DAPHabitat System

Environmental Product Declaration

www.daphabitat.pt

[in accordance with ISO 14025, EN 15804:2012+A2:2019 and EN 15942]

Registration number: **EPD 015:2024**

CEM I 52.5R PORTLAND CEMENT (NL) - OUTÃO

Issue date: **15/11/2024** Expiry date: **14/11/2029**

SECIL - COMPANHIA GERAL DE CAL E CIMENTO, S.A.

Cluster Habitat Sustentável

Version 1.4.1 Ed. March 2024

Contents

1. GENERAL INFORMATION

1.1. The DAPHabitat System

Identification of the programme operator:	Platform for Sustainable Construction Association www.clusterhabitat.pt geral@clusterhabitat.pt
Address:	University of Aveiro Department of Civil Engineering 3810-193 Aveiro
Email address:	deptecnico@clusterhabitat.pt
Telephone number:	(+351) 234 401 576
Website:	www.daphabitat.pt
Logo:	

1.2. EPD Owner

Name of the owner:	SECIL - Companhia Geral de Cal e Cimento, S.A.
Address (production site):	Outão Plant 2901-864 Setúbal
Address (head office):	Estrada do Outão s/n, 2901-864 Setúbal
Telephone number:	(+351) 217 927 100
Email address:	apoiotecnico@secil.pt
Website:	https://www.secil.pt/
Logo:	
Information concerning the applicable management systems:	NP EN ISO 9001 - Quality Management System NP ISO 14001 - Environmental Management System ISO 45001 - Health and Safety Management System and Health EMAS | Eco-Management Audit Scheme
Specific aspects regarding production:	CAE (economic activity code) 23510 - Manufacture of cement
Organization´s environmental policy:	Commitments made by SECIL as part of its Environmental Responsibility and Protection policy: • To ensure a responsible performance standard that makes the use of natural resources compatible with the maintenance and development of the ecosystems in which the company operates. • To mitigate the impacts of its actions, through the adoption of the best technologies and best practices available and the appropriate training of its employees. • To promote biodiversity in the territories under its management. To reduce the carbon impact of its activity, including by promoting the use of secondary raw materials and alternative fuels. To provide the public with regular data on its environmental performance.

1.3. EPD information

Authors:	Paula Quinteiro Secil - Companhia Geral de Cal e Cimento, S.A.
Contact of the authors:	Address: University of Aveiro, Santiago Campus, 3810-193 Aveiro, Portugal Telephone: 234 370 200 E-mail: p.sofia@ua.pt Address: Estrada do Outão s/n, 2901-864 Setúbal, Portugal E-mail: info.pssg@secil.pt
Issue date:	15/11/2024
Registration date:	22/11/2024
Registration number:	EPD 015:2024
Valid until:	14/11/2029
Representativeness of the EPD (location, product, group of producers):	EPD of one (1) product class, produced in one (1) industrial unit, belonging to one (1) single producer (Secil - Companhia Geral de Cal e Cimento, S.A)
Where to find product information:	https://www.secil.pt/
Type of EPD	EPD from cradle to gate (A1-A3) with additional sub-module A4 (transport)

1.4. Verification Statement

Independent external verification in accordance with the NP ISO 14025:2010 and EN 15804:2012+A2:2019 standards

Certification Body	Verifier(s)
(CERTIF - Associação para a Certificação)	Marisa Almeida | José Dinis Silvestre

1.5. Registration of the EPD

Registration Programme Operator

(Platform for Sustainable Construction)

1.6. PCR (product category rules) basic model

Name:	Base PCR model for construction products and services
Issue date:	Edition August 2023
Number of registration on the database:	RCP-mb001
Version:	Version 2.3
Identification and contact details of the coordinator(s):	Marisa Almeida | marisa@ctcv.pt Luís Arroja | arroja@ua.pt José Dinis Silvestre | jose.silvestre@ist.utl.pt
Identification and contact details of the authors:	Marisa Almeida | marisa@ctcv.pt Luís Arroja | arroja@ua.pt José Silvestre | jds@civil.ist.utl.pt Fausto Freire Cristina Rocha Ana Paula Duarte Ana Cláudia Dias Helena Gervásio Victor Ferreira Ricardo Mateus António Baio Dias
Composition of the sector panel:	-
Consultation period:	18/11/2015 - 18/01/2016
Valid until:	01/06/2027

The CEN EN 15804 standard serves as the basic product category rules (PCR).

