO P2 and E1
- 252 m^3/h for unit HCV 460 PRO

Name	Value	Unit
HCV 300 PRO		
Declared unit	1	Unit
Density	34.70	Kg
Conversion factor to 1 kg	0.03	-
HCV 400 PRO P1		
Declared unit	1	Unit
Density	42.20	Kg
Conversion factor to 1 kg.	0.02	-
HCV 400 PRO P2		
Declared unit	1	Unit
Density	42.50	Kg
Conversion factor to 1 kg	0.023	-
HCV 400 PRO E1		
Declared unit	1	Unit
Density	43.30	Kg
Conversion factor to 1 kg	0.02	-
HCV 460 PRO P2		
Declared unit	1	Unit
Density	42.50	Kg
Conversion factor to 1 kg	0.02	-
HCV 460 PRO E1		
Declared unit	1	Unit
Density	43.50	Kg
Conversion factor to 1 kg	0.02	-

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804 +A2:2019. Furthermore, the waste scenario is based on the *c-PCR for life cycle assessment of electronic and electrical products and systems in EN 50693:2019*.

Guarantee of Origin – certificates

Foreground system:

The products are produced without using any GO's. The energy process is modelled using '*electricity, medium voltage, residual mix*' for Denmark from EcoInvent.

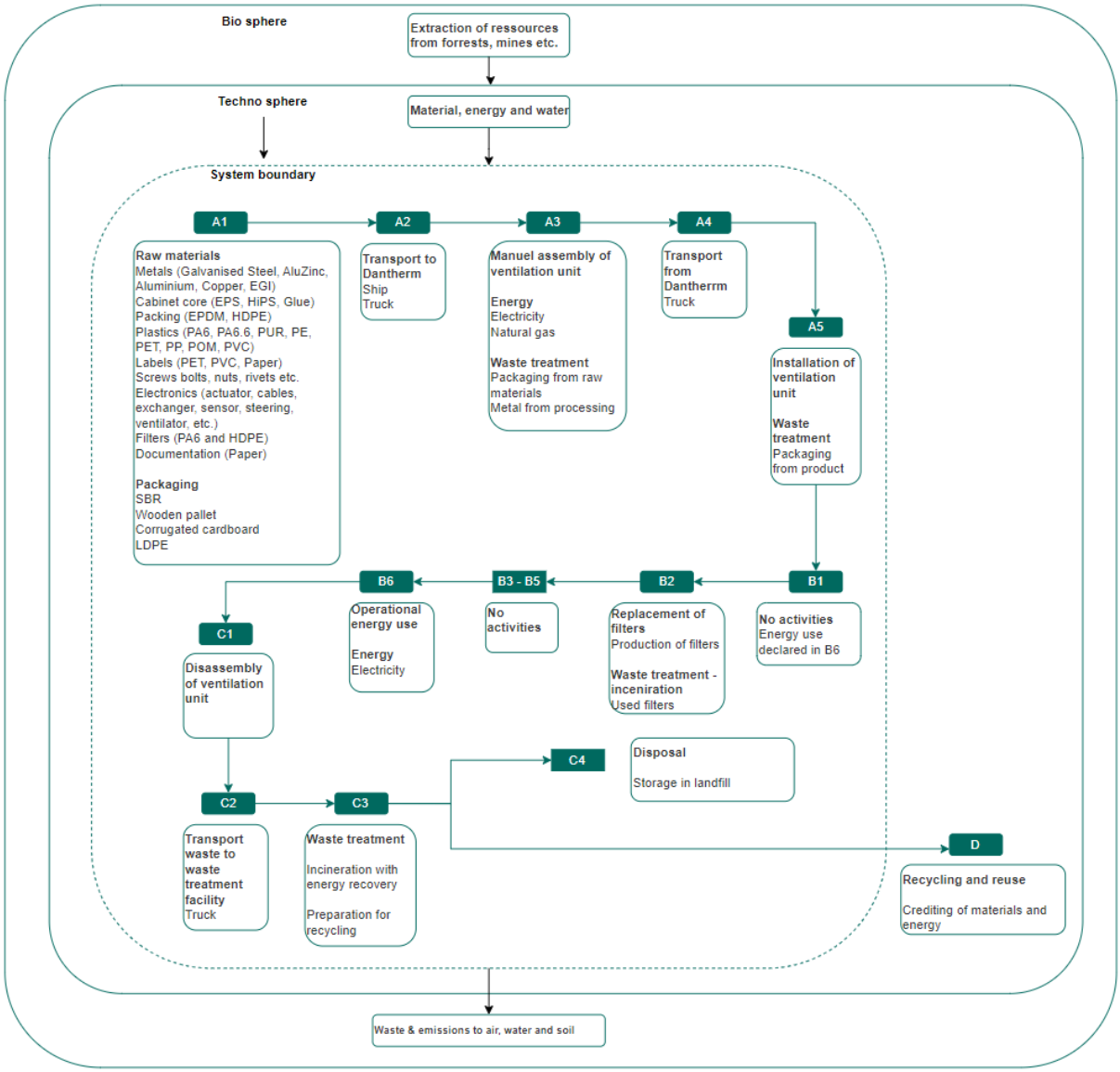
Background system:

Most of the upstream processes have electricity included modelled using the grid mix. For some specific processes where it has been possible to define the specific electricity mix, these were modelled as such. E.g., the production of filters in Poland, was modelled using the dataset for Polish electricity grid mix. Downstream processes are modelled using electricity grid mix for RER.

