epddanmark

ECO PLATFORM EPD VERIFIED

Owner: Golan Pipes Scandinavia A/S
No.: MD-23059-EN
Issued: 18-12-2024
Valid to: 18-12-2029

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration
Golan Pipes Scandinavia A/S
Lollandsvej 16,
DK-5500 Middelfart

CVR: 21829641

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product
Pipe

Number of declared datasets/product variations: 6
- Floor Heating (3 layers)
- Floor Heating (5 layers)
- Universal
- Corrugated
- Insulation
- Snow Melting

Production sites
Lollandsvej 16 & 35,
DK-5500 Middelfart (Denmark)

Use of Guarantees of Origin
☐ No certificates used
☒ Electricity covered by GO
☐ Biogas covered by GO

Declared unit
1 m

Period of production site data (A3)
1/9-2023 - 31/3-2024

EPD version
Version 1.0.

Issued: 18-12-2024
Valid to: 18-12-2029

Basis of calculation
This EPD is developed and verified in accordance with the European standard EN 15804+A2.

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 data-sets 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 ISO 14025

☐ internal ☒ external

Third party verifier:

Kim Christiansen

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	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, 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	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Product information

Product description

The product materials are listed below.

Floor Heating (3 layers)		
Material	**Amount [kg]**	**Weight-% of declared product**
PE-RT	0.104	93.7
LLDPE	0.003	2.7
EVOH	0.004	3.6
TOTAL	**0.111**	**100%**

Floor Heating (5 layers)		
Material	**Amount [kg]**	**Weight-% of declared product**
PE-RT	0.102	91.07
LLDPE	0.006	5.36
EVOH	0.004	3.57
TOTAL	**0.112**	**100%**

Universal		
Material	**Amount [kg]**	**Weight-% of declared product**
PE-RT	0.159	91.4
LLDPE	0.005	2.9
EVOH	0.010	5.7
TOTAL	**0.174**	**100%**

Corrugated		
Material	**Amount [kg]**	**Weight-% of declared product**
HDPE	0.105	92.9
LDPE	0.005	4.4
Colour	0.003	2.7
TOTAL	**0.113**	**100%**

Insulation		
Material	**Amount [kg]**	**Weight-% of declared product**
LDPE	0.094	97.92
Stearamide	0.001	1.04
Colour	0.001	1.04
TOTAL	**0.096**	**100%**

Snow Melting		
Material	**Amount [kg]**	**Weight-% of declared product**
PE-RT	0.151	98.1
Colour	0.003	1.9
TOTAL	**0.154**	**100%**

Product packaging

Sales packaging is listed below.

Material	Amount [kg]	Weight-% of sales packaging
PE Film	1.30E-04	8.5
Pallet	1.30E-05	0.9
Cardboard Box	1.38E-03	90.6
TOTAL	**1.52E-03**	**100%**

The sales packaging is identical for all six product variations.

Representativity

This EPD covers the declared unit of 1 m of pipe in six product variations produced by Golan Pipes Scandinavia in Middelfart. Product-specific data is from the period between 1/9-2023 - 31/3-2024.

Background data is from the cut-off by classification ecoinvent database (v.3.9.1). Generally, the used background datasets are of high quality and are only a couple of years old.

Hazardous substances

The product variations do not contain substances listed on the "Candidate List of substances of very high concern for Authorisation" in quantities exceeding 0,1% by weight.

http://echa.europa.eu/candidate-list-table

Product use

The floor heating pipe in both three and five layers is used to heat houses. The universal pipe is also used to heat houses but can also be used in water installations. The corrugated pipe is used in pipe in pipe installations where it acts as support and ensures that the installations are replaceable. The insulation pipe is used to insulate. The snow melting pipe is used in outdoor ramps to melt ice.

Essential characteristics

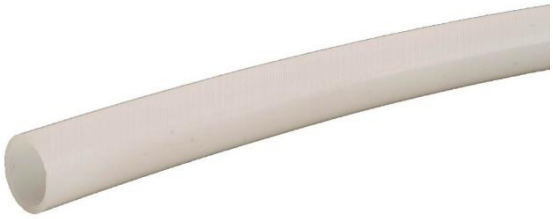
Technical information can be obtained by contacting Golan Pipes Scandinavia.

https://golan.dk/

Reference Service Life (RSL)

Not defined.

Pictures of the six product variations



From top right: Floor Heating, Corrugated, Insulation, Snow Melting and Universal.

Floor Heating (3 layers) and Floor Heating (5 layers) do not visually have any differences which is why there is only one picture illustrating these two product variations.

LCA background

Declared unit

The LCI and LCIA results in this EPD cover the declared unit of 1 m of pipe in six product variations.

	Value	Unit	Dimensions
Declared unit	1	m	Diameter x thickness
Floor Heating (3 layers)	0.111	kg/m	20x2,0 mm
Floor Heating (5 layers)	0.112	kg/m	20x2,0 mm
Universal	0.174	kg/m	22x3,0 mm
Corrugated	0.113	kg/m	28/34 mm
Insulation	0.096	kg/m	25x2,3 mm
Snow Melting	0.154	kg/m	48x13 mm

Functional unit

Not defined.

PCR

This EPD is developed in accordance with the core rules for the product category of construction products in EN 15804+A2.