1.7. c-PCR (complementary product category rules)

Name:	EN 16908:2017+A1:2022 – Cement and building lime – Environmental product declarations – Product category rules complementary to EN 15804
Issue date:	March 2022
Number of registration on the database:	EN 16908:2017+A1:2022
Version:	EN 16908:2017+A1, March 2022
Identification and contact details of the coordinator(s):	European Committee for Standardisation (CEN)
Identification and contact of the authors:	-
Composition of the sector panel:	-
Consultation period:	-
Valid until:	-

1.8. Product information/product class

<table>
<tr><td>Identification of the product:</td><td>CEM I 52.5R Portland Cement (nl)</td></tr>
<tr><td>Product illustration:</td><td>  </td></tr>
<tr><td>Brief description of the product:</td><td>CEM I 52.5R Portland cement (nl) is a high-performance cement produced mainly from Portland clinker - with an average composition of around 100 per cent clinker under NP EN 197-1:2012. The clinker comes from Secil Outão.
The cement does not contain any substance included on the Candidate List of Substances of Very High Concern (SVHC) above the limit for registration with the European Chemicals Agency, i.e. above 0.1 per cent (m/m).</td></tr>
<tr><td>Main technical characteristics of the product:</td><td>Table 1: Chemical, mechanical and physical characteristics of CEM I 52.5R Portland cement (nl).
<table>
<tr><th>Designation</th><th>Units</th><th>CEM I 52.5 Portland Cement (nl)</th><th>Standards</th></tr>
<tr><td>Sulphate content (in SO_3)</td><td>%</td><td>2.50-4.5</td><td>NP EN 196-2</td></tr>
<tr><td>Chloride Content</td><td>%</td><td>0.01 - 0.10</td><td>NP EN 196-2</td></tr>
<tr><td>Compressive strength</td><td>MPa</td><td>First days:
1 day: ≥ 25
2 days: ≥ 30
7 days, ≥ 50.0 and ≤ 58.0

Reference: 28 days,
≥ 59.0 and ≤ 70.0</td><td>NP EN 196-1</td></tr>
<tr><td>Final setting time</td><td>min</td><td>110 - 230</td><td>NP EN 196-3</td></tr>
<tr><td>Expandability</td><td>min</td><td>≤ 2.0</td><td>NP EN 196-3</td></tr>
</table></td></tr>
<tr><td>Description of the application/use of the product:</td><td>CEM I 52.5R Portland cement (nl) is used in industrial plants for the production/formulation of hydraulic binders for use in building and construction work, such as ready-mixed concrete, mortars, plasters, grouts, stuccos, as well as prefabricated concrete.</td></tr>
<tr><td>Placing on the market/Rules for application on the market/Technical product standards:</td><td>CNP EN 197-1:2012 composition, specifications and conformity criteria for ordinary cements
Conformity Certification</td></tr>
<tr><td>Quality control:</td><td>Not applicable</td></tr>
<tr><td>Special delivery conditions:</td><td>Not applicable</td></tr>
<tr><td>Components and substances to declare:</td><td>Not applicable</td></tr>
<tr><td>Information where explanatory documents can be obtained:</td><td>CEM I 52.5R Portland cement (nl) is available for sale to the public on the international market.
For detailed information about the product, please contact SECIL by e-mail info.pssg@secil.pt</td></tr>
<tr><td>History of LCA studies:</td><td>--</td></tr>
</table>

