











### Transport from production place to assembly/user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance (km)	Fuel/Energy consumption (l/tkm)	Value (l/t)
Truck	72.6%	Euro 6 [> 32t. diesel]	300	0.01	6.10

The distance of 300 km to the building site is taken as an average distance based on default values given in NPCR 010 2022 Part B (6.3.8.1).

### Assembly (A5)

	Unit	Value
Material loss	kg	0.05
Output materials for waste treatment	kg	0.066

Material loss and materials being a subject of waste treatment are reported for a declared unit.

### Use phase (B1-B7)

The product does not require any treatment, maintenance or replacement if properly installed.

### End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	-
Collected as mixed construction waste	kg	1
Reuse	kg	-
Recycling	kg	-
Energy recovery	kg	1
To landfill	kg	0.016

No hazardous materials are disposed. Scenarios developed for treatment of Hunton Undertak during waste processing are based on NPCR 010 2022.

### Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance (km)	Fuel/Energy consumption (l/tkm)	value (l/t)
Truck	50%	Euro 6 [> 32t. diesel]	300	0.01	6.10
Truck	50%	Euro 6 [> 16-32t. diesel]	85	0.015	2.65

Transport for distances refers to recycling and incineration.

### Benefits and loads beyond the system boundaries (D)

	Unit	Value
Electricity substitution	MJ	1.26
Thermal Heat substitution	MJ	14.4
Avoided materials	kg	0.001

Electricity and thermal heat substitution data are taken from SSB with 2021 as the basis year.

## LCA: Results

The results in this EPD are provided for a declared unit and shall be recalculated to a functional unit. Table 2 with appropriate scaling factors is presented on page number three.

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

Product stage			Assembly stage		Use stage								End of life stage				Benefits & loads beyond system boundary
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	X	X	X	X	X	X	X	X	X	X	X	X	

## Core environmental impact indicators

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5
GWP-total	kg CO2 eq.	-1.20E+00	1.45E-02	6.26E-02	-1.13E+00	2.18E-02	6.30E-02
GWP-fossil	kg CO2 eq.	1.52E-01	1.45E-02	5.28E-02	2.20E-01	2.18E-02	3.80E-02
GWP-biogenic	kg CO2 eq.	-1.36E+00	1.54E-05	9.52E-03	-1.35E+00	1.26E-05	2.50E-02
GWP-LULUC	kg CO2 eq.	5.51E-04	5.45E-06	2.94E-04	8.51E-04	4.93E-06	4.38E-05
ODP	kg CFC11 eq.	1.61E-07	3.62E-09	1.88E-09	1.66E-07	5.55E-09	9.14E-09
AP	mol H <sup>+</sup> eq.	1.40E-03	4.63E-05	1.99E-04	1.64E-03	6.77E-05	1.13E-04
EP-freshwater	kg P eq.	5.67E-06	1.04E-07	3.99E-06	9.77E-06	2.60E-07	5.73E-07
EP-marine	kg N eq.	2.00E-04	1.02E-05	3.65E-05	2.47E-04	1.39E-05	2.38E-05
EP-terrestrial	mol N eq.	2.19E-03	1.13E-04	4.42E-04	2.74E-03	1.60E-04	2.67E-04
POCP	kg NMVOC eq.	1.16E-03	4.46E-05	1.19E-04	1.32E-03	6.35E-05	1.02E-04
ADP-M&M	kg Sb eq.	7.45E-07	3.47E-08	1.47E-06	2.26E-06	4.45E-08	1.25E-07
ADP-fossil	MJ	1.01E+01	2.36E-01	8.73E-01	1.12E+01	3.65E-01	6.15E-01
WDP	m <sup>3</sup>	2.19E-01	8.13E-04	5.30E-02	2.73E-01	2.01E-03	5.96E-02

