ENVIRONMENTAL PRODUCT DECLARATION

Portland Cement Clinker

In accordance with: ISO 14025:2006, EN 15804:2012+A2:2019/AC:2021

Products included in the EPD:

Portland Cement Clinker

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

EPD of a single product from a manufacturer/service provider

EPD Owner
TITAN Usje AD Skopje

Programme
International EPD System
www.environdec.com

Programme operator
EPD International AB

Registration number
EPD-IES-0028635:001

Version date
2026-06-24

Validity date
2031-06-23

EPD INTERNATIONAL EPD SYSTEM

ECO PLATFORM EPD VERIFIED

TITAN USJE

GENERAL INFORMATION

Programme information

Programme	International EPD System
Address	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website	www.environdec.com
E-mail	support@environdec.com

Product category rules

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)	
Product Category Rules (PCR)	2019:14 Construction products (EN 15804+A2) (version 2.0.1) 2.0.1
PCR review was conducted by	The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via the Secretariat www.environdec.com/support.
Complementary Product Category Rules (c-PCR)	PCR 2019:14-c-PCR-001 Being updated - Cement and building lime (EN 16908) (c-PCR to PCR 2019:14) (1.0.0)
c-PCR review was conducted by	The Technical Committee of the International EPD System

Verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via	☑ EPD verification through an individual EPD verification ☐ EPD verification through EPD Process Certification* ☐ EPD verification through a fully pre-verified tool
Third-party verifier	EUROCERT S.A.
Accredited by	Hellenic Accreditation System ESYD
Accredited certification body address	Greece
Procedure for follow-up of data during EPD validity involves third party verifier	☑ Yes ☐ No

*EPD Process Certification involves an accredited certification body certifying and periodically auditing the EPD process and conducting external and independent verification of EPDs that are regularly published. More information can be found in the General Programme Instructions on www.environdec.com.

Ownership and limitations on use of EPD

Limitations

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.

Ownership

The EPD Owner has the sole ownership, liability, and responsibility for the EPD.

INFORMATION ABOUT EPD OWNER

EPD Owner	TITAN Usje AD Skopje
Contact person name	Natasha Bakreska
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LCA Practitioner	Frosina Dimoska, FrosinaD@usje.mk

Description of the organisation of the EPD Owner

Building materials manufacturer

PRODUCT INFORMATION

Product name	Portland Cement Clinker
Product identification	Portland Cement Clinker
Product description	The product under examination is an ordinary Portland clinker produced by the company, which is suitable for manufacturing both ordinary Portland cement and blended cement in compliance with EN 197-1:2011. It is made by sintering in rotary kiln a precisely specified uniform mixture of raw materials containing elements, usually expressed as oxides, CaO, SiO2, Al2O3, Fe2O3 and small quantities of other materials. The manufacturer produces only one type of clinker, which is ordinary clinker using marl, limestone, pozzolana, sand and Fe additive. In addition to these materials, fuels including hard coal, petroleum coke, natural gas, and refuse-derived fuels are utilized during production. The clinker produced is sold exclusively in bulk form, so no packaging material is required.
Technical purpose of product	Combined with suitable materials, it is used in the production of different types of cement
Manufacturing or service provision description	The production of clinker consists of several phases in which the main inputs are raw materials, fuel, water and energy, while the outputs consist of the finished products and waste. Raw Material Handling and Drying Marl is transported from the storage hall using cranes and deposited into two raw material hoppers. From there, it is conveyed by belt to the drum dryer, where it is dried using exhaust gases from the kiln. The dried marl is lifted via a bucket elevator into a dry marl silo. Exhaust gases pass through a cyclone system and then a fan, before reaching a bag filter. After dedusting, the cleaned gases are released into the atmosphere through a stack. Dust collected on the filter bags is periodically discharged using a pneumatic cleaning system, then reintroduced into the production process via a screw conveyor. Raw Material Grinding Marl, limestone, sand, and occasionally Fe additive (converter slag) are ground in the raw mill. Converter slag is used when producing clinker with low C_3A content. Each raw material is stored in separate silos. The raw mix composition is managed either automatically or manually by the Process Control team. The materials are fed into a crusher via weigh feeders. Crushed material is transported by bucket elevator and screw conveyor to a separator, where fine particles are separated from coarse ones. This closed-loop grinding process returns coarse particles to the mill, while fine particles move to the homogenization silo. Exhaust gases from grinding pass through a cyclone and then a bag filter. Cleaned gases exit via a stack, and the collected dust is directed to the homogenization silo or added to the transport system, similar to the dust from the marl dryer filters. A cooling tower and distribution chamber are used to manage the hot gases from the rotary kilns. Homogenization and Storage After the raw mix preparation stage, material is lifted via bucket elevator into two homogenization silos. Compressed air is introduced to mix the material and stabilize its chemical composition. The homogenized raw mix is then sent to storage silos, with excess air discharged through a pneumatic bag filter. The mix is conveyed from the storage silos to the rotary kilns using bucket elevators. Dust collected during de-dusting is returned to the homogenization silos using pneumatic and screw conveyor systems.

