Environmental Product Declaration

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

SCG BULK OPC Type I in Jumbo bag 1.5 MT EXP

from

SCG CEMENT CONSTRUCTION MATERIALS VIETNAM CO., LTD

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB, EPD is registered through the fully aligned regional hub: EPD Southeast Asia, www.epd-southeastasia.com
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General information

Programme:	The International EPD® System
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Accountabilities for PCR, LCA and independent, third-party verification	
Product Category Rules (PCR)	
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)	
PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.	
Life Cycle Assessment (LCA)	
Title:	Life Cycle Assessment of Cement production of SCG Cement Construction Materials Vietnam co., ltd : 1,000 kg average Cement
Revision date:	2025-04-30
LCA accountability :	Sawitree Vicheanpong – Environment and Social Manager Banthita Tangsuwan – Environment and Social Assistant Manager Phuchit Sooklon – ESG Consultant Environment & Social Management Department Email: sawitrev@scg.com banthita@scg.com, phuchits@scg.com SCG Cement Construction Materials Vietnam co., ltd Central Region: 12th Floor, G8 GOLDEN Building 65 Hai Phong, Thach Thang Ward, Hai Chau District, Da Nang City . South: 9th Floor, An Phu Plaza, 117-119 Ly Chinh Thang, Vo Thi Sau, District 3, HCM.

Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: Andrew D Moore : Life Cycle Logic. Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No [Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier]
The pre-verification of the GCCA tool **Pre-verified Tool Name:** GCCA Industry EPD Tool for Cement and Concrete (v5.1), International Version **Date :** The validity of the Tool is set as the validity of PCR 2019:14 v1.3.4, i.e. 2025-06-20

LCA Information

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

EPDs within the same product category but from different program may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025. For two EPDs to be comparable, they must be based on the same PCR (including the same 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 equivalent system boundaries and descriptions of data;

apply equivalent data quality requirements, methods of data collection and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
“CEN standard EN 15804 serve as the core Product Category Rules (PCR)”

This report presents the aggregated results per indicator and per life cycle stage, as per PCR 2019:14 Construction products version 1.3.4 (EN 15804: A2) and complementary PCR c-PCR-001 Cement and building limes (EN 16908 PAGE 10/24)

This product is classified as identical product which are not marketed as different products and/or are in no other way distinguishable by a downstream customer. For the EPD of products produced at multiple sites, a weighted average was calculated based on the production volumes of each site. The variations in GHG emissions between the declared results and the highest and lowest site-specific results were found to be below 10%.

Company Profile

SCG was established in 1913 following a Royal Decree by His Majesty King Rama VI as a means to reduce the nation's reliance on the import of cement. Since its foundation, the company has expanded its business and grown steadily into SCG, one of Thailand's leading industrial conglomerates.

With more than 100 years of experience and know-how, SCG, the manufacturer and supplier of SCG, has committed itself to developing and leveraging the standards of products in the market to ensure the excellent quality of its cement products that best address every application need and contribute to the development of the construction industry in Thailand.

The Cement and Green Solution business is a core business unit of SCG which The Concrete Products and Aggregate Co., Ltd. as an own legal entity.
While SCG Cement is represented as the branding used for external communications of cement and mortar products for construction industry in Thailand.

We are committed to reducing greenhouse gases and aim for net zero by 2050. Our key strategies include: (1) Reducing fossil fuel use and increasing the use of alternative fuels (AF) such as biomass and refuse-derived fuel (RDF) (2) Increasing the proportion of renewable energy (RE) usage, such as waste heat recovery and solar power, as well as exploring new technologies like energy storage (3) Developing low-carbon products to reduce CO_2 emissions from clinker usage (4) Developing carbon capture, utilization and storage (CCUS) technologies and (5) Implementing carbon sinks through natural climate solutions.

SCG Cement focused on developing green products, following Thailand's Net Zero Roadmap, which is one of the business priorities. The business is the first cement manufacturer in Thailand to receive the "Green Label" and "Carbon Reduction Label" for its achievement to reduce greenhouse gas emissions through the development of low-carbon products.

Additionally, the company became a member of the Global Cement and Concrete Association (GCCA), collaborating with GCCA and Thai Cement Manufacturers Association (TCMA) to drive the Thailand 2050 Net zero cement and concrete roadmap, aiming to guide Thailand's cement and concrete industry towards Net zero 2050.