Energy modelling principles

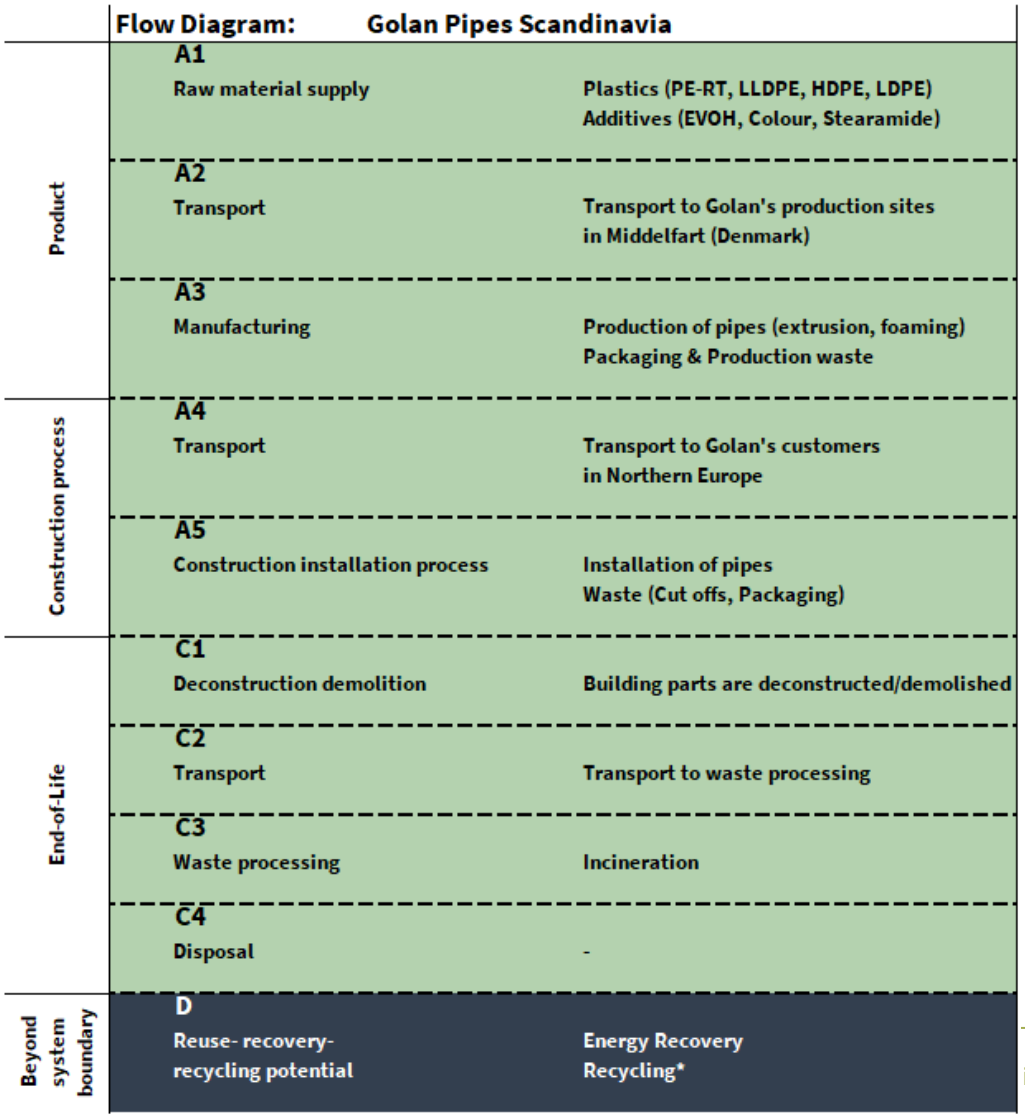
Golan Pipes Scandinavia purchases guarantees of origin on Norwegian hydroelectric power to cover the production in Middelfart. The LCA study is therefore modelled as described in the following.

The foreground system is modelled using electricity, produced by hydropower in Norway, see the table below for further information.

Dataset	EF	Unit
Electricity, Norway, hydro, pumped storage	0.040	kg CO_2e/kWh

The background system is modelled using electricity grid mixes both upstream and downstream.

Flowdiagram



System boundary

This EPD is based on a cradle-to-gate LCA study with options, modules C1-C4 and module D in which 100 weight-% has been accounted for.

There are no known excluded processes.

Product stage (A1-3) includes:

A1 - Extraction and processing of raw materials

A2 - Transport to the production site

A3 - Manufacturing processes

To produce the product variations, Golan Pipes Scandinavia purchases different types of plastic granulates and additives from producers located worldwide. These raw materials are transported to Golan Pipes Scandinavia's production facilities in Middelfart (Denmark). Except for the insulation pipe that is produced by a foaming process, the product variations are produced by an extrusion process. After production, the pipes are all packaged, ready for transport to customers.

The LCA results are declared in aggregated form, meaning A1-A3 is declared as one module.

Construction process stage (A4-5) includes:

The product variations are sold to customers in Northern Europe. Golan Pipes Scandinavia provided an overview of its customers' geographical locations in the data collection period. Module A4 is based on this overview.

The installation method of the product variations varies depending on intended use, construction type and customer needs (among other aspects). A diesel consumption of 0,0014 L/kg is assumed to be representative for the different installation methods that the product variations have. Golan Pipe Scandinavia estimates that its customers will generate cut offs during installation. These are accounted for in module A5.

Waste processing of sales packaging is also accounted for in module A5.

Use stage (B1-B7) includes:

The use stage is not declared.

End-of-Life (C1-C4) includes:

The End-of-Life is modelled by assuming that the product variations are collected with mixed construction waste and incinerated. A percentage is expected to be reused/recycled. This percentage is however unknown.

Transport is modelled by assuming a distance of 100 km to incineration in Northern Europe.

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

Module D includes benefits from the avoided production of average European electricity and heat. Both the product variations and sales packaging (pallets) are incinerated. Module D also includes benefits from the avoided production of virgin polyethylene granulates and virgin cardboard as the remaining sales packaging (film and boxes) is recycled.

