epd-norge

Environmental product declaration

In accordance with ISO 14025 and EN 15804 +A2

weber REP 05 Anti-corrosion mortar (weber REP 05 Korroosiosuojalaasti)

weber SAINT-GOBAIN

The Norwegian EPD Foundation

Owner of the declaration:
Saint-Gobain Finland Oy

Declared unit:
1 kg weber REP 05 Anti-corrosion mortar (weber REP 05 Korroosiosuojalaasti)

Product Category:
Technical-chemical building materials products

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 009:2018 Part B for Technical - Chemical products in the building and construction industry

Program operator:
The Norwegian EPD Foundation

Declaration number:
NEPD-3593-2258-EN

Registration number:
NEPD-3593-2258-EN

Issue date: 30.06.2022
Valid to: 30.06.2027

EPD Software:
LCA.no EPD generator
System ID: 49543

General information

Product
weber REP 05 Anti-corrosion mortar (weber REP 05 Korroosiosuojalaasti)

Owner of the declaration:
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Program operator:
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Manufacturer:
Saint-Gobain Finland Oy
P.O. Box 70, Fi-00381 Helsinki
Finland

Declaration number:
NEPD-3593-2258-EN

Place of production:
Saint-Gobain Weber Parainen
Parainen Premix plant, Kalkkitehtaantie, 21600 Parainen
Finland

Management system:
ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2007

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 009:2018 Part B for Technical - Chemical products in the building and construction industry

Organisation no:
FI09515553

Statement of liability:
The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Issue date: 30.06.2022

Valid to: 30.06.2027

Declared unit:
1 kg weber REP 05 Anti-corrosion mortar (weber REP 05 Korroosiosuojalaasti)

Year of study:
2021

Declared unit with option:
A1,A2,A3,A4,A5,C1,C2,C3,C4,D

Comparability:
EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

Functional Unit
Not relevant

The EPD has been worked out by:
The declaration is created using EPD tool lca.tools ver EPD2021.09, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

General information on verification of EPD from EPD tools:
Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Individualthird party verification of each EPD is not required when the EPD tool is i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPDNorway, and iii)the proccess is reviewed annualy. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools.

Developer of EPD:

Päivi Pesu

Reviewer of company-specific input data and EPD:

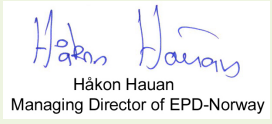
Helene Løvkvist Andersen

Verification:
Independent verification of data, other environmental information and the declaration according to ISO14025:2010, § 8.1.3 and § 8.1.4

Third party verifier:

Anne Rønning, Norsus AS

(Independent verifier approved by EPD Norway)

Approved:

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

weber REP 05 Anti-corrosion mortar is cement based quickly hardening mortar for corrosion protection. The product is polymer-modified (PMC), offers improved adhesion of repair mortar to the steel, and acts also as adhesive mortar. Weber REP 05 Anti-corrosion mortar protects cleaned concrete reinforcing bars from corrosion by forming a slowly permeable alkaline layer around steel. The product can also be used as adhesive layer between old concrete and repair mortar when concrete surface is not rough enough. Hand applied. Delivered in 5 kg bags (6415910043322).

Product specification

The composition of the product is described in the following table:

Materials	%
Binder	30-50
Aggregate	40-70
Packaging, PE	0,01 kg
Packaging, cardboard	0,02 kg
Packaging, pallet	0,037 kg
Additives	0-2

Technical data:

weber REP 05 Anti-corrosion mortar is produced according to the requirements of EN 1504-4 ZA 1b:2004 (Cement based product intended for structural bonding).

Material consumption: 3-4 kg/m² concrete; approx. 0.1 kg/jm on 10 mm steel
Recommended water content: 1.25-1.5 l/5 kg (25-30%).

More information: www.fi.weber/betonit/betonin-korjauslaastit/weber-rep-05-korroosiosuojalaasti

Market:

Nordic and Baltic countries

Reference service life, product

The reference service life of the product is similar to the service life of the building.