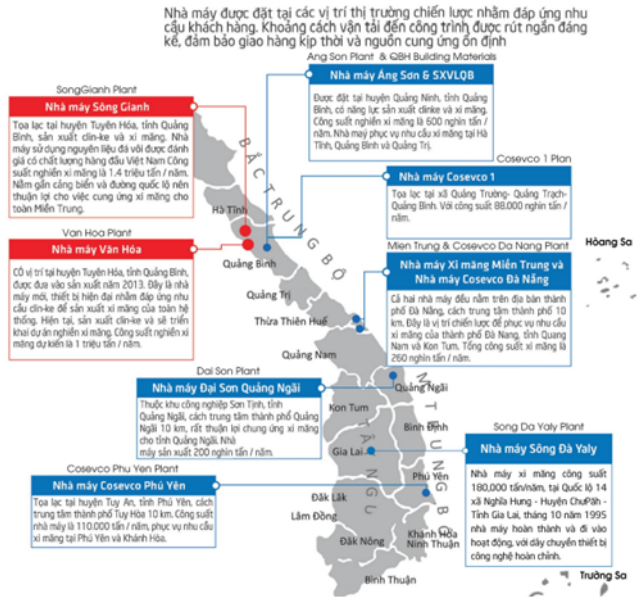
Furthermore, the company has previously proclaimed "Mission 2023", on behalf of the association's members in the Thai Cement Manufacturers Association (TCMA), as part of the efforts to advance towards carbon neutrality on industrial processes and product use, including clinker replacement measures by driving for the manufacturing of hydraulic cement in Thailand.

Company information

SCG Cement Construction Materials Vietnam Co., Ltd (CBMV). In Vietnam, SCG Cement – Building Materials operates in the field of manufacturing, supplying and distributing cement and building materials with a wide range of products including: white cement, ready-mixed concrete, colored roof tiles, fiber cement boards, wood-like cement bars, soundproofing and insulation materials, ceramic tiles, sanitary equipment and accessories, as well as other building materials products from reputable partners of SCG worldwide. In addition, SCG Cement – Building Materials owns a wide distribution channel system through a nationwide dealer and retail system. For international trade, we also develop a network across all continents in the world. In addition, SCG's logistics service is equipped with a modern information technology system, helping to manage transportation and warehouses effectively and ensure service quality.

SCG Cement – Building Materials is also continuing to expand its operations in the region and boost exports to meet the growing demand of the Southeast Asian market in particular and the world in general. Typical examples include the construction of cement plants in Indonesia, Myanmar, Laos and investments in ceramic tile production, making SCG's Cement – Building Materials business the largest ceramic tile manufacturer in the world.

The study adheres to internationally recognized standards ISO 14040 and ISO 14044, providing a detailed analysis of the environmental impacts associated with the entire life cycle of cement and the governing the Product category rules, PCR 2019:14 Construction products version 1.3.4. (EN 15804+A2). This report utilizes The GCCA Industry EPD Tool for Cement and Concrete (v5.1), International Version) LCA Model, International version to assess the environmental impacts occurring throughout the life cycle. Independent third-party verification of the declaration and data in accordance with ISO 14025:2006.



Clinker and Cement production plants	
Song Gianh (SG)	• Clinker • SG PC40 • Song Gianh PCB40 • Starmax Da Dung PCB40 • SCG Low Carbon Super Xi Mang PCB40
Vietnam Construction Materials (VCM)	• Clinker

Cement grinding plants	
Mien Trung (MT)	• SG PC40 • Song Gianh PCB40
Danang (DN)	• Song Gianh PCB40
Phu Yen (PY)	• Song Gianh PCB40
Buu Long (BL)	• SCG Low Carbon Super Xi Mang PCB40 • Starmax PCB40 • SCG Portland Composite Cement (PCC) • SCG PCB40 • SCG OPC Type I • SCG PCB50
Donac	• SCG Low Carbon Super Xi Mang PCB40 • Starmax PCB40 • SCG Portland Composite Cement (PCC) • SCG PCB40 • SCG BULK OPC Type I EXP - AUS Vue • SCG Portland Cement (OPC)Type I • SCG BULK Type I II EXP • BULK OPC Type I SCG OPC Type I • SCG PCB50