Geographical area

The geographical area is Europe.

Flow diagram



System boundary

This EPD is based on a cradle-to-grave with module D, in which 100 weight-% of the mass of the declared products has been accounted for.

Cut-off criteria

The general rules apply for the exclusion of inputs and outputs in the LCA, which is in compliance with the rules in EN 15804:2012+A2:2019, 6.3.6, in case of insufficient input data gaps for unit process, the cut-off criteria shall be 1% of renewable and non-renewable primary energy usage and 1% of the total mass input of that unit process. The total of neglected input flows per module, e.g., per module A1-A3, A4-A5, B1-B5, B6-B7, C1-C4 and module D shall be a maximum of 5% of energy usage and mass.

Excluded processes

- Use of electric screwdrivers during installation (module A5), and disassembly (module C1)
- Use of screws for installation (module A5)
- Energy use, waste usage and sewage in and for the administration (A3)
- Potential and accidental damage occurring when installing the unit at the building site (A5)

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the ”end-of-waste” state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

Galvanised steel: The HCV 300 PRO, HCV 400 PRO and HCV 460 PRO has a steel cabinet which account for the majority of the weight. The steel is modelled as primary steel. The cabinet sheets are bended and processed at Dantherm. Loss occurs during this process due to adjustments and errors. It is possible to replace specific parts of the cabinet. It is estimated by Dantherm that the lost amount of metal accumulates to 0.3%.

Aluminium: For the HCV 300, the exchanger is produced at Dantherm, based on aluminium. The aluminium consists of 39% scrap. Loss occurs during this process due to adjustments and errors. It is estimated by Dantherm that the lost amount of metal accumulates to 0.3%.

Plastic: There are several types of plastic components in the HCV 300 PRO, HCV 400 PRO and HCV 460 PRO. The plastic types which represent more than 90% of the total amounts of plastic are Polystyrene for the exchanger in the variations of HCV 400 and HCV 460 (16.76 – 18.08 weight-%), Expanded Polystyrene (9.49 – 10.84 weight-%), PE (2.78 -2.97 weight-%). The components are manufactured using primary resources.

Electronic: As HCV 300 PRO, HCV 400 PRO and HCV 460 PRO are electronic ventilation units, several electronic components are present in the unit e.g. cables, printed circuit boards etc. The components are produced based on primary resources.

Generally, the components of the HCV 300 PRO, HCV 400 PRO, or HCV 460 PRO unit are premanufactured and assembled manually at the production facility in Skive (DK). The energy consumption at Dantherm is allocated based on m^2 and energy used for processing of the specific ventilation units. The finished HCV 300 PRO, HCV 400 PRO or HCV 460 PRO are packed before distribution.

Construction process stage (A4-A5) includes:

Module A4 includes the impacts associated with the transportation of the finished product. The finished product is distributed to different markets in EU. The utilization capacity of the truck (including empty returns) is 47.8%.

A weighted average distance has been calculated based on Dantherm’s market distribution. Losses occur during transport due to damage. For certain units, only the packaging is damaged. To compensate for this, an additional 0.2% of cardboard was added. In other cases, the cabinet

had taken damage. To account for the replacement of the specific part of the cabinet 0.04% galvanised steel was additionally added.

The instillation of HCV 300 PRO, HCV 400 PRO, or HCV 460 PRO can be done with an electric screwdriver. Additionally, screws are needed for installation. These two processes are excluded due to the negligible impacts.

Module A5 includes the end-of-life treatment of the packaging. Hence, cardboard and LDPE are assumed 64% recycled and 36% incinerated (Eurostat, 2023a). The units are distributed on customized pallets which are assumed incinerated.

Use stage (B1-B7) includes:

B1: No activity occurs in modul B1.

B2: To maintain the performance of the decentralised ventilation units and ensure a continuous supply of fresh ventilated air continuously throughout their lifespan, it is necessary to replace the ventilation filters. Dantherm estimates a replacement of the two filters twice a year to maintain an optimal performance. The production of new filters is included in B2. The waste treatment of the replaced filters is also included in B2. It is important to note that B2 is modelled for one year and does not represent the lifespan of 25 years.

B3: No activity occurs in module B3.

B4: No activity occurs in module B4.

B5: No activity occurs in module B5.

B6: No specification regarding use is described in EN 50693:2019. Therefore, the Ecodesign Directive (*COMMISSION REGULATION (EU) No 1253/2014 of 7 July 2014 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for ventilation units*) is used to determine the reference capacity and thus the energy use of the ventilation units The Ecodesign requirements specify a reference flow rate set at 70% of the maximum flow rate. The annual operating hours are set to 8,760 hours per year as a conservative approach which is in accordance with the default value that is used in the Ecodesign directive to calculate the SEC (specific energy consumption). The RER electricity mix is applied to model the energy consumption since the units are sold in various European countries. B6 is modelled for 1 year.

B7: No activity occurs in module B7.

