Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804+A2:2019

Merika HT-PP plastic pipes for soil and waste discharge within building structures

Registration number:	EPD-Kiwa-EE-216011-EN
Issue date:	29-09-2025
Valid until:	29-09-2030
Declaration owner:	Meriser Oy
Publisher:	Kiwa-Ecobility Experts
Programme operator:	Kiwa-Ecobility Experts
Status:	verified

1 General information

1.1 PRODUCT

Merika HT-PP plastic pipes for soil and waste discharge within building structures

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-216011-EN

1.3 VALIDITY

Issue date: 29-09-2025

Valid until: 29-09-2030

1.4 PROGRAMME OPERATOR

Kiwa-Ecobility Experts
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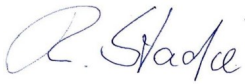
13355 Berlin
DE

Raoul Mancke

(Head of programme operations, Kiwa-Ecobility Experts)



Dr. Ronny Stadie

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Declaration owner: Meriser Oy

Address: Kauppatie 2, 29900 Merikarvia, Finland

E-mail: merika@meriser.fi

Website: www.meriser.fi

Production location: Meriser Oy

Address production location: Sulontie 1, 29900 Merikarvia, Finland

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804+A2:2019 serves as the core PCR.

☐ Internal ☒ External

Niklas van Dijk, Kiwa GmbH

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

Kiwa-EE GPI R.3.0 (2025) Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, SOP EE 1201_R.3.0 (03.06.2025)

Kiwa-EE GPI R.3.0 Annex B1 (2025) Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930 , SOP EE 1203_R.3.0 (03.06.2025)

prEN 16903:2024 Underground plastic piping systems outside buildings - Environmental product declarations - Product category rules according to EN 15804

1 General information

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2:2019. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2:2019 and ISO 14025.

1.10 CALCULATION BASIS

LCA method R<THINK: Ecobility Experts | EN15804+A2

LCA software*: Simapro 9.6

Characterization method: RETHINK characterization method (see references for more details)

LCA database profiles: ecoinvent (for version see references)

Version database: v3.19 (20250306)

** Simapro is used for calculating the characterized results of the Environmental profiles within R<THINK.*

1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'Merika HT-PP plastic pipes for soil and waste discharge within building structures' with the calculation identifier ReTHiNK-116011.

2 Product

2.1 PRODUCT DESCRIPTION

This EPD is based on the average environmental data for Merika HT-PP plastics pipes which are used in sewage systems within building structures. The pipes are straight, with or without sockets. The main raw material is mineral modified polypropylene (PP-MD). The products are single-layer, without coatings on the outer or inner surfaces. The material composition of all declared products is exactly same.

Product groups

Trade name of products	Product codes	General product description
Merika muhviputki PP-MD	M2410103, M2410113, M2410133, M2410163, M2410104, M2410114, M2410134, M2410154, M2410174, M2410106, M2410116, M2410136, M2410136P, M2410156, M2410156P, M2410166, M2410166P, M2410176, M2410176P, M2410196, M2410196P	Plastic pipes with socket, Diameters 50 mm, 75 mm and 110 mm, multiple lengths 250-6000 mm, made of PP-MD, color: grey.
Merika muhviton putki PP-MD	M2420033, M2410046_01, M2410044	Plastic pipe without socket, diameter 75 mm or 110 mm, length 3000 mm or 4000 mm, made of PP-MD, color: white or grey.

Material	Composition
Mineral modified polypropylene (PP-MD)	98 %
Additives	2 %

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

HT-PP plastic pipes are intended for use as waste and soil sewage systems in buildings. HT-PP pipes are resistant to heat, cold and chemicals.

Product group	Usage
Merika muhviputki PP-MD	Plastic piping systems for soil and waste discharge (low and high temperature) within building structures. Application area code is B or BD; intended for use above ground inside the building, or for components outside buildings fixed onto the wall and for the area under and within 1 m from the building where the pipes and fittings are buried in ground and are connected to the underground drainage and sewerage system.
Merika muhviton putki PP-MD	Plastic piping systems for soil and waste discharge (low and high temperature) within building structures. Application area code is BD; intended for use above ground inside the building, or for components outside buildings fixed onto the wall and for the area under and within 1 m from the building where the pipes and fittings are buried in ground and are connected to the underground drainage and sewerage system.