Figure 1: *SCG Cement production plants*

Table 1: Cement production address located in Vietnam

Located Area	Address
Dong Nai Roofsheet and Construction Materials Joint Stock Company (DONAC)	Ong Keo IP, Hamlet 3, Phuoc Khanh Commune, Nhon Trach District, Dong Nai Province, Vietnam

Company certifications, awards and standards

SCG CBMV is a pioneer in creating sustainable development for the environment according to the concept of circular economy (SCG Circular Way) through the invention and development of innovative products, services and solutions that help improve the quality of life for everyone in society.
For cement and building materials products, SCG CBMV has applied the “SCG Green Choice” label, a label certifying products and services that promote the environment and sustainable development. SCG CBMV helps consumers choose products more easily, while ensuring that the product or service satisfies one or more sustainability criteria.
It can be seen that SCG CBMV not only aims to provide superior quality products but also focuses on sustainability, environmental friendliness, ensuring health safety and contributing to improving the quality of life for the community.
Our company focuses on excellence and honor to have received several esteemed awards, certifications, and quality standards as follows:

TOP VIETNAM BRAND, GOLDEN PRODUCTS – GOLDEN VIETNAM SERVICES

The Top 20 Leading Brands of Vietnam award of 2019

The Top 20 Golden Products of 2019

The Top 20 Leading Brands of Vietnam award of 2020

The Top 20 Golden Products of 2020

Association goal groups

Global Cement and Concrete Association member

Near Term Target has been validated by Science Based Targets initiative

Vietnam Standards (TCVN)

- TCVN 2682:2009: Regulations on quality indicators for Portland cement, including compressive strength, setting time, fineness of grinding, volume stability, and chemical indicators such as SO3, MgO, MKN, CKT, Na2Oqđ content.
- TCVN 6260:1997: Regulations for blended Portland cement, including criteria for compressive strength, heat of hydration, fineness, and setting time.

International Standards

- ISO 14001: Not directly related to cement quality but is an environmental management system standard that helps control dust and other environmental impacts during cement production.
- ISO 9001: Quality management system standard, widely applied in cement factories to ensure product quality.

European Standard (EN)

- EN 196-1: Specifies a test method for the determination of dust in cement, applicable to all types of cement.

Product information

Product name
SCG BULK OPC Type I in Jumbo bag 1.5 MT EXP – Jumbo Bag 1.5 ton

Product description
SCG BULK OPC Type I in Jumbo bag 1.5 MT EXP - Jumbo Bag 1.5 ton is known for This blended Portland cement is ideal for various applications, including civil and industrial construction, transportation, irrigation, and infrastructure projects. It is particularly suitable for structures requiring high strength and early strength development, such as foundations, beams, piers, and mass concrete components.

Product Standard
- ASTM C150
- CEM I (EN 197-1:2011)

The EPD study is identified according to the United Nations Central Product Classification (UN CPC) scheme system.

Table 2: The United Nations Central Product Classification (UN CPC) code 374 for Cement, lime and plaster

Group	Class	Subclass	Title	Corresonding		
				HS 2007	CPC 2	ISIC 4
374	3744	37440	Portland cement, aluminous cement, slag cement and similar hydraulic cements, except in the form of clinkers	2523.21-.90	37440	2394

LCA information

Functional unit / declared unit:
The information in this report without using a complementary PCR (c-PCR) use a declared unit, which be defined and specified in the International System of Units (SI units) and relate to the typical applications of products. For bagged cement products, the declared unit is 1,000 kg of cement excluding the mass of the packaging.

Reference service life:
Not relevant due to the cradle-to-gate boundary conditions.

Time representativeness:
The data used in this study cover the consistent with the LCA report (2024-01-01 to 2024-12-31).

Database(s) and LCA software used:
Global Cement and Concrete Association, v5.1,
The validity of the Tool is set as the validity of PCR 2019:14 v1.3.4, i.e. 2025-06-20).
Ecoinvent version 3.10 (2024)
This LCA was modelled with GCCA Industry EPD Tool for Cement and Concrete (v5.1), International Version with the scope of A1-A3, cradle-to-gate.
The product does not contain biogenic carbon.
Modelling of biogenic CO2 emissions in the packaging follow the modular approach where the biogenic CO2 emissions are balanced out in each module.