Indicator	Unit	B1-B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	0.00E+00	1.40E-04	1.39E-02	1.79E+00	6.64E-04	-2.74E-01
GWP-fossil	kg CO2 eq.	0.00E+00	1.33E-04	1.38E-02	4.93E-01	6.65E-04	-1.39E-01
GWP-biogenic	kg CO2 eq.	0.00E+00	5.70E-06	1.26E-05	1.30E+00	-3.21E-07	-1.29E-01
GWP-LULUC	kg CO2 eq.	0.00E+00	7.20E-07	5.54E-06	1.12E-05	1.69E-08	-6.57E-03
ODP	kg CFC11 eq.	0.00E+00	5.24E-12	3.21E-09	6.05E-09	2.34E-10	-1.75E-08
AP	mol H <sup>+</sup> eq.	0.00E+00	9.79E-07	3.93E-05	4.52E-04	5.01E-06	-1.32E-03
EP-freshwater	kg P eq.	0.00E+00	7.15E-09	9.87E-08	1.23E-06	8.01E-09	-1.20E-05
EP-marine	kg N eq.	0.00E+00	1.11E-07	7.81E-06	1.82E-04	1.98E-06	-4.93E-04
EP-terrestrial	mol N eq.	0.00E+00	1.40E-06	8.71E-05	2.06E-03	2.18E-05	-5.28E-03
POCP	kg NMVOC eq.	0.00E+00	3.85E-07	3.35E-05	5.42E-04	6.62E-06	-1.46E-03
ADP-M&M	kg Sb eq.	0.00E+00	1.55E-08	4.91E-08	1.15E-07	7.26E-10	-8.72E-07
ADP-fossil	MJ	0.00E+00	2.20E-03	2.10E-01	3.50E-01	1.77E-02	-2.21E+00
WDP	m <sup>3</sup>	0.00E+00	1.36E-04	6.39E-04	9.12E-01	3.50E-02	-6.19E-02

**GWP-total:** Global Warming Potential; **GWP-fossil:** Global Warming Potential fossil fuels; **GWP-biogenic:** Global Warming Potential biogenic; **GWP-LULUC:** Global Warming Potential land use and land use change; **ODP:** Depletion potential of the stratospheric ozone layer; **AP:** Acidification potential. Accumulated Exceedance; **EP-freshwater:** Eutrophication potential. fraction of nutrients reaching freshwater end compartment; See "additional Norwegian requirements" for indicator given as PO4 eq. **EP-marine:** Eutrophication potential. fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential. Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential. deprivation weighted water consumption



## Additional environmental impact indicators

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5
PM	Disease incidence	8.82E-09	1.68E-09	2.22E-09	1.27E-08	2.44E-09	1.04E-09
IRP	kBq U235 eq.	4.19E-02	1.02E-03	1.92E-02	6.21E-02	1.69E-03	3.34E-03
ETP-fw	CTUe	5.60E+00	1.85E-01	1.17E+00	6.95E+00	2.25E-01	4.24E-01
HTP-c	CTUh	9.58E-11	5.03E-12	7.83E-11	1.79E-10	6.43E-12	2.75E-11
HTP-nc	CTUh	2.37E-09	1.94E-10	1.20E-09	3.76E-09	2.86E-10	3.10E-10
SQP	Dimensionless	8.81E+01	2.70E-01	3.04E-01	8.87E+01	4.24E-01	4.47E+00

Indicator	Unit	B1-B7	C1	C2	C3	C4	D
PM	Disease incidence	0.00E+00	8.09E-12	1.11E-09	3.61E-09	9.27E-11	-9.62E-08
IRP	kBq U235 eq.	0.00E+00	4.64E-05	9.11E-04	1.54E-03	2.84E-05	-1.39E-02
ETP-fw	CTUe	0.00E+00	6.82E-03	1.65E-01	1.02E+00	2.02E-02	-1.36E+01
HTP-c	CTUh	0.00E+00	4.26E-13	5.30E-12	3.47E-10	1.47E-12	-2.20E-10
HTP-nc	CTUh	0.00E+00	9.52E-12	1.66E-10	1.51E-09	4.94E-11	-1.30E-08
SQP	Dimensionless	0.00E+00	9.58E-04	1.46E-01	9.82E-02	3.45E-02	-1.83E+01

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

## 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
	Acidification potential. Accumulated Exceedance (AP)	None
ILCD type / level 2	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
	Potential Soil quality index (SQP)	2
<p><b>Disclaimer 1</b> – 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 are also not measured by this indicator.</p> <p><b>Disclaimer 2</b> – 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</p>		

## Resource use

Parameter	Unit	A1	A2	A3	A4	A5
RPEE	MJ	1.51E+01	3.02E-03	8.86E+00	2.40E+01	6.45E-03
RPEM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE	MJ	1.51E+01	3.02E-03	8.86E+00	2.40E+01	6.45E-03
NRPE	MJ	1.01E+01	2.36E-01	8.73E-01	1.12E+01	3.65E-01
NRPM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRPE	MJ	1.01E+01	2.36E-01	8.73E-01	1.12E+01	3.65E-01
SM	kg	2.08E-02	0.00E+00	0.00E+00	2.08E-02	0.00E+00
RSF	MJ	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
W	m3	5.26E-03	2.81E-05	6.49E-02	7.02E-02	7.77E-05

