epddanmark

ECO PLATFORM EPD VERIFIED

Owner: Nymølle Stenindustrier A/S

Stenløse Gravel Pit

No.: MD-24062-EN
Issued: 20-08-2024
Valid to: 20-08-2029

3rd PARTY **VERIFIED**

EPD

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

Owner of declaration
Nymølle Stenindustrier A/S
Østre Hedevej 2
4000 Roskilde
CVR: 48 88 54 11

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
Aggregates for concrete and construction

Number of declared datasets/product variations: 9

Production site
Stenløse grusgrav
Bramstrupvej 2,
5792 Årslev Denmark

Product(s) use
Fill aggregates for infrastructure and construction products, additives for concrete products.

Declared/ functional unit
[1 ton]

Year of production site data (A3)
[2022]

EPD version
1.0

Issued: 20-08-2024

Valid to: 20-08-2029

Basis of calculation
This EPD is developed 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 datasets 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 EN ISO 14025

☐ internal ☒ external

Third party verifier:

Guangli Du

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	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Product information

Product description

The main products are shown in the table below.

Name	
Betonsand	Sand for concrete production (Produced according to DS/EN 12620)
Bundsikring	Subbase gravel. quality 1 (Produced according to DS/EN 13285)
Støbemix	0-16 mm
Nøddesten	16-32mm for concrete (Produced according to DS/EN 12620)
Ærtesten	8-16mm for concrete (Produced according to DS/EN 12620))
Perlesten	4-11 mm (Produced according to DS/EN 12620)
Bundsten	32-200 mm
Kampesten	>180 mm stone
Filtergrus	Screened gravel

Product packaging:

No packaging is used for the products.

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of aggregates on the production site located in Stenløse, Denmark. Product specific data are based on average values collected in the period 2022.

Background generic data are based on GaBi Professional database (version 2023.2) and Ecoinvent 3.8. and are less than 10 years old.

Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old. The technical representativeness is high where data represents processes from products with similar technology and only smaller deviations. Geographical representativeness is also good where data generally represents average data from an area where the area under study is included.

Hazardous substances

The products from Nymølle Stenindustrier A/S does not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation"

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

Essential characteristics

The products consist of glacial meltwater deposits from the last ice age. The materials are a mixture of magmatic rocks, flint and limestone.

Performance declarations are available and can be obtained from the laboratory on Zealand (hpj@nymoelle.dk) or the laboratory covering Jutland/Fyn (lise.blessing@nymoelle.dk).

Further Bureau Veritas Certificates can be found at: https://nymoelle.dk/certifikater

www.nymoelle.dk

Reference Service Life (RSL)

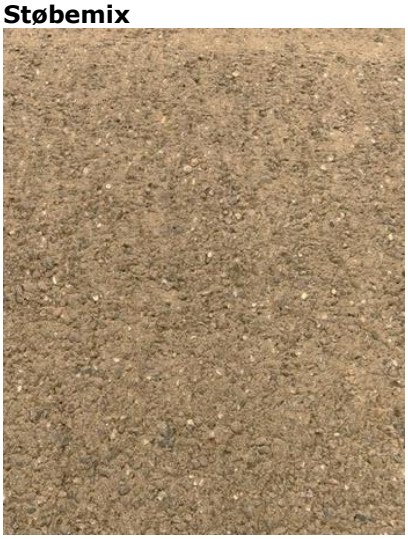
Not applicable.

Picture of product(s)

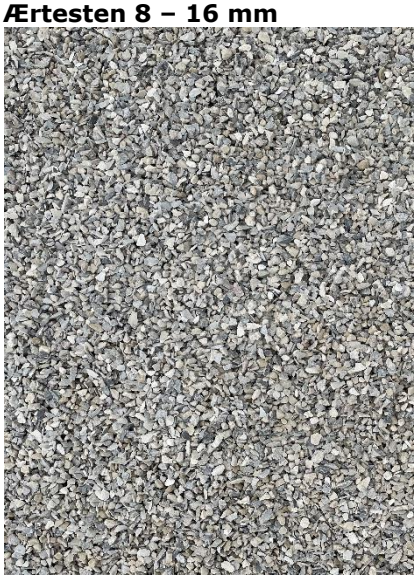
Betonsand

Bundsikring

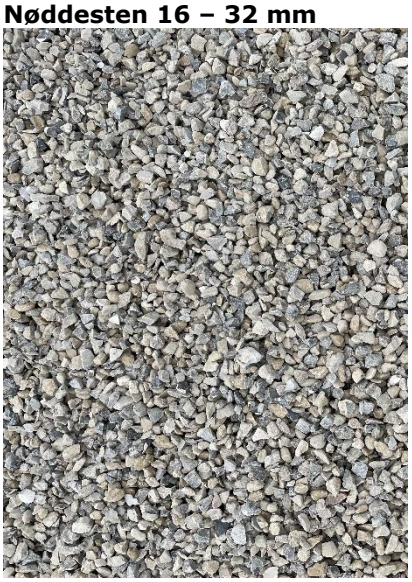
Støbemix



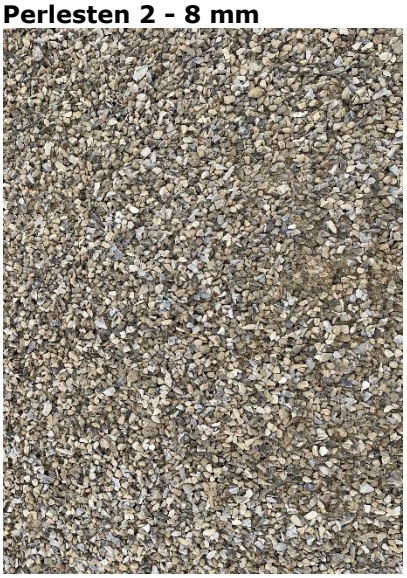
Ærtesten 8 – 16 mm



Nøddesten 16 – 32 mm

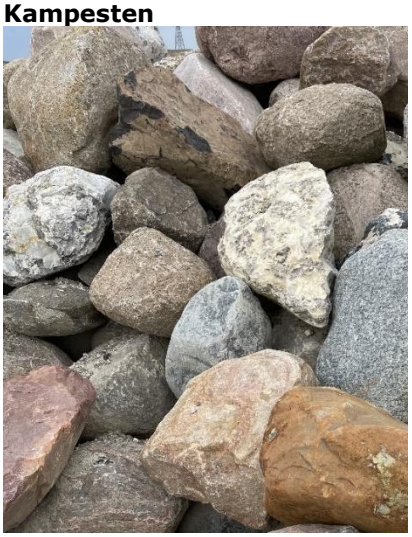


Perlesten 2 - 8 mm

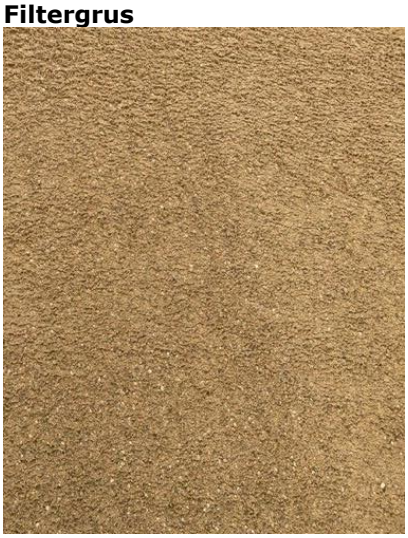


Bundsten

Kampesten



Filtergrus



Life Cycle Assessment, LCA, background

Declared unit

The Life Cycle Inventory, LCI, and Life Cycle Impact Assessment, LCIA, results in this Environmental Product Declaration, EPD, relates to 1 ton of aggregates for concrete and construction.
The products consist of glacial meltwater deposits from the last ice age. The materials consist of sand, gravel and stone and are a mixture of magmatic, flint and limestone material.

The products are presented as 9 individual products.

Name	Value	Unit
Declared unit	1	ton
Conversion factor to 1 kg.	0,001	-
Final products	**Size**	**Density (kg/m^3)**
Betonsand	0-2 mm	1 500
Bundsikring	0-8 mm	1 750
Støbemix	0-16 mm	1 400
Nøddesten	16-32 mm	1 500
Ærtesten	8-16 mm	1 700
Perlesten	2-8 mm	1 400
Bundsten	32-200 mm	1 500
Kampesten	>400 mm	1 500
Filtergrus	0-8 mm	1 600

Production

The materials are excavated below the water table by a dredger and thereafter sorted into the relevant size fractions. The products are picked up in the gravel pit and transported to the final destination.

The production process involves the removal of natural resources. These are not restored. After excavation (and ongoing), the areas can be used for extensive agriculture, or it can be left for nature to reestablish itself and used for recreational purposes.

The course is illustrated in the flow diagram.

Functional unit

1 ton of material.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804, and PCR 2019:14 Construction products published by EPD-International.

Guarantee of Origin – certificates

Foreground system:

No use of certified green electricity in the foreground system.

Background system:

No use of certified green electricity in the background system. Upstream processes are modelled using national energy mixes. Downstream processes are modelled using national energy mixes.