Reference service life, building

60 years

LCA: Calculation rules

Declared unit:

1 kg weber REP 05 Anti-corrosion mortar (weber REP 05 Korroosiosuojalaasti)

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Additives	ecoinvent 3.6	Database	2019
Aggregate	ecoinvent 3.6	Database	2019
Binder	ecoinvent 3.6	Database	2019
Filler	ecoinvent 3.6	Database	2019
Packaging	ecoinvent 3.6	Database	2019
Additives	LCA.no	Database	2021
Cement	Supplier	EPD	2021

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

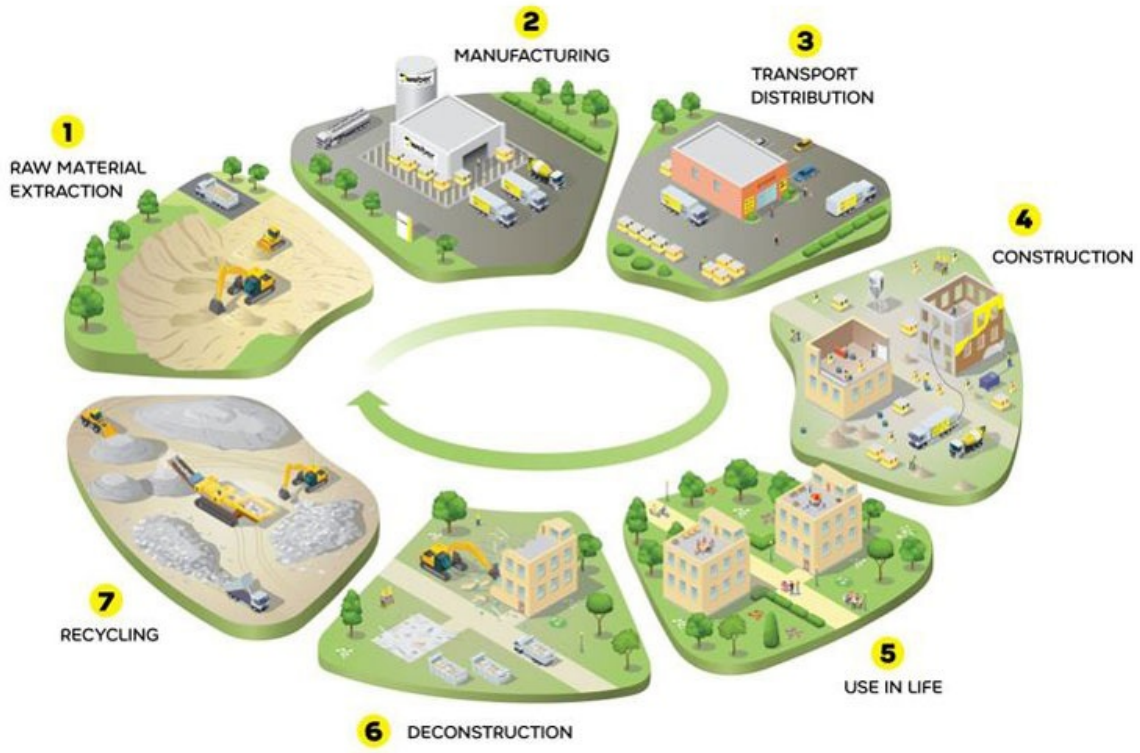
Product stage			Construction installation stage		User stage							End of life stage				Beyond the system bondaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MNR	MNR	MNR	MNR	MNR	MNR	MNR	X	X	X	X	X

System boundary:

All processes from raw materials extraction to product transportation to the building site, assembly, as well as end of life stage and phases beyond the system boundary (A1-A5, C1-C4, D) are included in the analysis.

The basic production process comprises of mixing raw materials together. Ready mixed product is then packed into small bags. At assembly phase, water is added according to instructions and it is mixed. When building is demolished at the end-of-life, the structure with mortar integrated into concrete slab are crushed. 90% of crushed concrete is recycled and used to replace natural gravel in soil construction, remaining 10% being disposed to landfill.

System boundaries are illustrated in the picture below.



