epd square .

Environmental Product Declaration

Average EPD

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

Prefabricated manhole parts, Concrete and reinforced concrete throat pipes, Water meter shaft

PREFA invest, a.s.

Programme
EPD Square | www.epdsquare.com

Programme operator
EPD Square, s.r.o.

EPD Registration number
SQ 00-054

Publication date
24.11.2025

Valid until
23.11.2030

epd square .

General information

Product
Prefabricated manhole parts, Concrete and reinforced concrete throat pipes, Water meter shaft

Program operator
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Registration number
SQ 00-054

Publication date
24.11.2025

Valid until date
23.11.2030

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Place of production
Podhradská cesta 2
038 52 Sučany
Slovakia

Product Category Rules (PCR)
EPD Square PCR v1.0, 2024

Declared/Functional unit
1 m^3

Mass per DU
2500 kg

UN CPC code
375 - Articles of concrete, cement and plaster

Geographical scope
Slovakia, Europe

Year of study
2024

Comparability
EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in the context of the building.

EPD author
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Verification type
Independent verification of the declaration and data, according to ISO14025:2006
Internal: ☐
External: ☒

Verified by
Daniel Satola, Daniel Satola Consulting

Satola Daniel

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

System boundaries

This EPD is based on system boundary cradle to gate (A1-A3) with modules C1-C4, module D and optional modules A4 and A5.

Modules declared and geographical scope

	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	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x
Geography	EU	EU	SK	EU	EU	-	-	-	-	-	-	-	SK	SK	SK	SK	EU

MND = Modules not declared.

Description of Organization

Prefa invest, a.s. is a young dynamic company that builds on the traditional foundations of concrete production in the Sučany factory. Since 1948, it has been producing prefabricated products for the construction of industrial buildings, shopping centres, administrative buildings and housing. The company's present-day operations date back to 2012. The production part of PREFA invest, a.s. can be divided into the following basic segments:

- Prefabricated building structures,

- Sewerage program,

- Concrete pavements and blocks,

- Mining and processing of aggregates,

- Demolition works, and

- Transport concrete.

Product information

Product name
Prefabricated manhole parts, Concrete and reinforced concrete throat pipes, Water meter shaft

Product number / reference
Shaft bottoms TBS 100, TBS 150 ; Shaft frames TBH 100, TBH 150, Cones TBS 100, Cover plates TZD100, Transition plates TZD 150, Cover plates TZD 150, Balancing parts (rings) TBS, Water meter shaft VS - Concrete pipes TBH, Reinforced concrete pipes TZH

Product description
The basic products of this product range are concrete and reinforced concrete pipes. Both pipe types are produced in DN 600, 800, 1000, 1200 mm and a length of 2500 mm. The range also includes manhole sewer elements and elements for concrete street drains such as water meter shaft with dimensions 1200x900x1800 mm, covering plates, manhole covers, bottoms, rings, cones, concrete-cast iron covers, transition plates and other elements of the sewer network.

Product application
Manhole sewer elements and elements for concrete street drains allow access, aeration, ventilation of sewer pipe systems or drains, for example in roadways, parking lots, paved shoulders and outside buildings

Pipes and other sewer elements allow access, aeration, ventilation of sewer pipe systems or drains for the conveyance of sewage, rainwater and surface water by gravity or occasionally at low pressure, installed mainly in areas subject to vehicular and pedestrian traffic. They may only be installed in a precisely defined location in the building structure in accordance with the relevant design documentation. Prefabricated trusses and slabs are designed to be loaded by their own gravity, the gravity of the embankment, the earth pressure, the gravity of the fill according to the applicable EN STN and to be loaded by the ground surface at a characteristic value of 10kN/m2

Pipes are used for the conveyance of wastewater, rainwater and surface water by gravity or occasionally at low pressure in pipes that are generally buried in the ground

Water meter shaft creates underground spaces suitable for the location of water meters and fittings of utility networks.

Concrete and reinforced concrete pipes: manufactured by vibroforming, which guarantees perfect compaction of the material and results in a pipe with high static parameters,

Shaft programme: manufactured by vibroforming, shaft bottoms and monolithic, in the cone there is a built-in pocket plastic-coated tread and a forked plastic-coated tread.

