epddanmark

ECO PLATFORM EPD VERIFIED

Owner: SR-Gruppen A/S
No.: MD-24097-EN
Issued: 01-08-2024
Valid to: 01-08-2029

3rd PARTY **VERIFIED**

EPD

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

Owner of declaration
SR-Gruppen A/S
Fuglesangsalle 14
6600 Vejen
CVR - 32678505

Program
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)

Construction Backfill:

1. Lime stabilised clay in situ (LCS In Situ)
2. Lime Stabilised clay mobile plant (LCS Mobile Plant)
3. Cement stabilised gravel (CSG In Situ)

Number of declared datasets/product variations: 3

Production site
Production takes place on-site at a construction site in Denmark.

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

Declared/ functional unit
1 ton

Year of production site data (A3)
2023

EPD version
v1

Issued: 01-08-2024
Valid to: 01-08-2029

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

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the 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:

Mirko Miseljic

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	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Product information

Product description

The main product components are shown in the table below.

Material	LSC w/w%	CSG w/w%
Clay	99%	0 %
Gravel	0%	91%
Quicklime	1%	0%
Cement	0%	7%
Water	0%	2%
Sum	**100%**	**100%**

Product packaging:

No sales- or transport packaging is used since all materials and products are transported directly on the bed of trucks or in tanker trucks.

Representativity

This declaration, including data collection and the modelled foreground system including results, represents the production of 1000 kg of stabilized soil, as backfill, in Denmark by SR-Gruppen. Product specific foreground data are based on average values collected from the year 2023, including January of 2024. Background data are based on datasets from the GaBi 10.7 database, as well as ecoinvent 3.9, and are less than 5 years old. Generally, the used background datasets are of high quality, and most datasets are no more than a few years old, and in accordance with EN15804:2012+A2:2019.

Hazardous substances

The products declared, do not contain substances listed on the "Candidate List of Substances of Very High Concern for authorization" if its content exceeds 0,1 w/w% of the declared product.

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

Product(s) use

Soil stabilization, regardless of the stabilizing agent used, plays a crucial role in construction projects. It transforms the physical properties of the soil, making it more suitable for construction demands. The production process occurs either in situ, or onboard a mobile mixing machinery, whereby material from the site is loaded by excavator into the machinery's intake hopper, whereby the soil is stabilized before being unloaded into a dump truck and unloaded by excavator.

The primary functions served by soil stabilization include:

1. Enhancement of Soil Strength: Stabilization increases the load-bearing capacity of the soil, making it suitable for supporting structures, pavements and traffic.
2. Moisture Control: By reducing the soil's moisture content, stabilization mitigates swelling, shrinkage, and other moisture-related issues.
3. Durability Improvement: Stabilized soil exhibits enhanced resistance to weathering and erosion, thus extending the lifespan of the construction.

Essential characteristics

Stabilized soil used as backfill complies with the requirements described in Vejdirektoratet's AAB *"Arbejdsbeskrivelse for Jordstabilisering"*.

The products are covered by harmonized technical specification EN 14227-15:2015 *"Hydraulically bound mixtures – Specifications – Part 15 Hydraulically stabilized soil"*. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations.

Further technical information can be obtained by contacting the manufacturer or on the manufacturers website:

https://www.sr-gruppen.dk/

Reference Service Life (RSL)

No official service life exists for stabilized soil, as such a minimum reference service life of at least 50 years under normal conditions was selected in accordance with EN16757.

Picture of product(s)

Lime Stabilized Clay Soil

Cement Stabilized Gravel

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1000kg of stabilized soil, either lime stabilized clay or cement stabilized gravel.

Name	LSC	CSG	Unit
Declared unit	1000	1000	kg
Density	2000	1700	kg/m3
Conversion factor to 1 kg.	0,001	0,001	-

Functional unit

Not defined.

PCR

This EPD is developed according to the core rules for the product category of construction products and services in EN 15804:2012+A2:2019.

Energy modelling principles

Foreground system:

Residual grid mix was not used, as no electricity was used by the foreground system, only average grid mixes were used by upstream and down stream processes in the background datasets.