Flowdiagrams

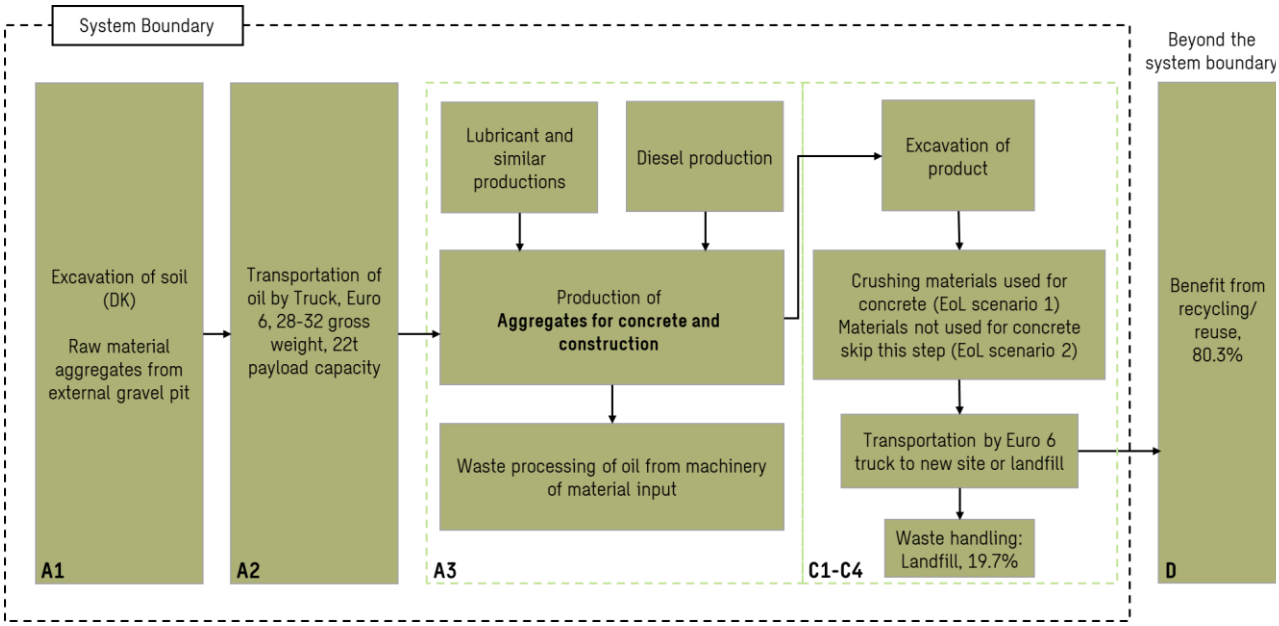


Figure 1 Visualization of life cycle stages

System boundary

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

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

The environmental impact from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process are not accounted for in the Life Cycle Inventory (LCI). Personnel-related impacts, such as transportation to and from work, are neither accounted for in the LCI.

Various oils and lubricants used in the production process are approximated since no product specific dataset or EPD were found. Economic allocation has been used to distribute quantities for oils and lubricants among the different products.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

The module encompasses the extraction and refinement of raw materials by Nymølle Stenindustrier which in this case includes removal of topsoil and excavation of raw materials.

Additional aggregates are imported from another gravel pit on Fyn to support the production.

A2 – Transport to the production site

The main resource used at the production site is diesel which is supplied to Nymølle Stenindustrier in Stenløse through fuel trucks coming from Fredericia harbour. The transport of additional aggregates from other gravel pits is also included.

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, and waste processing up to the "end-of-waste" state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

The module A3 raw material is fed into fraction separators, crushing machines, and then further fed onto conveyor belts for final sieving. The main resource used in this stage is diesel consumption for the machines (production equipment).

Construction process stage (A4-A5) includes:

Not included in this EPD.

Use stage (B1-B7) includes:

Not included in this EPD.

End of Life (C1-C4) includes:

All products are included for modules C1-C4+D. The modules C1, C2, C4, and D have the same processes for all products. Module C3 varies depending on whether the product group is used for concrete or not.

In the C1-module the materials are being excavated with a diesel consumption.

The C2 module includes transport of the excavated materials to waste management.

The C3 module is divided into two scenarios:

Scenario 1* covers the products: Betonsand, Støbemix, Nøddesten, Ærtesten, and Perlesten. These products are used in concrete, so a crushing process is included in the C3 module to prepare the products for recycling. The C3 module is marked with one asterisk (*) in the result tables for the products included in scenario 1.

Scenario 2** covers the following products: Bundsikring, Bundsten, Kampesten, and Filtergrus. These products are not used in concrete and can be reused directly as filling material after excavation, so there is no need for crushing or additional processing. Therefore, these products in scenario 2 will have no impact on the C3 module. The C3 module is marked with two asterisks (**) in the result tables for the products included in scenario 2.

The C4 module includes final disposal of waste. The distribution of materials sent to landfill and recycling/re-use is based on Dansk Affaldsstatistik 2021. The national statistic highlights the distribution of soil and stone aggregates for landfill and recycling/reuse which are used for the products.

In the statistic it is stated that 19.7% of soil and stone aggregates is sent to landfill.

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

In the D-module benefits and loads beyond the life cycle are included. For material being recycled/re-used, the fraction from Dansk Affaldsstatistik 2021 is used for all products which is 80.3% of the aggregates. Avoided products are reported in this module.

LCA results

The results are presented in individual sections for the 9 products, where **Error! Reference source not found.** showcases the products:

Table 1 Overview of products

PRODUCTS
Betonsand
Bundsikring
Støbemix
Nøddesten
Ærtesten
Perlesten
Bundsten
Kampesten
Filtergrus

The content of biogenic carbon is identical for all products.

Table 2 Biogenic carbon content at factory gate for all products

BIOGENIC CARBON CONTENT PER [ton]		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0

Table 3 Core environmental impact indicators

ENVIRONMENTAL IMPACTS PER [ton] of Betonsand										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
GWP-total	kg CO_2 eq.	9.87E-01	3.71E-03	1.95E+00	2.94E+00	3.08E-01	9.61E-01	2.73E-01	1.68E+00	-1.55E+00
GWP-fossil	kg CO_2 eq.	9.75E-01	3.73E-03	1.96E+00	2.94E+00	3.04E-01	9.67E-01	2.63E-01	1.67E+00	-1.59E+00
GWP-biogenic	kg CO_2 eq.	3.44E-03	-5.47E-05	-2.15E-02	-1.81E-02	1.07E-03	-1.42E-02	9.17E-03	7.70E-03	4.10E-02
GWP-luluc	kg CO_2 eq.	9.06E-03	3.43E-05	1.63E-02	2.54E-02	2.81E-03	8.91E-03	6.35E-04	1.15E-03	-6.87E-03
GWP-GHG	kg CO2 eq.	9.17E-01	3.51E-03	1.85E+00	2.77E+00	2.86E-01	9.10E-01	2.40E-01	1.66E+00	-1.33E+00
ODP	kg CFC 11 eq.	8.36E-11	4.82E-16	1.24E-10	2.08E-10	3.95E-14	1.25E-13	4.77E-09	3.79E-08	-1.03E-11
AP	mol H^+ eq.	1.53E-03	3.65E-06	1.93E-02	2.08E-02	1.12E-03	9.46E-04	1.31E-03	1.06E-02	-8.20E-03
EP-freshwater	kg P eq.	3.80E-06	1.36E-08	8.54E-06	1.23E-05	1.11E-06	3.52E-06	2.33E-04	3.39E-04	-8.04E-06
EP-marine	kg N eq.	5.67E-04	1.03E-06	9.39E-03	9.95E-03	5.01E-04	2.67E-04	2.38E-04	4.03E-03	-2.89E-03
EP-terrestrial	mol N eq.	6.52E-03	1.30E-05	1.03E-01	1.10E-01	5.58E-03	3.37E-03	2.11E-03	4.30E-02	-3.20E-02
POCP	kg NMVOC eq.	1.72E-03	3.04E-06	2.74E-02	2.92E-02	1.46E-03	7.89E-04	7.14E-04	1.45E-02	-7.87E-03
ADPm[1]	kg Sb eq.	7.53E-08	2.46E-10	1.23E-07	1.99E-07	2.01E-08	6.38E-08	5.78E-07	4.10E-06	-1.67E-07
ADPf[1]	MJ	1.34E+01	5.05E-02	2.41E+01	3.75E+01	4.13E+00	1.31E+01	6.56E+00	3.21E+01	-2.49E+01
WDP[1]	m^3 world eq. deprived	1.37E-02	4.48E-05	2.24E-02	3.61E-02	3.67E-03	1.16E-02	1.95E-01	1.05E+00	-1.70E-01
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 = Acidifcation; 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 use									
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.									