Product Standards
STN EN 1917, STN EN 1916

Geographical scope
Slovakia, Europe

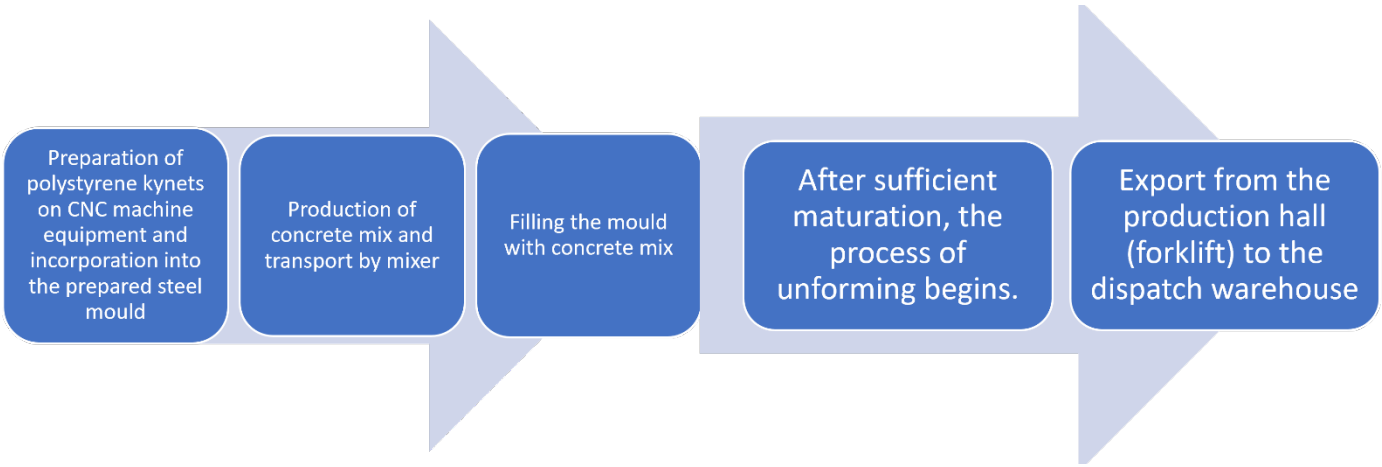
Product contents information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Aggregate	1959.56	-	-
Limestone	47.8	-	-
Cement	363.92	-	-
Additives	3.66	-	-
Water	116.64	-	-
Basalt cladding	0.001	-	-
Adhesive	0.22	-	-
Steel elements	0.72	15	-
Reinforcement steel	2.24	-	-
Polystyrene	4.56	10	-
Rubber elements	0.66	-	-
Fiberglass	0.004	-	-
PP elements	0.04	-	-
TOTAL	2500	0.14	-

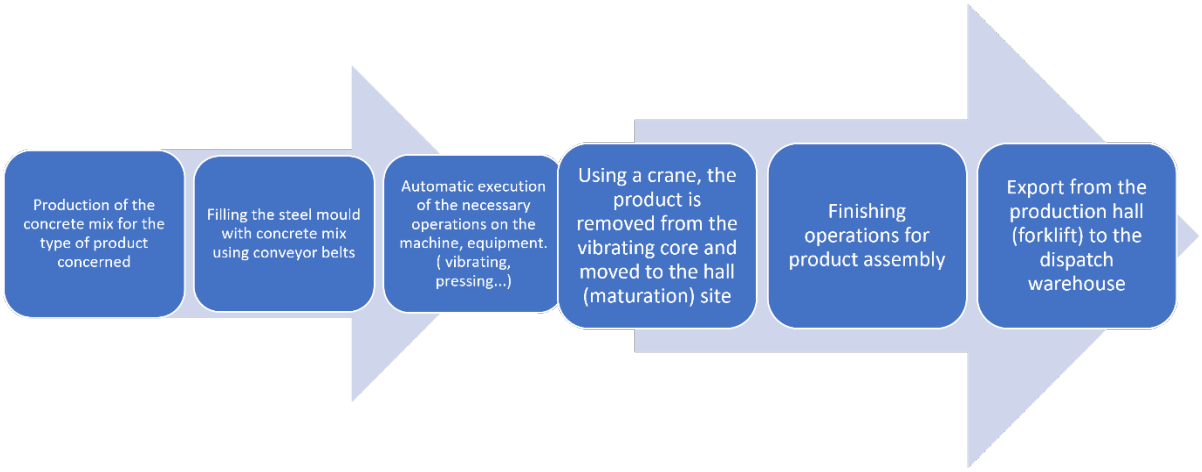
Packaging materials	Weight, kg	Weight-% (versus the product)
Euro-palette (wood)	10.59	0.42
Wooden beams	0.56	0.02
Wooden lath	0.11	0.004
TOTAL	11.88	0.048

Material losses	Weight, kg	Weight-% (versus the product)
Polystyrene	2.73	0.11
Other	0.47	0,02
Concrete	46.57	1.86
TOTAL	**49.78**	1.99