1.9. LCA calculation rules

Functional unit:	Not applicable
Declared unit:	1 000 kg CEM I 52.5R Portland cement (nl)
System boundary:	The system evaluated includes module A1-A3 (product stage) and the additional sub-module A4 (Transport). A more detailed description of the system boundary is given in Section 2.1.
Exclusion criteria:	The LCA considered the extraction and processing of natural raw materials, the production of auxiliary materials and the energy consumed in the manufacture of CEM I 52.5R Portland cement (nl), as well as the transport of cement to the port terminal in the Netherlands. As the Portland clinker produced at Secil is the main raw material, the extraction and processing of natural raw materials and the transport of secondary raw materials (waste from other industries) were also considered. The waste management processes generated in the production of clinker (until the end of waste status is reached) for which inventory data is available were considered. CEM I 52.5R Portland cement (nl) also excluded grinding bodies, bag filters, lubricating oils and the production of acetylene used in maintenance operations (welding). In clinker, bag filters, the refractory lining of the kiln, lubricating oils, the production of acetylene used in maintenance operations (welding), sodium hypochlorite, sodium hydroxide, chlorine and the biocide used for water treatment were excluded from the system boundary, as they correspond to a mass of less than 1% of the total mass of inputs. The total mass of input from the unit processes does not exceed 5% of the total mass of inputs and is therefore covered by the exclusion criterion defined in document EN 16908:2017+A1 - Cement and building lime - Environmental product declarations - Product category rules, namely its mass is less than 1% of the total mass of inputs. In the LCA for Portland cement, it should be noted that the energy and water consumption of the administrative areas, as well as the production of wastewater and waste from these areas, were not included. In addition, environmental loads associated with the construction and maintenance of infrastructure and equipment (capital goods) were excluded.
Assumptions and limitations:	The results of the environmental impacts and other indicators presented in this EPD refer to the year 2022.
Quality and other characteristics of the information used in the LCA:	The quality of the inventory data was assessed taking into account the criteria of the PEF (Product Environmental Footprint) category rules (section 5.6 of the guide, Menfredi et al., 2012), as indicated in table E.2 (Data quality and criteria from the Product Environmental Footprint Category Rules) of EN 15804:2012+A2:2019+AC and in the guide to the software used, the GCCA EPD Tool for Cement and Concrete (V 4.2), and based on the recommendations of the PCR documents - Base Model. The quality of the data was broadly classified between reasonable and good on a 5-level qualitative scale from very bad to very good, in line with the data quality requirements - temporal, geographical and technological. The information on the production of CEM I 42.5R Portland cement is less than 5 years old, using mostly primary data collected directly from SECIL - Outão Plant. Real and specific data from the production unit were used for the operations associated with the process of manufacturing CEM I 42.5R Portland cement (nl). The information for background processes not provided by SECIL, and over which SECIL has no influence, was obtained from generic data in the Ecoinvent database v3.5. These were selected to provide geographical and technological coverage that fulfils the data quality criteria stipulated in Annex E of EN 15804:2012+A2:2019. Electricity production was modelled in the GCCA with information on the mix of energy sources from the International Energy Agency (IEA).
Allocation rules:	To determine the inputs and outputs associated only with the production of CEM I 52,5R Portland cement (nl), the procedure for subdividing the unit process was first adopted, following the recommendations of the PCR document - Base Model. Thus, only the operations associated with the production of the product being analysed were considered, and operations exclusive to other products were excluded. Then, an allocation procedure was applied for the operations included based on the mass of the different products produced.
Software used for evaluation:	GCCA EPD Tool for Cement and Concrete (V 4.2), International version.
Background database used for the LCA:	Ecoinvent database version 3.5 published in December 2018; cut-off approach.
Variability of the results of LCIA	The main factor affecting the variability of LCIA results will be the clinker content used in the production of CEM I 52.5R Portland cement (nl), which can vary from 92.5% to 95.5%, with an average clinker consumption of 94%. This variability in cement composition resulted in a variability of less than 5 per cent in the LCIA results.
EPD comparability of construction products:	EPD for construction products and services may not be comparable if they are not produced in accordance with EN 15804 and EN 15942 and in accordance with the comparability conditions determined by ISO 14025.