Key assumption & allocations:
Due to the similarity in production processes and manufacturing technologies data collection for production will be collected from actual data at each facility and weighted average by mass for each product.
The study does not include the followings:

- Equipment maintenance
- Human labor and employee transport

Allocation was minimized wherever feasible.
Production was divided into two sub-processes: clinker and cement. Data for inputs and outputs were recorded separately for each subprocess. When electricity, water usage, waste and air emission could not be directly attributed to a specific product, they were allocated by mass. No by-products are generated during clinker and cement production, eliminating the need for allocation in by-products.
For secondary material consumption,

- Fly Ash is considered a waste product in this EPD and has a no allocation factor.
- Blast furnace slag has a no allocation factor but granulation process has been included (as per the GCCA dataset: Slag, granulated, without drying)
- Agricultural wastes as fuels has a no allocation factor.
- Agricultural wastes as fuels has a no allocation factor.
- Biogenic fuels (bark and woodchips) has a no allocation factor.
- Refuse derived fuels has a no allocation factor.
- The allocation and end-of-waste states for secondary materials are as per the GCCA tool default values.

For the transportation of clinker production, the distance of raw material transportation was calculated using Google Maps. Additionally, transportation data for the cement grinding process calculated as an average distance (weight average).

Furthermore, data for the cement grinding process was collected from operational plants.
Since air emissions data are based on quarterly spot measurements. Then the collected spot data are calculated to an average value within the selected time frame in declared unit as a limitation data. Using spot measurements as representative data for annual emission.

Cut-off rules:

According to EN 15804 and PCR 2019:14 version 1.3.4, LCI data was covered at least 95% of total inflows (mass and energy) per module (e.g. A1-A3, A4-A5, B1-B5, B6-B7, C1-C4 and module D).
The contribution of capital goods (production equipment and infrastructure) and personnel is excluded, as these processes are non-attributable and they contribute less than 10% to GWP-GHG.
Additionally, at least 95% of the environmental impact per module of this LCA was included.
Direct (foreground) infrastructure is excluded, as it is commonly accepted to contribute negligibly to the environmental footprint of clinker, cement, aggregates, concrete and precast. The (background) infrastructure is however included by default in the ecoinvent database used in the model.

Description of underlying LCA – Based information

The cement production process of all SCG Cement plants in the following the steps as shown in Figure 2:

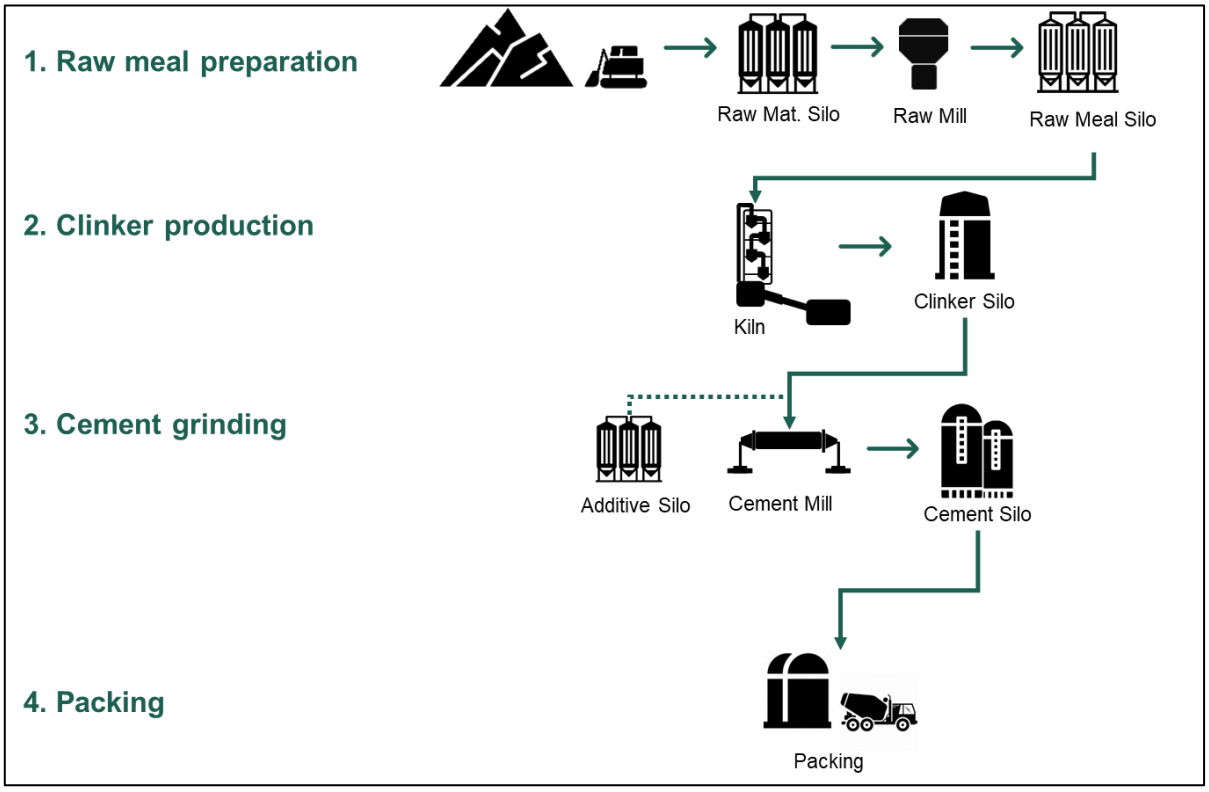


Figure 2: *Life Cycle Stages of Cement Product*

1. **Raw Meal Preparation**

   The main raw materials for cement production include limestone, clay, shale, and additional minerals such as gypsum and slag etc. These raw materials are crushed to be ground and mixed together in appropriate proportions into the homogenized material called “raw meal”.

2. **Clinker Production**

   The raw meal is transported to the cyclone preheater from the top to the bottom to exchange heat with the hot air from the kiln and when the temperature reaches around 800 – 900 ºC, limestone undergoes a process called Decarbonization, where it decomposes into Calcium oxide (CaO) and carbon dioxide (CO_2). After that, these materials are fed into the rotary kiln for be burned with temperatures reaching up to 1,450 ºC. Important compounds such as tricalcium silicate (C_3S), dicalcium silicate (C_2S), tricalcium aluminate (C_3A), and tetracalcium aluminoferrite (C_4AF) are formed which melt together to form “clinker”. The clinker flows out of the kiln through a clinker cooler to rapidly reduce its temperature to about 100 ºC before being transported to the storage in the clinker silo.

3. **Cement Grinding**

   Clinker will be conveyed/ transport to the cement mill for grinding, mixed with gypsum, limestone, fly ash, and special additives in proportions designed to be suitable for the type

of cement. The grinding process of cement involves stringent quality control, both chemically and physically, to ensure a consistently high-quality product that meets customer requirements

4. **Packing**

The cement is conveyed to the silo for storage, awaiting further packaging and transportation. It can be packaged both in bulk form and in bags before being transported to various retailers, factories, or construction sites etc.