2 Product

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

According to the customer and relevant studies also mentioned in publication by Finnish Omakotiliitto Assosiation, the technical service life of plastic pipe sewers is estimated at 50 years.

USED RSL (YR) IN THIS LCA CALCULATION:

50

2.4 TECHNICAL DATA

Characteristic	Unit	Merika muhviputki PP-MD	Merika muhviton putki PP-MD
Pipe type	-	pipe with integral elastomeric socket	pipe without socket
Diameters	mm	50, 75 and 100	75 and 100
Lengths	mm	250-6000	4500
Ring stiffness	-	SN 8	SN 8
Application area	-	B or BD	BD
Pipe series	-	S16	S16
Bulk density	kg/m3	111	111

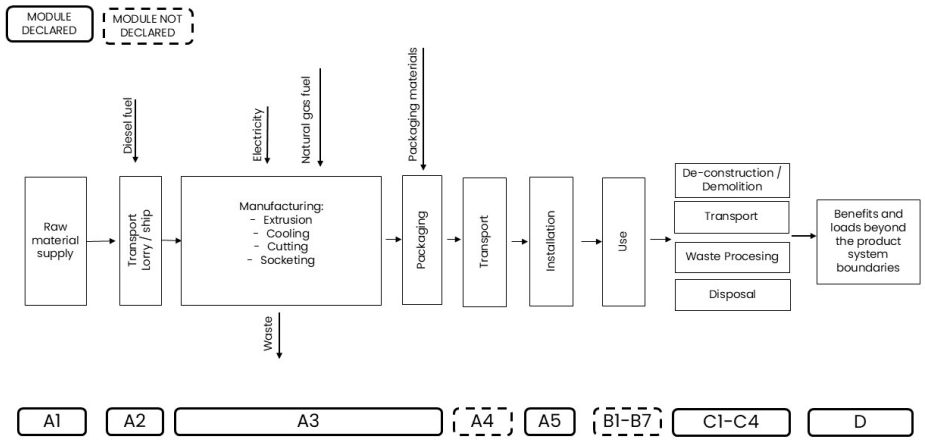
The pipes meet the requirements of normative document NPG/PS 102 and the specific rules SBC PS 102 . The products have been granted INSTA_CERT certificate 4111-03 issued by Kiwa Sertifiointi Oy member of INSTA-CERT

2.5 SUBSTANCES OF VERY HIGH CONCERN

The product does not contain any substances from the “Candidate List of Substances of Very High Concern” (SVHC) in amounts greater than 0,1% (1.000 ppm).

2.6 DESCRIPTION PRODUCTION PROCESS

The raw materials are transported to the factory by truck and ship, where they are stored in raw material silos. The raw materials are then directed and dosed into the extruder process, where they are melted, extruded, shaped, cooled, cut, and socketed. Finally, the finished products are packaged and stored.



2.7 CONSTRUCTION DESCRIPTION

This EPD does not cover the construction process stage (A4-A5) except the processing of the waste of the packaging materials in module (A5).

3 Calculation rules

3.1 DECLARED UNIT

One kilogram of plastic pipes

Declared unit: The declared unit is 1 kg of plastic pipes.

Reference unit: kilogram (kg)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	kg
Conversion factor to 1 kg	1.000000	kg

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with options EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN 15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

3.4 REPRESENTATIVENESS

This EPD is representative for Merika HT-PP plastic pipes for buildings, a product of Meriser Oy. The results of this EPD are representative for Finland.

3.5 CUT-OFF CRITERIA

Product stage (A1-A3)
All relevant input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output flows (e.g. production waste) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

3 Calculation rules

Excluded input flows:

- The integrated sealing rings of the socket pipes

Excluded processes are:

- Long-term emissions
- The manufacture of equipment used in production, buildings or any other capital goods;
- The transport of personnel to the plant;
- The transportation of personnel within the plant;
- Research and development activities
- The disposal of packaging waste

End of life stage (C1-C4)
All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

Benefits and loads beyond the system boundary (Module D)
All benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and/or useful energy carriers leaving the product system are considered in this LCA.

3.6 ALLOCATION

Allocation has not been applied in this LCA.