Table 4 – Additional environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER ton of Betonsand										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
PM	[Disease incidence]	1.51E-08	2.80E-11	5.62E-07	5.77E-07	1.22E-08	7.27E-09	5.13E-09	2.02E-07	-4.80E-07
IRP[2]	[kBq U235 eq.]	3.83E-03	1.41E-05	6.80E-03	1.06E-02	1.16E-03	3.67E-03	1.64E-01	5.72E-02	-2.81E-01
ETP-fw[1]	[CTUe]	9.56E+00	3.62E-02	1.73E+01	2.69E+01	2.96E+00	9.39E+00	7.96E-01	1.41E+01	-1.21E+01
HTP-c[1]	[CTUh]	1.94E-10	7.34E-13	4.21E-10	6.16E-10	6.01E-11	1.90E-10	2.79E-10	1.14E-09	-1.07E-09
HTP-nc[1]	[CTUh]	8.64E-09	3.27E-11	1.58E-08	2.45E-08	2.68E-09	8.47E-09	4.71E-09	1.32E-08	-9.82E-08
SQP[1]	-	5.57E+00	2.11E-02	1.01E+01	1.56E+01	1.73E+00	5.47E+00	9.39E-01	5.68E+01	-8.42E+00
Caption	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									
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.									

Table 5 - Parameters describing resource use

RESOURCE USE PER ton of Betonsand										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
PERE	[MJ]	9.71E-01	3.68E-03	1.75E+00	2.73E+00	3.01E-01	9.53E-01	1.11E+00	6.44E-01	-8.08E+00
PERM	[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	0.00E+00
PERT	[MJ]	9.71E-01	3.68E-03	1.75E+00	2.73E+00	3.01E-01	9.53E-01	1.11E+00	6.44E-01	-8.08E+00
PENRE	[MJ]	1.34E+01	5.07E-02	2.42E+01	3.76E+01	4.15E+00	1.32E+01	6.56E+00	3.21E+01	-2.49E+01
PENRM	[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	0.00E+00
PENRT	[MJ]	1.34E+01	5.07E-02	2.42E+01	3.76E+01	4.15E+00	1.32E+01	6.56E+00	3.21E+01	-2.49E+01
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	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	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	0.00E+00
FW	[m^3]	1.11E-03	4.03E-06	1.94E-03	3.05E-03	3.29E-04	1.04E-03	4.55E-03	2.44E-02	-7.39E-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									

Table 6 – End-of-life (waste categories and output flows)

WASTE CATEGORIES AND OUTPUT FLOWS PER ton of Betonsand										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
HWD	[kg]	4.14E-11	1.57E-13	7.47E-11	1.16E-10	1.28E-11	4.07E-11	0.00E+00	0.00E+00	6.08E-10
NHWD	[kg]	2.04E-03	7.73E-06	3.68E-03	5.73E-03	6.32E-04	2.00E-03	0.00E+00	1.97E+02	-3.34E+01
RWD	[kg]	2.50E-05	9.49E-08	4.52E-05	7.03E-05	7.76E-06	2.46E-05	0.00E+00	0.00E+00	-1.71E-03
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	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.03E+02	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	0.00E+00
EEE	[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	0.00E+00
EET	[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	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									

Table 7 - Core environmental impact indicators

ENVIRONMENTAL IMPACTS PER ton of Bundsikring										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
GWP-total	kg CO_2 eq.	9.92E-01	3.71E-03	1.96E+00	2.95E+00	3.08E-01	9.61E-01	0.00E+00	1.68E+00	-1.55E+00
GWP-fossil	kg CO_2 eq.	9.80E-01	3.73E-03	1.96E+00	2.94E+00	3.04E-01	9.67E-01	0.00E+00	1.67E+00	-1.59E+00
GWP-biogenic	kg CO_2 eq.	3.46E-03	-5.47E-05	-2.15E-02	-1.81E-02	1.07E-03	-1.42E-02	0.00E+00	7.70E-03	4.10E-02
GWP-luluc	kg CO_2 eq.	9.07E-03	3.43E-05	1.63E-02	2.55E-02	2.81E-03	8.91E-03	0.00E+00	1.15E-03	-6.87E-03
GWP-GHG	kg CO_2 eq	9.22E-01	3.51E-03	1.86E+00	2.78E+00	2.86E-01	9.10E-01	0.00E+00	1.66E+00	-1.33E+00
ODP	kg CFC 11 eq.	4.14E-10	4.82E-16	2.66E-10	6.80E-10	3.95E-14	1.25E-13	0.00E+00	3.79E-08	-1.03E-11
AP	mol H^+ eq.	1.55E-03	3.65E-06	1.93E-02	2.09E-02	1.12E-03	9.46E-04	0.00E+00	1.06E-02	-8.20E-03
EP-freshwater	kg P eq.	4.66E-06	1.36E-08	8.91E-06	1.36E-05	1.11E-06	3.52E-06	0.00E+00	3.39E-04	-8.04E-06
EP-marine	kg N eq.	5.71E-04	1.03E-06	9.39E-03	9.96E-03	5.01E-04	2.67E-04	0.00E+00	4.03E-03	-2.89E-03
EP-terrestrial	mol N eq.	6.56E-03	1.30E-05	1.03E-01	1.10E-01	5.58E-03	3.37E-03	0.00E+00	4.30E-02	-3.20E-02
POCP	kg NMVOC eq.	1.76E-03	3.04E-06	2.75E-02	2.92E-02	1.46E-03	7.89E-04	0.00E+00	1.45E-02	-7.87E-03
ADPm[1]	kg Sb eq.	1.17E-07	2.46E-10	1.39E-07	2.56E-07	2.01E-08	6.38E-08	0.00E+00	4.10E-06	-1.67E-07
ADPf[1]	MJ	1.35E+01	5.05E-02	2.41E+01	3.77E+01	4.13E+00	1.31E+01	0.00E+00	3.21E+01	-2.49E+01
WDP[1]	m^3 world eq. deprived	2.09E-02	4.48E-05	2.45E-02	4.55E-02	3.67E-03	1.16E-02	0.00E+00	1.05E+00	-1.70E-01
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 = Acidifcation; 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 use									
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.									

Table 8 – Additional environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER ton of Bundsikring										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
PM	[Disease incidence]	1.52E-08	2.80E-11	5.62E-07	5.77E-07	1.22E-08	7.27E-09	0.00E+00	2.02E-07	-4.80E-07
IRP[2]	[kBq U235 eq.]	4.19E-03	1.41E-05	6.98E-03	1.12E-02	1.16E-03	3.67E-03	0.00E+00	5.72E-02	-2.81E-01
ETP-fw[1]	[CTUe]	9.60E+00	3.62E-02	1.73E+01	2.69E+01	2.96E+00	9.39E+00	0.00E+00	1.41E+01	-1.21E+01
HTP-c[1]	[CTUh]	1.97E-10	7.34E-13	4.22E-10	6.20E-10	6.01E-11	1.90E-10	0.00E+00	1.14E-09	-1.07E-09
HTP-nc[1]	[CTUh]	8.69E-09	3.27E-11	1.59E-08	2.46E-08	2.68E-09	8.47E-09	0.00E+00	1.32E-08	-9.82E-08
SQP[1]	-	5.59E+00	2.11E-02	1.01E+01	1.57E+01	1.73E+00	5.47E+00	0.00E+00	5.68E+01	-8.42E+00
Caption	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									
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.									

Table 9 - Parameters describing resource use

RESOURCE USE PER ton of Bundsikring										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
PERE	[MJ]	9.74E-01	3.68E-03	1.75E+00	2.73E+00	3.01E-01	9.53E-01	0.00E+00	6.44E-01	-8.08E+00
PERM	[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	0.00E+00
PERT	[MJ]	9.74E-01	3.68E-03	1.75E+00	2.73E+00	3.01E-01	9.53E-01	0.00E+00	6.44E-01	-8.08E+00
PENRE	[MJ]	1.36E+01	5.07E-02	2.42E+01	3.78E+01	4.15E+00	1.32E+01	0.00E+00	3.21E+01	-2.49E+01
PENRM	[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	0.00E+00
PENRT	[MJ]	1.36E+01	5.07E-02	2.42E+01	3.78E+01	4.15E+00	1.32E+01	0.00E+00	3.21E+01	-2.49E+01
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	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	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	0.00E+00
FW	[m^3]	1.27E-03	4.03E-06	1.99E-03	3.27E-03	3.29E-04	1.04E-03	0.00E+00	2.44E-02	-7.39E-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									

Table 10 – End-of-life (waste categories and output flows)

WASTE CATEGORIES AND OUTPUT FLOWS PER ton of Bundsikring										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
HWD	[kg]	4.14E-11	1.57E-13	7.47E-11	1.16E-10	1.28E-11	4.07E-11	0.00E+00	0.00E+00	6.08E-10
NHWD	[kg]	2.04E-03	7.73E-06	3.68E-03	5.73E-03	6.32E-04	2.00E-03	0.00E+00	1.97E+02	-3.34E+01
RWD	[kg]	2.50E-05	9.49E-08	4.52E-05	7.03E-05	7.76E-06	2.46E-05	0.00E+00	0.00E+00	-1.71E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.03E+02	0.00E+00	0.00E+00
MFR	[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	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	0.00E+00
EEE	[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	0.00E+00
EET	[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	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									