LCA results

Floor Heating (3 layers)

ENVIRONMENTAL IMPACTS PER 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	3.01E-01	6.15E-03	6.10E-02	5.58E-07	1.55E-02	2.65E-01	0.00E+00	-1.07E-01
GWP-fossil	[kg CO_2 eq.]	3.03E-01	6.14E-03	5.81E-02	5.58E-07	1.55E-02	2.65E-01	0.00E+00	-1.07E-01
GWP-biogenic	[kg CO_2 eq.]	-2.40E-03	5.59E-06	2.87E-03	1.28E-10	2.82E-06	3.62E-05	0.00E+00	-2.46E-06
GWP-luluc	[kg CO_2 eq.]	1.69E-04	3.04E-06	1.75E-05	6.28E-11	1.97E-06	1.32E-06	0.00E+00	-1.27E-04
ODP	[kg CFC 11 eq.]	1.85E-09	1.34E-10	2.40E-10	8.88E-15	2.43E-10	2.97E-10	0.00E+00	-1.25E-09
AP	[mol H^+ eq.]	1.84E-03	1.44E-05	1.92E-04	5.17E-09	8.49E-05	5.77E-05	0.00E+00	-7.06E-04
EP-freshwater	[kg P eq.]	5.28E-05	4.35E-07	5.42E-06	1.71E-11	2.90E-07	5.75E-07	0.00E+00	-6.60E-05
EP-marine	[kg N eq.]	3.90E-04	3.64E-06	4.36E-05	2.40E-09	3.69E-05	3.39E-05	0.00E+00	-1.03E-04
EP-terrestrial	[mol N eq.]	4.19E-03	3.73E-05	4.60E-04	2.61E-08	3.99E-04	2.88E-04	0.00E+00	-1.02E-03
POCP	[kg NMVOC eq.]	1.51E-03	2.15E-05	1.65E-04	7.72E-09	1.56E-04	7.20E-05	0.00E+00	-3.22E-04
ADPm[1]	[kg Sb eq.]	1.12E-06	2.00E-08	1.16E-07	1.95E-13	9.96E-09	9.87E-09	0.00E+00	-1.06E-07
ADPf[1]	[MJ]	8.90E+00	8.72E-02	9.12E-01	7.31E-06	2.01E-01	3.90E-02	0.00E+00	-1.66E+00
WDP[1]	[m^3 world eq. deprived]	2.08E-02	3.59E-04	2.29E-03	1.58E-08	3.80E-04	1.41E-03	0.00E+00	-1.62E-02
Caption	GWP-total = Global 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 = Acidification; 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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	1.21E-08	4.56E-10	1.36E-09	1.44E-13	2.03E-09	2.57E-10	0.00E+00	-6.10E-09
IRP[2]	[kBq U235 eq.]	6.60E-03	1.18E-04	6.96E-04	3.47E-09	6.64E-05	1.35E-04	0.00E+00	-2.89E-02
ETP-fw[1]	[CTUe]	1.80E+00	8.62E-02	3.10E-01	6.99E-06	1.96E-01	1.13E+00	0.00E+00	-6.18E-01
HTP-c[1]	[CTUh]	1.68E-10	5.60E-12	2.08E-11	3.42E-16	4.57E-12	2.98E-11	0.00E+00	-6.24E-11
HTP-nc[1]	[CTUh]	3.81E-09	1.23E-10	5.28E-10	2.38E-15	7.90E-11	1.26E-09	0.00E+00	-1.82E-09
SQP[1]	-	4.73E-01	5.25E-02	5.66E-02	4.92E-07	2.24E-02	1.09E-02	0.00E+00	-7.98E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation - human health; ETP-fw = Ecotoxicity - 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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	1.50E-01	1.37E-03	1.54E-02	4.16E-08	7.95E-04	2.28E-03	0.00E+00	-3.27E-01
PERM	[MJ]	2.09E-01	0.00E+00	-2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	3.59E-01	1.37E-03	-1.94E-01	4.16E-08	7.95E-04	2.28E-03	0.00E+00	-3.27E-01
PENRE	[MJ]	8.90E+00	8.72E-02	9.12E-01	7.31E-06	2.01E-01	3.90E-02	0.00E+00	-1.66E+00
PENRM	[MJ]	4.74E+00	0.00E+00	-7.91E-03	0.00E+00	0.00E+00	-1.64E-01	0.00E+00	0.00E+00
PENRT	[MJ]	1.36E+01	8.72E-02	9.04E-01	7.31E-06	2.01E-01	-1.25E-01	0.00E+00	-1.66E+00
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
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
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
FW	[m^3]	6.70E-04	1.25E-05	1.00E-04	5.74E-10	1.35E-05	3.08E-04	0.00E+00	-1.20E-03
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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	6.00E-06	5.54E-07	7.83E-07	4.92E-11	1.36E-06	6.87E-07	0.00E+00	-2.44E-06
NHWD	[kg]	1.76E-02	4.31E-03	2.77E-03	1.05E-08	1.02E-03	3.65E-03	0.00E+00	-4.73E-03
RWD	[kg]	1.61E-06	2.86E-08	1.70E-07	8.01E-13	1.47E-08	3.35E-08	0.00E+00	-7.40E-06
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]	9.05E-04	0.00E+00	1.50E-02	0.00E+00	0.00E+00	0.00E+00	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
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E-01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.58E-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 1 m OF PIPE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	2.87E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Floor Heating (5 layers)