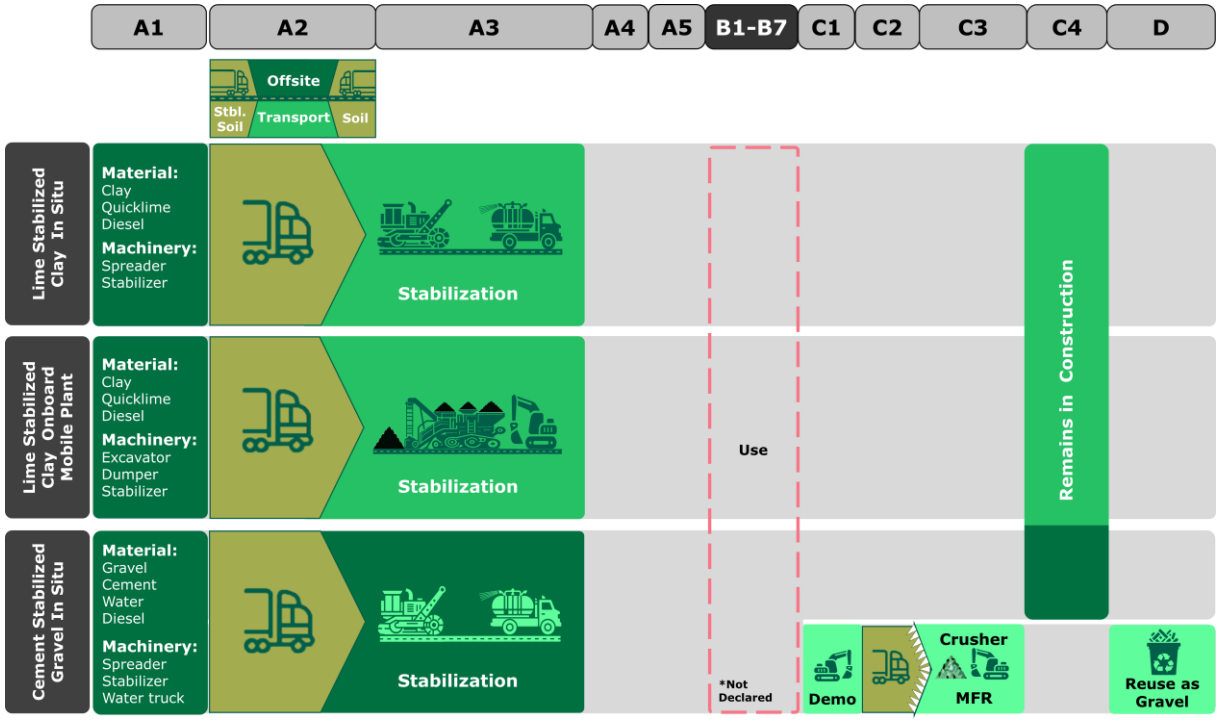
None of the energy consumed in the production of the declared products are covered by guarantees of origin certificates.

All the energy consumed is generated from the combustion of diesel fuel. The fuel is modelled with the dataset [RER:Diesel mix at filling station with DEF]. This includes the production of the diesel exhaust fluid AdBlue, as is used by all machinery and transport in compliance with emissions standards.

Background system:

Both upstream and downstream processes in the background system are modelled using an average electrical grid mix, where electricity is used in the background datasets. i.e. the sources of electricity consumption within aggregated secondary datasets cannot be isolated and altered.

Flowdiagram



In ~90% of the cases Cement Stabilized Gravel will remain in the construction in end of life. An additional end of life scenario has been modelled for the remaining 10% of cases where the stabilized gravel is removed and recycled as gravel. There are therefore two end of life pathways in the flow diagram above for cement stabilized gravel. The results for this scenario in section **Error! Reference source not found.** include two sets of end of life results in modules C1-D, for both end of life pathways. As production and installation generally occurs simultaneously it wasn't possible to destinguish between what processes would be declared in modules A2 and A3 from modules A4 and A5. As such all impacts related to transport, production and installation have been declared in modules A2 and A3 respectively.