Table 11 - Core environmental impact indicators

ENVIRONMENTAL IMPACTS PER ton of Støbemix										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
GWP-total	kg CO_2 eq.	1.21E+00	1.07E+00	9.79E-01	3.27E+00	3.08E-01	9.61E-01	2.73E-01	1.68E+00	-1.55E+00
GWP-fossil	kg CO_2 eq.	1.23E+00	1.08E+00	9.81E-01	3.29E+00	3.04E-01	9.67E-01	2.63E-01	1.67E+00	-1.59E+00
GWP-biogenic	kg CO_2 eq.	-2.46E-02	-1.59E-02	-1.08E-02	-5.13E-02	1.07E-03	-1.42E-02	9.17E-03	7.70E-03	4.10E-02
GWP-luluc	kg CO_2 eq.	6.54E-03	9.96E-03	8.19E-03	2.47E-02	2.81E-03	8.91E-03	6.35E-04	1.15E-03	-6.87E-03
GWP-GHG	kg CO_2 eq.	1.06E+00	1.02E+00	9.29E-01	3.00E+00	2.86E-01	9.10E-01	2.40E-01	1.66E+00	-1.33E+00
ODP	kg CFC 11 eq.	1.06E-11	1.40E-13	8.03E-11	9.11E-11	3.95E-14	1.25E-13	4.77E-09	3.79E-08	-1.03E-11
AP	mol H^+ eq.	5.68E-03	1.06E-03	9.68E-03	1.64E-02	1.12E-03	9.46E-04	1.31E-03	1.06E-02	-8.20E-03
EP-freshwater	kg P eq.	5.91E-06	3.93E-06	4.38E-06	1.42E-05	1.11E-06	3.52E-06	2.33E-04	3.39E-04	-8.04E-06
EP-marine	kg N eq.	2.04E-03	2.98E-04	4.70E-03	7.04E-03	5.01E-04	2.67E-04	2.38E-04	4.03E-03	-2.89E-03
EP-terrestrial	mol N eq.	2.26E-02	3.77E-03	5.18E-02	7.82E-02	5.58E-03	3.37E-03	2.11E-03	4.30E-02	-3.20E-02
POCP	kg NMVOC eq.	5.60E-03	8.83E-04	1.37E-02	2.02E-02	1.46E-03	7.89E-04	7.14E-04	1.45E-02	-7.87E-03
ADPm[1]	kg Sb eq.	1.21E-07	7.13E-08	6.07E-08	2.53E-07	2.01E-08	6.38E-08	5.78E-07	4.10E-06	-1.67E-07
ADPf[1]	MJ	1.88E+01	1.46E+01	1.21E+01	4.55E+01	4.13E+00	1.31E+01	6.56E+00	3.21E+01	-2.49E+01
WDP[1]	m^3 world eq. deprived	1.09E-01	1.30E-02	1.10E-02	1.33E-01	3.67E-03	1.16E-02	1.95E-01	1.05E+00	-1.70E-01
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 = Acidifcation; 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 use									
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.									

Table 12 – Additional environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER ton of Støbemix										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
PM	[Disease incidence]	3.05E-07	8.13E-09	2.81E-07	5.95E-07	1.22E-08	7.27E-09	5.13E-09	2.02E-07	-4.80E-07
IRP[2]	[kBq U235 eq.]	1.76E-01	4.10E-03	3.40E-03	1.83E-01	1.16E-03	3.67E-03	1.64E-01	5.72E-02	-2.81E-01
ETP-fw[1]	[CTUe]	9.93E+00	1.05E+01	8.66E+00	2.91E+01	2.96E+00	9.39E+00	7.96E-01	1.41E+01	-1.21E+01
HTP-c[1]	[CTUh]	7.13E-10	2.13E-10	2.11E-10	1.14E-09	6.01E-11	1.90E-10	2.79E-10	1.14E-09	-1.07E-09
HTP-nc[1]	[CTUh]	6.33E-08	9.47E-09	7.93E-09	8.07E-08	2.68E-09	8.47E-09	4.71E-09	1.32E-08	-9.82E-08
SQP[1]	-	6.64E+00	6.12E+00	5.04E+00	1.78E+01	1.73E+00	5.47E+00	9.39E-01	5.68E+01	-8.42E+00
Caption	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									
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.									

Table 13 - Parameters describing resource use

RESOURCE USE PER ton of Støbemix										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
PERE	[MJ]	5.27E+00	1.07E+00	8.77E-01	7.21E+00	3.01E-01	9.53E-01	1.11E+00	6.44E-01	-8.08E+00
PERM	[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	0.00E+00
PERT	[MJ]	5.27E+00	1.07E+00	8.77E-01	7.21E+00	3.01E-01	9.53E-01	1.11E+00	6.44E-01	-8.08E+00
PENRE	[MJ]	1.89E+01	1.47E+01	1.21E+01	4.57E+01	4.15E+00	1.32E+01	6.56E+00	3.21E+01	-2.49E+01
PENRM	[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	0.00E+00
PENRT	[MJ]	1.89E+01	1.47E+01	1.21E+01	4.57E+01	4.15E+00	1.32E+01	6.56E+00	3.21E+01	-2.49E+01
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	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	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	0.00E+00
FW	[m^3]	4.87E-03	1.17E-03	9.68E-04	7.01E-03	3.29E-04	1.04E-03	4.55E-03	2.44E-02	-7.39E-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									

Table 14 – End-of-life (waste categories and output flows)

WASTE CATEGORIES AND OUTPUT FLOWS PER ton of Støbemix										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
HWD	[kg]	-3.68E-10	4.55E-11	3.74E-11	-2.85E-10	1.28E-11	4.07E-11	0.00E+00	0.00E+00	6.08E-10
NHWD	[kg]	2.08E+01	2.24E-03	1.84E-03	2.08E+01	6.32E-04	2.00E-03	0.00E+00	1.97E+02	-3.34E+01
RWD	[kg]	1.07E-03	2.75E-05	2.26E-05	1.12E-03	7.76E-06	2.46E-05	0.00E+00	0.00E+00	-1.71E-03
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	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.03E+02	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	0.00E+00
EEE	[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	0.00E+00
EET	[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	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									

Table 15 - Core environmental impact indicators

ENVIRONMENTAL IMPACTS PER ton of Nøddesten										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
GWP-total	kg CO_2 eq.	9.87E-01	4.88E-03	2.91E+00	3.90E+00	3.08E-01	9.61E-01	2.73E-01	1.68E+00	-1.55E+00
GWP-fossil	kg CO_2 eq.	9.75E-01	4.90E-03	2.92E+00	3.90E+00	3.04E-01	9.67E-01	2.63E-01	1.67E+00	-1.59E+00
GWP-biogenic	kg CO_2 eq.	3.44E-03	-7.19E-05	-3.21E-02	-2.87E-02	1.07E-03	-1.42E-02	9.17E-03	7.70E-03	4.10E-02
GWP-luluc	kg CO_2 eq.	9.06E-03	4.52E-05	2.44E-02	3.35E-02	2.81E-03	8.91E-03	6.35E-04	1.15E-03	-6.87E-03
GWP-GHG	kg CO_2 eq.	9.17E-01	4.61E-03	2.76E+00	3.69E+00	2.86E-01	9.10E-01	2.40E-01	1.66E+00	-1.33E+00
ODP	kg CFC 11 eq.	7.50E-11	6.35E-16	1.29E-10	2.04E-10	3.95E-14	1.25E-13	4.77E-09	3.79E-08	-1.03E-11
AP	mol H^+ eq.	1.53E-03	4.80E-06	2.88E-02	3.03E-02	1.12E-03	9.46E-04	1.31E-03	1.06E-02	-8.20E-03
EP-freshwater	kg P eq.	3.77E-06	1.78E-08	1.25E-05	1.63E-05	1.11E-06	3.52E-06	2.33E-04	3.39E-04	-8.04E-06
EP-marine	kg N eq.	5.67E-04	1.35E-06	1.40E-02	1.46E-02	5.01E-04	2.67E-04	2.38E-04	4.03E-03	-2.89E-03
EP-terrestrial	mol N eq.	6.52E-03	1.71E-05	1.54E-01	1.61E-01	5.58E-03	3.37E-03	2.11E-03	4.30E-02	-3.20E-02
POCP	kg NMVOC eq.	1.72E-03	4.00E-06	4.09E-02	4.26E-02	1.46E-03	7.89E-04	7.14E-04	1.45E-02	-7.87E-03
ADPm[1]	kg Sb eq.	7.43E-08	3.23E-10	1.81E-07	2.56E-07	2.01E-08	6.38E-08	5.78E-07	4.10E-06	-1.67E-07
ADPf[1]	MJ	1.34E+01	6.65E-02	3.59E+01	4.93E+01	4.13E+00	1.31E+01	6.56E+00	3.21E+01	-2.49E+01
WDP[1]	m^3 world eq. deprived	1.35E-02	5.90E-05	3.30E-02	4.65E-02	3.67E-03	1.16E-02	1.95E-01	1.05E+00	-1.70E-01
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 = Acidifcation; 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 use									
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.									