	Clinker Production Cement Plant TITAN Usje A.D. Skopje operates two clinker production lines: Rotary Kilns No. 3 and No. 4. Both use the dry process with cyclone preheaters. The raw mix is transported pneumatically and by elevator to the preheater, where it is partially decarbonized before entering the rotary kiln. In the kiln, decarbonization continues and clinker minerals form, with sintering temperatures reaching approximately 1450°C. The hot material exits into a clinker cooler, is further crushed, and transported to clinker silos via steel conveyor. Solid fuel and fuel oil are used for heating, dosed via a multi-channel burner, with alternative fuels used when needed. Kiln ignition and startup use only fuel oil or gas. Ground solid fuel is dosed from a silo through a dedicated system. Hot combustion gases are used in the preheater and, if petroleum coke is ground, in the vertical fuel mill. Gases from the clinker cooler serve as secondary air in the kiln; excess gases are filtered and dust is returned to the clinker silos Clinker is sorted by quality: • Type A (LSF >94, CaO_free <2.5%) is stored in the clinker silos. • Substandard clinker (LSF <94, CaO free >2.5%) is stored separately.
Material properties	Volumetric mass density: 3150 kg/m^3
Manufacturing site	TITAN Usje AD Skopje TITAN Usje AD Skopje Bul. Boris Trajkovski br.94 1000 Skopje, Kisela Voda North Macedonia
UN CPC code	3743. Cement clinkers
Geographical scope(s)	Global

PRODUCT IMAGES

CONTENT DECLARATION

Hazardous and toxic substances	The product does not contain any substances from the SVHC candidate list in concentrations exceeding 0.1% of its weight.

PRODUCT CONTENT

Content name	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material[1], kg C/declared unit
Marl	63			
Limestone	32.5			
Pozzolana	3.5			
Sand	0.7			
Fe additive	0.3			
Total	**100**	**0**	**0**	**0**
Note 1	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2			