System boundary

This EPD is based on a cradle-to-gate LCA with options to include modules A4, A5, 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.

It was assumed that these exclusions were of negligeable importance to the final results. In addition it was assumed that the transport distance at end of life for the additional end of life recycling scenario for CSG. Transporting the CSG from the construction site to the nearest depot would be 50km. It was also assumed that all residual materials remaining post stabilization would be driven to subsequent construction sites, resulting in no leftover material or waste from the process. Assumptions for the degree of carbonation of cement and quicklime for all three products were made from previous studies on carbonation.

SR-Gruppen provided total production figures for the year 2023, for each project carried out under each declared product as well as the first three weeks of 2024 for CSG. The total diesel consumed by transport, as well as the total diesel consumed by equipment and process machinery associated

with these production figures were included alongside as well as their respective material inputs of quicklime, cement, water, and soil. These total figures were divided by their respective tons of stabilized soil each declared product produced, thus allocating the values uniformly by mass.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials and semi-finished goods, the transport of these materials to the production site, and the energy consumed by the stabilization process. The LCA results are declared in aggregated form for the product stage; that is, the sub-modules A1, A2, and A3 are declared as one module, A1-A3.

The A2 module accounts for the transportation of materials onto the production site, which, in the case of stabilized soil, is the construction site itself. However, there are cases where the construction site lacks the necessary space for onsite stabilization. In such situations, an additional step is taken to transport the soil (gravel/clay) to another nearby location more suitable for stabilization. The stabilized soil is then returned to the construction site. This additional transport is not factored into the results but can be easily included in the module's impacts, by utilizing the values presented in the section titled "Technical Specifications on Scenarios".

A3 declares all impacts associated with activities in the formulation of the product which occurs on the construction site. This includes the combustion of diesel fuel to stabilize the soil. Site preparation activities are not included, as this is considered part of a different construction product system. Two methods of stabilization are declared, in situ stabilization, and an onboard stabilization. The difference between the in-situ method and the onboard method of stabilization is predominantly the equipment used and the quantity of diesel consumed in the process.

With in situ stabilization a truck evenly disperses the binder(i.e. cement or quicklime) onto the soils surface. Once the binder has been dispersed, a milling machine homogenizes the binder into the soil, in place, at a depth of 0,4m.

When this process is used to stabilize gravel with cement, the addition of water is in most instances required, depending on the moisture content of the gravel. A pump truck is therefore used to spray water onto the gravel as the miller operates.

Stabilization via the mobile plant requires an excavator to unearth the soil and load it into the plant's hopper. The soil is then mixed with the binder onboard, before being unloaded onto a pile via a conveyor belt and laid uniformly using a tractor and dumper to reach a thickness of 0,4m.

Construction process stage (A4-A5) includes:

As construction occurs at the site of production, all transport and construction processes have been declared under modules A2 and A3.

Use stage (B1-B7) includes:

Modules not declared.

End of Life (C1-C4) includes:

All the products declared remain in the construction at the end of life (C4), apart from the cement stabilized gravel, which can be recycled into gravel, for a minority instances where the construction is redeveloped. In this case the cement stabilized gravel includes an additional end of life recycling scenario, whereby an excavator digs up the stabilized gravel, and loads it onto a truck (C1*). The truck then transports the material to a depot (C2*) where it is crushed into a 0-32 grade gravel, and then stored for 10 days on average (C3*). The lime stabilized clay can also be reused, however there are no impacts associated with this, as it can be reused directly without any additional processing.

The carbonation of LSC, and CSG has also been declared within module C4.

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

The additional end of life scenario for recycling cement stabilized gravel includes an external benefit outside of the system boundaries to be declared in module D*. This benefit results from the avoided burden of producing gravel, which is substituted with the gravel produced from recycling cement stabilized gravel.

Carbonation occurs for all product scenarios outside of the system boundaries and is declared in module D.