Table 16 – Additional environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER ton of Nøddesten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
PM	[Disease incidence]	1.51E-08	3.69E-11	8.37E-07	8.52E-07	1.22E-08	7.27E-09	5.13E-09	2.02E-07	-4.80E-07
IRP[2]	[kBq U235 eq.]	3.82E-03	1.86E-05	1.01E-02	1.39E-02	1.16E-03	3.67E-03	1.64E-01	5.72E-02	-2.81E-01
ETP-fw[1]	[CTUe]	9.56E+00	4.76E-02	2.57E+01	3.54E+01	2.96E+00	9.39E+00	7.96E-01	1.41E+01	-1.21E+01
HTP-c[1]	[CTUh]	1.94E-10	9.66E-13	6.28E-10	8.23E-10	6.01E-11	1.90E-10	2.79E-10	1.14E-09	-1.07E-09
HTP-nc[1]	[CTUh]	8.64E-09	4.30E-11	2.36E-08	3.23E-08	2.68E-09	8.47E-09	4.71E-09	1.32E-08	-9.82E-08
SQP[1]	-	5.57E+00	2.78E-02	1.50E+01	2.06E+01	1.73E+00	5.47E+00	9.39E-01	5.68E+01	-8.42E+00
Caption	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									
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.									

Table 17 - Parameters describing resource use

RESOURCE USE PER ton of Nøddesten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
PERE	[MJ]	9.71E-01	4.84E-03	2.61E+00	3.59E+00	3.01E-01	9.53E-01	1.11E+00	6.44E-01	-8.08E+00
PERM	[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	0.00E+00
PERT	[MJ]	9.71E-01	4.84E-03	2.61E+00	3.59E+00	3.01E-01	9.53E-01	1.11E+00	6.44E-01	-8.08E+00
PENRE	[MJ]	1.34E+01	6.67E-02	3.60E+01	4.95E+01	4.15E+00	1.32E+01	6.56E+00	3.21E+01	-2.49E+01
PENRM	[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	0.00E+00
PENRT	[MJ]	1.34E+01	6.67E-02	3.60E+01	4.95E+01	4.15E+00	1.32E+01	6.56E+00	3.21E+01	-2.49E+01
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	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	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	0.00E+00
FW	[m^3]	1.10E-03	5.30E-06	2.88E-03	3.99E-03	3.29E-04	1.04E-03	4.55E-03	2.44E-02	-7.39E-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									

Table 18 – End-of-life (waste categories and output flows)

WASTE CATEGORIES AND OUTPUT FLOWS PER ton of Nøddesten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
HWD	[kg]	4.14E-11	2.07E-13	1.11E-10	1.53E-10	1.28E-11	4.07E-11	0.00E+00	0.00E+00	6.08E-10
NHWD	[kg]	2.04E-03	1.02E-05	5.49E-03	7.54E-03	6.32E-04	2.00E-03	0.00E+00	1.97E+02	-3.34E+01
RWD	[kg]	2.50E-05	1.25E-07	6.74E-05	9.25E-05	7.76E-06	2.46E-05	0.00E+00	0.00E+00	-1.71E-03
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	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.03E+02	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	0.00E+00
EEE	[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	0.00E+00
EET	[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	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									

Table 19 - Core environmental impact indicators

ENVIRONMENTAL IMPACTS PER ton of Ærtesten										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
GWP-total	kg CO_2 eq.	1.02E+00	8.95E-02	1.95E+00	3.07E+00	3.08E-01	9.61E-01	2.73E-01	1.68E+00	-1.55E+00
GWP-fossil	kg CO_2 eq.	1.01E+00	9.00E-02	1.96E+00	3.06E+00	3.04E-01	9.67E-01	2.63E-01	1.67E+00	-1.59E+00
GWP-biogenic	kg CO_2 eq.	1.26E-03	-1.32E-03	-2.15E-02	-2.16E-02	1.07E-03	-1.42E-02	9.17E-03	7.70E-03	4.10E-02
GWP-luluc	kg CO_2 eq.	9.04E-03	8.30E-04	1.63E-02	2.62E-02	2.81E-03	8.91E-03	6.35E-04	1.15E-03	-6.87E-03
GWP-GHG	kg CO_2 eq.	9.46E-01	8.47E-02	1.85E+00	2.88E+00	2.86E-01	9.10E-01	2.40E-01	1.66E+00	-1.33E+00
ODP	kg CFC 11 eq.	4.18E-11	1.17E-14	1.06E-10	1.48E-10	3.95E-14	1.25E-13	4.77E-09	3.79E-08	-1.03E-11
AP	mol H^+ eq.	1.87E-03	8.81E-05	1.93E-02	2.13E-02	1.12E-03	9.46E-04	1.31E-03	1.06E-02	-8.20E-03
EP-freshwater	kg P eq.	3.94E-06	3.28E-07	8.49E-06	1.28E-05	1.11E-06	3.52E-06	2.33E-04	3.39E-04	-8.04E-06
EP-marine	kg N eq.	6.88E-04	2.49E-05	9.39E-03	1.01E-02	5.01E-04	2.67E-04	2.38E-04	4.03E-03	-2.89E-03
EP-terrestrial	mol N eq.	7.84E-03	3.14E-04	1.03E-01	1.12E-01	5.58E-03	3.37E-03	2.11E-03	4.30E-02	-3.20E-02
POCP	kg NMVOC eq.	2.03E-03	7.35E-05	2.74E-02	2.95E-02	1.46E-03	7.89E-04	7.14E-04	1.45E-02	-7.87E-03
ADPm[1]	kg Sb eq.	7.58E-08	5.94E-09	1.21E-07	2.03E-07	2.01E-08	6.38E-08	5.78E-07	4.10E-06	-1.67E-07
ADPf[1]	MJ	1.41E+01	1.22E+00	2.41E+01	3.93E+01	4.13E+00	1.31E+01	6.56E+00	3.21E+01	-2.49E+01
WDP[1]	m^3 world eq. deprived	2.07E-02	1.08E-03	2.21E-02	4.39E-02	3.67E-03	1.16E-02	1.95E-01	1.05E+00	-1.70E-01
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 = Acidifcation; 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 use									
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.									

Table 20 – Additional environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER ton of Ærtesten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
PM	[Disease incidence]	3.84E-08	6.77E-10	5.62E-07	6.01E-07	1.22E-08	7.27E-09	5.13E-09	2.02E-07	-4.80E-07
IRP[2]	[kBq U235 eq.]	1.76E-02	3.42E-04	6.78E-03	2.48E-02	1.16E-03	3.67E-03	1.64E-01	5.72E-02	-2.81E-01
ETP-fw[1]	[CTUe]	9.78E+00	8.74E-01	1.73E+01	2.79E+01	2.96E+00	9.39E+00	7.96E-01	1.41E+01	-1.21E+01
HTP-c[1]	[CTUh]	2.39E-10	1.77E-11	4.21E-10	6.78E-10	6.01E-11	1.90E-10	2.79E-10	1.14E-09	-1.07E-09
HTP-nc[1]	[CTUh]	1.32E-08	7.89E-10	1.58E-08	2.98E-08	2.68E-09	8.47E-09	4.71E-09	1.32E-08	-9.82E-08
SQP[1]	-	5.77E+00	5.10E-01	1.01E+01	1.63E+01	1.73E+00	5.47E+00	9.39E-01	5.68E+01	-8.42E+00
Caption	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									
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.									

Table 21 - Parameters describing resource use

RESOURCE USE PER ton of Ærtesten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
PERE	[MJ]	1.33E+00	8.88E-02	1.75E+00	3.17E+00	3.01E-01	9.53E-01	1.11E+00	6.44E-01	-8.08E+00
PERM	[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	0.00E+00
PERT	[MJ]	1.33E+00	8.88E-02	1.75E+00	3.17E+00	3.01E-01	9.53E-01	1.11E+00	6.44E-01	-8.08E+00
PENRE	[MJ]	1.41E+01	1.22E+00	2.42E+01	3.95E+01	4.15E+00	1.32E+01	6.56E+00	3.21E+01	-2.49E+01
PENRM	[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	0.00E+00
PENRT	[MJ]	1.41E+01	1.22E+00	2.42E+01	3.95E+01	4.15E+00	1.32E+01	6.56E+00	3.21E+01	-2.49E+01
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	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	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	0.00E+00
FW	[m^3]	1.41E-03	9.73E-05	1.93E-03	3.44E-03	3.29E-04	1.04E-03	4.55E-03	2.44E-02	-7.39E-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									

Table 22 – End-of-life (waste categories and output flows)

WASTE CATEGORIES AND OUTPUT FLOWS PER ton of Ærtesten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
HWD	[kg]	9.48E-12	3.79E-12	7.47E-11	8.80E-11	1.28E-11	4.07E-11	0.00E+00	0.00E+00	6.08E-10
NHWD	[kg]	1.67E+00	1.87E-04	3.68E-03	1.67E+00	6.32E-04	2.00E-03	0.00E+00	1.97E+02	-3.34E+01
RWD	[kg]	1.09E-04	2.29E-06	4.52E-05	1.57E-04	7.76E-06	2.46E-05	0.00E+00	0.00E+00	-1.71E-03
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	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.03E+02	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	0.00E+00
EEE	[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	0.00E+00
EET	[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	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									