Additional technical information:

The LCA calculation has been made taking into account the fact that during the manufacturing process 100% renewable electricity is used. This 100% renewable electricity bought is evidenced by Guarantee of Origin certificates (GOs) from LOS, valid for the study year (2021).

Unused product powder is classified as hazardous waste. Product hardens after adding water in 5 to 6 hours and can then be disposed as mixed construction waste.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

The results of stage A4 (transportation of product) in the table of this EPD refer to transportation in Finland (average distance 2021). This product may also be delivered to the countries in the table "Additional A4 information". In order to adapt the impact of transportation to these countries, A4 figures from this EPD shall be multiplied by the multiplication factors below. At installation stage, it is assumed that mixing is done by electric mixer. Electricity mix used is that of Finland. Material loss is considered to be 0. At end of life stage, it is assumed that all demolition waste is collected and 90% of crushed concrete is recycled and 10% is disposed into landfill. Transport distance to processing is estimated to be 30 km.

Transport from production place to user (A4)	Capacity Utilization	Distance (km)	Fuel/Energy Consumption	Unit	Value (L/t)
Truck, over 32 tonnes, EURO 5 (km)	53,3 %	206	0,023	l/tkm	4,74

Additional A4 information	Unit/Range	Value			
Tullinge, Sweden (truck / ferry 384 km)	Multiplication factor GWP/A4	2,20			
Lillestrøm, Norway (truck / ferry 871 km)	Multiplication factor GWP/A4	4,57			
Karlslunde, Denmark (truck / ferry 1033 km)	Multiplication factor GWP/A4	5,35			
Tallinn, Estonia (truck / ferry 271 km)	Multiplication factor GWP/A4	1,41			
Riga, Latvia (truck / ferry 579 km)	Multiplication factor GWP/A4	2,90			
Kaunas, Lithuania (truck / ferry 848 km)	Multiplication factor GWP/A4	4,21			

Assembly (A5)	Unit	Value			
Waste, cardboard and paper packaging, to average treatment (kg)	kg	0,02			
Waste, plastic packaging, mixture, to average treatment (kg)	kg	0,01			
Waste, wood packaging, average treatment (kg)	kg	0,04			
Water, tap water (L)	kg/DU	0,30			
Electricity, Finland (kWh)	kWh/DU	0,00			

C1 Deconstruction demolition	Unit	Value			
Demolition of building per kg product (kg)	kg/DU	1,00			

Transport to waste processing (C2)	Capacity Utilization	Distance (km)	Fuel/Energy Consumption	Unit	Value (L/t)
Truck, over 32 tonnes, EURO 5 (km)	53,3 %	30	0,023	l/tkm	0,69

C3 Waste Processing	Unit	Value			
Waste treatment of product after demolition (kg)	kg	0,90			

C4 Disposal	Unit	Value			
Disposal of product in landfill (kg)	kg	0,10			

D Reuse-Recovery Recycling potential	Unit	Value			
Substitution of primary aggregates with crushed recycled inert products (kg)	kg	0,90			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact

Parameter		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2-eq.	4,94E-01	1,87E-02	2,74E-03	4,00E-03	2,73E-03	6,47E-04	8,22E-04	-2,10E-03
	GWP-fossil	kg CO_2-eq.	5,04E-01	1,87E-02	2,73E-03	4,00E-03	2,73E-03	6,38E-04	8,20E-04	-2,06E-03
	GWP-biogenic	kg CO_2-eq.	-1,04E-02	7,68E-06	8,74E-06	7,50E-07	1,12E-06	5,52E-06	9,58E-07	-4,11E-05
	GWP-luluc	kg CO_2-eq.	2,74E-04	5,47E-06	6,39E-06	3,15E-07	7,96E-07	8,83E-07	2,02E-07	-1,39E-06
	ODP	kg CFC11-eq.	2,07E-08	4,33E-09	3,55E-10	8,64E-10	6,30E-10	1,25E-10	3,11E-10	-3,74E-10
	AP	mol H+-eq.	1,41E-03	7,87E-05	1,34E-05	4,19E-05	1,15E-05	5,17E-06	7,30E-06	-1,85E-05
	EP-FreshWater[3]	kg P-eq.	1,68E-05	1,43E-07	4,76E-08	1,46E-08	2,08E-08	4,03E-08	9,30E-09	-5,48E-08
	EP-Marine	kg N-eq.	1,75E-04	2,37E-05	5,28E-06	1,85E-05	3,45E-06	1,51E-06	2,71E-06	-6,43E-06
	EP-Terrestial	mol N-eq.	4,59E-03	2,62E-04	5,14E-05	2,00E-04	3,81E-05	1,74E-05	2,99E-05	-7,56E-05
	POCP	kg NMVOC-eq.	1,30E-03	8,41E-05	1,37E-05	5,57E-05	1,23E-05	4,67E-06	8,56E-06	-2,00E-05
	ADPE[1]	kg Sb-eq.	2,58E-06	3,20E-07	3,53E-08	6,14E-09	4,66E-08	8,10E-09	7,39E-09	-1,83E-07
	ADPF[1]	MJ	5,40E+00	2,91E-01	3,72E-02	5,51E-02	4,24E-02	1,98E-02	2,26E-02	-3,49E-02
	WDP[1]	m^3	2,92E+00	2,23E-01	9,56E-01	1,17E-02	3,25E-02	2,19E+00	1,39E-01	-1,63E+00

GWP total Global Warming Potential total; GWP fossil Global Warming Potential fossil fuels ; GWP biogenic Global Warming Potential biogenic; GWP luluc Global W Potential land use change; ODP Ozone Depletion; AP Acidification; EP freshwater Eutrophication aquatic freshwater; EP marine Eutrophication aquatic marine; EP terrestrial Eutrophication terrestrial ;POCP Photochemical zone formation; ADPE Abiotic Depletion Potential minerals and metals; ADPf Abiotic Depletion Potential fossil fuels; WDP Water Depletion Potential

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. 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
3. Eutrophication aquatic freshwater shall be in kg P-eq., there is a typo in EN 15804:2012+A2:2019 regarding this unit. Eutrophication calculated as PO4-eq is presented on page 11

Additional environmental impact indicators

Parameter		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	1,70E-08	1,65E-09	1,53E-10	5,07E-09	2,40E-10	8,30E-11	1,56E-10	-3,96E-10
	IRP[2]	kgBq U235-eq.	1,63E+01	1,27E-03	4,82E-04	2,40E-04	1,85E-04	3,33E-04	1,03E-04	-3,20E-04
	ETP-fw[1]	CTUe	4,15E+00	2,13E-01	3,56E-02	3,01E-02	3,10E-02	1,41E-02	1,23E-02	-3,59E-02
	HTP-c[1]	CTUh	5,88E-10	0,00E+00	1,00E-12	1,00E-12	0,00E+00	0,00E+00	0,00E+00	-2,00E-12
	HTP-nc[1]	CTUh	1,35E-08	2,06E-10	9,50E-11	2,80E-11	3,00E-11	1,20E-11	8,00E-12	-4,30E-11
	SQP[1]	Pt	6,63E+00	3,34E-01	2,54E-02	6,69E-03	4,86E-02	1,12E-02	8,69E-02	7,91E-02

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)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. 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
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

Parameter		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	6,67E-01	3,67E-03	5,61E-03	3,00E-04	5,34E-04	1,02E-02	8,08E-04	-8,16E-03
	PERM	MJ	8,32E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	1,50E+00	3,67E-03	5,61E-03	3,00E-04	5,34E-04	1,02E-02	8,08E-04	-8,16E-03
	PENRE	MJ	3,37E+00	2,91E-01	3,78E-02	5,51E-02	4,24E-02	1,98E-02	2,26E-02	-3,68E-02
	PENRM	MJ	2,52E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PENRT	MJ	5,89E+00	2,91E-01	3,78E-02	5,51E-02	4,24E-02	1,98E-02	2,26E-02	-3,68E-02
	SM	kg	5,05E-02	0,00E+00	1,46E-05	2,70E-05	0,00E+00	1,70E-05	9,79E-06	-7,05E-05
	RSF	MJ	1,37E-01	1,28E-04	8,89E-05	7,33E-06	1,87E-05	2,07E-04	1,68E-05	-1,67E-04
	NRSF	MJ	2,00E-01	4,30E-04	3,00E-04	-1,10E-04	6,26E-05	-1,28E-05	3,62E-05	-1,71E-04
	FW	m^3	3,75E-03	3,32E-05	3,30E-04	2,83E-06	4,83E-06	3,40E-05	2,78E-05	-1,28E-03