LCA INFORMATION

EPD based on declared or functional unit	Declared unit
Declared unit and reference flow	Clinker Mass: 1000 kg
Conversion factor to mass	1
Are infrastructure or capital goods included in any upstream, core or downstream processes?	☐ Yes ☑ No
Data sources used for this EPD	ecoinvent database (general) ecoinvent 3.5 database Other database GCCA Industry EPD Tool for Cement and Concrete and Ecoinvent database (v5.2).
LCA Software	GCCA Industry EPD Tool v5.2
Additional information about the underlying LCA-based information	**Cut-off rules:** Cut-off criteria were employed to include all the environmental impact sources while ensuring the study to be complete, relevant, accurate and consistent. Cut-off criteria considered for this study are below: • Mass – For mass flow less than 0.5% of the total mass flow environmental impact source may be eliminated with the stipulation that impact would be marginal. • Energy – For energy flow less than 0.5% of the total energy flow environmental impact source may be eliminated under that condition that environmental impact is not a concern. • Environment – For those flows (mass or energy flow) less than 0.5% of the total respective flow with significant environmental concern impact source must be included for the study. **Allocation:** The allocation has been avoided where that was possible. Production was split into two sub-processes, clinker and cement, and the associated input and output data for each sub-process were recorded. When data could not be directly attributed to a specific product, they were assigned physical properties (mass). No by-products occur during clinker and cement production; therefore, there is no need for allocations in by-products. For water (consumed and recycled), waste and emissions allocation, the “clinker to cement ratio” was used for allocating the volumes to clinker or cement respectively. Since the rule pertaining to allocation applies only when there are two or more by-products produced from a single stream, the allocation rule was not considered in this study, as the operation in TITAN Usje cement production Plant resulted in no more than one product from each stream. **Assumptions and approximations:** The cradle to gate study approach was adopted. In this study, an assumption was made on the data for the specific usage of solar electrical energy produced on site. The rest of the data considered for this study was obtained from primary sources. Another assumption was made for road and sea transportation. A >32 metric ton lorry, EURO6 and bulk carrier for dry goods were used respectively. The cement recipe (materials percentage participation) was defined by the pre-verified and automated ERP system (SAP) that the company uses. An approximation was made when calculating the packaging waste, as the data was taken from a packaging normative created to describe the packaging of all the products individually.
Version of the EN 15804 reference package	EF Reference Package 3.1

Characterisation methods	LCI results are classified into impact categories, each with a category indicator (ISO 14044:2006). In the present study, the environmental indicators (impact categories) are reported according to the PCR 2019:14 "Construction products", c-PCR-001 "Cement and building lime (EN 16908:2017)" and EN 15804:2012+A2/AC:2021.
Technology description including background system	The product considered is Portland cement clinker. The product is produced using primarily marl, as well as limestone, sand, natural pozzolana, and pyrite.
Scrap (recycled material) inputs contribution level	Less than 10% of the GWP-GHG results in modules A1-A3 come from scrap inputs

Data quality assessment

Description of data quality assessment and reference years	In terms of data collection and quality requirements ISO 14044 was applied. The data concerning the modules A1 (raw material supply), A2 (transportation) and A3 (product manufacturing) were provided by Titan Usje and involved all input and output materials to the plant, the consumed utilities (energy, water) and the distances and means of transport for each input stream. Regarding the electricity mix, the default values in GCCA's Industry EPD Tool for Cement and Concrete LCA database (v 4.2) were used. This web-based tool, developed by the Global Cement and Concrete Association, is a calculation tool for EPDs of clinker, cement, concrete, and precast elements. The GCCA EPD tool is developed by Quantis https://quantis-intl.com/ and verified by Studio Fieschi http://www.studiofieschi.it/en. The International EPD® System, which provides the framework to develop and publish EPDs based on I1SO 14025 and EN 15804, gives the final approval of the tool's compliance with the rules. As a part of the study, data authentication was carried out to understand the assurance level provided by the collected data. This authentication process enabled TITAN Usje to avoid any ambiguities that may encircle in the future. The GCCA EPD Tool database was used for the missing data. Generic data used in this study relate to: - CO2 emission factors for different transportation ways - Specific emission factor of used energy mix (kg CO2/kWh) The required data were sourced from several reliable sources: - The company's ERP system (SAP), - Flow meters monitoring water consumption and recycling, - Continuously recorded emissions data obtained from monitoring systems installed at each cement plant (MEAC). The monitored emissions include Dust, NOx and SO2 Reference year: 2024

ELECTRICITY USED IN THE MANUFACTURING PROCESS IN A3 (A5 FOR SERVICES)		
Type of electricity mix	Specific electricity mix as generated, or purchased from an electricity supplier, demonstrated by a contractual instrument	
Energy sources	Hydro	14.8%
	Wind	9.3%
	Solar	3%