End of Life (C1-C4) includes:

For the end-of-life scenario, a collection rate of 100% is assumed.

No impacts from dismantling have been included in module C1 as this is done manually.

Module C2 includes the impacts associated with the transport of the waste from the dismantling to the waste handling. The product is placed on different European markets, average distances to waste handling for countries have been included to account for the different distances. For energy recovery an average of 45 km is modelled. For landfilling an average of 250 km is modelled. For recycling 285 – 455 km is modelled depending on the specific waste fraction to account for the transportation of materials to recycling facilities.

Waste fraction	Distance to recycling facility [km]
Paper	433
Cardboard	455
LDPE, HDPE, PET	365
Aluminium	450
Ferrous metals	500
Mixed metals	285

Module C3 contains the impacts of waste handling. Here, the impacts of recycling and incineration are modelled. 56 -63% of the units are recycled and 10 – 17% is modelled as incinerated.

Module C4 covers the impacts of landfilling. Following waste treatment rates (recycling,

incineration, and landfilling) are included in the waste treatment, the distribution is based on EN 50693:2019.

Materials	Recycling rate (%)	Incineration rate (%)	Landfilling rate (%)
Steel	80	0	20
Aluminium	70	0	30
Plastics	20	40	40
Metals in printed circuit boards	50	0	50
Non-metal support (Plastic, epoxy resins and glass) in printed circuit boards	0	0	100

Re-use, recovery, and recycling potential (D) includes:

In module D potential benefits from recovery and recycling of materials from the product are calculated. The materials are either used as secondary material in a new product system, thus substituting virgin material, or incinerated with energy recovery. To avoid double counting, the amount of scrap in the galvanised steel and aluminium is not credited in module D.

Calculation and forming of product groups

First, calculations were conducted for the six product variations, with the detail that there is only one HCV 300 PRO variant. Hereafter, the simple average for modules A1-C4 was calculated for the three variations of HCV 400 PRO variations and the two variations of HCV 460 PRO to assess if the requirement of establishing product groups was met (no more than +/- 10% variation of each of the core indicators from the simple average). The process of grouping follows the guidelines from EPD Danmark.

LCA results

HCV300 PRO

ENVIRONMENTAL IMPACTS PER HCV 300 PRO														
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3 – B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	2.62E+02	6.08E-01	7.32E+00	0.00E+00	3.01E+00	0.00E+00	9.65E+01	0.00E+00	0.00E+00	4.17E-01	7.84E+00	4.07E-01	-3.10E+01
GWP-fossil	[kg CO_2 eq.]	2.68E+02	6.02E-01	4.06E-01	0.00E+00	3.00E+00	0.00E+00	9.56E+01	0.00E+00	0.00E+00	4.13E-01	7.84E+00	4.12E-01	-3.09E+01
GWP-biogenic	[kg CO_2 eq.]	-5.76E+00	1.33E-03	5.73E+00	0.00E+00	9.40E-03	0.00E+00	8.33E-01	0.00E+00	0.00E+00	2.70E-04	8.13E-04	-5.09E-03	-9.86E-02
GWP-luluc	[kg CO_2 eq.]	2.91E-01	4.98E-03	4.71E-04	0.00E+00	1.61E-04	0.00E+00	1.04E-02	0.00E+00	0.00E+00	3.86E-03	3.29E-05	3.89E-04	-1.15E-02
ODP	[kg CFC 11 eq.]	7.83E-06	7.47E-14	7.42E-13	0.00E+00	5.87E-12	0.00E+00	1.77E-09	0.00E+00	0.00E+00	5.43E-14	1.81E-12	6.86E-13	-1.74E-10
AP	[mol H^+ eq.]	1.54E+00	4.24E-03	1.52E-03	0.00E+00	3.58E-03	0.00E+00	2.04E-01	0.00E+00	0.00E+00	2.22E-03	1.20E-03	1.29E-03	-1.26E-01
EP-freshwater	[kg P eq.]	2.44E-01	1.98E-06	3.85E-07	0.00E+00	2.80E-06	0.00E+00	3.58E-04	0.00E+00	0.00E+00	1.53E-06	4.30E-07	3.01E-05	-6.69E-05
EP-marine	[kg N eq.]	2.08E-01	1.96E-03	4.96E-04	0.00E+00	8.59E-04	0.00E+00	4.89E-02	0.00E+00	0.00E+00	1.07E-03	3.60E-04	3.14E-04	-2.05E-02
EP-terrestrial	[mol N eq.]	3.28E+00	2.17E-02	6.71E-03	0.00E+00	8.18E-03	0.00E+00	5.10E-01	0.00E+00	0.00E+00	1.19E-02	5.50E-03	3.45E-03	-2.20E-01
POCP	[kg NMVOC eq.]	1.04E+00	4.30E-03	1.26E-03	0.00E+00	2.90E-03	0.00E+00	1.30E-01	0.00E+00	0.00E+00	2.10E-03	9.85E-04	9.88E-04	-8.63E-02
ADPm[1]	[kg Sb eq.]	5.39E-02	3.63E-08	9.94E-09	0.00E+00	9.24E-08	0.00E+00	1.48E-05	0.00E+00	0.00E+00	2.77E-08	1.48E-08	1.12E-08	-8.92E-04
ADPf[1]	[MJ]	3.38E+03	8.18E+00	2.50E+00	0.00E+00	4.15E+01	0.00E+00	2.01E+03	0.00E+00	0.00E+00	5.68E+00	2.77E+00	6.17E+00	-4.72E+02
WDP[1]	[m^3 world eq. deprived]	6.34E+01	6.61E-03	8.07E-01	0.00E+00	1.26E-01	0.00E+00	2.10E+01	0.00E+00	0.00E+00	5.04E-03	7.13E-01	-5.69E-03	-4.49E+00
Caption	GWP-total = Globale Warming Potential - total; 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential													
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.													
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.													