Parameter	Unit	B1-B7	C1	C2	C3	C4	D
RPEE	MJ	0.00E+00	2.12E-02	3.01E-03	1.46E+01	2.08E-04	-1.41E+01
RPEM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE	MJ	0.00E+00	2.12E-02	3.01E-03	1.46E+01	2.08E-04	-1.41E+01
NRPE	MJ	0.00E+00	2.21E-03	2.10E-01	3.50E-01	1.77E-02	-2.21E+00
NRPM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRPE	MJ	0.00E+00	2.21E-03	2.10E-01	3.50E-01	1.77E-02	-2.21E+00
SM	kg	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	-6.84E-04
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W	m3	0.00E+00	1.56E-04	2.38E-05	2.16E-02	8.16E-04	-4.03E-02

**RPEE** Renewable primary energy resources used as energy carrier; **RPEM** Renewable primary energy resources used as raw materials; **TPE** Total use of renewable primary energy resources; **NRPE** Nonrenewable primary energy resources used as energy carrier; **NRPM** Nonrenewable primary energy resources used as materials; **TRPE** Total use of nonrenewable primary energy resources; **SM** Use of secondary materials; **RSF** Use of renewable secondary fuels; **NRSF** Use of nonrenewable secondary fuels; **W** Use of net fresh water



## Additional Norwegian requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase  
For the calculation electricity with certificate of origins has been applied (A3).

National electricity grid	Unit	Value
El-mix low-voltage Norway (ecoinvent 3.8)	g CO <sub>2</sub> -eq/kWh	26
El-mix medium-voltage Norway (ecoinvent 3.8)	g CO <sub>2</sub> -eq/kWh	23

### Additional environmental impact indicators required in NPCR Part A for construction products

In order to increase the transparency of biogenic carbon contribution to climate impact. the indicator for GWP has been sub-divided into the following:

GWP-IOBC Climate impacts calculated according to the principle of instantaneous oxidation  
GWP-BC Climate impacts from the net uptake and emission of biogenic carbon from each module.

In addition. EP-freshwater shall also be declared as PO4 eq.

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5
EP-freshwater*	kg PO4 eq.	1,37E-04	5,04E-06	2,90E-04	4,32E-04	7,59E-06	2,64E-05
GWP-IOBC	kg CO2 eq.	1,53E-01	1,45E-02	5,47E-02	2,22E-01	2,18E-02	3,81E-02
GWP-BC	kg CO2 eq.	-1,36E+00	9,67E-06	7,92E-03	-1,35E+00	4,95E-06	2,49E-02
GWP	kg CO2 eq.	-1,20E+00	1,45E-02	6,26E-02	-1,13E+00	2,18E-02	6,30E-02

Indicator	Unit	B1-B7	C1	C2	C3	C4	D
EP-freshwater*	kg PO4 eq.	0,00E+00	7,74E-08	4,10E-06	7,29E-05	7,36E-07	-3,09E-04
GWP-IOBC	kg CO2 eq.	0,00E+00	1,37E-04	1,39E-02	4,93E-01	6,65E-04	-1,49E-01
GWP-BC	kg CO2 eq.	0,00E+00	2,39E-06	7,27E-06	1,30E+00	-5,92E-07	-1,25E-01
GWP	kg CO2 eq.	0,00E+00	1,40E-04	1,39E-02	1,79E+00	6,64E-04	-2,74E-01

**EP-freshwater\*** Eutrophication potential. fraction of nutrients reaching freshwater end compartment. Declared as PO4 eq. **GWP-IOBC** Global warming potential calculated according to the principle of instantaneous oxidation. **GWP-BC** Global warming potential from net uptake and emissions of biogenic carbon from the materials in each module. **GWP** Global warming potential

## Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- The product contains no substances given by the REACH Candidate list or the Norwegian priority list.
- The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0.1 % by weight.
- The product contains dangerous substances more than 0.1% by weight. given by the REACH Candidate List or the Norwegian Priority list. see table.
- The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforsikten. Annex III). see table.

Name	CAS no.	Amount (kg)
Formaldehyde, oligomeric reaction products with phenol	9003-35-4	0.002

The values given in the table have been calculated for 1 kg of an average Hunton Undertak.

According to SINTEF Technical Approval nr 2190 Hunton Undertak does not contain any substances from the priority list in quantities which might be assessed as hazardous for health or environment.




## Indoor environment

The product meets the M1 requirements specified in the classification of indoor air 2018 as well as in the general specifications for the classification of buildings.

## Carbon footprint

Calculations related to climate change and global warming potential (GWP) include greenhouse gas emissions from fossil sources and land use change connected to extraction of raw materials. Biogenic emissions of CO<sub>2</sub> are also calculated and included.



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