	Biomass	4%
	Geothermal	0.4%
	Waste	1.2%
	Nuclear	22.5%
	Natural gas	20.9%
	Coal	22.3%
	Oil	1.6%
	Peat	0%
	Other	0%
Climate impact (GWP-GHG):	0.95 kg CO_2 eq./kWh	

CO_2 UPTAKE ASSOCIATED WITH CARBONATION AND ITS ASSUMPTIONS		
	Production stage (module A)	Excluded
	Use stage (module B)	Excluded
	End-of-Life stage (module C)	Excluded
	Beyond product life cycle (Module D)	Excluded

SYSTEM BOUNDARY

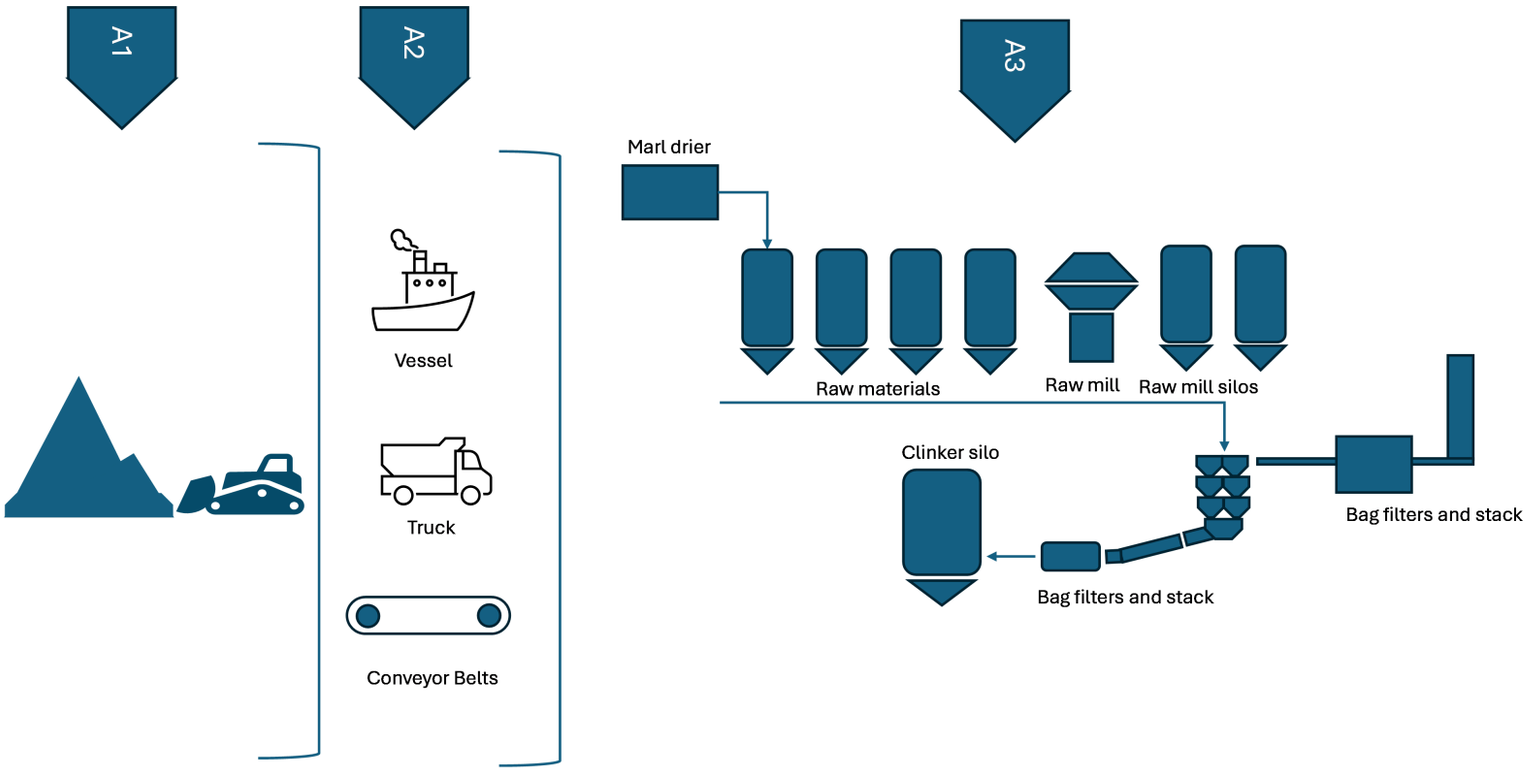
Description of the System boundary	d) Cradle to gate (A1-A3).
Excluded modules	Yes, there is an excluded module, or there are excluded modules
Justification for omission of modules	The scope of this study is "Cradle to gate" covering the product stage (modules A1-A3), since the product fulfils the three conditions required by EN 15804:2012+A2:2019, about the exclusion of modules C1-C4 and D. The EPD covers the product stage ("cradle to gate", A1-A3), since the three criteria of EN 15804 are met for the exclusion of stages B1-B7, C1-C4 and D. Modules C1–C4 and D are not included in this EPD, and the environmental impacts of the end-of-life stage are therefore not covered.