ADDITIONAL ENVIRONMENTAL IMPACTS PER HCV 300 PRO														
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3-B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	1.26E-05	5.04E-08	9.52E-09	0.00E+00	2.83E-08	0.00E+00	1.71E-06	0.00E+00	0.00E+00	1.09E-08	8.57E-09	1.34E-08	-1.36E-06
IRP[2]	[kBq U235 eq.]	2.58E+01	2.20E-03	1.66E-02	0.00E+00	3.48E-02	0.00E+00	5.30E+01	0.00E+00	0.00E+00	1.59E-03	4.84E-02	1.07E-02	-4.50E+00
ETP-fw[1]	[CTUe]	4.44E+03	5.87E+00	1.23E+00	0.00E+00	1.65E+01	0.00E+00	5.59E+02	0.00E+00	0.00E+00	4.07E+00	1.08E+00	3.12E+00	-1.60E+02
HTP-c[1]	[CTUh]	5.54E-07	1.18E-10	8.51E-11	0.00E+00	5.01E-10	0.00E+00	2.96E-08	0.00E+00	0.00E+00	8.27E-11	8.78E-11	2.37E-10	-1.46E-08
HTP-nc[1]	[CTUh]	6.08E-06	5.09E-09	4.42E-09	0.00E+00	1.77E-08	0.00E+00	4.71E-07	0.00E+00	0.00E+00	3.68E-09	2.52E-09	2.10E-08	-4.62E-07
SQP[1]	-	1.94E+03	3.06E+00	8.33E-01	0.00E+00	3.72E+00	0.00E+00	7.92E+02	0.00E+00	0.00E+00	2.37E+00	9.53E-01	5.60E-01	-1.54E+02
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)													
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.													
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.													
	[2] 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.													

RESOURCE USE PER HCV 300 PRO														
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3-B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	5.95E+02	5.36E-01	5.08E-01	0.00E+00	3.86E+00	0.00E+00	1.20E+03	0.00E+00	0.00E+00	4.14E-01	1.19E+00	5.55E-01	-2.05E+02
PERM	[MJ]	9.77E+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]	7.15E+02	5.36E-01	5.08E-01	0.00E+00	3.86E+00	0.00E+00	1.20E+03	0.00E+00	0.00E+00	4.14E-01	1.19E+00	5.55E-01	-2.05E+02
PENRE	[MJ]	4.05E+03	8.21E+00	2.51E+00	0.00E+00	4.15E+01	0.00E+00	2.01E+03	0.00E+00	0.00E+00	5.70E+00	2.77E+00	6.17E+00	-4.73E+02
PENRM	[MJ]	1.82E+02	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
PENRT	[MJ]	4.05E+03	8.21E+00	2.51E+00	0.00E+00	4.15E+01	0.00E+00	2.01E+03	0.00E+00	0.00E+00	5.70E+00	2.77E+00	6.17E+00	-4.73E+02
SM	[kg]	2.22E+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
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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	2.30E+00	5.88E-04	1.90E-02	0.00E+00	7.91E-03	0.00E+00	9.67E-01	0.00E+00	0.00E+00	4.53E-04	1.71E-02	6.62E-05	-3.15E-01
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water													
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.													

WASTE CATEGORIES AND OUTPUT FLOWS PER HCV 300 PRO														
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3-B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	4.93E-02	2.55E-11	4.55E-11	0.00E+00	2.96E-09	0.00E+00	-1.57E-07	0.00E+00	0.00E+00	1.77E-11	-7.99E-11	5.13E-10	-4.21E-08
NHWD	[kg]	1.42E+01	1.20E-03	1.50E-01	0.00E+00	1.98E-02	0.00E+00	1.47E+00	0.00E+00	0.00E+00	8.69E-04	2.06E-01	7.76E+00	-5.29E+00
RWD	[kg]	4.70E-02	1.48E-05	1.04E-04	0.00E+00	3.31E-04	0.00E+00	3.19E-01	0.00E+00	0.00E+00	1.07E-05	2.95E-04	7.22E-05	-2.61E-02
CRU	[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
MFR	[kg]	1.36E+01	0.00E+00	8.72E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.41E+01	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	0.00E+00	0.00E+00	1.03E+01	0.00E+00	2.41E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.43E+01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	1.88E+01	0.00E+00	4.28E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.56E+01	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy													
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.													