3.7 DATA COLLECTION & REFERENCE PERIOD

All process-specific data was collected for the operating year from 1st of Jan to 31st Dec, 2023. The quantities of raw materials, consumables and supplies used and the energy consumption were recorded and averaged over the entire 2023 operating year. The reference area is Finland.

3.8 ESTIMATES AND ASSUMPTIONS

For the deconstruction of the product (module C1) a scenario was used that reflects an average deconstruction process. The weight of the raw material was set in relation to the hourly deconstruction potential of the construction machine. The value of the environmental impact was taken from a Nationale Milieudatabase (NMD) dataset stored in R<THINK. The NMD is the Netherlands' national environmental database, providing standardized data for assessing the environmental impact of building materials. The assumptions regarding the deconstruction potential of the construction machine were taken from a study, carried out by the NMD, listed in the references. The scenario was determined using LCA Rapportage categorie 3 data Nationale Milieudatabase - Hoofdstuk 25 Leidingwerken. In Table 12 provided data for PE pipes per meter (C1). The estimate is based on a calculation using a pipe size that represents the majority of the production of the declared products.

Based on EN 15804+A2, the end-of-life system boundary of the product system is set, where outputs of the system under study, have reached the end-of-waste state. Thus, waste processing of the materials flows during any module of the product system (e.g. the production stage, end-of-life stage) are included up to the system boundary of the respective module. A product reaches its end-of-waste state when there is a market for the recovered product and when the recovered product fulfils the technical requirements for the specific purposes and meets the legislation and standards applicable to the product. Therefore producers of waste bear the burden of the waste treatment, based on the "polluter pays" principle. Consumers of recycled products receive them burden-free.

The scenario used in the disposal phase is as follows: An existing pipework system will be dismantled and replaced with a new one. The scenarios included are currently in use and are representative for one of the most likely scenario alternatives.

The module A5 is not declared completely, it includes only processing of the waste of the packaging materials to achieve GWP biogenic balance.

3.9 DATA QUALITY

The quality level of geographical representativeness can be considered "good". The quality level of technical representativeness can be considered "good". The time representativeness can also be regarded as "good".

The overall data quality for this EPD can, therefore, be described as "good". All relevant process-specific data were collected during data collection.

In all possible cases, primary data from customers was used, which has very good data quality because it comes directly from the source. In addition, secondary data from the EcoInvent database (2022, version 3.9.1) was used when no primary data could be supplied. The database is checked regularly and, therefore, meets the requirements of EN ISO 14040/44 (background data not older than 10 years). The background data meets the requirements of EN 15804+A2. The quantities of raw materials, consumables and supplies..

3 Calculation rules

3.10 POWER MIX

At least 15% of the electricity used is from the company`s own solar power. The used dataset is (ei3.9.1) [E0001-8850] self-produced electricity is modelled for this EPD and it is not publicly available. The dataset is based on ecoinvent dataset “Electricity, low voltage (FI) | electricity production, photovoltaic, 3kWp slanted-roof installation, single-Si, panel, mounted | Cut-off, U”. The GWP-total of the solar power in applied electricity mix is 0.118 kg CO2 eqv. per kWh.

The remaining electricity used has been modelled as residual mix for Finland, the market-based approach. The used dataset (ei3.9.1) Electricity (FI) - low voltage (max 1kV), residual mix". The GWP-total of the applied electricity mix is 0.406 kg CO2 eqv. per kWh.

4 Scenarios and additional technical information

4.1 ASSEMBLY (A5)

The following information describes the scenarios for flows entering the system and flows leaving the system at module A5.

FLOWS ENTERING THE SYSTEM

There are no significant environment impacts as a result of materials or energy used in the construction stage (A5).

FLOWS LEAVING THE SYSTEM

The following output flows leaving the system at module A5 are assumed.

Description	Value	Unit
Output materials as result of loss during construction	0	%
Output materials as result of waste processing of materials used for installation/assembly at the building site	0.000	kg
Output materials as result of waste processing of used packaging	0.067	kg

4.2 DE-CONSTRUCTION, DEMOLITION (C1)

The following information describes the scenario for demolition at end of life.

Description	Amount	Unit
(ei3.9.1) Hydraulic excavator (average) [NMD generic]	0.003	hr

4.3 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
plastics, civil constructions (small water piping and sewage) (based on NMD ID 44)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	0
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	0

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.

