epd square .

Environmental Product Declaration

Average EPD

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

Concrete tiles, Concrete paving blocks, Concrete paving mouldings, Curbstones, Concrete drainage gutters, Grass paving, Masonry and formwork blocks

PREFA invest, a.s.

Programme
EPD Square | www.epdsquare.com

Programme operator
EPD Square, s.r.o.

EPD Registration number
SQ 00-053

Publication date
11.11.2025

Valid until
10.11.2030

epd square .

General information

Product
Concrete tiles, Concrete paving blocks, Concrete paving mouldings, Curbstones, Concrete drainage gutters, Grass paving, Masonry and formwork blocks

Program operator
EPD Square, s.r.o.
Lermontovova 3, 811 05 Bratislava, Slovakia
Email: info@epdsquare.com

Registration number
SQ 00-053

Publication date
11.11.2025

Valid until date
10.11.2030

Owner of the declaration
PREFA invest, a.s.
Contact person: Jana Avramová
Email: avramova@prefa-su.sk

Manufacturer
PREFA invest, a.s.
Podhradská cesta 2,
038 52 Sučany
Slovakia
Telephone: 043/ 49 11 100
Email: prefa@prefa-su.sk

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
2400 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
Želmíra Blichová, Silvia Vilčeková, EPD Clarity s.r.o.

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	SK	EU	-	-	-	-	-	-	-	EU	EU	EU	EU	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
Concrete tiles, Concrete paving blocks, Concrete paving mouldings, Curbstones, Concrete drainage gutters, Grass paving, Masonry and formwork blocks

Product description
The product range of interlocking paving is a type of vibrated concrete paving. One of the main advantages of this range is that it can be disassembled and reassembled to its original state. The production of concrete paving is carried out in a production process on a technological line that can produce these products according to the current requirements and market demand in 4 basic colours. The products can be used for corporate customers as well as for individuals. In addition to concrete paving blocks, formwork and masonry blocks, which are highly sought after in the market, are also produced. Concrete paving is united by maximum quality and durability.

Product application
Concrete pavers are used to form the pavement of roads and traffic areas.
Concrete paving blocks are used to form the pavement of roads and traffic areas.
Concrete kerbs are precast elements used to form the edges of paved road surfaces and to separate surfaces of the same or different levels in order to provide:

- physical or visual separation or separation,
- drainage channels, either alone or in combination with other kerbs,
- differentiation of surfaces serving different modes of traffic

Concrete drainage gutter is used to drain water from ditches and landscaping.
Gravel blocks are used to construct:

- paved grassed car parks, paved grassed lay-bys for roads and motorways, recreational and other types of car parks,
- paved access roads to garages, residential buildings for sporadic passages of special vehicles (ambulances, etc.),
- masonry elements that are used for the construction of load-bearing and non-load-bearing membranes, partitions and walls, and the formwork blocks that also form the lost formwork.
-