1.10. Use of average environmental performance

Not applicable

1.11. Technical information for Reference Service Life (RSL)

Not applicable.

1.12. Diagram of the process input and output flows

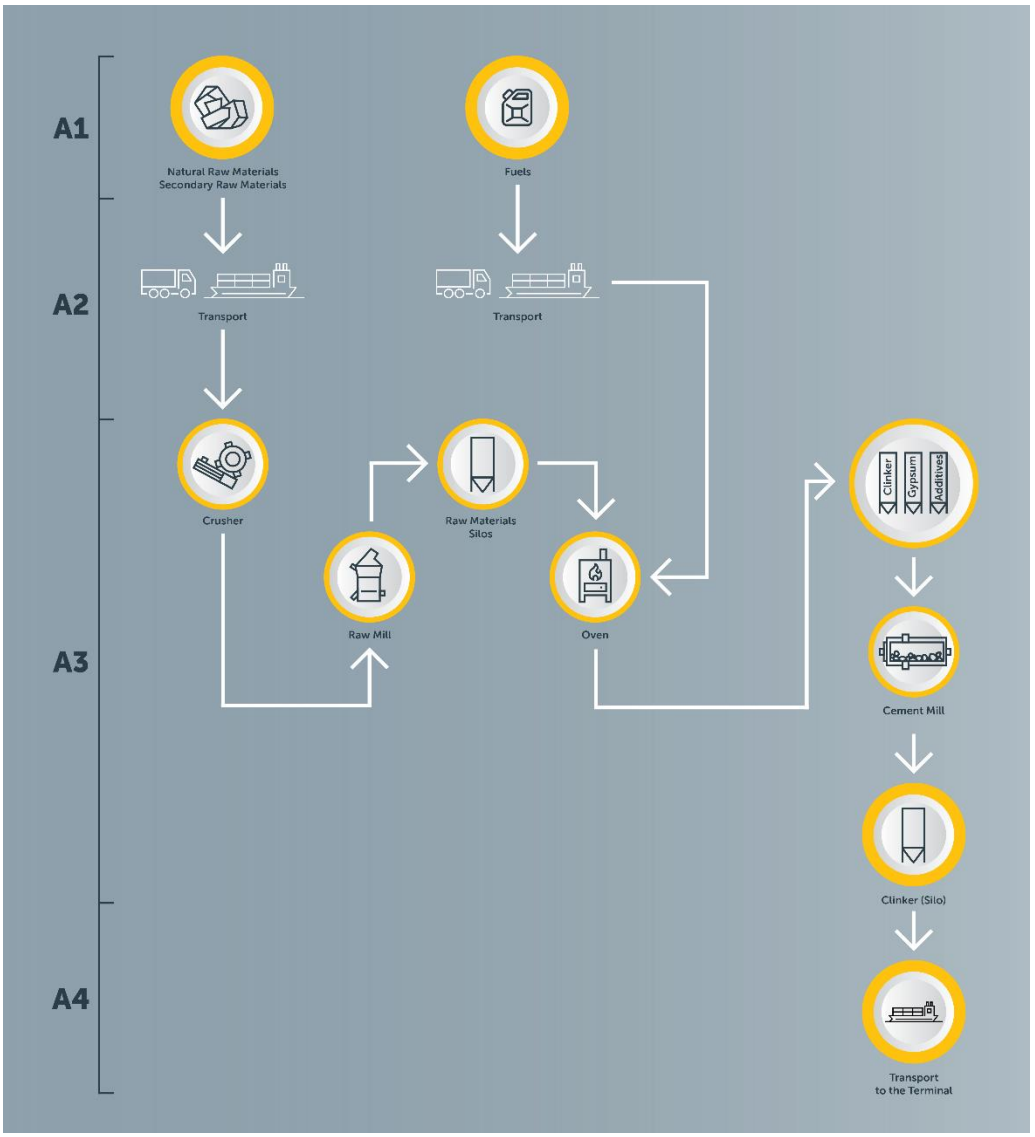

Figure 1: Flowchart of the Portland cement manufacturing process

2. CORE ENVIRONMENTAL IMPACT INDICATORS

2.1. Description of the system boundaries

(✓= included; ND = module not declared)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				ENVIRONMENTAL BENEFITS AND BURDENS BEYOND THE SYSTEM BOUNDARY
Raw materials	Transport	Manufacturing	Transport	Construction and installation process	Use	Maintenance	Repairing	Replacement	Restoration	Operational energy use	Operational water use	Deconstruction and demolition	Transport	Waste processing	Disposal	Reuse, recovery, potential recycling
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
✓	✓	✓	✓	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Module A1-A3 (product stage) of CEM I 52.5R Portland cement (nl) considers the extraction and processing of primary (natural) raw materials, the production of auxiliary materials, the transport of raw materials, fuels and electricity to the production unit, Secil Outão.

Module A4 (transport) considers the transport by ship of CEM I 52.5R Portland cement (nl) to the Terneuzen port terminal in the Netherlands.

The production of CEM I 52.5R Portland cement (nl) requires Portland clinker, gypsum and ground limestone as the main raw materials. The clinker is produced at Secil Outão. The limestone comes from the Outão quarry. Mining is carried out above ground, on plateaus, starting at the highest level. In line with good environmental practice, the quarry's paths are watered to minimise the effect of dust during the exploration phase and the landscape recovery of the floors that have already been explored is guaranteed, under the approved Environmental and Landscape Recovery Plan. The plaster comes from external production.