4 Scenarios and additional technical information

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4.4 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables. First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

Waste Scenario	Region	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
plastics, civil constructions (small water piping and sewage) (based on NMD ID 44)	NL	0	0	20	80	0
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	NL	0	10	85	5	0

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
plastics, civil constructions (small water piping and sewage) (based on NMD ID 44)	0.000	0.000	0.196	0.784	0.000
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.000	0.002	0.017	0.001	0.000
Total	**0.000**	**0.002**	**0.213**	**0.785**	**0.000**

4.5 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
plastics, civil constructions (small water piping and sewage) (based on NMD ID 44)	0.784	5.048
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.001	0.433
Total	**0.785**	**5.482**

5 Results

For the impact assessment long-term emissions (>100 years) are not considered. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER KILOGRAM

CORE ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	1.50E+0	1.91E-1	4.42E-1	2.14E+0	1.28E-1	1.68E-1	1.06E-2	8.65E-1	2.55E-4	-1.74E+0
GWP-f	kg CO_2 eq.	1.50E+0	1.91E-1	5.51E-1	2.24E+0	1.80E-2	1.68E-1	1.06E-2	8.64E-1	2.55E-4	-1.74E+0
GWP-b	kg CO_2 eq.	2.16E-3	5.76E-5	-1.10E-1	-1.07E-1	1.10E-1	2.34E-5	3.45E-6	3.28E-4	1.41E-7	-2.35E-3
GWP-luluc	kg CO_2 eq.	3.74E-4	1.01E-4	6.68E-4	1.14E-3	6.76E-6	1.89E-5	3.78E-5	2.47E-4	1.81E-8	-5.04E-4
ODP	kg CFC 11 eq.	7.85E-9	3.96E-9	1.07E-8	2.25E-8	5.01E-10	2.67E-9	1.89E-10	1.83E-8	5.53E-13	-2.36E-8
AP	mol H+ eq.	5.33E-3	1.40E-3	2.22E-3	8.95E-3	2.99E-5	1.56E-3	5.07E-5	1.02E-3	1.72E-7	-5.60E-3
EP-fw	kg P eq.	1.84E-5	1.43E-6	2.35E-5	4.33E-5	7.28E-8	6.07E-7	1.05E-7	6.64E-6	3.62E-10	-2.25E-5
EP-m	kg N eq.	9.07E-4	4.23E-4	4.20E-4	1.75E-3	1.23E-5	7.21E-4	1.93E-5	2.97E-4	1.13E-7	-1.03E-3
EP-T	mol N eq.	9.93E-3	4.60E-3	4.80E-3	1.93E-2	1.36E-4	7.85E-3	2.06E-4	3.22E-3	6.77E-7	-1.15E-2
POCP	kg NMVOC eq.	4.96E-3	1.51E-3	1.60E-3	8.07E-3	3.88E-5	2.32E-3	7.02E-5	1.15E-3	2.92E-7	-5.77E-3
ADP-mm	kg Sb-eq.	6.55E-6	5.56E-7	6.09E-6	1.32E-5	1.31E-8	5.87E-8	3.32E-8	1.30E-6	5.00E-11	-6.82E-6
ADP-f	MJ	5.68E+1	2.66E+0	1.37E+1	7.31E+1	3.89E-2	2.20E+0	1.52E-1	3.32E+0	5.14E-4	-5.92E+1
WDP	m3 world eq.	1.08E+0	1.03E-2	1.10E-1	1.20E+0	1.05E-3	4.74E-3	8.29E-4	6.22E-2	2.16E-5	-1.27E+0

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratosperic ozon layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