Product Standards
STN EN 1338, STN EN 1339, STN EN 1340, EN 771-3, EN 15435

Geographical scope
Slovakia, Europe

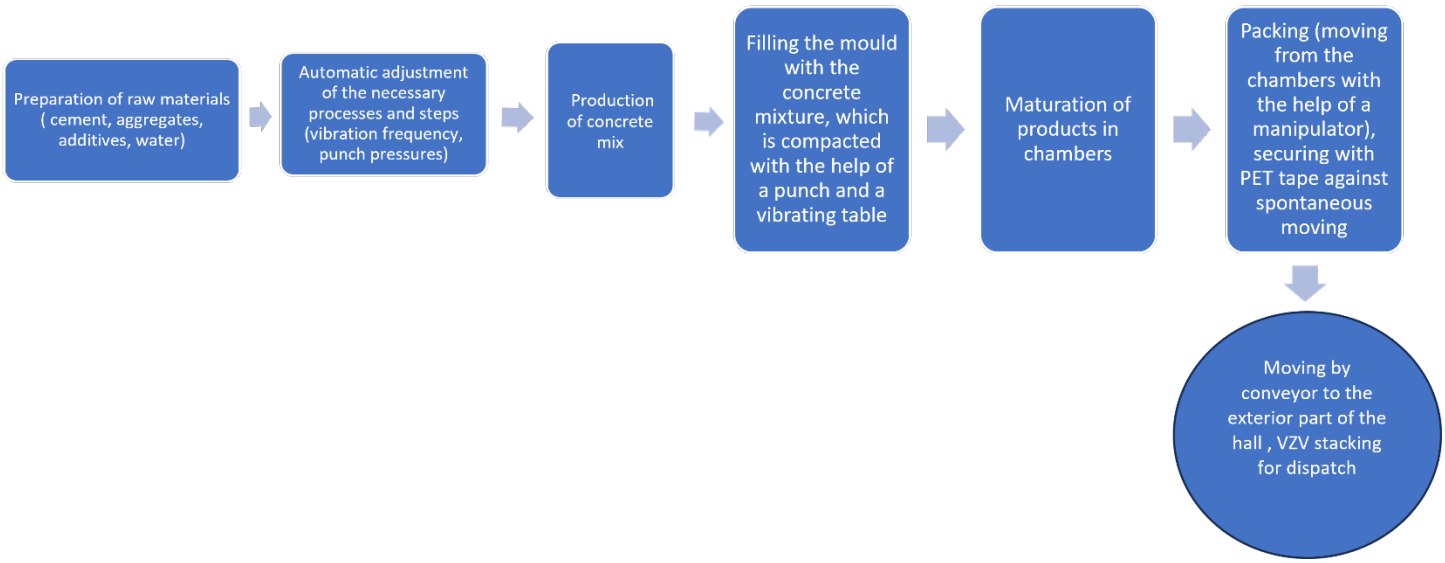
Product contents information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Water	39.80	-	-
Aggregate	1974.84	-	-
Limestone	12.69	-	-
Cement CEM II AS 42,5R	370.64	-	-
Additives	2.23	-	-
TOTAL	2400	-	-

Packaging materials	Weight, kg	Weight-% (versus the product)
Euro-palette	7.31	0.30
LDPE white,70 my	0.06	0.00
TOTAL	7.37	0.30

Material losses	Weight, kg	Weight-% (versus the product)
Other	0.3	0,01
Concrete	46.57	1.94
TOTAL	**46.87**	1.95

Manufacturing process



Process of vibro-pressed production

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 only, precast concrete is produced. The annual production percentages are taken into consideration for allocation. 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 45,82 km and the transportation method assumed to be lorry. This distance was calculated using annual transport data. The number of journeys was determined for each specific location. The total distance travelled was then divided by the total number of journeys.

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. LDPE is incinerated for energy recovery. 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 will be recycled and 30% of the concrete waste will be taken to landfill for final disposal.

Module D: There are declared benefits of recycling such as 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 and One Click LCA 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	45,82
Capacity utilization	100
Capacity utilization factor	1

End of Life (C1, C3, C4)

	Value	Unit
Collected separately	2400	kg
To recycling	1680.0	kg
Energy recovery	-	kg
To landfill	720.0	kg

LCA results

Core environmental impact indicators – EN 15804+A2

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	4,00E+02	2,09E+01	1,29E+01	9,01E+00	2,32E+01	6,65E+00	4,20E+00	-1,69E+01
GWP-fossil	kg CO2 eq.	4,12E+02	2,09E+01	2,96E-01	9,01E+00	2,32E+01	7,35E+00	4,49E+00	-1,71E+01
GWP-biogenic	kg CO2 eq.	-1,16E+01	0,00E+00	1,26E+01	1,08E-19	0,00E+00	-7,04E-01	-3,02E-01	2,82E-01
GWP-LULUC	kg CO2 eq.	6,98E-02	7,52E-03	3,80E-04	9,23E-04	8,20E-03	7,53E-04	2,57E-03	-1,57E-02
ODP	kg CFC11 eq.	1,24E-05	4,17E-07	4,04E-09	1,38E-07	4,62E-07	1,13E-07	1,30E-07	-1,35E-07
AP	mol H^+ eq.	1,22E+00	4,36E-02	1,38E-03	8,13E-02	7,26E-02	6,64E-02	3,19E-02	-1,05E-01
EP-freshwater	kg P eq.	6,55E-03	1,41E-03	-1,46E-02	2,60E-04	1,54E-03	2,12E-04	3,69E-04	-5,32E-03
EP-marine	kg N eq.	2,82E-01	1,05E-02	1,50E-03	3,77E-02	2,45E-02	3,08E-02	1,21E-02	-2,46E-02
EP-terrestrial	mol N eq.	3,33E+00	1,13E-01	5,83E-03	4,13E-01	2,66E-01	3,37E-01	1,33E-01	-2,98E-01
POCP	kg NMVOC eq.	8,73E-01	7,25E-02	1,88E-03	1,23E-01	1,14E-01	1,01E-01	4,75E-02	-8,25E-02
ADP-M&M	kg Sb eq.	3,49E-03	6,97E-05	6,69E-07	3,23E-06	7,59E-05	2,64E-06	7,14E-06	-9,04E-05
ADP-fossil	MJ	2,21E+03	2,95E+02	2,52E+00	1,18E+02	3,26E+02	9,62E+01	1,10E+02	-2,07E+02
WDP	m^3	5,13E+01	1,46E+00	9,52E-02	2,94E-01	1,60E+00	2,40E-01	3,18E-01	-2,53E+01