Manufacturing process



Products related to water meter shafts



Pipe program and shaft program

Life cycle assessment

Cut-off criteria

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

Allocation, estimations, and assumptions

Allocation is based on annual production rate and made with high accuracy and precision. The values for 1 m^3 of the product which is used within this study are calculated based on the total annual input of materials and energy for all products within the EPD scope and the total annual production volume (m^3) in 2024. This approach represents a weighted average according to the actual production volumes of each product, ensuring that each product's contribution to the

overall results is proportional to its share of the total production. The product output is fixed to 1 m^3 and the corresponding amount of product is used in the calculations.
In the production plant, several kinds of products are produced. According to the annual production of the declared product, the annual total energy consumption and the generated waste per the declared product are allocated.

Module A1: This stage considers the extraction and processing of all raw materials. Within the product stage accurate data has been used. In the case of absence in the database, it was modelled as close to reality as possible using proxy, representative datapoint. According to data provided by the manufacturer, material losses were also added.

Module A3: In the plant, electricity, LPG, and diesel are allocated on yearly consumption.

Module A2, A4 & C2: These stages account for transport activities. Vehicle capacity utilization volume factor is assumed to be 1 which means full load. It may vary but as the role of transportation emission in total results is small and so the variety in load is assumed to be negligible. Empty returns are considered.

Module A4: Transportation doesn't cause losses as products are packaged properly. Also, volume capacity utilization factor is assumed to be 1 for the nested packaged products. Additionally, transportation distances and vehicle types are assumed according to the delivery in the last year. The distance is assumed to be 79,51 km and the transportation method assumed to be lorry.

Module A5: It is assumed that wood used for packaging is partially incinerated at the nearest municipal incineration plant for energy recovery, partially landfilled and partially recycled by shredding. The distance is assumed as 50 km and the transportation method assumed to be lorry. No additional construction activities are assumed.

Module C1: The impacts of the disassembly stage are assumed to take 25 kWh/m^3 of the product. The source of energy is diesel fuel used by work machines.

Module C2: It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed that it has the same weight as the declared product. All the end-of-life products are assumed to be sent to the closest facilities such as recycling and landfill. Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is assumed as lorry which is the most common.

Module C3, C4: In the case of selective demolition of buildings, the product can be recovered and sent to companies specialized in recovery. It is assumed that 70% of the concrete waste and 85% of the steel will be recycled and 30% of the concrete waste and 15% of steel will be taken to landfill for final disposal. 100% of rubber waste is incinerated.

Module D: There are declared benefits of recycling such as steel, gravel and woodchip production. Loads of recycling are linked to production of mentioned products. Also energy can be recovered from the packaging.

Database(s) and LCA software

This EPD has been created using One Click LCA Pre-Verified EPD Generator. Ecoinvent v3.10.1, One Click LCA and Worldsteel 2023 Methodology Report databases were used as sources of environmental data. EPDs were also used for some materials as source of environmental data.

LCA Scenarios and additional technical information

Manufacturing energy scenario

Electricity data source and quality	Electricity, medium voltage, residual mix, Slovak Republic	Ecoinvent 3.10.1
Electricity CO2e / kWh	0.25	
Electricity data source and quality	Electricity production, photovoltaic, 3kWp slanted-roof installation, multi-Si, panel, mounted (Reference product: electricity, low voltage)	Ecoinvent 3.10.1
Electricity kg CO2e / kWh	0.0819	
Natural gas source and quality	Natural gas	LCA inventory for heat production from natural gas (OneClickLCA 2023)
Natural gas kg CO2e / m3	2.42	
Diesel source and quality	Diesel, burned in building machine	Ecoinvent 3.10.1
Electricity kg CO2e / MJ	0.1	

Transportation scenario (A4)

Vehicle type used for transport	Transport, freight, lorry >32 metric ton, EURO6
Distance to the construction site	79.51
Capacity utilization	100
Capacity utilization factor	1

End of Life (C1, C3, C4)

	Value	Unit
Collected separately	2500	kg
To recycling	1753.75	kg
Energy recovery	0.65	kg
To landfill	745.60	kg