BIOGENIC CARBON CONTENT PER HCV 300 PRO		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	2.07
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

HCV 400 PRO

ENVIRONMENTAL IMPACTS PER HCV 400 PRO														
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3 – B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	2.69E+02	5.06E+00	5.75E+00	0.00E+00	5.45E+00	0.00E+00	9.64E+01	0.00E+00	0.00E+00	5.17E-01	2.07E+01	6.63E-01	-2.92E+01
GWP-fossil	[kg CO_2 eq.]	2.74E+02	5.00E+00	3.96E-01	0.00E+00	5.43E+00	0.00E+00	9.56E+01	0.00E+00	0.00E+00	5.12E-01	2.07E+01	6.70E-01	-2.92E+01
GWP-biogenic	[kg CO_2 eq.]	-3.97E+00	1.15E-02	3.77E+00	0.00E+00	1.71E-02	0.00E+00	8.33E-01	0.00E+00	0.00E+00	1.07E-03	1.27E-03	-8.28E-03	4.76E-02
GWP-luluc	[kg CO_2 eq.]	3.09E-01	4.68E-02	3.86E-04	0.00E+00	2.92E-04	0.00E+00	1.04E-02	0.00E+00	0.00E+00	4.79E-03	5.53E-05	6.03E-04	-2.00E-02
ODP	[kg CFC 11 eq.]	7.85E-06	6.58E-13	5.85E-13	0.00E+00	1.07E-11	0.00E+00	1.77E-09	0.00E+00	0.00E+00	6.73E-14	2.73E-12	1.12E-12	-2.31E-10
AP	[mol H^+ eq.]	1.49E+00	2.69E-02	1.22E-03	0.00E+00	6.60E-03	0.00E+00	2.04E-01	0.00E+00	0.00E+00	2.75E-03	2.47E-03	2.07E-03	-9.45E-02
EP-freshwater	[kg P eq.]	2.51E-01	1.85E-05	3.09E-07	0.00E+00	5.09E-06	0.00E+00	3.58E-04	0.00E+00	0.00E+00	1.89E-06	6.51E-07	8.00E-05	-1.24E-04
EP-marine	[kg N eq.]	2.03E-01	1.30E-02	4.00E-04	0.00E+00	1.56E-03	0.00E+00	4.88E-02	0.00E+00	0.00E+00	1.33E-03	6.65E-04	4.92E-04	-2.00E-02
EP-terrestrial	[mol N eq.]	3.35E+00	1.44E-01	5.40E-03	0.00E+00	1.53E-02	0.00E+00	5.10E-01	0.00E+00	0.00E+00	1.47E-02	1.14E-02	5.41E-03	-2.11E-01
POCP	[kg NMVOC eq.]	1.10E+00	2.55E-02	1.01E-03	0.00E+00	5.27E-03	0.00E+00	1.30E-01	0.00E+00	0.00E+00	2.61E-03	1.86E-03	1.55E-03	-9.06E-02
ADPm[1]	[kg Sb eq.]	5.45E-02	3.35E-07	7.91E-09	0.00E+00	1.68E-07	0.00E+00	1.48E-05	0.00E+00	0.00E+00	3.43E-08	2.31E-08	1.80E-08	-1.20E-03
ADPf[1]	[MJ]	3.79E+03	6.89E+01	1.99E+00	0.00E+00	7.52E+01	0.00E+00	2.01E+03	0.00E+00	0.00E+00	7.05E+00	4.70E+00	1.00E+01	-5.52E+02
WDP[1]	[m^3 world eq. deprived]	6.15E+01	6.11E-02	6.34E-01	0.00E+00	2.27E-01	0.00E+00	2.10E+01	0.00E+00	0.00E+00	6.25E-03	1.77E+00	-9.35E-03	-4.22E+00
Caption	GWP-total = Globale Warming Potential - total; 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential													
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.													
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.													

ADDITIONAL ENVIRONMENTAL IMPACTS PER HCV 400 PRO														
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3-B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	1.19E-05	1.32E-07	7.57E-09	0.00E+00	5.20E-08	0.00E+00	1.71E-06	0.00E+00	0.00E+00	1.35E-08	1.62E-08	2.10E-08	-1.02E-06
IRP[2]	[kBq U235 eq.]	2.10E+01	1.93E-02	1.30E-02	0.00E+00	6.17E-02	0.00E+00	5.30E+01	0.00E+00	0.00E+00	1.97E-03	7.12E-02	1.75E-02	-3.84E+00
ETP-fw[1]	[CTUe]	4.75E+03	4.94E+01	9.81E-01	0.00E+00	2.99E+01	0.00E+00	5.58E+02	0.00E+00	0.00E+00	5.05E+00	1.84E+00	6.42E+00	-2.22E+02
HTP-c[1]	[CTUh]	7.81E-07	1.00E-09	6.66E-11	0.00E+00	9.09E-10	0.00E+00	2.95E-08	0.00E+00	0.00E+00	1.03E-10	1.69E-10	4.07E-10	-1.06E-08
HTP-nc[1]	[CTUh]	6.13E-06	4.46E-08	3.41E-09	0.00E+00	3.20E-08	0.00E+00	4.71E-07	0.00E+00	0.00E+00	4.56E-09	3.70E-09	3.46E-08	-4.69E-07
SQP[1]	-	1.86E+03	2.88E+01	6.63E-01	0.00E+00	6.75E+00	0.00E+00	7.91E+02	0.00E+00	0.00E+00	2.95E+00	1.57E+00	8.95E-01	-2.56E+02
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)													
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.													
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.													
	[2] 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.													