LCA results

In Situ Lime Stabilized Clay Soil:

ENVIRONMENTAL IMPACTS PER TON LSC IN SITU								
Parameter	**Unit**	**A1-A3**	**A4-A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	1,42E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,41E+00	-1,14E+00
GWP-fossil	[kg CO_2 eq.]	1,42E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,41E+00	-1,14E+00
GWP-biogenic	[kg CO_2 eq.]	6,86E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-luluc	[kg CO_2 eq.]	3,52E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ODP	[kg CFC 11 eq.]	8,51E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
AP	[mol H^+ eq.]	4,45E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-freshwater	[kg P eq.]	3,71E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-marine	[kg N eq.]	1,89E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-terrestrial	[mol N eq.]	2,08E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
POCP	[kg NMVOC eq.]	5,24E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADPm[1]	[kg Sb eq.]	8,54E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADPf[1]	[MJ]	7,42E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
WDP[1]	[m^3 world eq. deprived]	4,63E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Caption	GWP-total = Globale 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 depletion potential							
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.							
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							

ADDITIONAL ENVIRONMENTAL IMPACTS PER TON LSC IN SITU									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	1,91E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
IRP[2]	[kBq U235 eq.]	5,51E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETP-fw[1]	[CTUe]	1,42E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
HTP-c[1]	[CTUh]	1,69E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
HTP-nc[1]	[CTUh]	1,73E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
SQP[1]	-	3,10E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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 (dimensionless)								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^{2}$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.								
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.								
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.								

RESOURCE USE PER TON LSC IN SITU								
Parameter	**Unit**	**A1-A3**	**A4-A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	1,78E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	1,78E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRE	[MJ]	7,42E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	7,42E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
SM	[kg]	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
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m^3]	3,14E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water							

	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^{2}$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.

WASTE CATEGORIES AND OUTPUT FLOWS PER TON LSC IN SITU								
Parameter	**Unit**	**A1- A3**	**A4-A5**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	6,27E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NHWD	[kg]	1,82E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RWD	[kg]	3,48E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
CRU	[kg]	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	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
EEE	[MJ]	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
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy							
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^{2}$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.							

BIOGENIC CARBON CONTENT PER TON LSC IN SITU		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0,00E+00
Biogenic carbon content in accompanying packaging	[kg C]	0,00E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Lime Stabilized Clay Onboard Mobile Plant:

ENVIRONMENTAL IMPACTS PER TON LSC MOBILE PLANT								
Parameter	**Unit**	**A1-A3**	**A4-A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	1,59E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,41E+00	-1,14E+00
GWP-fossil	[kg CO_2 eq.]	1,59E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,41E+00	-1,14E+00
GWP-biogenic	[kg CO_2 eq.]	2,73E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-luluc	[kg CO_2 eq.]	1,88E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ODP	[kg CFC 11 eq.]	7,09E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
AP	[mol H^+ eq.]	8,26E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-freshwater	[kg P eq.]	2,19E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-marine	[kg N eq.]	3,50E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-terrestrial	[mol N eq.]	3,88E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
POCP	[kg NMVOC eq.]	9,79E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADPm[1]	[kg Sb eq.]	3,16E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADPf[1]	[MJ]	9,74E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
WDP[1]	[m^3 world eq. deprived]	7,49E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Caption	GWP-total = Globale 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 depletion potential								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.							
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							

ADDITIONAL ENVIRONMENTAL IMPACTS PER LSC MOBILE PLANT									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	2,35E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
IRP[2]	[kBq U235 eq.]	6,30E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETP-fw[1]	[CTUe]	3,05E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
HTP-c[1]	[CTUh]	2,46E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
HTP-nc[1]	[CTUh]	1,89E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
SQP[1]	-	1,26E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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 (dimensionless)
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^{2}$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

RESOURCE USE PER LSC MOBILE PLANT								
Parameter	**Unit**	**A1-A3**	**A4-A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	3,46E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	3,46E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRE	[MJ]	9,75E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	9,75E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
SM	[kg]	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
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m^3]	5,16E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water							
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^{2}$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.							