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 materials; RSF Use of renewable secondary fuels; NRSF Use of non renewable secondary fuels; FW Use of net fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Parameter		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	2,65E-03	1,59E-05	4,04E-04	1,62E-06	2,32E-06	1,98E-06	1,59E-06	-8,40E-06
	NHWD	kg	3,18E-02	2,53E-02	5,77E-03	6,52E-05	3,69E-03	6,26E-05	1,00E-01	-2,55E-04
	RWD	kg	6,57E-06	1,99E-06	3,06E-07	3,82E-07	2,90E-07	2,10E-07	1,47E-07	-2,76E-07

HWD Hazardous waste disposed; NHWDNon-hazardous waste disposed; RWD Radioactive waste disposed;

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Parameter		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	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
	MFR	kg	3,06E-03	0,00E+00	2,36E-02	2,66E-05	0,00E+00	8,99E-01	8,92E-06	-1,65E-06
	MER	kg	3,66E-04	0,00E+00	7,05E-07	8,23E-08	0,00E+00	2,07E-06	1,68E-07	-6,17E-05
	EEE	MJ	7,14E-03	0,00E+00	2,69E-02	2,82E-07	0,00E+00	3,55E-06	1,39E-05	-1,49E-05
	EET	MJ	1,33E-01	0,00E+00	4,07E-01	4,27E-06	0,00E+00	5,37E-05	2,10E-04	-2,25E-04

CRU Components for re-use; MFR Materials for recycling; MER Materials for energy recovery; EEE Exported electrical energy; EET Exported energy Thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	2,46E-02

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional Norwegian requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Data source	Amount	Unit
Renewable electricity Saint-Gobain, based on 100% hydro power, with Guarantee of Origin from LOS 2021 (kWh)	ecoinvent 3.6	4,26	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskriften, Annex III), see table.

Name	CASNo	Amount
Portland cement	65997-15-1	25-50%

Indoor environment

Not relevant

Additional Environmental Information

Environmental impact indicators EN 15804+A1 and NPCR Part A v2.0

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP	kg CO_2-eq.	5,33E-01	1,85E-02	2,75E-03	3,95E-03	2,70E-03	6,29E-04	8,04E-04	-2,20E-03
ODP	kg CFC11-eq.	2,01E-08	3,50E-09	3,43E-10	6,86E-10	5,10E-10	1,56E-10	2,48E-10	-3,41E-10
POCP	kg C_2H_4-eq.	8,47E-05	2,42E-06	4,73E-07	6,09E-07	3,52E-07	1,40E-07	1,89E-07	-4,59E-07
AP	kg SO_2-eq.	1,10E-03	3,74E-05	8,60E-06	5,84E-06	5,44E-06	2,37E-06	2,23E-06	-5,39E-06
EP	kg PO_4^{3-}-eq.	1,64E-04	4,08E-06	2,23E-06	6,50E-07	5,94E-07	3,13E-07	2,64E-07	-6,32E-07
ADPM	kg Sb-eq.	2,44E-05	3,20E-07	3,53E-08	6,14E-09	4,66E-08	8,10E-09	7,39E-09	-1,83E-07
ADPE	MJ	6,20E+00	2,86E-01	3,68E-02	5,47E-02	4,16E-02	7,62E-03	2,16E-02	-3,49E-02
GWPIOBC	kg CO_2-eq.	1,54E-01	1,87E-02	8,08E-04	5,37E+00	2,73E-03	0,00E+00	0,00E+00	-2,20E-03
GWPBC	kg CO_2-eq.	1,09E-05	5,56E-07	4,60E-08	0,00E+00	8,09E-08	0,00E+00	0,00E+00	0,00E+00

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