RESOURCE USE PER HCV 400 PRO														
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3-B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	4.70E+02	5.01E+00	4.01E-01	0.00E+00	7.01E+00	0.00E+00	1.20E+03	0.00E+00	0.00E+00	5.13E-01	1.78E+00	9.04E-01	-1.93E+02
PERM	[MJ]	1.20E+02	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]	5.91E+02	5.01E+00	4.01E-01	0.00E+00	7.01E+00	0.00E+00	1.20E+03	0.00E+00	0.00E+00	5.13E-01	1.78E+00	9.04E-01	-1.93E+02
PENRE	[MJ]	4.54E+03	6.91E+01	1.99E+00	0.00E+00	7.52E+01	0.00E+00	2.01E+03	0.00E+00	0.00E+00	7.08E+00	4.70E+00	1.00E+01	-5.53E+02
PENRM	[MJ]	5.46E+02	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
PENRT	[MJ]	5.08E+03	6.91E+01	1.99E+00	0.00E+00	7.52E+01	0.00E+00	2.01E+03	0.00E+00	0.00E+00	7.08E+00	4.70E+00	1.00E+01	-5.53E+02
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	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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	2.00E+00	5.49E-03	1.49E-02	0.00E+00	1.43E-02	0.00E+00	9.66E-01	0.00E+00	0.00E+00	5.62E-04	4.18E-02	1.04E-04	-1.95E-01
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water													
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.													

WASTE CATEGORIES AND OUTPUT FLOWS PER HCV 400 PRO														
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3-B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	5.51E-02	2.14E-10	3.62E-11	0.00E+00	5.37E-09	0.00E+00	-1.57E-07	0.00E+00	0.00E+00	2.19E-11	-6.88E-11	8.39E-10	-7.27E-08
NHWD	[kg]	5.14E+00	1.05E-02	1.18E-01	0.00E+00	3.60E-02	0.00E+00	1.47E+00	0.00E+00	0.00E+00	1.08E-03	3.06E-01	1.15E+01	-1.77E+00
RWD	[kg]	2.84E-02	1.29E-04	8.15E-05	0.00E+00	5.94E-04	0.00E+00	3.19E-01	0.00E+00	0.00E+00	1.32E-05	4.37E-04	1.18E-04	-2.51E-02
CRU	[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
MFR	[kg]	1.29E+01	0.00E+00	8.86E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.44E+01	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	0.00E+00	0.00E+00	8.13E+00	0.00E+00	3.72E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.73E+01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	1.49E+01	0.00E+00	8.56E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.65E+01	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy													
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.													

BIOGENIC CARBON CONTENT PER HCV 400 PRO		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	1.84
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

HCV 460 PRO

ENVIRONMENTAL IMPACTS PER HCV 460 PRO														
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3 – B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	2.69E+02	5.09E+00	5.76E+00	0.00E+00	5.45E+00	0.00E+00	1.69E+02	0.00E+00	0.00E+00	5.23E-01	2.10E+01	6.70E-01	-2.96E+01
GWP-fossil	[kg CO_2 eq.]	2.74E+02	5.03E+00	3.96E-01	0.00E+00	5.43E+00	0.00E+00	1.67E+02	0.00E+00	0.00E+00	5.17E-01	2.10E+01	6.78E-01	-2.96E+01
GWP-biogenic	[kg CO_2 eq.]	-3.97E+00	1.16E-02	3.95E+00	0.00E+00	1.71E-02	0.00E+00	1.46E+00	0.00E+00	0.00E+00	1.07E-03	1.29E-03	-8.38E-03	4.58E-02
GWP-luluc	[kg CO_2 eq.]	3.08E-01	4.71E-02	3.86E-04	0.00E+00	2.92E-04	0.00E+00	1.82E-02	0.00E+00	0.00E+00	4.85E-03	5.57E-05	6.09E-04	-2.01E-02
ODP	[kg CFC 11 eq.]	7.79E-06	6.62E-13	5.86E-13	0.00E+00	1.07E-11	0.00E+00	3.09E-09	0.00E+00	0.00E+00	6.81E-14	2.76E-12	1.13E-12	-2.33E-10
AP	[mol H^+ eq.]	1.49E+00	2.71E-02	1.22E-03	0.00E+00	6.60E-03	0.00E+00	3.57E-01	0.00E+00	0.00E+00	2.79E-03	2.50E-03	2.09E-03	-9.58E-02
EP-freshwater	[kg P eq.]	2.49E-01	1.86E-05	3.10E-07	0.00E+00	5.09E-06	0.00E+00	6.27E-04	0.00E+00	0.00E+00	1.91E-06	6.57E-07	8.14E-05	-1.25E-04
EP-marine	[kg N eq.]	2.02E-01	1.30E-02	4.00E-04	0.00E+00	1.56E-03	0.00E+00	8.55E-02	0.00E+00	0.00E+00	1.34E-03	6.72E-04	4.98E-04	-2.02E-02
EP-terrestrial	[mol N eq.]	3.34E+00	1.45E-01	5.41E-03	0.00E+00	1.53E-02	0.00E+00	8.93E-01	0.00E+00	0.00E+00	1.49E-02	1.16E-02	5.46E-03	-2.13E-01
POCP	[kg NMVOC eq.]	1.09E+00	2.57E-02	1.01E-03	0.00E+00	5.27E-03	0.00E+00	2.28E-01	0.00E+00	0.00E+00	2.64E-03	1.88E-03	1.57E-03	-9.14E-02
ADPm[1]	[kg Sb eq.]	5.40E-02	3.37E-07	7.92E-09	0.00E+00	1.68E-07	0.00E+00	2.59E-05	0.00E+00	0.00E+00	3.47E-08	2.33E-08	1.82E-08	-1.20E-03
ADPf[1]	[MJ]	3.81E+03	6.93E+01	1.99E+00	0.00E+00	7.52E+01	0.00E+00	3.51E+03	0.00E+00	0.00E+00	7.13E+00	4.75E+00	1.01E+01	-5.61E+02
WDP[1]	[m^3 world eq. deprived]	6.13E+01	6.15E-02	6.35E-01	0.00E+00	2.27E-01	0.00E+00	3.68E+01	0.00E+00	0.00E+00	6.32E-03	1.79E+00	-9.45E-03	-4.28E+00
Caption	GWP-total = Globale Warming Potential - total; 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential													
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.													
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.													