WASTE CATEGORIES AND OUTPUT FLOWS PER LSC MOBILE PLANT								
Parameter	**Unit**	**A1- A3**	**A4-A5**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	6,39E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NHWD	[kg]	1,85E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RWD	[kg]	3,92E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
CRU	[kg]	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	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
EEE	[MJ]	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
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy							
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^{2}$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.							

BIOGENIC CARBON CONTENT PER LSC MOBILE PLANT		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0,00E+00
Biogenic carbon content in accompanying packaging	[kg C]	0,00E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

In Situ Cement Stabilized Gravel Soil:

Modules C1-D annotated with a "*" declares the additional end of life scenario for cement stabilized gravel soil, whereby gravel is removed from the construction, transported to a gravel depot, crushed and stored before being recycled. The cement stabilized gravel, much like lime stabilized clay, will remain in construction in the majority of cases. This is declared in C4 as final disposal. No processes and subsequently, impacts are declared in modules C1-C3, and D for this standard end of life scenario. Carbonation occurs in modules C4, and D of all product scenarios.

ENVIRONMENTAL IMPACTS PER TON CSG IN SITU													
Indicator	**Unit**	**A1-A3**	**A4-A5**	**C1**	**C2**	**C3**	**C4**	**D**	**C1***	**C2***	**C3***	**C4***	**D***
GWP-total	kg CO_2 eq.	5,18E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,77E+01	-5,90E+00	6,20E-01	2,54E+00	8,43E+00	0,00E+00	-2,62E+01
GWP-fossil	kg CO_2 eq.	5,16E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,77E+01	-5,90E+00	6,07E-01	2,48E+00	8,38E+00	0,00E+00	-2,62E+01
GWP-biogenic	kg CO_2 eq.	2,89E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,53E-03	2,83E-02	3,02E-02	0,00E+00	0,00E+00
GWP-luluc	kg CO_2 eq.	2,64E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,56E-03	2,31E-02	2,30E-02	0,00E+00	-3,20E-04
ODP	kg CFC 11 eq.	7,78E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,39E-14	3,90E-13	8,77E-08	0,00E+00	-2,40E-14
AP	mol H^+ eq.	1,62E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,14E-03	3,82E-03	3,12E-01	0,00E+00	-2,70E-02
EP-freshwater	kg P eq.	7,22E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,20E-06	9,13E-06	1,72E-03	0,00E+00	-8,00E-07
EP-marine	kg N eq.	3,50E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,48E-03	1,43E-03	1,57E-01	0,00E+00	-1,30E-02
EP-terrestrial	mol N eq.	4,01E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,63E-02	1,66E-02	1,72E+00	0,00E+00	-1,50E-01
POCP	kg NMVOC eq.	1,17E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,12E-03	3,36E-03	4,53E-01	0,00E+00	-3,90E-02
ADPm[1]	kg Sb eq.	2,28E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,04E-08	1,67E-07	1,71E-05	0,00E+00	0,00E+00
ADPf[1]	MJ	2,19E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,26E+00	3,43E+01	1,09E+02	0,00E+00	-3,60E+01
WDP[1]	m^3 world eq. deprived	8,97E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,54E-03	3,13E-02	1,18E+00	0,00E+00	-1,50E-05
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.

ADDITIONAL ENVIRONMENTAL IMPACTS PER TON CSG IN SITU													
Parameter	**Unit**	**A1-A3**	**A4-A5**	**C1**	**C2**	**C3**	**C4**	**D**	**C1***	**C2***	**C3***	**C4***	**D***
PM	[Disease incidence]	4,93E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,55E-08	3,20E-08	4,51E-06	0,00E+00	-5,23E-05
IRP[2]	[kBq U235 eq.]	3,41E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,37E-03	9,85E-03	2,09E-01	0,00E+00	-3,69E+01
ETP-fw[1]	[CTUe]	9,60E+05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,88E+00	2,44E+01	4,63E+01	0,00E+00	-1,05E+06
HTP-c[1]	[CTUh]	6,49E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,19E-10	4,95E-10	6,25E-08	0,00E+00	-6,72E-07
HTP-nc[1]	[CTUh]	1,80E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,33E-09	2,21E-08	1,41E-07	0,00E+00	-1,95E-05
SQP[1]	-	3,11E+05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,42E+00	1,42E+01	2,37E+01	0,00E+00	-3,40E+05
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.											