ENVIRONMENTAL IMPACTS PER 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	3.05E-01	6.15E-03	6.14E-02	5.58E-07	1.55E-02	2.65E-01	0.00E+00	-1.07E-01
GWP-fossil	[kg CO_2 eq.]	3.07E-01	6.14E-03	5.86E-02	5.58E-07	1.55E-02	2.65E-01	0.00E+00	-1.07E-01
GWP-biogenic	[kg CO_2 eq.]	-2.43E-03	5.59E-06	2.87E-03	1.28E-10	2.82E-06	3.62E-05	0.00E+00	-5.64E-05
GWP-luluc	[kg CO_2 eq.]	2.05E-04	3.04E-06	2.11E-05	6.28E-11	1.97E-06	1.32E-06	0.00E+00	-1.26E-04
ODP	[kg CFC 11 eq.]	2.09E-09	1.34E-10	2.64E-10	8.88E-15	2.43E-10	2.97E-10	0.00E+00	-1.25E-09
AP	[mol H^+ eq.]	1.86E-03	1.44E-05	1.94E-04	5.17E-09	8.49E-05	5.77E-05	0.00E+00	-7.05E-04
EP-freshwater	[kg P eq.]	5.40E-05	4.35E-07	5.54E-06	1.71E-11	2.90E-07	5.75E-07	0.00E+00	-6.60E-05
EP-marine	[kg N eq.]	3.97E-04	3.64E-06	4.43E-05	2.40E-09	3.69E-05	3.39E-05	0.00E+00	-1.03E-04
EP-terrestrial	[mol N eq.]	4.27E-03	3.73E-05	4.68E-04	2.61E-08	3.99E-04	2.88E-04	0.00E+00	-1.02E-03
POCP	[kg NMVOC eq.]	1.53E-03	2.15E-05	1.67E-04	7.72E-09	1.56E-04	7.20E-05	0.00E+00	-3.22E-04
ADPm[1]	[kg Sb eq.]	1.13E-06	2.00E-08	1.18E-07	1.95E-13	9.96E-09	9.87E-09	0.00E+00	-1.06E-07
ADPf[1]	[MJ]	8.99E+00	8.72E-02	9.21E-01	7.31E-06	2.01E-01	3.90E-02	0.00E+00	-1.65E+00
WDP[1]	[m^3 world eq. deprived]	2.17E-02	3.59E-04	2.38E-03	1.58E-08	3.80E-04	1.41E-03	0.00E+00	-1.61E-02
Caption	GWP-total = Global 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 = Acidification; 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								
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ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	1.23E-08	4.56E-10	1.38E-09	1.44E-13	2.03E-09	2.57E-10	0.00E+00	-6.09E-09
IRP[2]	[kBq U235 eq.]	1.11E-02	1.18E-04	1.15E-03	3.47E-09	6.64E-05	1.35E-04	0.00E+00	-2.89E-02
ETP-fw[1]	[CTUe]	1.82E+00	8.62E-02	3.12E-01	6.99E-06	1.96E-01	1.13E+00	0.00E+00	-6.17E-01
HTP-c[1]	[CTUh]	1.76E-10	5.60E-12	2.17E-11	3.42E-16	4.57E-12	2.98E-11	0.00E+00	-6.24E-11
HTP-nc[1]	[CTUh]	3.88E-09	1.23E-10	5.34E-10	2.38E-15	7.90E-11	1.26E-09	0.00E+00	-1.82E-09
SQP[1]	-	4.26E-01	5.25E-02	5.20E-02	4.92E-07	2.24E-02	1.09E-02	0.00E+00	-7.91E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation - human health; ETP-fw = Ecotoxicity - 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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	8.17E-01	1.37E-03	8.22E-02	4.16E-08	7.95E-04	2.28E-03	0.00E+00	-3.25E-01
PERM	[MJ]	2.09E-01	0.00E+00	-2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.03E+00	1.37E-03	-1.27E-01	4.16E-08	7.95E-04	2.28E-03	0.00E+00	-3.25E-01
PENRE	[MJ]	8.99E+00	8.72E-02	9.20E-01	7.31E-06	2.01E-01	3.90E-02	0.00E+00	-1.65E+00
PENRM	[MJ]	4.70E+00	0.00E+00	-7.91E-03	0.00E+00	0.00E+00	-4.69E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.37E+01	8.72E-02	9.13E-01	7.31E-06	2.01E-01	-4.65E+00	0.00E+00	-1.65E+00
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
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
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
FW	[m^3]	5.32E-03	1.25E-05	5.65E-04	5.74E-10	1.35E-05	3.08E-04	0.00E+00	-1.20E-03
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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	6.16E-06	5.54E-07	7.99E-07	4.92E-11	1.36E-06	6.87E-07	0.00E+00	-2.44E-06
NHWD	[kg]	2.23E-02	4.31E-03	3.25E-03	1.05E-08	1.02E-03	3.65E-03	0.00E+00	-4.72E-03
RWD	[kg]	2.60E-06	2.86E-08	2.68E-07	8.01E-13	1.47E-08	3.35E-08	0.00E+00	-7.40E-06
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]	9.20E-04	0.00E+00	1.50E-02	0.00E+00	0.00E+00	0.00E+00	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
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.36E-01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.50E-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 1 m OF PIPE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	2.87E-03
Note		1 kg biogenic carbon is equivalent to 44/12 kg of CO_2