ADDITIONAL ENVIRONMENTAL IMPACTS PER HCV 460 PRO														
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3-B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	1.19E-05	1.33E-07	7.58E-09	0.00E+00	5.20E-08	0.00E+00	3.00E-06	0.00E+00	0.00E+00	1.37E-08	1.64E-08	2.12E-08	-1.03E-06
IRP[2]	[kBq U235 eq.]	2.11E+01	1.94E-02	1.30E-02	0.00E+00	6.17E-02	0.00E+00	9.27E+01	0.00E+00	0.00E+00	2.00E-03	7.20E-02	1.77E-02	-3.90E+00
ETP-fw[1]	[CTUe]	4.74E+03	4.97E+01	9.82E-01	0.00E+00	2.99E+01	0.00E+00	9.78E+02	0.00E+00	0.00E+00	5.11E+00	1.86E+00	6.52E+00	-2.25E+02
HTP-c[1]	[CTUh]	7.79E-07	1.01E-09	6.67E-11	0.00E+00	9.09E-10	0.00E+00	5.17E-08	0.00E+00	0.00E+00	1.04E-10	1.71E-10	4.11E-10	-1.08E-08
HTP-nc[1]	[CTUh]	6.10E-06	4.49E-08	3.42E-09	0.00E+00	3.20E-08	0.00E+00	8.24E-07	0.00E+00	0.00E+00	4.61E-09	3.72E-09	3.50E-08	-4.73E-07
SQP[1]	-	1.88E+03	2.90E+01	6.64E-01	0.00E+00	6.75E+00	0.00E+00	1.39E+03	0.00E+00	0.00E+00	2.98E+00	1.58E+00	9.05E-01	-2.58E+02
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)													
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.													
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.													
	[2] 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.													

RESOURCE USE PER HCV 460 PRO														
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3-B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	4.77E+02	5.05E+00	4.02E-01	0.00E+00	7.01E+00	0.00E+00	2.10E+03	0.00E+00	0.00E+00	5.19E-01	1.80E+00	9.14E-01	-1.96E+02
PERM	[MJ]	1.22E+02	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]	6.00E+02	5.05E+00	4.02E-01	0.00E+00	7.01E+00	0.00E+00	2.10E+03	0.00E+00	0.00E+00	5.19E-01	1.80E+00	9.14E-01	-1.96E+02
PENRE	[MJ]	4.55E+03	6.96E+01	2.00E+00	0.00E+00	7.52E+01	0.00E+00	3.52E+03	0.00E+00	0.00E+00	7.16E+00	4.75E+00	1.02E+01	-5.61E+02
PENRM	[MJ]	5.51E+02	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
PENRT	[MJ]	5.11E+03	6.96E+01	2.00E+00	0.00E+00	7.52E+01	0.00E+00	3.52E+03	0.00E+00	0.00E+00	7.16E+00	4.75E+00	1.02E+01	-5.61E+02
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	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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	2.00E+00	5.53E-03	1.50E-02	0.00E+00	1.43E-02	0.00E+00	1.69E+00	0.00E+00	0.00E+00	5.68E-04	4.25E-02	1.06E-04	-1.99E-01
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water													
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.													