RESOURCE USE PER TON CSG IN SITU													
Parameter	**Unit**	**A1-A3**	**A4-A5**	**C1**	**C2**	**C3**	**C4**	**D**	**C1***	**C2***	**C3***	**C4***	**D***
PERE	[MJ]	1,00E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,03E-01	2,50E+00	5,48E+00	0,00E+00	-8,00E+01
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	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	6,39E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,03E-01	2,50E+00	5,48E+00	0,00E+00	-4,00E+01
PENRE	[MJ]	2,58E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,29E+00	3,44E+01	1,09E+02	0,00E+00	-7,20E+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	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	2,25E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,29E+00	3,44E+01	1,09E+02	0,00E+00	-3,60E+01
SM	[kg]	3,09E-03	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	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	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	0,00E+00	0,00E+00	0,00E+00
FW	[m^3]	2,28E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,69E-04	2,77E-03	2,92E-02	0,00E+00	-9,20E-07
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												

WASTE CATEGORIES AND OUTPUT FLOWS PER TON CSG IN SITU													
Parameter	**Unit**	**A1-A3**	**A4-A5**	**C1**	**C2**	**C3**	**C4**	**D**	**C1***	**C2***	**C3***	**C4***	**D***
HWD	[kg]	1,32E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,25E-11	1,76E-10	1,45E-10	0,00E+00	-4,10E-03
NHWD	[kg]	2,83E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,28E-03	5,32E-03	4,46E-03	0,00E+00	-3,20E-02
RWD	[kg]	5,70E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,62E-05	6,72E-05	5,71E-05	0,00E+00	-1,10E-04
CRU	[kg]	1,37E+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	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	2,90E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,00E+03	0,00E+00	0,00E+00
MER	[kg]	1,66E-01	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	0,00E+00	-2,00E-02
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	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	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											

BIOGENIC CARBON CONTENT PER TON CSG IN SITU		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	0,00E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

LCA interpretation

The largest portion of impacts are derived from module A1, with the extraction and production of resources necessary for soil stabilization. Within module A1, it is more specifically the soil stabilizing agent, quicklime, or cement, which causes the largest burden for the majority of impact categories.

Table 1 - Maximum contribution to impact categories for LSC In Situ

Environmental Impact				
Impact Category	**Unit**	**Contribution**	**Process**	**% of category**
Climate Change - total	[kg CO2 eq.]	1,39E+01	A1: Quicklime	74,1%
Climate Change, fossil	[kg CO2 eq.]	1,39E+01	A1: Quicklime	74,1%
Climate Change, biogenic	[kg CO2 eq.]	1,22E-02	A3: Machine Operation	46,7%
Climate Change, land use and land use change	[kg CO2 eq.]	1,89E-03	A3: Diesel Fuel	53,9%
Ozone depletion	[kg CFC 11 eq.]	8,30E-11	A3: Machine Operation	97,5%
Acidification	[mol H+ eq.]	3,59E-03	A1: Quicklime	80,7%
Eutrophication, freshwater	[kg PO4 eq.]	1,62E-06	A3: Machine Operation	43,6%
Eutrophication, marine	[kg N eq.]	1,51E-03	A1: Quicklime	79,8%
Eutrophication, terrestrial	[mol N eq.]	1,65E-02	A1: Quicklime	79,5%
Photochemical ozone formation, human health	[kg NMVOC eq.]	4,30E-03	A1: Quicklime	82,1%
Resource use, mineral and metals	[kg Sb eq.]	4,90E-08	A1: Quicklime	57,4%
Resource use, fossils	[MJ]	6,99E+01	A1: Quicklime	94,3%
Water use	[m3]	4,14E-02	A1: Quicklime	89,5%