Universal

ENVIRONMENTAL IMPACTS PER 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	4.81E-01	9.56E-03	9.42E-02	8.67E-07	2.41E-02	4.12E-01	0.00E+00	-1.64E-01
GWP-fossil	[kg CO_2 eq.]	4.84E-01	9.55E-03	9.13E-02	8.67E-07	2.41E-02	4.12E-01	0.00E+00	-1.65E-01
GWP-biogenic	[kg CO_2 eq.]	-2.81E-03	8.68E-06	2.87E-03	1.99E-10	4.39E-06	5.63E-05	0.00E+00	1.74E-03
GWP-luluc	[kg CO_2 eq.]	3.04E-04	4.73E-06	3.13E-05	9.76E-11	3.05E-06	2.06E-06	0.00E+00	-2.04E-04
ODP	[kg CFC 11 eq.]	3.34E-09	2.08E-10	4.14E-10	1.38E-14	3.77E-10	4.61E-10	0.00E+00	-1.96E-09
AP	[mol H^+ eq.]	2.29E-03	2.24E-05	2.43E-04	8.04E-09	1.32E-04	8.96E-05	0.00E+00	-1.10E-03
EP-freshwater	[kg P eq.]	8.56E-05	6.76E-07	8.76E-06	2.66E-11	4.50E-07	8.94E-07	0.00E+00	-1.03E-04
EP-marine	[kg N eq.]	4.67E-04	5.66E-06	5.36E-05	3.73E-09	5.73E-05	5.27E-05	0.00E+00	-1.61E-04
EP-terrestrial	[mol N eq.]	4.92E-03	5.79E-05	5.54E-04	4.05E-08	6.19E-04	4.47E-04	0.00E+00	-1.59E-03
POCP	[kg NMVOC eq.]	1.98E-03	3.35E-05	2.17E-04	1.20E-08	2.42E-04	1.12E-04	0.00E+00	-4.98E-04
ADPm[1]	[kg Sb eq.]	1.84E-06	3.11E-08	1.90E-07	3.03E-13	1.55E-08	1.53E-08	0.00E+00	-1.60E-07
ADPf[1]	[MJ]	1.40E+01	1.35E-01	1.43E+00	1.14E-05	3.13E-01	6.06E-02	0.00E+00	-2.51E+00
WDP[1]	[m^3 world eq. deprived]	3.90E-02	5.57E-04	4.20E-03	2.45E-08	5.90E-04	2.19E-03	0.00E+00	-2.32E-02
Caption	GWP-total = Global 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 = Acidification; 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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	2.09E-08	7.09E-10	2.28E-09	2.24E-13	3.15E-09	3.99E-10	0.00E+00	-9.54E-09
IRP[2]	[kBq U235 eq.]	1.10E-02	1.83E-04	1.15E-03	5.39E-09	1.03E-04	2.10E-04	0.00E+00	-4.49E-02
ETP-fw[1]	[CTUe]	3.04E+00	1.34E-01	5.03E-01	1.09E-05	3.05E-01	1.76E+00	0.00E+00	-9.66E-01
HTP-c[1]	[CTUh]	2.83E-10	8.70E-12	3.43E-11	5.31E-16	7.09E-12	4.64E-11	0.00E+00	-9.74E-11
HTP-nc[1]	[CTUh]	6.63E-09	1.92E-10	8.87E-10	3.69E-15	1.23E-10	1.96E-09	0.00E+00	-2.83E-09
SQP[1]	-	1.04E+00	8.15E-02	1.17E-01	7.65E-07	3.48E-02	1.69E-02	0.00E+00	-1.45E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation - human health; ETP-fw = Ecotoxicity - 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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	2.67E-01	2.13E-03	2.74E-02	6.47E-08	1.24E-03	3.54E-03	0.00E+00	-5.44E-01
PERM	[MJ]	2.09E-01	0.00E+00	-2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	4.76E-01	2.13E-03	-1.82E-01	6.47E-08	1.24E-03	3.54E-03	0.00E+00	-5.44E-01
PENRE	[MJ]	1.40E+01	1.35E-01	1.43E+00	1.14E-05	3.13E-01	6.06E-02	0.00E+00	-2.51E+00
PENRM	[MJ]	7.33E+00	0.00E+00	-7.91E-03	0.00E+00	0.00E+00	-7.32E+00	0.00E+00	0.00E+00
PENRT	[MJ]	2.13E+01	1.35E-01	1.42E+00	1.14E-05	3.13E-01	-7.26E+00	0.00E+00	-2.51E+00
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
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
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
FW	[m^3]	1.33E-03	1.95E-05	1.84E-04	8.91E-10	2.10E-05	4.79E-04	0.00E+00	-1.84E-03
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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	1.32E-05	8.61E-07	1.57E-06	7.64E-11	2.12E-06	1.07E-06	0.00E+00	-3.82E-06
NHWD	[kg]	5.00E-02	6.70E-03	6.47E-03	1.62E-08	1.58E-03	5.67E-03	0.00E+00	-7.50E-03
RWD	[kg]	2.69E-06	4.44E-08	2.81E-07	1.24E-12	2.28E-08	5.20E-08	0.00E+00	-1.15E-05
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]	9.68E-05	0.00E+00	1.50E-02	0.00E+00	0.00E+00	0.00E+00	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
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.84E-01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E+00	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 1 m OF PIPE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	2.87E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Corrugated