WASTE CATEGORIES AND OUTPUT FLOWS PER HCV 460 PRO														
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3-B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	5.51E-02	2.15E-10	3.62E-11	0.00E+00	5.37E-09	0.00E+00	-2.75E-07	0.00E+00	0.00E+00	2.22E-11	-6.91E-11	8.49E-10	-7.31E-08
NHWD	[kg]	5.33E+00	1.06E-02	1.19E-01	0.00E+00	3.60E-02	0.00E+00	2.58E+00	0.00E+00	0.00E+00	1.09E-03	3.08E-01	1.16E+01	-1.83E+00
RWD	[kg]	2.93E-02	1.30E-04	8.17E-05	0.00E+00	5.94E-04	0.00E+00	5.58E-01	0.00E+00	0.00E+00	1.34E-05	4.41E-04	1.19E-04	-2.55E-02
CRU	[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
MFR	[kg]	1.31E+01	0.00E+00	8.86E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E+01	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	0.00E+00	0.00E+00	8.14E+00	0.00E+00	3.72E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.79E+01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	1.49E+01	0.00E+00	8.56E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.76E+01	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy													
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.													

BIOGENIC CARBON CONTENT PER HCV 460 PRO		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	1.84
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

LCA interpretation

The results of the EPD shows the potential environmental impact associated with one HCV 300 PRO, HCV 400 PRO or HCV 460 PRO decentralised ventilation unit. Through a contribution analysis, the production of the printed circuit boards is the most dominant source of impact. Next to PCB, the production of steel contributes the most.

Technical information on scenarios

Transport to the building site (A4)

Scenario information	Truck	Unit
Fuel type	Diesel	-
Vehicle type	Truck, Euro 5, 28 - 32t gross weight / 18.4t payload capacity	-
Transport distance	274.1 – 1201.9	km
Capacity utilisation (including empty runs)	47.8	%
Gross density of products transported	41 – 50.62	kg/m^3

Installation of the product in the building (A5)

Scenario information	Value	Unit
Ancillary materials	0	kg
Water use	0	m^3
Other resource use	0	kg
Energy type and consumption	0	kWh
Waste materials	3.8 – 4.8	kg
Output materials	0	kg
Direct emissions to air, soil or water	0	kg

Reference service life

RSL information		Unit
Reference service Life	1	Year
Life span of the units	25	Years
Declared product properties	The declared unit is one HCV 300 PRO, HCV 400 PRO P1, P2, E1 or HCV 460 PRO P2 and E1 decentralised ventilation unit with an air capacity of 50 – 360 m^3/h.	
Assumed quality of work	Technical specification and guidance can be obtained at https://catalogue.dantherm.com/dantherm/dantherm-catalogue-residential-ventilation-dk/ or by directly contacting Dantherm A/S	
Maintenance	The HCV 300 PRO, HCV 400 PRO, or HCV 460 PRO variations require change of filters twice per year during its lifespan.	

Use (B1-B7)

Scenario information	Value		Unit
B2 - Maintenance			
Maintenance process	To maintain HCV 300 PRO, HCV 400 PRO, or HCV 460 PRO variations, it is necessary to replace filters twice a year throughout its lifespan.		
Maintenance cycle	2		/year
Ancillary materials for maintenance (specify which)	0		kg/cycle
Waste materials resulting from maintenance (specify which)	HCV 300 PRO	0.36	kg
	HCV 400 PRO and HCV 460 PRO	0.65	
B6 + B7 – Use of energy and water			
Electricity	126 - 252		kWh
Further assumptions for scenario development	The scenario is based on the ventilation units being used 8,760 hours (1 year) at a 70% performance of maximum flow rate, as prescribed in COMMISSION REGULATION (EU) No 1253/2014.		

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	34.7 – 43.5	kg
Collected with mixed waste	0	kg
For reuse	0	kg
For recycling	22.28 - 24.68	kg
For energy recovery	3.39 – 7.55	kg
For final disposal	7.92 – 11.52	kg
Assumptions for scenario development	45 km to waste incineration, 285 – 455 km depending on waste material, to recycling facility	

Re-use, recovery and recycling potential (D)

Scenario information/Materiel (energy recovery)		Value	Unit
Module A5	Wooden Pallet	3 – 4	kg
Module B2	Filters	0.36 – 0.65	Kg
Module C3	Plastics (EPS, PA, PE, PET, PP, PS, PVC, plastics in wire)	42.70 – 108.20	MJ

Scenario information/Materiel (recycling)		Value	Unit
Module A5	LDPE, corrugated cardboard	0.78 – 0.80	kg
Module C3	Steel, Aluminium, Copper, recyclable plastic (PA, PE, PET, PP, PVC, PS)	22.28 – 24.68	kg

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

References

Publisher	www.epddanmark.dk Template version 2023.1
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Artelia A/S Mariane Thomsens Gade 1c 8000 Aarhus C Denmark Sabine Kristensen
LCA software /background data	Sphera LCA for Experts vers. 10.7, professional database, version 2023.1 and EcoInvent vers. 3.9.1
3rd party verifier	Life Cycle Assessment Consulting Linda Høibye

General programme instructions
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

EN 50693
DS/EN 50693:2019 – "Product category rules for life cycle assessments of electronic and electrical products and systems"

EN 15942
DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025
DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040
DS/EN ISO 14040:2008 – ” Environmental management – Life cycle assessment – Principles and framework”

ISO 14044
DS/EN ISO 14044:2008 – ” Environmental management – Life cycle assessment – Requirements and guidelines”

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Eurostat
Treatment of waste by waste category, hazardousness and waste management operations https://ec.europa.eu/eurostat/databrowser/view/env_wastrt/default/table?lang=en&category=env.env_was.env_wasgt