The main raw materials used to produce Secil Portland clinker are marl or clay and limestone. Once the materials are extracted from the quarry, they are in the form of blocks measuring up to $1m^3$, so it is necessary to reduce their size to a dimension compatible with the transportation, storage and supply of the subsequent manufacturing phases; this operation is performed in the crusher. After crushing, the natural raw materials are transported by conveyor belt for storage. The limestone is stored in vertical silos, while the marl and secondary raw materials are stored in a horizontal, circular hangar that allows for the pre-homogenisation of these materials.

This is followed by raw milling, in which the natural and secondary raw materials (materials derived from waste, e.g. concrete sludge, calcination waste, lime sludge, kiln linings, construction and demolition waste) are subjected to a drying, milling and homogenising process. Once the proportion of raw materials has been defined, they are transported to mills where the "flour" or “raw” material is produced, i.e. a finely ground mixture, in well-defined proportions, of all the natural and secondary raw materials. The mill works by injecting water to stabilise the grinding track layer. The water will mix with the raw materials creating a layer height necessary for the grinding process to be efficient. The hot gases coming from the kiln will feed the mill, which will cause some of the water to evaporate, making it necessary to replace it (make-up). This make-up therefore corresponds to actual water consumption. This water comes from the company boreholes and requires treatment with sodium hypochlorite, sodium chloride, bio-dispersant, chlorine and disinfectant to eliminate bacteria and prevent calcification in the equipment, respectively. During milling, the "raw" material is also dried, using the heat contained in the exhaust gases from the rotary kilns.