	Product stage			**Construction process stage**		**Use stage**							**End of life stage**				**Beyond product life cycle**
	Raw material supply	Transport	Manufacturing	Transport to site	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	Global	Global	Global	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Share of specific data	100%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Disclaimer	The share of specific/primary data and both variations (products and sites) refer to GWP-GHG results only.																

Description of the process flow diagram(s)

Process flow diagram of the product system, divided into the life-cycle stages and modules (or other division of the product life cycle, if defined in the PCR), showing the main processes included and the system boundary of the LCA. The diagram shall make it clear when the end-of-waste state is reached for main input flows of reused/recycled materials and recovered energy, and for output flows of reused/recycled materials and recovered energy exiting the end-of-life stage.

Process flow diagram(s) related images



DEFAULT SCENARIO

Name of the default scenario	The LCI results for clinker for the reference period
Description of the default scenario	The LCI results (calculated by GCCA EPD tool) are presented as environmental indicators according to the EN 15804. The scenario affects the Global warming potential – total indicator, which defines the emitted kg CO2 eq. per ton of clinker produced. By increasing the substitution rate of alternatives fuels up to 20% in the clinker production process, the emissions decrease by 54.23 kg CO2 eq., or by 11 %.

ADDITIONAL SCENARIO 1

Name of the additional scenario	LCI results for a 20% AF substitution rate
Description of the additional scenario	The impact indicators were calculated, with 20% substitution of the fossil fuel (petroleum coke) with alternative fuels. The scenario affects the Global warming potential – total indicator, which defines the emitted kg CO2 eq. per ton of clinker produced. By increasing the substitution rate of alternatives fuels up to 20% in the clinker production process, the emissions decrease by 54.23 kg CO2 eq., or by 11 %.

ADDITIONAL SCENARIO 2

Name of the additional scenario	LCI results for a 50% share of biomass in the already increased quantity of the AF mix
Description of the additional scenario	The impact indicators were calculated, with 50% share of biomass in the already increased quantity of the AF mix (20%). By increasing the share of biomass in the alternative fuels mix by 38%, the emissions decrease by 186,4 kg CO2 eq., or by 14 %.