Table 2 - Maximum contribution to impact categories for LSC Mobile Plant

Environmental Impact				
Impact Category	**Unit**	**Contribution**	**Process**	**% of category**
Climate Change - total	[kg CO2 eq.]	1,39E+01	A1: Quicklime	67,8%
Climate Change, fossil	[kg CO2 eq.]	1,39E+01	A1: Quicklime	68,0%
Climate Change, biogenic	[kg CO2 eq.]	1,04E-01	A3: Machine Operation	54,2%
Climate Change, land use and land use change	[kg CO2 eq.]	1,61E-02	A3: Diesel Fuel	85,8%
Ozone depletion	[kg CFC 11 eq.]	7,07E-10	A3: Machine Operation	99,7%
Acidification	[mol H+ eq.]	3,59E-03	A1: Quicklime	43,5%
Eutrophication, freshwater	[kg PO4 eq.]	1,38E-05	A3: Machine Operation	62,9%
Eutrophication, marine	[kg N eq.]	1,51E-03	A1: Quicklime	43,1%
Eutrophication, terrestrial	[mol N eq.]	1,65E-02	A1: Quicklime	42,6%
Photochemical ozone formation, human health	[kg NMVOC eq.]	4,30E-03	A1: Quicklime	44,0%
Resource use, mineral and metals	[kg Sb eq.]	1,36E-07	A3: Machine Operation	43,1%
Resource use, fossils	[MJ]	6,99E+01	A1: Quicklime	71,8%
Water use	[m3]	4,14E-02	A1: Quicklime	55,2%

Table 3 - Maximum contribution to impact categories for CSG In Situ

Environmental Impact				
Impact Category	**Unit**	**Contribution**	**Process**	**% of category**
Climate Change - total	[kg CO2 eq.]	4,70E+01	A1: Cement	62,4%
Climate Change, fossil	[kg CO2 eq.]	4,68E+01	A1: Cement	62,3%
Climate Change, biogenic	[kg CO2 eq.]	5,42E-02	A3: Machine Operation	47,3%
Climate Change, land use and land use change	[kg CO2 eq.]	1,27E-02	A2: Transport	47,9%
Ozone depletion	[kg CFC 11 eq.]	7,77E-07	A1: Cement	100,0%
Acidification	[mol H+ eq.]	1,27E-01	A1: Cement	78,5%
Eutrophication, freshwater	[kg PO4 eq.]	7,04E-04	A1: Cement	97,5%
Eutrophication, marine	[kg N eq.]	1,85E-02	A1: Cement	53,0%
Eutrophication, terrestrial	[mol N eq.]	2,13E-01	A1: Cement	53,2%
Photochemical ozone formation, human health	[kg NMVOC eq.]	7,04E-02	A1: Cement	60,1%
Resource use, mineral and metals	[kg Sb eq.]	9,23E-08	A2: Transport	40,5%
Resource use, fossils	[MJ]	1,53E+02	A1: Cement	70,1%
Water use	[m3]	8,62E-01	A1: Water	96,1%

Technical information on scenarios

Additional Return Transport Offsite for Stabilization (A2)

For instances where stabilization occurs at a nearby site, instead of the construction site, an additional transport of the clay soil to the offsite facility, and transport for the stabilized soil from the facility back to the construction site. This will incurr additional environmental impacts which must be added to the total declared value in module A2. Values are presented in Table 4, for the environmental impacts associated with the transportation of one ton of cargo one km. This value should then be multiplied by actual quantity of ton*km before being added to module A2. The values are given for both at 22 ton payload truck, and a 40 ton payload truck-trailer. A default utilization factor of 0,61 was used, as the number of trips back and forth between the construction and offsite facilities will dictate where the utilization factor lies within the range 0,5 – 1.

Table 4 - Environmental Impacts related to the transport of 1 ton, 1km, for a 22-ton truck and a 40-ton truck-trailer.