I YR/vqvcn Global Warming Potential; I YR/lquuln Global Warming Potential fossil fuels; I YR/dkqi gple: Global Warming Potential biogenic; I YR/NWWE: Global Warming Potential land use and land use change; QFR: Depletion potential of the stratospheric ozone layer; CR: Acidification potential, Accumulated Exceedance; GR/ltguj y cvgt: Eutrophication potential, fraction of nutrients reaching freshwater end compartment; See "additional requirements" for indicator given as PO4 eq. GR/o ctlpg: Eutrophication potential, fraction of nutrients reaching freshwater end compartment; GR/vgttguvtkcn Eutrophication potential, Accumulated Exceedance; RQER: Formation potential of tropospheric ozone; CFR/O(O: Abiotic depletion potential for non-fossil resources (minerals and metals); CFR/lquuln Abiotic depletion potential for fossil resources; YFR: 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	1,08E-05	1,54E-06	2,41E-08	2,31E-06	1,82E-06	1,44E-05	7,25E-07	-1,58E-06
IRP	kBq U235 eq.	1,77E+01	3,80E-01	8,81E-03	5,22E-02	4,16E-01	4,26E-02	6,93E-02	-1,52E+00
ETP-fw	CTUe	3,91E+03	3,92E+01	1,18E+00	6,49E+00	4,28E+01	5,29E+00	9,25E+00	-4,88E+01
HTP-c	CTUh	8,76E-08	3,51E-09	9,15E-11	9,27E-10	3,96E-09	7,56E-10	8,29E-10	-4,56E-09
HTP-nc	CTUh	2,69E-06	1,86E-07	6,63E-09	1,47E-08	2,05E-07	1,20E-08	1,90E-08	-1,34E-07
SQP	Dimensionless	2,15E+03	1,78E+02	3,31E+00	8,26E+00	1,94E+02	6,74E+00	2,17E+02	-1,91E+02

RO: Particulate matter emissions; IR: Ionising radiation, human health; GVR/hy: Ecotoxicity (freshwater); GVR/e: Human toxicity, cancer effects; J VR/pe: Human toxicity, non-cancer effects; USR Land use related impacts / soil quality

Use of Natural Resources

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	2,24E+02	5,16E+00	-1,07E+02	7,47E-01	5,63E+00	6,09E-01	1,06E+00	-1,19E+01
RPEM	MJ	1,79E+02	0,00E+00	-1,11E+02	0,00E+00	0,00E+00	-4,77E+01	-2,04E+01	1,93E+00
TPE	MJ	4,03E+02	5,16E+00	-2,18E+02	7,47E-01	5,63E+00	-4,71E+01	-1,94E+01	-1,00E+01
NRPE	MJ	1,48E+03	2,95E+02	2,52E+00	1,18E+02	3,26E+02	9,62E+01	1,10E+02	-2,07E+02
NRPM	MJ	7,82E+02	0,00E+00	-7,31E+00	0,00E+00	0,00E+00	-5,42E+02	-2,32E+02	6,30E-01
TRPE	MJ	2,26E+03	2,95E+02	-4,79E+00	1,18E+02	3,26E+02	-4,46E+02	-1,22E+02	-2,06E+02
SM	kg	8,69E-01	1,37E-01	2,52E-03	4,90E-02	1,49E-01	3,99E-02	2,77E-02	-2,26E-01
RSF	MJ	3,74E+00	1,73E-03	2,94E-05	1,28E-04	1,88E-03	1,04E-04	5,74E-04	-1,56E-03
NRSF	MJ	1,16E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m^3	1,07E+00	4,01E-02	-9,28E-03	7,79E-03	4,39E-02	6,36E-03	1,15E-01	-6,02E-01