LCA results

Core environmental impact indicators – EN 15804+A2

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	3,80E+02	3,79E+01	7,50E+01	9,01E+00	2,42E+01	1,19E+01	4,62E+00	-2,19E+01
GWP-fossil	kg CO_2 eq.	4,56E+02	3,79E+01	4,06E-01	9,01E+00	2,42E+01	9,76E+00	4,68E+00	-2,23E+01
GWP-biogenic	kg CO_2 eq.	-7,66E+01	0,00E+00	7,46E+01	1,08E-19	0,00E+00	2,09E+00	-5,68E-02	4,59E-01
GWP-LULUC	kg CO_2 eq.	4,25E-01	1,36E-02	6,17E-04	9,23E-04	8,54E-03	8,62E-04	2,67E-03	-1,71E-02
ODP	kg CFC11 eq.	1,34E-05	7,54E-07	6,69E-09	1,38E-07	4,81E-07	1,18E-07	1,36E-07	-1,57E-07
AP	mol H^+ eq.	1,58E+00	7,89E-02	2,25E-03	8,13E-02	7,56E-02	7,00E-02	3,32E-02	-1,27E-01
EP-freshwater	kg P eq.	1,72E-02	2,55E-03	1,08E-04	2,60E-04	1,60E-03	2,62E-04	3,85E-04	-7,49E-03
EP-marine	kg N eq.	3,99E-01	1,89E-02	2,41E-03	3,77E-02	2,55E-02	3,23E-02	1,26E-02	-2,96E-02
EP-terrestrial	mol N eq.	4,46E+00	2,04E-01	9,15E-03	4,13E-01	2,77E-01	3,53E-01	1,38E-01	-3,53E-01
POCP	kg NMVOC eq.	1,43E+00	1,31E-01	3,01E-03	1,23E-01	1,18E-01	1,05E-01	4,95E-02	-1,00E-01
ADP-M&M	kg Sb eq.	3,49E-03	1,26E-04	1,09E-06	3,23E-06	7,91E-05	6,85E-06	7,43E-06	-1,36E-04
ADP-fossil	MJ	3,49E+03	5,33E+02	5,78E+00	1,18E+02	3,39E+02	1,01E+02	1,15E+02	-2,57E+02
WDP	m^3	9,34E+01	2,65E+00	1,55E-01	2,94E-01	1,67E+00	3,71E-01	3,31E-01	-2,71E+01

GWP-total: Global Warming Potential; 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; See "additional requirements" for indicator given as PO4 eq. EP-marine: Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-terrestrial: Eutrophication potential, Accumulated Exceedance; POCP: Formation potential of tropospheric ozone; ADP-M&M: Abiotic depletion potential for non-fossil resources (minerals and metals); ADP-fossil: Abiotic depletion potential for fossil resources; WDP: Water deprivation potential, deprivation weighted water consumption

Additional (optional) environmental impact indicators – EN 15804+A2

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	2,36E-05	2,79E-06	4,00E-08	2,31E-06	1,90E-06	1,50E-05	7,55E-07	-1,94E-06
IRP	kBq U235 eq.	3,53E+01	6,88E-01	1,50E-02	5,22E-02	4,33E-01	5,18E-02	7,22E-02	-1,47E+00
ETP-fw	CTUe	4,23E+03	7,09E+01	1,92E+00	6,49E+00	4,46E+01	9,35E+00	9,63E+00	-6,16E+01
HTP-c	CTUh	1,82E-07	6,36E-09	1,97E-10	9,27E-10	4,12E-09	8,59E-10	8,62E-10	-5,47E-09
HTP-nc	CTUh	3,14E-06	3,37E-07	1,08E-08	1,47E-08	2,13E-07	1,64E-08	1,98E-08	-1,75E-07
SQP	Dimensionless	7,30E+03	3,22E+02	5,39E+00	8,26E+00	2,02E+02	8,57E+00	2,26E+02	-2,12E+02

PM: Particulate matter emissions; IRP: Ionising radiation, human health; ETP-fw: Ecotoxicity (freshwater); ETP-c: Human toxicity, cancer effects; HTP-nc: Human toxicity, non-cancer effects; SQP: Land use related impacts / soil quality

Use of Natural Resources

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	6,49E+02	9,34E+00	-1,75E+02	7,47E-01	5,87E+00	7,91E-01	1,11E+00	-1,13E+01
RPEM	MJ	7,47E+02	0,00E+00	-6,52E+02	0,00E+00	0,00E+00	-7,21E+01	-2,30E+01	3,10E+00
TPE	MJ	1,40E+03	9,34E+00	-8,27E+02	7,47E-01	5,87E+00	-7,13E+01	-2,19E+01	-8,24E+00
NRPE	MJ	2,55E+03	5,33E+02	5,78E+00	1,18E+02	3,39E+02	8,33E+01	1,15E+02	-2,57E+02
NRPM	MJ	9,19E+02	0,00E+00	-4,23E+01	0,00E+00	0,00E+00	-6,14E+02	-2,63E+02	1,03E+00
TRPE	MJ	3,47E+03	5,33E+02	-3,65E+01	1,18E+02	3,39E+02	-5,31E+02	-1,48E+02	-2,56E+02
SM	kg	4,79E+00	2,48E-01	3,84E-03	4,90E-02	1,55E-01	4,28E-02	2,89E-02	2,15E+00
RSF	MJ	2,16E+01	3,13E-03	3,88E-05	1,28E-04	1,96E-03	1,61E-04	5,97E-04	-1,98E-03
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
W	m^3	2,23E+00	7,27E-02	-1,51E-02	7,79E-03	4,57E-02	8,99E-03	1,19E-01	-6,38E-01

