

Materials	Source	Data quality	Year
Metal - Steel	ecoinvent 3.6	Database	2019
Plastic - Polypropylene (PP)	ecoinvent 3.6	Database	2019
Plastic - Polystyrene expandable (EPS)	ecoinvent 3.6	Database	2019
Powder coating	Ecoinvent 3.6	Database	2019
Printed paper	ecoinvent 3.6	Database	2019
Metal - Steel	Modified ecoinvent 3.6	Database	2019
Packaging - Cardboard	Modified ecoinvent 3.6	Database	2019
Recycled cardboard	Modified ecoinvent 3.6	Database	2019

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

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

System boundary:



Additional technical information:

LCA: Scenarios and additional technical information

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

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (km)	53,3 %	373	0,023	l/tkm	8,58
Assembly (A5)					
	Unit	Value			
Waste, packaging, cardboard, 100 % recycled, to average treatment (kg)	kg	0,30			
Waste, packaging, corrugated board box, 0 % recycled, to average treatment (kg)	kg	0,49			
Maintenance (B2)					
	Unit	Value			
Electricity, Nordic (kWh)	kWh/DU	0,81			
Water, tap water (m3)	m3/DU	11,70			
Repair (B3)					
	Unit	Value			
Electricity, Nordic (kWh)	kWh/DU	0,55			
Transport to waste processing (C2)					
	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km)	36,7 %	100	0,043	l/tkm	4,30
Waste processing (C3)					
	Unit	Value			
Waste treatment per kg Expanded Polystyrene (EPS), incineration - C3 (kg)	kg	0,00			
Waste treatment per kg Graphical paper, incineration with fly ash extraction (kg)	kg	0,01			
Waste treatment per kg Non-hazardous waste, incineration with fly ash extraction - C3 (kg)	kg	0,02			
Waste treatment per kg Polypropylene (PP), incineration with fly ash extraction - C3 (kg)	kg	2,51			
Waste treatment per kg Scrap steel, incineration with fly ash extraction (kg)	kg	5,21			
Waste, materials to recycling (kg)	kg	1,77			
Disposal (C4)					
	Unit	Value			
Landfilling of ashes and residues from incineration of Scrap steel (kg)	kg	3,44			
Landfilling of ashes from incineration of expanded polystyrene (EPS), process per kg ashes and residues - C4 (kg)	kg	0,00			
Landfilling of ashes from incineration of Graphical paper, process of ashes and residues (kg)	kg	0,00			
Landfilling of ashes from incineration of Non-hazardous waste, process per kg ashes and residues - C4 (kg)	kg	0,00			
Landfilling of ashes from incineration of Polypropylene, PP, process per kg ashes and residues - C4 (kg)	kg	0,07			
Benefits and loads beyond the system boundaries (D)					
	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	4,11			
Substitution of primary steel with net scrap (kg)	kg	1,50			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	62,18			

LCA: Results

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

Environmental impact							
Indicator	Unit	A1-A3	A4	A5	B2	B3	
GWP-total	kg CO ₂ -eq	1,99E+01	2,78E-01	1,36E+00	4,16E+00	8,01E-02	
GWP-fossil	kg CO ₂ -eq	2,11E+01	2,78E-01	1,28E-02	4,12E+00	7,47E-02	
GWP-biogenic	kg CO ₂ -eq	-1,16E+00	1,19E-04	1,35E+00	2,72E-02	1,36E-03	
GWP-luluc	kg CO ₂ -eq	2,13E-02	8,46E-05	4,24E-06	1,26E-02	4,09E-03	
ODP	kg CFC11 -eq	1,23E-06	6,69E-08	2,71E-09	3,67E-07	8,08E-09	
AP	mol H+ -eq	1,03E-01	8,94E-04	6,07E-05	2,39E-02	3,44E-04	
EP-FreshWater	kg P -eq	1,11E-03	2,21E-06	1,05E-07	3,28E-04	4,94E-06	
EP-Marine	kg N -eq	1,94E-02	1,96E-04	2,01E-05	3,79E-03	5,44E-05	
EP-Terrestrial	mol N -eq	2,18E-01	2,18E-03	2,17E-04	4,43E-02	7,31E-04	
POCP	kg NMVOC -eq	8,62E-02	8,57E-04	6,25E-05	1,38E-02	1,71E-04	
ADP-minerals&metals ¹	kg Sb -eq	3,27E-04	4,95E-06	3,12E-07	1,14E-04	1,16E-06	
ADP-fossil ¹	MJ	3,81E+02	4,51E+00	1,79E-01	7,15E+01	2,02E+00	
WDP ¹	m ³	6,01E+03	3,46E+00	2,27E-01	1,46E+03	1,56E+02	