Scenario information	Truck EURO 6 A-C, 22t payload	Truck-trailer EURO 6 A-C, 40t payload	Unit
Default Payload Utilization Factor	0,61	0,61	-
GWP-total	8,74E-02	7,30E-02	[kg CO2 eq./ton*km]
GWP-fossil	8,66E-02	7,24E-02	[kg CO2 eq./ton*km]
GWP-biogenic	-1,16E-06	-9,73E-07	[kg CO2 eq./ton*km]
GWP-luluc	7,96E-04	6,67E-04	[kg CO2 eq./ton*km]
ODP	1,34E-14	1,13E-14	[kg CFC 11 eq./ton*km]
AP	1,29E-04	4,26E-04	[mol H+ eq./ton*km]
EP-freshwater	3,15E-07	2,64E-07	[kg P eq./ton*km]
EP-marine	4,78E-05	2,08E-04	[kg N eq./ton*km]
EP-terrestrial	5,54E-04	2,30E-03	[mol N eq./ton*km]
POCP	1,13E-04	4,04E-04	[kg NMVOC eq./ton*km]
ADPm	5,78E-09	4,84E-09	[kg Sb eq./ton*km]
ADPf	1,18E+00	9,90E-01	[MJ/ton*km]

WDP	1,08E-03	9,04E-04	[m3 world eq. deprived/ton*km]
PM	1,06E-09	1,67E-09	[Disease incidence/ton*km]
IRP	3,40E-04	2,85E-04	[kBq U235 eq./ton*km]
ETP-fw	8,42E-01	7,05E-01	[CTUe/ton*km]
HTP-c	1,71E-11	1,43E-11	[CTUh/ton*km]
HTP-nc	7,62E-10	6,38E-10	[CTUh/ton*km]
SQP	4,90E-01	4,10E-01	[SQP/ton*km]
PERE	8,63E-02	7,23E-02	[MJ/ton*km]
PERM	0,00E+00	0,00E+00	[MJ/ton*km]
PERT	8,63E-02	7,23E-02	[MJ/ton*km]
PENRE	1,19E+00	9,94E-01	[MJ/ton*km]
PENRM	0,00E+00	0,00E+00	[MJ/ton*km]
PENRT	1,19E+00	9,94E-01	[MJ/ton*km]
SM	0,00E+00	0,00E+00	[kg/ton*km]
RSF	0,00E+00	0,00E+00	[MJ/ton*km]
NRSF	0,00E+00	0,00E+00	[MJ/ton*km]
FW	9,57E-05	8,02E-05	[m3/ton*km]
HWD	6,08E-12	5,09E-12	[kg/ton*km]
NHWD	1,83E-04	1,54E-04	[kg/ton*km]
RWD	2,32E-06	1,94E-06	[kg/ton*km]
CRU	0,00E+00	0,00E+00	[kg/ton*km]
MFR	0,00E+00	0,00E+00	[kg/ton*km]
MER	0,00E+00	0,00E+00	[kg/ton*km]
EEE	0,00E+00	0,00E+00	[MJ/ton*km]
EET	0,00E+00	0,00E+00	[MJ/ton*km]

Transport to the building site (A4)
N.A.

Installation of the product in the building (A5)
N.A.

Reference service life

RSL information		Unit
Reference service Life	50	Years

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	1000*	kg
Collected with mixed waste	0	kg
For reuse	0	kg
For recycling	1000*	kg
For energy recovery	0	kg
Remains in construction	1000	kg

*Recycling is presented as an additional end of life scenario for cement stabilized gravel. Its processes are declared exclusively in modules C1, C2, C3, and D, while the standard scenario has the product being considered for final disposal as remaining in construction, declared exclusively in modules C4 for all declared products.

Re-use, recovery and recycling potential (D*)

Scenario information/Materiel	Value	Unit
Displaced material	1000*	kg
Energy recovery from waste incineration	0	MJ

*Declared as an additional end of life recycling scenario for cement stabilized gravel

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+A2 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+A2 chapter 7.4.2.

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