TRGG *Renewable primary energy resources used as energy carrier;* ***TRGO****: Renewable primary energy resources used as raw materials;* ***VRG*** *Total use of renewable primary energy resources;* ***PTRG*** *Non-renewable primary energy resources used as energy carrier;* ***PTRO****: Non-renewable primary energy resources used as materials;* ***VTRG*** *Total use of non-renewable primary energy resources;* ***UO****: Use of secondary materials;* ***TUH*** *Use of renewable secondary fuels;* ***PTUH*** *Use of non-renewable secondary fuels;* ***Y****: Use of net fresh water*

End of life – Waste

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HW	kg	7,38E+00	4,28E-01	2,24E-02	1,31E-01	4,68E-01	1,07E-01	1,22E-01	-1,60E+00
NHW	kg	2,11E+02	9,04E+00	1,63E+01	1,79E+00	9,87E+00	1,46E+00	2,78E+00	-2,91E+01
RW	kg	1,15E-02	9,44E-05	2,30E-06	1,28E-05	1,03E-04	1,05E-05	1,69E-05	-3,67E-04

JY*: Hazardous waste disposed;* ***PJY****: Non-hazardous waste disposed;* ***TY****: 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	0,00E+00	0,00E+00	2,34E+00	0,00E+00	0,00E+00	1,68E+03	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	2,19E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	4,90E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	6,73E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ET: Components for reuse; OT: Materials for recycling; OGT: Materials for energy recovery; GGG: Exported electric energy; GVG: 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	3.29	kg C

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

Specific data and data variation	Value-%
Specific data	95.30%
Variation - product	-
Variation - site	-

Hazardous substances

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

Contact information

Programme operator
EPD Square, s.r.o.
Lermontovova 3, 811 05
Bratislava, Slovak Republic
Email: info@epdsquare.com

EPD owner
PREFA invest, a.s.
Podhradská cesta 2,
038 52 Sučany
Slovakia
Email: prefa@prefa-su.sk
Website: https://www.prefasu.sk/

Author of Life Cycle Assessment (LCA)
Želmíra Blichová, Silvia Vilčeková, EPD Clarity, s.r.o.
Email: vilcekova@salvis.sk
Website: www.epdclarity.com

EPD verifier
Daniel Satola, Daniel Satola Consulting
Email: danielsatolaconsulting@gmail.com

Bibliography

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Environmental labels and declarations – General principles

ISO 14025:2010
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Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006
Environmental management - Life cycle assessment - Requirements and guidelines

EN 15804:2012+A2:2019
Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products

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 Concrete admixtures – Plasticisers and Superplasticisers

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

EPD Concrete admixtures – Plasticizers and Superplasticizers European Federation of Concrete Admixtures Associations a.i.s.b.l. (EFCA)

EUROSTAT, https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519174/default/table?lang=en
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 CO2 eq.	4,08E+02	2,08E+01	4,55E-01	8,96E+00	2,31E+01	7,31E+00	4,45E+00	-1,70E+01
ODP	kg CFC11 eq.	9,91E-06	3,32E-07	3,17E-09	1,09E-07	3,67E-07	8,92E-08	1,03E-07	-1,14E-07
AP	kg SO_2 eq.	9,58E-01	3,50E-02	1,02E-03	5,72E-02	5,52E-02	4,67E-02	2,36E-02	-8,14E-02
EP	kg PO_4 eq.	3,30E-01	8,84E-03	3,77E-04	1,34E-02	1,40E-02	1,09E-02	7,50E-03	-1,57E-02
POCP	kg C_2H_4 eq.	4,06E-02	3,70E-03	1,11E-04	4,29E-03	5,26E-03	3,50E-03	2,23E-03	-7,12E-03
ADP-M&M	kg Sb eq.	3,53E-03	6,81E-05	6,42E-07	3,14E-06	7,42E-05	2,56E-06	7,00E-06	-8,90E-05
ADP-fossil	MJ	2,41E+03	2,88E+02	2,38E+00	1,17E+02	3,19E+02	9,55E+01	1,09E+02	-1,83E+02

Environmental impacts – GWP-GHG

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - GHG	kg CO2e	4,12E+02	2,09E+01	2,96E-01	9,01E+00	2,32E+01	7,35E+00	4,50E+00	-1,71E+01

IYR/TJI: Global Warming Potential, greenhouse gases