Indicator	Unit	B4	C1	C2	C3	C4	D
GWP-total	kg CO ₂ -eq	0	0	1,40E-01	6,49E+00	4,11E-02	-2,03E+00
GWP-fossil	kg CO ₂ -eq	0	0	1,40E-01	6,48E+00	4,11E-02	-2,01E+00
GWP-biogenic	kg CO ₂ -eq	0	0	5,78E-05	1,61E-02	3,03E-05	-1,66E-03
GWP-luluc	kg CO ₂ -eq	0	0	4,97E-05	1,59E-05	1,20E-05	-1,32E-02
ODP	kg CFC11 -eq	0	0	3,16E-08	7,69E-09	1,22E-08	-2,63E-02
AP	mol H+ -eq	0	0	4,01E-04	9,96E-04	2,82E-04	-1,12E-02
EP-FreshWater	kg P -eq	0	0	1,11E-06	1,39E-06	4,18E-07	-1,34E-04
EP-Marine	kg N -eq	0	0	7,94E-05	4,57E-04	1,00E-04	-2,67E-03
EP-Terrestrial	mol N -eq	0	0	8,88E-04	4,94E-03	1,11E-03	-2,79E-02
POCP	kg NMVOC -eq	0	0	3,40E-04	1,24E-03	3,19E-04	-1,12E-02
ADP-minerals&metals ¹	kg Sb -eq	0	0	3,85E-06	4,13E-07	6,82E-07	-3,21E-05
ADP-fossil ¹	MJ	0	0	2,11E+00	6,92E-01	9,07E-01	-1,91E+01
WDP ¹	m ³	0	0	2,04E+00	1,77E+00	1,98E+00	2,15E+01

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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Remarks to environmental impacts

Additional environmental impact indicators							
Indicator	Unit	A1-A3	A4	A5	B2	B3	
PM	Disease incidence	1,55E-06	2,55E-08	8,96E-10	1,99E-07	1,83E-09	
IRP ²	kgBq U235 -eq	8,30E-01	1,97E-02	7,68E-04	5,42E-01	4,60E-02	
ETP-fw ¹	CTUe	7,38E+02	3,30E+00	2,39E-01	7,79E+01	2,53E+00	
HTP-c ¹	CTUh	9,86E-08	0,00E+00	8,00E-12	1,12E-08	5,90E-11	
HTP-nc ¹	CTUh	7,10E-07	3,19E-09	3,00E-10	2,49E-07	1,55E-09	
SQP ¹	dimensionless	2,61E+02	5,17E+00	1,20E-01	2,14E+01	1,52E+00	

Indicator	Unit	B4	C1	C2	C3	C4	D
PM	Disease incidence	0	0	8,54E-09	1,28E-08	5,11E-09	-3,17E-07
IRP ²	kgBq U235 -eq	0	0	9,22E-03	1,52E-03	3,65E-03	-2,70E-02
ETP-fw ¹	CTUe	0	0	1,56E+00	3,40E+00	5,63E-01	-1,20E+02
HTP-c ¹	CTUh	0	0	0,00E+00	3,98E-10	2,10E-11	-8,47E-09
HTP-nc ¹	CTUh	0	0	1,71E-09	6,78E-09	5,73E-10	1,46E-07
SQP ¹	dimensionless	0	0	1,48E+00	1,19E-01	1,98E+00	-3,55E+01