ENVIRONMENTAL IMPACTS PER 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	4.90E-01	6.03E-03	7.93E-02	5.48E-07	1.52E-02	2.61E-01	0.00E+00	-1.05E-01
GWP-fossil	[kg CO_2 eq.]	4.90E-01	6.02E-03	7.64E-02	5.48E-07	1.52E-02	2.61E-01	0.00E+00	-1.05E-01
GWP-biogenic	[kg CO_2 eq.]	-1.27E-03	5.47E-06	2.87E-03	1.26E-10	2.77E-06	3.56E-05	0.00E+00	-2.20E-04
GWP-luluc	[kg CO_2 eq.]	4.14E-04	2.98E-06	4.19E-05	6.17E-11	1.93E-06	1.30E-06	0.00E+00	-1.23E-04
ODP	[kg CFC 11 eq.]	3.14E-09	1.31E-10	3.68E-10	8.72E-15	2.38E-10	2.92E-10	0.00E+00	-1.23E-09
AP	[mol H^+ eq.]	2.49E-03	1.41E-05	2.59E-04	5.08E-09	8.34E-05	5.66E-05	0.00E+00	-6.92E-04
EP-freshwater	[kg P eq.]	1.09E-04	4.26E-07	1.10E-05	1.68E-11	2.85E-07	5.65E-07	0.00E+00	-6.47E-05
EP-marine	[kg N eq.]	5.18E-04	3.57E-06	5.65E-05	2.35E-09	3.62E-05	3.33E-05	0.00E+00	-1.00E-04
EP-terrestrial	[mol N eq.]	5.43E-03	3.65E-05	5.86E-04	2.56E-08	3.92E-04	2.82E-04	0.00E+00	-9.96E-04
POCP	[kg NMVOC eq.]	1.97E-03	2.11E-05	2.11E-04	7.58E-09	1.53E-04	7.08E-05	0.00E+00	-3.14E-04
ADPm[1]	[kg Sb eq.]	1.33E-06	1.96E-08	1.37E-07	1.91E-13	9.79E-09	9.70E-09	0.00E+00	-1.03E-07
ADPf[1]	[MJ]	1.24E+01	8.54E-02	1.26E+00	7.18E-06	1.98E-01	3.83E-02	0.00E+00	-1.62E+00
WDP[1]	[m^3 world eq. deprived]	1.03E-01	3.51E-04	1.05E-02	1.55E-08	3.73E-04	1.38E-03	0.00E+00	-1.56E-02
Caption	GWP-total = Global 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 = Acidification; 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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	2.41E-08	4.47E-10	2.55E-09	1.42E-13	1.99E-09	2.52E-10	0.00E+00	-5.96E-09
IRP[2]	[kBq U235 eq.]	2.38E-02	1.15E-04	2.41E-03	3.41E-09	6.52E-05	1.33E-04	0.00E+00	-2.84E-02
ETP-fw[1]	[CTUe]	2.71E+00	8.44E-02	3.99E-01	6.86E-06	1.93E-01	1.11E+00	0.00E+00	-6.05E-01
HTP-c[1]	[CTUh]	2.78E-10	5.48E-12	3.17E-11	3.36E-16	4.48E-12	2.93E-11	0.00E+00	-6.11E-11
HTP-nc[1]	[CTUh]	9.11E-09	1.21E-10	1.05E-09	2.33E-15	7.76E-11	1.24E-09	0.00E+00	-1.78E-09
SQP[1]	-	8.79E-01	5.14E-02	9.66E-02	4.84E-07	2.20E-02	1.07E-02	0.00E+00	-7.56E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation - human health; ETP-fw = Ecotoxicity - 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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	3.66E-01	1.34E-03	3.71E-02	4.09E-08	7.81E-04	2.24E-03	0.00E+00	-3.16E-01
PERM	[MJ]	2.09E-01	0.00E+00	-2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	5.75E-01	1.34E-03	-1.72E-01	4.09E-08	7.81E-04	2.24E-03	0.00E+00	-3.16E-01
PENRE	[MJ]	1.24E+01	8.54E-02	1.26E+00	7.18E-06	1.98E-01	3.83E-02	0.00E+00	-1.62E+00
PENRM	[MJ]	4.75E+00	0.00E+00	-7.91E-03	0.00E+00	0.00E+00	-4.74E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.72E+01	8.54E-02	1.26E+00	7.18E-06	1.98E-01	-4.70E+00	0.00E+00	-1.62E+00
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
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
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
FW	[m^3]	3.15E-03	1.23E-05	3.48E-04	5.64E-10	1.33E-05	3.03E-04	0.00E+00	-1.17E-03
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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	3.29E-05	5.43E-07	3.47E-06	4.83E-11	1.34E-06	6.75E-07	0.00E+00	-2.39E-06
NHWD	[kg]	4.08E-02	4.22E-03	5.04E-03	1.03E-08	9.99E-04	3.58E-03	0.00E+00	-4.60E-03
RWD	[kg]	5.81E-06	2.80E-08	5.89E-07	7.86E-13	1.44E-08	3.29E-08	0.00E+00	-7.26E-06
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]	4.64E-04	0.00E+00	1.50E-02	0.00E+00	0.00E+00	0.00E+00	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
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.44E-02	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.66E-02	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 1 m OF PIPE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	2.87E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Insulation