Table 23 - Core environmental impact indicators

ENVIRONMENTAL IMPACTS PER ton of Perlesten										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
GWP-total	kg CO_2 eq.	1.63E+00	1.46E+00	1.95E+00	5.05E+00	3.08E-01	9.61E-01	2.73E-01	1.68E+00	-1.55E+00
GWP-fossil	kg CO_2 eq.	1.65E+00	1.47E+00	1.96E+00	5.08E+00	3.04E-01	9.67E-01	2.63E-01	1.67E+00	-1.59E+00
GWP-biogenic	kg CO_2 eq.	-3.36E-02	-2.16E-02	-2.15E-02	-7.67E-02	1.07E-03	-1.42E-02	9.17E-03	7.70E-03	4.10E-02
GWP-luluc	kg CO_2 eq.	8.72E-03	1.36E-02	1.63E-02	3.86E-02	2.81E-03	8.91E-03	6.35E-04	1.15E-03	-6.87E-03
GWP-GHG	kg CO_2 eq.	1.42E+00	1.38E+00	1.85E+00	4.65E+00	2.86E-01	9.10E-01	2.40E-01	1.66E+00	-1.33E+00
ODP	kg CFC 11 eq.	1.04E-11	1.90E-13	8.87E-11	9.92E-11	3.95E-14	1.25E-13	4.77E-09	3.79E-08	-1.03E-11
AP	mol H^+ eq.	7.43E-03	1.44E-03	1.93E-02	2.82E-02	1.12E-03	9.46E-04	1.31E-03	1.06E-02	-8.20E-03
EP-freshwater	kg P eq.	7.96E-06	5.35E-06	8.45E-06	2.18E-05	1.11E-06	3.52E-06	2.33E-04	3.39E-04	-8.04E-06
EP-marine	kg N eq.	2.63E-03	4.06E-04	9.39E-03	1.24E-02	5.01E-04	2.67E-04	2.38E-04	4.03E-03	-2.89E-03
EP-terrestrial	mol N eq.	2.91E-02	5.14E-03	1.03E-01	1.38E-01	5.58E-03	3.37E-03	2.11E-03	4.30E-02	-3.20E-02
POCP	kg NMVOC eq.	7.21E-03	1.20E-03	2.74E-02	3.58E-02	1.46E-03	7.89E-04	7.14E-04	1.45E-02	-7.87E-03
ADPm[1]	kg Sb eq.	1.63E-07	9.70E-08	1.20E-07	3.79E-07	2.01E-08	6.38E-08	5.78E-07	4.10E-06	-1.67E-07
ADPf[1]	MJ	2.54E+01	1.99E+01	2.41E+01	6.94E+01	4.13E+00	1.31E+01	6.56E+00	3.21E+01	-2.49E+01
WDP[1]	m^3 world eq. deprived	1.48E-01	1.77E-02	2.18E-02	1.88E-01	3.67E-03	1.16E-02	1.95E-01	1.05E+00	-1.70E-01
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 = Acidifcation; 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 use									
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.									

Table 24 – Additional environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER ton of Perlesten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
PM	[Disease incidence]	4.12E-07	1.11E-08	5.62E-07	9.84E-07	1.22E-08	7.27E-09	5.13E-09	2.02E-07	-4.80E-07
IRP[2]	[kBq U235 eq.]	2.39E-01	5.59E-03	6.76E-03	2.52E-01	1.16E-03	3.67E-03	1.64E-01	5.72E-02	-2.81E-01
ETP-fw[1]	[CTUe]	1.33E+01	1.43E+01	1.73E+01	4.49E+01	2.96E+00	9.39E+00	7.96E-01	1.41E+01	-1.21E+01
HTP-c[1]	[CTUh]	9.66E-10	2.90E-10	4.21E-10	1.68E-09	6.01E-11	1.90E-10	2.79E-10	1.14E-09	-1.07E-09
HTP-nc[1]	[CTUh]	8.59E-08	1.29E-08	1.58E-08	1.15E-07	2.68E-09	8.47E-09	4.71E-09	1.32E-08	-9.82E-08
SQP[1]	-	8.91E+00	8.33E+00	1.00E+01	2.73E+01	1.73E+00	5.47E+00	9.39E-01	5.68E+01	-8.42E+00
Caption	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									
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.									

Table 25 - Parameters describing resource use

RESOURCE USE PER ton of Perlesten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
PERE	[MJ]	7.15E+00	1.45E+00	1.75E+00	1.04E+01	3.01E-01	9.53E-01	1.11E+00	6.44E-01	-8.08E+00
PERM	[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	0.00E+00
PERT	[MJ]	7.15E+00	1.45E+00	1.75E+00	1.04E+01	3.01E-01	9.53E-01	1.11E+00	6.44E-01	-8.08E+00
PENRE	[MJ]	2.54E+01	2.00E+01	2.41E+01	6.96E+01	4.15E+00	1.32E+01	6.56E+00	3.21E+01	-2.49E+01
PENRM	[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	0.00E+00
PENRT	[MJ]	2.54E+01	2.00E+01	2.41E+01	6.96E+01	4.15E+00	1.32E+01	6.56E+00	3.21E+01	-2.49E+01
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	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	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	0.00E+00
FW	[m^3]	6.60E-03	1.59E-03	1.93E-03	1.01E-02	3.29E-04	1.04E-03	4.55E-03	2.44E-02	-7.39E-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									

Table 26 – End-of-life (waste categories and output flows)

WASTE CATEGORIES AND OUTPUT FLOWS PER ton of Perlesten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3***	**C4**	**D**
HWD	[kg]	-5.02E-10	6.20E-11	7.47E-11	-3.65E-10	1.28E-11	4.07E-11	0.00E+00	0.00E+00	6.08E-10
NHWD	[kg]	2.83E+01	3.05E-03	3.68E-03	2.83E+01	6.32E-04	2.00E-03	0.00E+00	1.97E+02	-3.34E+01
RWD	[kg]	1.46E-03	3.75E-05	4.52E-05	1.54E-03	7.76E-06	2.46E-05	0.00E+00	0.00E+00	-1.71E-03
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	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.03E+02	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	0.00E+00
EEE	[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	0.00E+00
EET	[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	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									

Table 27 - Core environmental impact indicators

ENVIRONMENTAL IMPACTS PER ton of Bundsten										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
GWP-total	kg CO_2 eq.	9.86E-01	4.88E-03	2.91E+00	3.90E+00	3.08E-01	9.61E-01	0.00E+00	1.68E+00	-1.55E+00
GWP-fossil	kg CO_2 eq.	9.74E-01	4.90E-03	2.92E+00	3.90E+00	3.04E-01	9.67E-01	0.00E+00	1.67E+00	-1.59E+00
GWP-biogenic	kg CO_2 eq.	3.44E-03	-7.19E-05	-3.21E-02	-2.87E-02	1.07E-03	-1.42E-02	0.00E+00	7.70E-03	4.10E-02
GWP-luluc	kg CO_2 eq.	9.06E-03	4.52E-05	2.44E-02	3.35E-02	2.81E-03	8.91E-03	0.00E+00	1.15E-03	-6.87E-03
GWP-GHG	kg CO_2 eq.	9.16E-01	4.61E-03	2.76E+00	3.68E+00	2.86E-01	9.10E-01	0.00E+00	1.66E+00	-1.33E+00
ODP	kg CFC 11 eq.	5.06E-13	6.35E-16	9.75E-11	9.80E-11	3.95E-14	1.25E-13	0.00E+00	3.79E-08	-1.03E-11
AP	mol H^+ eq.	1.52E-03	4.80E-06	2.88E-02	3.03E-02	1.12E-03	9.46E-04	0.00E+00	1.06E-02	-8.20E-03
EP-freshwater	kg P eq.	3.58E-06	1.78E-08	1.25E-05	1.61E-05	1.11E-06	3.52E-06	0.00E+00	3.39E-04	-8.04E-06
EP-marine	kg N eq.	5.66E-04	1.35E-06	1.40E-02	1.46E-02	5.01E-04	2.67E-04	0.00E+00	4.03E-03	-2.89E-03
EP-terrestrial	mol N eq.	6.51E-03	1.71E-05	1.54E-01	1.61E-01	5.58E-03	3.37E-03	0.00E+00	4.30E-02	-3.20E-02
POCP	kg NMVOC eq.	1.70E-03	4.00E-06	4.09E-02	4.26E-02	1.46E-03	7.89E-04	0.00E+00	1.45E-02	-7.87E-03
ADPm[1]	kg Sb eq.	6.49E-08	3.23E-10	1.78E-07	2.43E-07	2.01E-08	6.38E-08	0.00E+00	4.10E-06	-1.67E-07
ADPf[1]	MJ	1.33E+01	6.65E-02	3.59E+01	4.93E+01	4.13E+00	1.31E+01	0.00E+00	3.21E+01	-2.49E+01
WDP[1]	m^3 world eq. deprived	1.18E-02	5.90E-05	3.25E-02	4.44E-02	3.67E-03	1.16E-02	0.00E+00	1.05E+00	-1.70E-01
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 = Acidifcation; 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 use									
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.									