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use								
Indicator		Unit	A1-A3	A4	A5	B2	B3	
	PERE	MJ	7,21E+01	5,67E-02	2,95E-03	1,22E+01	1,98E+00	
	PERM	MJ	1,04E+01	0,00E+00	-9,59E+00	0,00E+00	0,00E+00	
	PERT	MJ	8,26E+01	5,67E-02	-9,59E+00	1,22E+01	1,98E+00	
	PENRE	MJ	2,99E+02	4,51E+00	1,79E-01	7,16E+01	2,05E+00	
	PENRM	MJ	8,24E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
	PENRT	MJ	3,82E+02	4,51E+00	1,79E-01	7,16E+01	2,05E+00	
	SM	kg	1,08E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
	RSF	MJ	8,12E-01	1,98E-03	9,80E-05	7,76E-01	2,00E-02	
	NRSF	MJ	1,33E-01	6,65E-03	4,04E-04	7,36E-01	0,00E+00	
	FW	m ³	2,02E-01	5,13E-04	8,47E-05	1,18E+01	9,03E-03	

Indicator		Unit	B4	C1	C2	C3	C4	D
	PERE	MJ	0	0	3,02E-02	2,64E-02	1,77E-02	-3,30E+01
	PERM	MJ	0	0	0,00E+00	-1,27E-01	0,00E+00	0,00E+00
	PERT	MJ	0	0	3,02E-02	-1,01E-01	1,77E-02	-3,30E+01
	PENRE	MJ	0	0	2,11E+00	6,94E-01	9,07E-01	-1,91E+01
	PENRM	MJ	0	0	0,00E+00	-8,24E+01	0,00E+00	0,00E+00
	PENRT	MJ	0	0	2,11E+00	-8,17E+01	9,07E-01	-1,91E+01
	SM	kg	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	RSF	MJ	0	0	1,08E-03	6,22E-04	4,67E-04	5,41E-02
	NRSF	MJ	0	0	3,86E-03	0,00E+00	2,86E-02	-1,50E-01
	FW	m ³	0	0	2,26E-04	1,48E-03	8,18E-04	-4,18E-02

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed

End of life - Waste								
Indicator		Unit	A1-A3	A4	A5	B2	B3	
	HWD	kg	1,41E-01	2,47E-04	0,00E+00	1,32E-02	1,89E-04	
	NHWD	kg	5,60E+00	3,92E-01	7,93E-01	8,51E-01	1,25E-02	
	RWD	kg	7,78E-04	3,08E-05	0,00E+00	4,33E-04	2,11E-05	

Indicator		Unit	B4	C1	C2	C3	C4	D
	HWD	kg	0	0	1,09E-04	0,00E+00	3,49E+00	-8,84E-03
	NHWD	kg	0	0	1,03E-01	1,90E-02	5,48E-02	-7,98E-01
	RWD	kg	0	0	1,44E-05	0,00E+00	5,57E-06	-2,24E-05

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

*Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3}$ = 0,009"

*INA Indicator Not Assessed

End of life - Output flow								
Indicator		Unit	A1-A3	A4	A5	B2	B3	
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
	MFR	kg	5,35E-01	0,00E+00	7,37E-01	0,00E+00	0,00E+00	
	MER	kg	2,97E-06	0,00E+00	1,08E-06	0,00E+00	0,00E+00	
	EEE	MJ	2,82E-01	0,00E+00	4,53E-02	0,00E+00	0,00E+00	
	EET	MJ	4,26E+00	0,00E+00	6,86E-01	0,00E+00	0,00E+00	

Indicator		Unit	B4	C1	C2	C3	C4	D
	CRU	kg	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0	0	0,00E+00	1,77E+00	0,00E+00	0,00E+00
	MER	kg	0	0	0,00E+00	7,75E+00	0,00E+00	0,00E+00
	EEE	MJ	0	0	0,00E+00	4,24E+00	0,00E+00	0,00E+00
	EET	MJ	0	0	0,00E+00	6,42E+01	0,00E+00	0,00E+00

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

*Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3}$ = 0,009"






*INA Indicator Not Assessed

Biogenic Carbon Content		
Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	4,25E-03
Biogenic carbon content in accompanying packaging	kg C	3,67E-01

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

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