ENVIRONMENTAL IMPACTS PER 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	2.81E-01	5.38E-03	5.59E-02	4.89E-07	1.36E-02	2.32E-01	0.00E+00	-9.37E-02
GWP-fossil	[kg CO_2 eq.]	2.82E-01	5.38E-03	5.26E-02	4.88E-07	1.36E-02	2.32E-01	0.00E+00	-9.35E-02
GWP-biogenic	[kg CO_2 eq.]	-5.09E-03	4.89E-06	2.87E-03	1.12E-10	2.47E-06	3.17E-05	0.00E+00	-5.65E-05
GWP-luluc	[kg CO_2 eq.]	3.71E-03	2.66E-06	3.71E-04	5.50E-11	1.72E-06	1.16E-06	0.00E+00	-1.10E-04
ODP	[kg CFC 11 eq.]	1.69E-09	1.17E-10	2.17E-10	7.77E-15	2.12E-10	2.60E-10	0.00E+00	-1.09E-09
AP	[mol H^+ eq.]	1.17E-03	1.26E-05	1.27E-04	4.53E-09	7.43E-05	5.05E-05	0.00E+00	-6.17E-04
EP-freshwater	[kg P eq.]	6.05E-05	3.81E-07	6.17E-06	1.50E-11	2.54E-07	5.03E-07	0.00E+00	-5.77E-05
EP-marine	[kg N eq.]	2.52E-04	3.19E-06	2.98E-05	2.10E-09	3.23E-05	2.97E-05	0.00E+00	-8.96E-05
EP-terrestrial	[mol N eq.]	2.42E-03	3.26E-05	2.84E-04	2.28E-08	3.49E-04	2.52E-04	0.00E+00	-8.89E-04
POCP	[kg NMVOC eq.]	1.20E-03	1.88E-05	1.33E-04	6.75E-09	1.36E-04	6.30E-05	0.00E+00	-2.81E-04
ADPm[1]	[kg Sb eq.]	1.02E-06	1.75E-08	1.06E-07	1.70E-13	8.72E-09	8.64E-09	0.00E+00	-9.20E-08
ADPf[1]	[MJ]	7.91E+00	7.63E-02	8.11E-01	6.40E-06	1.76E-01	3.41E-02	0.00E+00	-1.44E+00
WDP[1]	[m^3 world eq. deprived]	-3.29E-03	3.14E-04	-1.45E-04	1.38E-08	3.32E-04	1.23E-03	0.00E+00	-1.39E-02
Caption	GWP-total = Global 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 = Acidification; 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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	1.26E-08	3.99E-10	1.40E-09	1.26E-13	1.77E-09	2.25E-10	0.00E+00	-5.32E-09
IRP[2]	[kBq U235 eq.]	9.78E-03	1.03E-04	1.01E-03	3.03E-09	5.81E-05	1.18E-04	0.00E+00	-2.53E-02
ETP-fw[1]	[CTUe]	2.10E+00	7.54E-02	3.25E-01	6.11E-06	1.72E-01	9.89E-01	0.00E+00	-5.40E-01
HTP-c[1]	[CTUh]	1.54E-10	4.90E-12	1.90E-11	2.99E-16	3.99E-12	2.61E-11	0.00E+00	-5.45E-11
HTP-nc[1]	[CTUh]	4.13E-09	1.08E-10	5.41E-10	2.08E-15	6.91E-11	1.10E-09	0.00E+00	-1.59E-09
SQP[1]	-	7.72E-01	4.59E-02	8.51E-02	4.31E-07	1.96E-02	9.50E-03	0.00E+00	-6.91E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation - human health; ETP-fw = Ecotoxicity - 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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	2.53E-01	1.20E-03	2.57E-02	3.64E-08	6.96E-04	2.00E-03	0.00E+00	-2.84E-01
PERM	[MJ]	2.09E-01	0.00E+00	-2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	4.62E-01	1.20E-03	-1.83E-01	3.64E-08	6.96E-04	2.00E-03	0.00E+00	-2.84E-01
PENRE	[MJ]	7.91E+00	7.63E-02	8.11E-01	6.40E-06	1.76E-01	3.41E-02	0.00E+00	-1.44E+00
PENRM	[MJ]	4.02E+00	0.00E+00	-7.91E-03	0.00E+00	0.00E+00	-4.02E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.19E+01	7.63E-02	8.03E-01	6.40E-06	1.76E-01	-3.99E+00	0.00E+00	-1.44E+00
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
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
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
FW	[m^3]	2.62E-04	1.10E-05	5.53E-05	5.02E-10	1.18E-05	2.70E-04	0.00E+00	-1.04E-03
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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	5.63E-06	4.85E-07	7.27E-07	4.30E-11	1.19E-06	6.01E-07	0.00E+00	-2.13E-06
NHWD	[kg]	3.12E-02	3.77E-03	3.98E-03	9.15E-09	8.90E-04	3.19E-03	0.00E+00	-4.12E-03
RWD	[kg]	2.38E-06	2.50E-08	2.46E-07	7.01E-13	1.28E-08	2.93E-08	0.00E+00	-6.47E-06
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]	3.98E-04	0.00E+00	1.50E-02	0.00E+00	0.00E+00	0.00E+00	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
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.78E-01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.38E-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 1 m OF PIPE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	2.87E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Snow Melting