This is followed by the preheating stage in which the raw material is extracted from the storage silos and fed into the preheating system (cyclone tower), where it is heated by the exhaust gases resulting from the burning of the fuels in the rotary kiln. The raw material then enters the kiln, moving along the kiln due to its rotation and slight inclination, continuing to heat up and carrying out the physical-chemical reactions of the clinker process at a temperature of up to 1450ºC, to ultimately obtain clinker. As firing is an energy-intensive stage, primary fuels are used, i.e. fossil fuels, as well as secondary fuels (fuels derived from waste, e.g. used tyres, fluff and refuse-derived fuel RDF).

From 1450ºC onwards, the clinker begins to cool, still inside the kiln, and is completed in the cooler, where counter-current air is introduced, using this heated air as secondary and tertiary firing air. This air is generated by the cooler's fans and is therefore divided into secondary air, which goes into the kiln, and tertiary air, which is the air needed for combustion in the calciner. In this way, there is a partial recovery of the clinker's thermal content to reduce energy consumption in the kilns. Particle matter emissions are controlled by dedusting systems and gas emissions into the air by automated control systems for driving the kilns. The clinker is stored and then used to produce CEM I 42.5R Portland cement. The clinker transport to the mills is equipped with bag filters to minimise diffuse dust emissions. The clinker is then transported by conveyor screen to the wharf where cement is produced in horizontal tubular mills. Clinker, gypsum (cement setting regulator), limestone and grinding aids, in well-defined proportions, according to the quality plan, to obtain CEM I 52.5R (nl) Portland cement, which is stored in silos. The cement is ground in a closed circuit using 3rd generation separators. Also, to minimise diffuse dust emissions, the cement mill has bag filters. Spot monitoring of total suspended particulate emissions is carried out.

CEM I 52.5R Portland cement (nl) is then transported in bulk by boat to the Terneuzen harbour terminal in the Netherlands. Module A4.

During clinker production, the diesel used for internal movements at the Secil plant and quarry comes from diesel refuelling stations at the plant and quarry. Therefore, pollutant emissions to rainwater from hydrocarbon separators associated with the diesel refuelling station and the collection of oily water throughout the plant and in the quarry, associated with the workshop and diesel refuelling station, were considered. The diesel consumption of emergency generators was also considered to guarantee the normal operation of clinker production processes in the event of a temporary power cut. The transport and treatment of waste resulting from the clinker production process, such as waste containing hydrocarbons, was considered.

During Portland cement production, the diesel used for internal movements at the Secil plant and quarry comes from diesel refuelling stations at the plant and quarry. Pollutant emissions to rainwater from the hydrocarbon separators associated with the diesel refuelling station and the collection of oily water throughout the plant and on the wharf were therefore considered.

2.1.1. Justification for the exemption to declare modules C1, C2, C3, C4 and D

CEM I 52.5R Portland cement (nl), being an intermediate product, fulfils all the conditions required by EN 15804:2012+A2:2019+AC and EN 16908:2017+A1, to consider the life cycle from cradle to gate (A1-A3), and the additional module A4 - transport to the terminal in the Netherlands, namely:

- Cement is a raw material with a wide range of potential applications, and it is not possible a priori to establish a single reference service life;
- cement is physically integrated with other products, such as aggregates, into downstream products, such as concrete, mortar, etc., so it is not possible to physically separate it at the end of its life;
- the cement is not identifiable at the end of its life as the result of a physical or chemical transformation process
- cement does not contain biogenic carbon and is exempt from the obligation to declare modules C1-C4 and D.

Module A4 was considered because the cement in question is transported exclusively to the terminal at the Port of Terneuzen in the Netherlands, which is owned by Secil, SA

2.2. Basic environmental impact indicators

	Global warming potential - total; GWP-total	Global warming potential - fossil fuels; GWP-fossil	Global warming potential - biogenic; GWP-biogenic	Global warming potential - Land use and land use change; GWP-luluc	Depletion potential of the stratospheric ozone-layer; ODP	Acidification potential; AP
Unit	kg CO_2 eq.	kg CO_2 eq.	kg CO_2 eq.	kg CO_2 eq.	kg CFC 11 eq.	mol H^+ eq.
Module A1-A3	8.36E+02	8.36E+02	3.63E-02	1.07E-01	1.90E-05	1.41E+00
Module A4	1.22E+01	1.22E+01	1.16E-02	7.95E-03	1.91E-06	3.23E-01

LEGEND:

Product Stage

Transport Stage

Units expressed per declared unit (1000 kg CEM I 52.5R Portland cement (nl)).