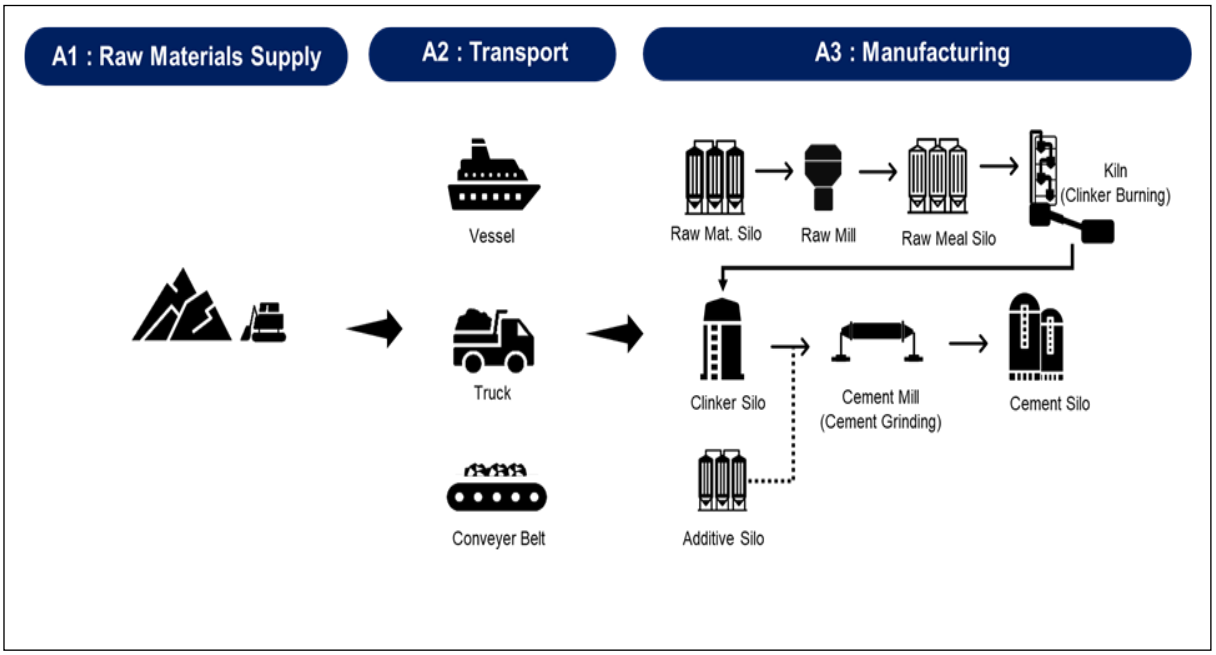


Figure 3: *Information Modules of Cement production process*

A1: Raw Material Supply

The production process commences with the raw material supply, encompassing the extraction and processing of raw materials, and the generation of electricity and fuels necessary for manufacturing process.

The primary raw materials in the production process consist of limestone, clay, shale, etc. which mainly composed of calcite, alumina, silicate, and ferrite. These materials are extracted using drilling, blasting techniques, and crushing before transported to clinker burning process.

A2: Transportation

For the transportation of clinker production, the distance of raw material transportation was calculated using Google Maps. Additionally, transportation data for the cement grinding process calculated as an average distance (weight average).

The transportation of primary raw materials to the manufacturer involves sourcing from the quarry to the entrance of SCG CBMV 's cement plant. Conveyors and Trucks are employed to transport raw materials from various regions to each of SCG CBMV's cement plants.

Additionally, other raw materials such as shale, clay, gypsum, fly ash, sand, other alternative raw material (Industrial waste or by product form other industry), and additives are transported via trucks and stored in the outdoor or/and indoor building.

The raw material will be transported into Feed Hopper, and forward to Raw Mill. The raw materials grinding will extract hot air from the burning process (Kiln) to heated material at the pre-heater tower which has a temperature of approximately 325 ºC to moisture out of the material during the grinding in the Raw mill. The raw material powder is stored in Blending Silo and enters to the clinker burning process.

A3: Manufacturing

The manufacturing process overview begins with the powder material (Raw meal) is conveyed out of Blending Silo to the cyclone preheater from the top to the bottom to exchange heat with the hot air from the kiln which the powder material is heated and has a temperature of about 800 – 900ºC and flows to Pre-Calciner and transferred to Rotary Kiln for burning process with temperatures reaching up to 1,450 ºC. This process used coal-fired fuel as the main fuel and use RDF (Refuse-derived fuel), Industrial waste and Biomass as the alternative fossil fuels.

The waste heat from the pre-calciner and kiln processes will be reused in the raw material preparation process to reduce the moisture content of the materials and will be sent to the AQC boiler to generate electricity. The hot air will then pass through the electrostatic precipitator (EP) before being vented into the atmosphere.

After the clinker burning process, the clinker will be convey/transport to the cement mill for grinding with gypsum, limestone, fly ash, and special additives as in proportions designed to be suitable for each type of cement.

Following mixing and grinding, the cement is conveyed to the silo for storage and packaged into bags or bulk containers. Finally, the packaged final products are ready for delivery to customers and dealer.

For Electricity, For Electricity, Vietnam is a participant in the I-REC system. Therefore, to comply with PCR2019:14v1.3.4 (section 4.8.1), the residual electricity mix data is based on the year 2023, as provided by the International Tracking Standard Foundation through the I-REC(e) Residual Mix database. The residual electricity mix has been estimated by subtracting renewable electricity (potentially sold as I-REC) from the total electricity generation mix. This conservative approach ensures no double counting of renewable attributes. The Global Warming Potential (GWP-GHG) for electricity is 0.63 kg CO_2e/kWh based on the residual mix. The Residual Grid Electricity Mix for Vietnam are Coal and peat (46.76%), Oil (0.87%), Gas (9.97%), Biomass (0.15%), Waste (0%), Nuclear (0%), Hydro (28.89%), Geothermal (0%), Solar (9.59%) and Wind (3.76%).