ENVIRONMENTAL IMPACTS PER 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	4.27E-01	8.46E-03	8.32E-02	7.68E-07	2.13E-02	3.65E-01	0.00E+00	-1.46E-01
GWP-fossil	[kg CO_2 eq.]	4.29E-01	8.45E-03	8.03E-02	7.67E-07	2.13E-02	3.65E-01	0.00E+00	-1.48E-01
GWP-biogenic	[kg CO_2 eq.]	-1.93E-03	7.68E-06	2.87E-03	1.76E-10	3.88E-06	4.98E-05	0.00E+00	2.15E-03
GWP-luluc	[kg CO_2 eq.]	2.38E-04	4.18E-06	2.20E-05	8.64E-11	2.70E-06	1.82E-06	0.00E+00	-1.84E-04
ODP	[kg CFC 11 eq.]	2.59E-09	1.84E-10	3.22E-10	1.22E-14	3.34E-10	4.08E-10	0.00E+00	-1.76E-09
AP	[mol H^+ eq.]	2.63E-03	1.99E-05	2.71E-04	7.11E-09	1.17E-04	7.93E-05	0.00E+00	-9.79E-04
EP-freshwater	[kg P eq.]	7.61E-05	5.98E-07	7.68E-06	2.36E-11	3.98E-07	7.91E-07	0.00E+00	-9.24E-05
EP-marine	[kg N eq.]	5.60E-04	5.01E-06	6.09E-05	3.30E-09	5.07E-05	4.66E-05	0.00E+00	-1.44E-04
EP-terrestrial	[mol N eq.]	6.02E-03	5.12E-05	6.46E-04	3.58E-08	5.48E-04	3.95E-04	0.00E+00	-1.43E-03
POCP	[kg NMVOC eq.]	2.15E-03	2.96E-05	2.29E-04	1.06E-08	2.14E-04	9.91E-05	0.00E+00	-4.51E-04
ADPm[1]	[kg Sb eq.]	1.50E-06	2.75E-08	1.54E-07	2.68E-13	1.37E-08	1.36E-08	0.00E+00	-1.51E-07
ADPf[1]	[MJ]	1.24E+01	1.20E-01	1.26E+00	1.01E-05	2.77E-01	5.36E-02	0.00E+00	-2.29E+00
WDP[1]	[m^3 world eq. deprived]	3.42E-02	4.93E-04	3.58E-03	2.17E-08	5.22E-04	1.93E-03	0.00E+00	-2.27E-02
Caption	GWP-total = Global 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 = Acidification; 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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	1.75E-08	6.27E-10	1.89E-09	1.98E-13	2.79E-09	3.53E-10	0.00E+00	-8.56E-09
IRP[2]	[kBq U235 eq.]	1.06E-02	1.62E-04	1.09E-03	4.77E-09	9.13E-05	1.86E-04	0.00E+00	-4.00E-02
ETP-fw[1]	[CTUe]	2.48E+00	1.19E-01	4.18E-01	9.61E-06	2.70E-01	1.55E+00	0.00E+00	-8.64E-01
HTP-c[1]	[CTUh]	2.31E-10	7.70E-12	2.77E-11	4.70E-16	6.28E-12	4.10E-11	0.00E+00	-8.73E-11
HTP-nc[1]	[CTUh]	5.56E-09	1.70E-10	7.48E-10	3.27E-15	1.09E-10	1.74E-09	0.00E+00	-2.53E-09
SQP[1]	-	6.03E-01	7.22E-02	6.13E-02	6.77E-07	3.08E-02	1.49E-02	0.00E+00	-1.36E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation - human health; ETP-fw = Ecotoxicity - 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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	2.03E-01	1.88E-03	1.89E-02	5.73E-08	1.09E-03	3.14E-03	0.00E+00	-4.98E-01
PERM	[MJ]	2.09E-01	0.00E+00	-2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	4.12E-01	1.88E-03	-1.90E-01	5.73E-08	1.09E-03	3.14E-03	0.00E+00	-4.98E-01
PENRE	[MJ]	1.24E+01	1.20E-01	1.26E+00	1.00E-05	2.77E-01	5.36E-02	0.00E+00	-2.29E+00
PENRM	[MJ]	6.49E+00	0.00E+00	-7.91E-03	0.00E+00	0.00E+00	-6.49E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.89E+01	1.20E-01	1.26E+00	1.00E-05	2.77E-01	-6.44E+00	0.00E+00	-2.29E+00
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
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
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
FW	[m^3]	1.04E-03	1.72E-05	1.46E-04	7.89E-10	1.86E-05	4.24E-04	0.00E+00	-1.66E-03
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 1 m OF PIPE									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	9.90E-06	7.62E-07	1.20E-06	6.76E-11	1.88E-06	9.44E-07	0.00E+00	-3.41E-06
NHWD	[kg]	2.41E-02	5.93E-03	3.62E-03	1.44E-08	1.40E-03	5.02E-03	0.00E+00	-6.79E-03
RWD	[kg]	2.60E-06	3.93E-08	2.65E-07	1.10E-12	2.02E-08	4.60E-08	0.00E+00	-1.02E-05
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]	8.90E-04	0.00E+00	1.50E-02	0.00E+00	0.00E+00	0.00E+00	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
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.05E-01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E+00	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 1 m OF PIPE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	2.87E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

Technical information on scenarios

Transport to the building site (A4)

Scenario information	Value	Value	Unit
Fuel type	Diesel	Heavy fuel oil	-
Vehicle type	Lorry 16-32 tons, EURO6	Container ship	-
Transport distance and load	33.1 33.1 51.4 32.5 28.9 45.5	3.6 3.6 5.6 3.6 3.2 5.0	kgkm

*Data is given in the following order: Floor Heating (3 layer), Floor Heating (5 layer), Universal, Corrugated, Insulation and Snow Melting.

Installation of the product in the building (A5)

Scenario information	Value	Unit
Energy type	Diesel	-
Energy consumption	0	MJ
Waste materials	1.27E-02 1.27E-02 1.89E-02 1.28E-02 1.12E-02 1.69E-02	kg

*Data is given in the following order: Floor Heating (3 layer), Floor Heating (5 layer), Universal, Corrugated, Insulation and Snow Melting.

End-of-Life (C1-C4)

Scenario information	Value	Unit
Collected with mixed waste	1.00	m
For energy recovery	1.00	m

Reuse, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Energy recovery from waste incineration **(electricity)**	4.40E-01 4.38E-01 6.85E-01 4.43E-01 3.78E-01 6.06E-01	MJ
Energy recovery from waste incineration **(heat)**	8.57E-01 8.53E-01 1.33E+00 8.63E-01 7.38E-01 1.18E+00	MJ

*Data is given in the following order: Floor Heating (3 layer), Floor Heating (5 layer), Universal, Corrugated, Insulation and Snow Melting.

Indoor air

The EPD does not give information on the release of dangerous substances to indoor air because the horizontal standards of the relevant measurements are not available.

Read more in EN 15804+A1, Chapter 7.4.1.

Soil and water

The EPD does not give information on the release of dangerous substances to soil and water because the horizontal standards of the relevant measurements are not available.

Read more in EN15804+A1, Chapter 7.4.2

The product variations can be combined as illustrated below by Floor Heating, Corrugated and Insulation. These product combinations are not included in this EPD but their environmental impacts can be calculated by aggregating the product variations' environmental impacts.

References

Publisher	epddanmark www.epddanmark.dk Template version 2024.1
Programme operator	Danish Technological Institute Gregersensvej DK-2630 Taastrup www.teknologisk.dk
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The Danish Environmental Protection Agency 2022
Selektiv nedrivning i byggebranchen: Livscyklusvurdering (LCA) af konsekvenser ved selektiv nedrivning.