ENVIRONMENTAL PERFORMANCE

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Mandatory environmental performance indicators according to EN 15804

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change - total	GWP-total	kg CO_2 eq.	1.36E+3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Climate change - fossil	GWP-fossil	kg CO_2 eq.	1.36E+3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Climate change - biogenic	GWP-biogenic	kg CO_2 eq.	5.72E-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Climate change - land use and land-use change	GWP-luluc	kg CO_2 eq.	1.41E-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ozone depletion	ODP	kg CFC-11 eq.	9.43E-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acidification	AP	mol H^+ eq.	3.08E+0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	5.24E-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Eutrophication aquatic marine	EP-marine	kg N eq.	3.93E-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Eutrophication terrestrial	EP-terrestrial	mol N eq.	1.11E+1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Photochemical ozone formation	POCP	kg NMVOC eq.	3.55E+0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Depletion of abiotic resources - minerals and metals	ADP-minerals&metals[1]	kg Sb eq.	1.30E-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Depletion of abiotic resources - fossil fuels	ADP-fossil[1]	MJ, net calorific value	9.01E+3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Water use	WDP[1]	m^3 world eq. deprived	5.33E+1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption																
Disclaimer 1	The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator																

Additional mandatory environmental performance indicators

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change - GWP-GHG	GWP-GHG[1]	kg CO_2 eq.	1.36E+3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acronyms	GWP-GHG = Global warming potential greenhouse gas.																
Disclaimer 1	The GWP-GHG indicator is termed GWP-IOBC/GHG in the ILCD+EPD+ data format. The indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.																

Additional voluntary environmental performance indicators according to EN 15804

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter emissions	PM	Disease incidence	4.54E-5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ionizing radiation - human health	IRP[1]	kBq U235 eq.	1.17E+1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Eco-toxicity - freshwater	ETP-fw[2]	CTUe	1.67E+3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Human toxicity - cancer effects	HTP-c[2]	CTUh	2.68E-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Human toxicity - non-cancer effects	HTP-nc[2]	CTUh	5.83E-5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Land-use related impacts/soil quality	SQP[2]	Dimensionless	3.62E+3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acronyms	PM = Potential incidence of disease due to particulate matter emissions; IRP = Potential human exposure efficiency relative to U235; ETP-fw = Potential comparative toxic unit for ecosystems; HTP-c = Potential comparative toxic unit for humans; HTP-nc = Potential comparative toxic unit for humans; SQP = Potential soil quality index.																
Disclaimer 1	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.																
Disclaimer 2	The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.																

Resource use indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ, net calorific value	1.78E+2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PERM	MJ, net calorific value	0.00E+0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PERT	MJ, net calorific value	1.78E+2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRE	MJ, net calorific value	9.01E+3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRM	MJ, net calorific value	0.00E+0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRT	MJ, net calorific value	9.01E+3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SM	kg	5.87E+0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RSF	MJ, net calorific value	5.28E+1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NRSF	MJ, net calorific value	4.85E+1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FW	m^3	3.38E+0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acronyms	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 = Use of net fresh water.															

Waste indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1.00E-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NHWD	kg	1.20E-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RWD	kg	3.48E+0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acronyms	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed.															

Output flow indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	kg	0.00E+0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MFR	kg	6.60E-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MER	kg	0.00E+0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EEE	MJ, net calorific value	0.00E+0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EET	MJ, net calorific value	0.00E+0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acronyms	CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.															

ABBREVIATIONS

Not applicable

REFERENCES

a) General Programme Instructions of International EPD System. Version. 5.0.1

b) PCR 2019:14.. Version 2.0.1 N Product Category rules | Construction products | The International EPD System ame

c) ISO 14040:2006 Environmental management - Life Cycle Assessment - Principles and framework

d) ISO 14044:2006 Environmental management - Life Cycle Assessment - Requirements and guidelines

e) EN 16908:2017+A1:2022 Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804

f) ISO 14025:2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures

g) EN 197-1:2012 - Part 1: Composition, specifications and conformity criteria for common cements

h) Industry EPD Tool for Cement and Concrete (https://concrete-epd-tool.org/)

- User Guide (v5.2, International version, 24 June 2025)

- LCA Model (v5.2, International version, 17 July 2025)

- LCA Database (v5.2, 24 June 2025)

VERSION HISTORY

Version 1, 2026-06-24

Original version of the EPD