RPEE: Renewable primary energy resources used as energy carrier; RPEM: Renewable primary energy resources used as raw materials; TPE: Total use of renewable primary energy resources; NRPE: Non-renewable primary energy resources used as energy carrier; NRPM: Non-renewable primary energy resources used as materials; TRPE: 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; W: Use of net fresh water

End of life – Waste

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HW	kg	1,05E+01	7,75E-01	3,65E-02	1,31E-01	4,87E-01	1,80E-01	1,27E-01	-3,10E+00
NHW	kg	2,83E+02	1,64E+01	2,64E+01	1,79E+00	1,03E+01	2,44E+00	2,90E+00	-4,19E+01
RW	kg	1,81E-02	1,71E-04	3,74E-06	1,28E-05	1,08E-04	1,28E-05	1,76E-05	-3,55E-04

HW: Hazardous waste disposed; NHW: Non-hazardous waste disposed; RW: Radioactive waste disposed

End of life – Output flows

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
CR	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
MR	kg	4,67E+01	0,00E+00	3,80E+00	0,00E+00	0,00E+00	1,75E+03	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	3,57E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	6,58E-04	0,00E+00	1,89E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	7,96E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CR: Components for reuse; MR: Materials for recycling; MER: Materials for energy recovery; EEE: Exported electric energy; ETE: Exported thermal energy

Information describing biogenic carbon content at factory gate

Biogenic carbon content	Value	Unit
Biogenic carbon content in product	0	kg C
Biogenic carbon content in the accompanying packaging	5.067	kg C

Specific data (GWP-GHG) and data variation for A1-A3

Specific data and data variation	Value-%
Specific data	86.43%
Variation - product	0.11%
Variation - site	-

Hazardous substances

☒ The product does not contain any REACH SVHC substances in amounts greater than 0.1 %.

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EN 15804:2012+A2:2019
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EPD Square PCR v.1.0, 2024

EPD Square, General Programme Instructions v.1, 2024

Ecoinvent database v3.10.1 (2024) and One Click LCA database

EPD MAPEFORM ECO OIL 70

EPD Concrete admixtures – Plasticisers and Superplasticisers

EPD Concrete admixtures – Hardening Accelerators European Federation of Concrete Admixtures Associations a.i.s.b.l. (EFCA)

IDEMAT

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https://eplca.jrc.ec.europa.eu/LCDN/EN15804.html

Annex

Environmental impacts – EN 15804+A1, CML/ISO 21930

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP	kg CO_2 eq.	4,50E+02	3,77E+01	6,63E-01	8,96E+00	2,40E+01	9,72E+00	4,63E+00	-2,22E+01
ODP	kg CFC11 eq.	1,08E-05	6,00E-07	5,38E-09	1,09E-07	3,83E-07	9,39E-08	1,08E-07	-1,36E-07
AP	kg SO_2 eq.	1,23E+00	6,34E-02	1,67E-03	5,72E-02	5,74E-02	4,93E-02	2,46E-02	-9,94E-02
EP	kg PO_4 eq.	8,84E-01	1,60E-02	6,03E-04	1,34E-02	1,46E-02	1,15E-02	7,80E-03	-1,89E-02
POCP	kg C_2H_4 eq.	6,61E-02	6,70E-03	1,90E-04	4,29E-03	5,48E-03	3,68E-03	2,32E-03	-9,63E-03
ADP-M&M	kg Sb eq.	3,56E-03	1,23E-04	1,05E-06	3,14E-06	7,73E-05	6,71E-06	7,29E-06	-1,35E-04
ADP-fossil	MJ	3,38E+03	5,22E+02	5,53E+00	1,17E+02	3,32E+02	1,00E+02	1,14E+02	-2,34E+02

Environmental impacts – GWP-GHG

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - GHG	kg CO_2e	4,56E+02	3,79E+01	4,06E-01	9,01E+00	2,42E+01	9,76E+00	4,68E+00	-2,23E+01

GWP- GHG: Global Warming Potential, greenhouse gases