Table 28 – Additional environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER ton of Bundsten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
PM	[Disease incidence]	1.51E-08	3.69E-11	8.37E-07	8.52E-07	1.22E-08	7.27E-09	0.00E+00	2.02E-07	-4.80E-07
IRP[2]	[kBq U235 eq.]	3.74E-03	1.86E-05	1.01E-02	1.38E-02	1.16E-03	3.67E-03	0.00E+00	5.72E-02	-2.81E-01
ETP-fw[1]	[CTUe]	9.55E+00	4.76E-02	2.57E+01	3.53E+01	2.96E+00	9.39E+00	0.00E+00	1.41E+01	-1.21E+01
HTP-c[1]	[CTUh]	1.94E-10	9.66E-13	6.28E-10	8.22E-10	6.01E-11	1.90E-10	0.00E+00	1.14E-09	-1.07E-09
HTP-nc[1]	[CTUh]	8.63E-09	4.30E-11	2.36E-08	3.23E-08	2.68E-09	8.47E-09	0.00E+00	1.32E-08	-9.82E-08
SQP[1]	-	5.57E+00	2.78E-02	1.50E+01	2.06E+01	1.73E+00	5.47E+00	0.00E+00	5.68E+01	-8.42E+00
Caption	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									
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.									

Table 29 - Parameters describing resource use

RESOURCE USE PER ton of Bundsten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
PERE	[MJ]	9.70E-01	4.84E-03	2.61E+00	3.58E+00	3.01E-01	9.53E-01	0.00E+00	6.44E-01	-8.08E+00
PERM	[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	0.00E+00
PERT	[MJ]	9.70E-01	4.84E-03	2.61E+00	3.58E+00	3.01E-01	9.53E-01	0.00E+00	6.44E-01	-8.08E+00
PENRE	[MJ]	1.34E+01	6.67E-02	3.60E+01	4.95E+01	4.15E+00	1.32E+01	0.00E+00	3.21E+01	-2.49E+01
PENRM	[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	0.00E+00
PENRT	[MJ]	1.34E+01	6.67E-02	3.60E+01	4.95E+01	4.15E+00	1.32E+01	0.00E+00	3.21E+01	-2.49E+01
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	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	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	0.00E+00
FW	[m^3]	1.06E-03	5.30E-06	2.87E-03	3.94E-03	3.29E-04	1.04E-03	0.00E+00	2.44E-02	-7.39E-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									

Table 30 – End-of-life (waste categories and output flows)

WASTE CATEGORIES AND OUTPUT FLOWS PER ton of Bundsten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
HWD	[kg]	4.14E-11	2.07E-13	1.11E-10	1.53E-10	1.28E-11	4.07E-11	0.00E+00	0.00E+00	6.08E-10
NHWD	[kg]	2.04E-03	1.02E-05	5.49E-03	7.54E-03	6.32E-04	2.00E-03	0.00E+00	1.97E+02	-3.34E+01
RWD	[kg]	2.50E-05	1.25E-07	6.74E-05	9.25E-05	7.76E-06	2.46E-05	0.00E+00	0.00E+00	-1.71E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.03E+02	0.00E+00	0.00E+00
MFR	[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	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	0.00E+00
EEE	[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	0.00E+00
EET	[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	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									

Table 31 - Core environmental impact indicators

ENVIRONMENTAL IMPACTS PER [ton] of Kampesten										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
GWP-total	kg CO_2 eq.	9.86E-01	3.71E-03	1.95E+00	2.94E+00	3.08E-01	9.61E-01	0.00E+00	1.68E+00	-1.55E+00
GWP-fossil	kg CO_2 eq.	9.74E-01	3.73E-03	1.96E+00	2.94E+00	3.04E-01	9.67E-01	0.00E+00	1.67E+00	-1.59E+00
GWP-biogenic	kg CO_2 eq.	3.44E-03	-5.47E-05	-2.15E-02	-1.81E-02	1.07E-03	-1.42E-02	0.00E+00	7.70E-03	4.10E-02
GWP-luluc	kg CO_2 eq.	9.06E-03	3.43E-05	1.63E-02	2.54E-02	2.81E-03	8.91E-03	0.00E+00	1.15E-03	-6.87E-03
GWP-GHG	kg CO2 eq.	9.16E-01	3.51E-03	1.85E+00	2.77E+00	2.86E-01	9.10E-01	0.00E+00	1.66E+00	-1.33E+00
ODP	kg CFC 11 eq.	1.63E-12	4.82E-16	8.86E-11	9.03E-11	3.95E-14	1.25E-13	0.00E+00	3.79E-08	-1.03E-11
AP	mol H^+ eq.	1.52E-03	3.65E-06	1.93E-02	2.08E-02	1.12E-03	9.46E-04	0.00E+00	1.06E-02	-8.20E-03
EP-freshwater	kg P eq.	3.58E-06	1.36E-08	8.45E-06	1.20E-05	1.11E-06	3.52E-06	0.00E+00	3.39E-04	-8.04E-06
EP-marine	kg N eq.	5.66E-04	1.03E-06	9.39E-03	9.95E-03	5.01E-04	2.67E-04	0.00E+00	4.03E-03	-2.89E-03
EP-terrestrial	mol N eq.	6.51E-03	1.30E-05	1.03E-01	1.10E-01	5.58E-03	3.37E-03	0.00E+00	4.30E-02	-3.20E-02
POCP	kg NMVOC eq.	1.70E-03	3.04E-06	2.74E-02	2.91E-02	1.46E-03	7.89E-04	0.00E+00	1.45E-02	-7.87E-03
ADPm[1]	kg Sb eq.	6.51E-08	2.46E-10	1.20E-07	1.85E-07	2.01E-08	6.38E-08	0.00E+00	4.10E-06	-1.67E-07
ADPf[1]	MJ	1.33E+01	5.05E-02	2.41E+01	3.74E+01	4.13E+00	1.31E+01	0.00E+00	3.21E+01	-2.49E+01
WDP[1]	m^3 world eq. deprived	1.19E-02	4.48E-05	2.18E-02	3.37E-02	3.67E-03	1.16E-02	0.00E+00	1.05E+00	-1.70E-01
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 = Acidifcation; 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 use									
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.									

Table 32 – Additional environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER ton of Kampesten										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
PM	[Disease incidence]	1.51E-08	2.80E-11	5.62E-07	5.77E-07	1.22E-08	7.27E-09	0.00E+00	2.02E-07	-4.80E-07
IRP[2]	[kBq U235 eq.]	3.74E-03	1.41E-05	6.76E-03	1.05E-02	1.16E-03	3.67E-03	0.00E+00	5.72E-02	-2.81E-01
ETP-fw[1]	[CTUe]	9.55E+00	3.62E-02	1.73E+01	2.69E+01	2.96E+00	9.39E+00	0.00E+00	1.41E+01	-1.21E+01
HTP-c[1]	[CTUh]	1.94E-10	7.34E-13	4.21E-10	6.16E-10	6.01E-11	1.90E-10	0.00E+00	1.14E-09	-1.07E-09
HTP-nc[1]	[CTUh]	8.63E-09	3.27E-11	1.58E-08	2.45E-08	2.68E-09	8.47E-09	0.00E+00	1.32E-08	-9.82E-08
SQP[1]	-	5.57E+00	2.11E-02	1.00E+01	1.56E+01	1.73E+00	5.47E+00	0.00E+00	5.68E+01	-8.42E+00
Caption	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									
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.									