	Eutrophication potential of aquatic freshwater; EP-freshwater	Eutrophication potential of aquatic marine EP-marine	Terrestrial eutrophication potential; EP-terrestrial	Formation potential tropospheric ozone formation; POCP	Abiotic depletion potential for non-fossil resources; ADP-minerals & metals	Abiotic depletion potential for fossil resources; ADP-fossil	Water (user) deprivation potential; WDP
Unit	kg P eq.	kg N eq.	mol N eq.	Kg COVNM eq.	kg Sb eq.	MJ, P.C.I	m^3 eq. of water globally unavailable
Module A1-A3	1.10E-02	1.11E-03	5.12E+00	1.38E+00	1.80E-04	3.51E+03	4.21E+01
Module A4	1.73E-03	1.25E-04	3.38E-01	1.01E-01	3.07E-06	1.72E+02	1.29E+00

LEGEND:

Product Stage

Transport Stage

Units expressed per declared unit (1000 kg CEM I 52.5R Portland cement (nl)).

The results obtained for the indicators “Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)”, “Abiotic depletion potential for fossil resources potential (ADP-fossil)” and “Water (user) deprivation potential (WDP)” should be used with caution since the uncertainties associated with them are high or there is little experience with the indicator.

2.3. Additional environmental impact indicators

	Potential incidence of disease due to emissions of fine particulate matter PM	Potential human exposure efficiency in relation to U235 IRP	Potential Comparative Toxic Unit for ecosystems ETP-fw	Potential Comparative Human Toxicity Unit, carcinogenic HTP-c	Potential Comparative Human Toxicity Unit, non-carcinogenic HTP-nc	Potential soil quality index SQP
Unit	Incidence of disease	kBq U 235 eq.	CTUe	CTUh	CTUh	-
Module A1-A3	1.74E-05	5.19E+00	6.68E+01	1.44E-06	1.90E-05	2.66E+03
Module A4	4.15-07	1.08E+00	2.51E+00	7.41E-08	4.29E-07	3.05E+01

LEGEND:

Product Stage

Transport Stage

Units expressed per declared unit (1000 kg CEM I 52.5R Portland cement (nl)).

The impact indicator “potential human exposure efficiency relative to U235” focuses mainly on the possible impact of a low dose of ionising radiation on human health resulting from the nuclear fuel cycle. It does not consider effects arising from possible nuclear accidents, occupational exposure or the disposal of radioactive waste in underground facilities. Potential ionising radiation from soil, radon and some building materials is also not measured by this indicator.
The results of the indicators “potential comparative toxic unit for ecosystems (ETP-fw)”, “potential comparative toxic unit for humans, cancer effects”, “potential comparative toxic unit for humans, not cancer effects” and “potential soil quality index” should be used with caution as the uncertainties associated with them are high or there is little experience with the indicator.

2.4. Indicators describing the utilisation of resources

	Primary energy					
	EPR	RR	TRR	EPNR	RNR	TRNR
Unit	MJ, P.C.I	MJ, P.C.I	MJ, P.C.I	MJ, P.C.I	MJ, P.C.I	MJ, P.C.I
Module A1-A3	2.01+03	0.00E+00	2.01E+03	3.51E+03	0.00E+00	3.51E+03
Module A4	4.48+00	0.00E+00	4.48E+02	1.72E+02	0.00E+00	1.72E+02

LEGEND:

Product Stage

Transport Stage

Units expressed per declared unit (1000 kg CEM I 52.5R Portland cement (nl)).