5 Results

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A5	C1	C2	C3	C4	D
PM	disease incidence	5.89E-8	1.50E-8	1.68E-8	9.07E-8	3.39E-10	4.34E-8	1.05E-9	1.87E-8	3.62E-12	-5.70E-8
IR	kBq U235 eq.	2.53E-2	1.23E-3	2.63E-1	2.90E-1	6.29E-5	4.50E-4	5.92E-5	5.05E-3	2.83E-7	-3.30E-2
ETP-fw	CTUe	1.90E+0	1.32E+0	2.02E+0	5.25E+0	2.05E-1	1.05E+0	1.12E-1	7.74E+0	3.84E-4	-1.97E+0
HTP-c	CTUh	2.82E-10	9.48E-11	2.67E-10	6.43E-10	1.88E-11	5.15E-11	5.61E-12	3.98E-10	1.41E-14	-3.92E-10
HTP-nc	CTUh	7.48E-9	1.84E-9	8.81E-9	1.81E-8	7.73E-11	3.58E-10	1.22E-10	3.65E-9	5.52E-13	-8.32E-9
SQP	Pt	1.44E+0	1.42E+0	1.49E+1	1.78E+1	2.52E-2	1.48E-1	1.20E-1	2.27E+0	1.16E-3	-3.62E+0

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality idex (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2

5 Results

ILCD classification	Indicator	Disclaimer
	Potential Soil quality index (SQP)	2

Disclaimer 1 – 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.

Disclaimer 2 – 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.

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1-A3	A5	C1	C2	C3	C4	D
PERE	MJ	8.16E-1	3.84E-2	2.89E+0	3.74E+0	1.98E-3	1.25E-2	2.15E-3	1.93E-1	9.51E-6	-1.50E+0
PERM	MJ	0.00E+0	0.00E+0	9.23E-1	9.23E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	8.16E-1	3.84E-2	3.81E+0	4.66E+0	1.98E-3	1.25E-2	2.15E-3	1.93E-1	9.51E-6	-1.50E+0
PENRE	MJ	3.10E+1	2.66E+0	1.55E+1	4.91E+1	3.89E-2	2.20E+0	1.52E-1	3.32E+0	5.14E-4	-2.59E+1
PENRM	MJ	2.58E+1	0.00E+0	-1.77E+0	2.40E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-3.33E+1
PENRT	MJ	5.68E+1	2.66E+0	1.37E+1	7.31E+1	3.89E-2	2.20E+0	1.52E-1	3.32E+0	5.14E-4	-5.92E+1
SM	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m^3	1.44E-2	3.59E-4	1.06E-2	2.54E-2	5.33E-5	1.73E-4	3.67E-5	1.86E-3	5.27E-7	-1.71E-2

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

5 Results

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	A5	C1	C2	C3	C4	D
HWD	Kg	1.42E-5	1.65E-5	3.20E-5	6.27E-5	1.98E-7	1.48E-5	9.68E-7	1.18E-5	2.54E-9	-3.29E-5
NHWD	Kg	4.97E-2	1.15E-1	8.32E-2	2.48E-1	6.56E-2	3.15E-3	1.00E-2	3.68E-1	2.01E-3	-5.45E-2
RWD	Kg	2.00E-5	7.89E-7	1.25E-4	1.46E-4	4.84E-8	2.41E-7	3.47E-8	3.68E-6	1.73E-10	-2.61E-5

HWD=Hazardous waste disposed | **NHWD**=Non-hazardous waste disposed | **RWD**=Radioactive waste disposed

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	A5	C1	C2	C3	C4	D
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	1.28E-1	1.28E-1	3.35E-3	0.00E+0	0.00E+0	7.85E-1	0.00E+0	0.00E+0
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	1.75E-2	1.75E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.02E+0
EEE	MJ	0.00E+0	0.00E+0	1.01E-2	1.01E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.17E+0

CRU=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EET**=Exported Energy, Thermic | **EEE**=Exported Energy, Electric

5 Results

5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER KILOGRAM

BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per kilogram:

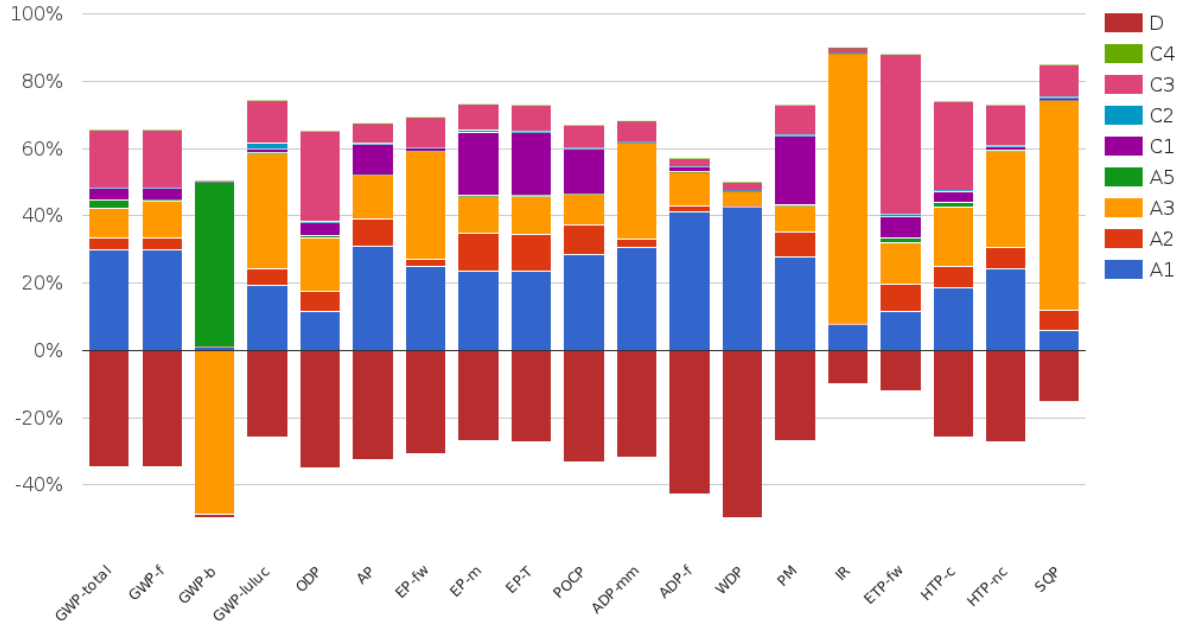
Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0.03	kg C

UPTAKE OF BIOGENIC CARBON DIOXIDE

The following amount of carbon dioxide uptake is taken into account. Related uptake and release of carbon dioxide in downstream processes are not taken into account in this number although they do appear in the presented results. One kilogram of biogenic Carbon content is equivalent to 44/12 kg of biogenic carbon dioxide uptake.

Uptake Biogenic Carbon dioxide	Amount	Unit
Packaging	0.11	kg CO2 (biogenic)

6 Interpretation of results



As shown in the figure, the raw-material supply (A1) dominates in most environmental core indicators. Energy consumption required for production (A3) is also a significant cause of environmental impacts. However a positive impact is obtained from solar power. The product´s recycling potential as a secondary material is seen as positive environmental impacts in module D. The majority of the CO2 emissions within the impact category GWP-biogenic originate from the packaging.

7 References

ISO 14040
ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044
ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14044:2006

ISO 14025
ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804+A2
EN 15804:2012+A2:2019/AC:2021, Sustainability of Buildings - Environmental Product Declarations - Framework Development Rules by Product Category

Kiwa-EE GPI R.3.0
Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, SOP EE 1203_R. 3.0 (03.06.2025)

Kiwa-EE GPI R.3.0 Annex B1
Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930, SOP EE 1203_R. 3.0 (03.06.2025)

Product specific PCR
prEN 16903:2024 Underground plastic piping systems outside buildings - Environmental product declarations - Product category rules according to EN 15804

Ecoinvent
ecoinvent Version 3.9.1 (December 2022)

R<THINK characterization method
ecoinvent 3.9.1: EN 15804+A1 indicators (CML-IA Baseline v3.09), EN 15804+A2 indicators (EF 3.1)

NPG/PS 102
Nordic Pipe Group Product Specification NPG/PS 102 October 2021 Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Polypropylene with mineral modifiers (PP-MD): Specifications for pipes, fittings and the system

SBC PS 102
INSTA-CERT SBC PS 102 January 2022 supersedes version June 2019 Specific rules for Nordic certification in accordance with NPG/PS 102 Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure – Polypropylene with mineral modifiers (PP-MD) – Specifications for pipes, fittings and the system

7 References

LCA Rapportage categorie 3 data Nationale Milieudatabase
Nationale Milieudatabase, LCA Rapportage categorie 3 data Nationale Milieudatabase 23 Drainage, Versie 1.4 - Aanvulling polyesterbeton lijngoot (16.04.2022)

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