Table 33 - Parameters describing resource use

RESOURCE USE PER ton of Betonsand										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
PERE	[MJ]	9.70E-01	3.68E-03	1.75E+00	2.72E+00	3.01E-01	9.53E-01	0.00E+00	6.44E-01	-8.08E+00
PERM	[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	0.00E+00
PERT	[MJ]	9.70E-01	3.68E-03	1.75E+00	2.72E+00	3.01E-01	9.53E-01	0.00E+00	6.44E-01	-8.08E+00
PENRE	[MJ]	1.34E+01	5.07E-02	2.41E+01	3.76E+01	4.15E+00	1.32E+01	0.00E+00	3.21E+01	-2.49E+01
PENRM	[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	0.00E+00
PENRT	[MJ]	1.34E+01	5.07E-02	2.41E+01	3.76E+01	4.15E+00	1.32E+01	0.00E+00	3.21E+01	-2.49E+01
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	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	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	0.00E+00
FW	[m^3]	1.06E-03	4.03E-06	1.93E-03	3.00E-03	3.29E-04	1.04E-03	0.00E+00	2.44E-02	-7.39E-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									

Table 34 – End-of-life (waste categories and output flows)

WASTE CATEGORIES AND OUTPUT FLOWS PER ton of Betonsand										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
HWD	[kg]	4.14E-11	1.57E-13	7.47E-11	1.16E-10	1.28E-11	4.07E-11	0.00E+00	0.00E+00	6.08E-10
NHWD	[kg]	2.04E-03	7.73E-06	3.68E-03	5.73E-03	6.32E-04	2.00E-03	0.00E+00	1.97E+02	-3.34E+01
RWD	[kg]	2.50E-05	9.49E-08	4.52E-05	7.03E-05	7.76E-06	2.46E-05	0.00E+00	0.00E+00	-1.71E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.03E+02	0.00E+00	0.00E+00
MFR	[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	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	0.00E+00
EEE	[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	0.00E+00
EET	[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	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									

Table 35 - Core environmental impact indicators

ENVIRONMENTAL IMPACTS PER ton of Filtergrus										
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
GWP-total	kg CO_2 eq.	1.09E+00	7.11E-01	1.31E+00	3.11E+00	3.08E-01	9.61E-01	0.00E+00	1.68E+00	-1.55E+00
GWP-fossil	kg CO_2 eq.	1.10E+00	7.15E-01	1.31E+00	3.12E+00	3.04E-01	9.67E-01	0.00E+00	1.67E+00	-1.59E+00
GWP-biogenic	kg CO_2 eq.	-1.53E-02	-1.05E-02	-1.44E-02	-4.01E-02	1.07E-03	-1.42E-02	0.00E+00	7.70E-03	4.10E-02
GWP-luluc	kg CO_2 eq.	6.94E-03	6.58E-03	1.09E-02	2.45E-02	2.81E-03	8.91E-03	0.00E+00	1.15E-03	-6.87E-03
GWP-GHG	kg CO_2 eq	9.63E-01	6.72E-01	1.24E+00	2.88E+00	2.86E-01	9.10E-01	0.00E+00	1.66E+00	-1.33E+00
ODP	kg CFC 11 eq.	3.59E-11	9.25E-14	9.53E-11	1.31E-10	3.95E-14	1.25E-13	0.00E+00	3.79E-08	-1.03E-11
AP	mol H^+ eq.	4.23E-03	7.00E-04	1.29E-02	1.79E-02	1.12E-03	9.46E-04	0.00E+00	1.06E-02	-8.20E-03
EP-freshwater	kg P eq.	5.02E-06	2.60E-06	5.78E-06	1.34E-05	1.11E-06	3.52E-06	0.00E+00	3.39E-04	-8.04E-06
EP-marine	kg N eq.	1.53E-03	1.97E-04	6.28E-03	8.01E-03	5.01E-04	2.67E-04	0.00E+00	4.03E-03	-2.89E-03
EP-terrestrial	mol N eq.	1.70E-02	2.49E-03	6.93E-02	8.88E-02	5.58E-03	3.37E-03	0.00E+00	4.30E-02	-3.20E-02
POCP	kg NMVOC eq.	4.25E-03	5.84E-04	1.84E-02	2.32E-02	1.46E-03	7.89E-04	0.00E+00	1.45E-02	-7.87E-03
ADPm[1]	kg Sb eq.	1.02E-07	4.71E-08	8.18E-08	2.31E-07	2.01E-08	6.38E-08	0.00E+00	4.10E-06	-1.67E-07
ADPf[1]	MJ	1.63E+01	9.68E+00	1.61E+01	4.21E+01	4.13E+00	1.31E+01	0.00E+00	3.21E+01	-2.49E+01
WDP[1]	m^3 world eq. deprived	7.61E-02	8.59E-03	1.49E-02	9.95E-02	3.67E-03	1.16E-02	0.00E+00	1.05E+00	-1.70E-01
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 = Acidifcation; 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 use									
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.									

Table 36 – Additional environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER ton of Filtergrus										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
PM	[Disease incidence]	2.06E-07	5.37E-09	3.76E-07	5.87E-07	1.22E-08	7.27E-09	0.00E+00	2.02E-07	-4.80E-07
IRP[2]	[kBq U235 eq.]	1.17E-01	2.71E-03	4.55E-03	1.24E-01	1.16E-03	3.67E-03	0.00E+00	5.72E-02	-2.81E-01
ETP-fw[1]	[CTUe]	9.32E+00	6.94E+00	1.16E+01	2.78E+01	2.96E+00	9.39E+00	0.00E+00	1.41E+01	-1.21E+01
HTP-c[1]	[CTUh]	5.27E-10	1.41E-10	2.82E-10	9.50E-10	6.01E-11	1.90E-10	0.00E+00	1.14E-09	-1.07E-09
HTP-nc[1]	[CTUh]	4.43E-08	6.26E-09	1.06E-08	6.11E-08	2.68E-09	8.47E-09	0.00E+00	1.32E-08	-9.82E-08
SQP[1]	-	5.99E+00	4.05E+00	6.73E+00	1.68E+01	1.73E+00	5.47E+00	0.00E+00	5.68E+01	-8.42E+00
Caption	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									
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.									

Table 37 - Parameters describing resource use

RESOURCE USE PER ton of Filtergrus										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
PERE	[MJ]	3.76E+00	7.05E-01	1.17E+00	5.64E+00	3.01E-01	9.53E-01	0.00E+00	6.44E-01	-8.08E+00
PERM	[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	0.00E+00
PERT	[MJ]	3.76E+00	7.05E-01	1.17E+00	5.64E+00	3.01E-01	9.53E-01	0.00E+00	6.44E-01	-8.08E+00
PENRE	[MJ]	1.63E+01	9.72E+00	1.62E+01	4.22E+01	4.15E+00	1.32E+01	0.00E+00	3.21E+01	-2.49E+01
PENRM	[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	0.00E+00
PENRT	[MJ]	1.63E+01	9.72E+00	1.62E+01	4.22E+01	4.15E+00	1.32E+01	0.00E+00	3.21E+01	-2.49E+01
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	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	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	0.00E+00
FW	[m^3]	3.54E-03	7.72E-04	1.30E-03	5.60E-03	3.29E-04	1.04E-03	0.00E+00	2.44E-02	-7.39E-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									

Table 38 – End-of-life (waste categories and output flows)

WASTE CATEGORIES AND OUTPUT FLOWS PER ton of Bundsikring										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3****	**C4**	**D**
HWD	[kg]	-2.31E-10	3.01E-11	5.00E-11	-1.51E-10	1.28E-11	4.07E-11	0.00E+00	0.00E+00	6.08E-10
NHWD	[kg]	1.37E+01	1.48E-03	2.46E-03	1.38E+01	6.32E-04	2.00E-03	0.00E+00	1.97E+02	-3.34E+01
RWD	[kg]	7.16E-04	1.82E-05	3.02E-05	7.64E-04	7.76E-06	2.46E-05	0.00E+00	0.00E+00	-1.71E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.03E+02	0.00E+00	0.00E+00
MFR	[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	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	0.00E+00
EEE	[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	0.00E+00
EET	[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	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									

Additional information

LCA interpretation

The overall results presented in the LCA showed, that the life cycle stage Production (A1-A3), has the largest impact in the core environmental impact indicators for five of the products: Støbemix, Nøddesten, Perlesten, Bundsten, and Filtergrus. In modules A1-A3 the product Perlesten has the largest environmental impact. Some of the stones are imported from another gravel pit in Denmark, due to the transportation and the process chosen for the gravel, the product contributes with a higher impact compared to the remaining products.

The environmental impact categories are significantly influenced by the impact of the C1-C4 modules. This is due to the landfill process used in C4 which has a large impact on the End-of-Life stages. The products: Støbemix, Nøddesten, Perlesten, Bundsten, and Filtergrus have a greater environmental impact compared to the other products, as they are used for concrete and therefore have an impact in module C3 caused by the crushing process. Other than this, the products have the same environmental impact in the C and D modules, as they undergo the same End-of-Life treatment.

Technical information on scenarios

End of life (C1-C4)

Scenario information	Value		Unit
	Scenario 1	Scenario 2	
Collected separately	1000	1000	kg
Collected with mixed waste	0	0	kg
For reuse	0	803	kg
For recycling	803	0	kg
For energy recovery	0	0	kg
For final disposal (landfill)	197	197	kg
Assumptions for scenario development			As appropriate

Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Displaced material	803	kg
Energy recovery from waste incineration	0	MJ

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

References

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Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Marie Laursen Bjørneboe Heidi Stranddorf Sweco Danmark, Ørestad Boulevard 41, 2300 København S Denmark
LCA software /background data	LCA for Experts from Sphera (version 10.7). Generic data and background data is primarily based on data from the database Managed LCA Content (MLC) from Sphera (version 2023.2) and Ecoinvent database version 3.8 (Ecoinvent. 2021).
3rd party verifier	*Guangli Du* *Department of the Built Environment* *Aalborg University, Denmark*

General programme instructions
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

[Product-specific cPCR]
Construction products - PCR 2019:14, VERSION 1.3.1

EN 15942
DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025
DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040
DS/EN ISO 14040:2008 – ” Environmental management – Life cycle assessment – Principles and framework”

ISO 14044
DS/EN ISO 14044:2008 – ” Environmental management – Life cycle assessment – Requirements and guidelines”