EPR = use of renewable primary energy excluding renewable primary energy resources used as raw materials; RR = use of renewable primary energy resources used as raw materials; TRR = total use of renewable primary energy resources (EPR + RR); EPNR = use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; RNR = use of non-renewable primary energy resources used as raw materials; TRNR = total use of non-renewable primary energy resources (EPRN + RNR).

	Secondary material and fuel, and water use			
	SM	RSF	NRSF	Net value of fresh water
Unit	kg	MJ, P.C.I	MJ, P.C.I	m^3
Module A1-A3	7.73E+01	2.96E+02	7.95E+02	1.04E+00
Module A4	0.00E+00	0.00E+00	0.00E+00	4.12E-02

LEGEND:

Product Stage

Transport Stage

Units expressed per declared unit (1000 kg CEM I 52.5R Portland cement (nl)).

SM = use of secondary material; RSF= use of renewable secondary fuels; NRSF = use of non-renewable secondary fuels; Fresh water = use of the net value of fresh water.

2.5. Other environmental information describing different categories of waste

	Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed
Unit	kg	kg	kg
Module A1-A3	1.97E-01	1.34E-03	0.00+00
Module A4	0.00E+00	0.00E+00	0.00E+00

LEGEND:

Product Stage

Transport Stage

Units expressed per declared unit (1000 kg Portland cement).

The characteristics that make waste hazardous are described in the applicable legislation in force, for example in the European Waste Framework Directive.

2.6. Other environmental information describing output flows

	Components for reuse	Materials for recycling	Materials for energy recovery	Exported energy
Unit	kg	kg	kg	MJ
Module A1-A3	0.00E+00	1.92E+00	8.61E+00	0.00E+00
Module A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00

LEGEND:

Product Stage

Transport Stage

Units expressed per declared unit (1000 kg CEM I 52.5R Portland cement (nl)).

The characteristics that make waste hazardous are described in the applicable legislation in force, for example in the European Waste Framework Directive.

2.7. Information describing the biogenic carbon content at the plant gate

Biogenic carbon content*	Units**	Module A1-A3 (results)
Biogenic carbon content in the product	Kg C	Not applicable
Biogenic carbon content in the packaging	Kg C	Not applicable

* 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2

** This information may be omitted when the biogenic carbon content of the product or its packaging is less than 5 per cent of the mass of the product or its packaging.

3. REFERENCES

- ✓ GCCA (2023). GCCA Industry EPD Tool for cement and concrete (V4.0). Global Cement and Concrete Association (GCCA) Quantis, Switzerland;
- ✓ **DAPHabitat System General Instructions**, Version 2.1, August 2023 (at www.daphabitat.pt);
- ✓ **PCR - Base Model. Construction products and services. In accordance with EN 15804:2012+A2:2019. DAPHabitat System.** Version 2.3, August 2023 (at www.daphabitat.pt);
- ✓ **NP ISO 14025:2009** Environmental labelling and declarations - Type III environmental declarations - Principles and procedures;
- ✓ **EN 15804:2012+A2:2019+AC** Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products;
- ✓ EN 16908:2017+A1 - Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804 European Committee for Standardisation;
- ✓ **EN 15942:2021** Sustainability of construction works – Environmental product declarations – Communication format business-to-business;
- ✓ IEA (2024). Portugal - Countries & Regions. International Energy Agency (IEA). https://www.iea.org/countries/portugal/electricity, accessed June 2024.
- ✓ Manfredi S., Allacker K., Chomkhamsri K., Pelletier N., Maia de Souza D. (2012). Product Environmental Footprint (PEF) Guide. European Commission (EC), Joint Research Centre (JRC), Ispra, Italy;
- ✓ Secil (2023). Secil CO_2 Manual. Monitoring, calculating and reporting CO_2 emissions. Period 2021-2025. Version 06.