Table 3: Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	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	Vietnam			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

This section presents the aggregated results per indicator and per life cycle stage, as per PCR 2019:14 Construction products version 1.3.4 (EN 15804: A2) and complementary PCR c-PCR-001 Cement and building limes (EN 16908 PAGE 10/24), including i) core environmental impact indicators (13 indicators), ii) additional environmental impact indicators (6 indicators), iii) parameters describing resource use (10 indicators), iv) other environmental information describing waste categories (3 indicators) and environmental information describing output flows (4 indicators).

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 stage included in the study is just product stage (A1-A3), since the product fulfils the three conditions required:

- the product or material is physically integrated with other products during installation so they cannot be physically separated from them at end of life.
- the product or material is no longer identifiable at end of life as a result of a physical or chemical transformation process.
- the product and packaging material does not contain biogenic carbon.

Content information

Table 4: Content declaration of a product.

Product components	Weight, kg	Post-consumer recycled material, weight-% of product	Biogenic material, weight-% of product	Biogenic material, kg C/product or declared unit
Clinker	90 - 95 %	0%	0%	0%
Minor Additional Constituents	5 - 10 %	0%	0%	0%
Hexavalent Chromium	<0.002%	0%	0%	0%

Table 5: Content declaration of a packaging.

Product components	Weight, kg	Post-consumer recycled material, weight-% of packaging	Weight-% (versus the product)	Biogenic material, kg C/product or declared unit
Paper	-	-	-	-
Plastic		-	-	-

The permissible soluble chromium VI content of this product , when hydrated, is less than 2 mg/kg (0.0002%) of the total dry weight of the cement.

Environmental performance

The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, non-cancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.
This section presents impact categories (indicators 1-14 and 15-20) for each indicator and per life cycle stage, as per PCR 2019:14 VERSION 1.3.4 Construction products (EN 15804: A2) and complementary PCR c-PCR-001 Cement and building limes (EN PAGE 10/24 16908)
The reference for the characterization factors (CF) of the default list, the "EN 15804 reference package" provided by JRC, was updated in February 2023. As of this update, the CFs are based on version 3.1.

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.
The 'Water deprivation potential' (WDP) indicator is characterized according to global characterization factors and not local ones.

Impact per 1,000 kg average

Potential environmental impact – mandatory indicators according to EN 15804

Indicator	Abbrevation	Unit	Total A1-A3
Global Warming Potential, total	GWP-tot	kg CO_2 eq.	9.15E2 *
Global Warming Potential, fossil fuels	GWP-fos	kg CO_2 eq.	9.15E2 *
Global Warming Potential, biogenic	GWP-bio	kg CO_2 eq.	1.98E-1 *
Global Warming Potential, land use and land use change	GWP-luc	kg CO_2 eq.	9.91E-2
Depletion potential of the stratospheric ozone layer	ODP	kg CFC 11 eq.	2.14E-6
Acidification potential, Accumulated Exceedance	AP	mol H^+ eq.	4.85E+0
Eutrophication potential, fraction of nutrients reaching freshwater end compartment	EP-fw	kg P eq	4.37E-2
Eutrophication potential, fraction of nutrients reaching marine end compartment	EP-mar	kg N eq.	3.23E-1
Eutrophication potential, Accumulated Exceedance	EP-ter	mol N eq.	1.62E+1
Formation potential of tropospheric ozone	POCP	kg NMVOC eq.	4.04E+0
Abiotic depletion potential for non-fossil resources	ADPE[1]	kg Sb eq.	1.92E-3
Abiotic depletion potential for fossil resources potential	ADPF[1]	MJ, net calorific value	4.79E+3
Water (user) deprivation potential,deprivation-weighted water consumption	WDP[1]	m^3 world eq. deprived	2.57E+1

*The indicated values (gross values) include the greenhouse gas emissions from the incineration of secondary fuels at clinker production. The net GWP-tot (excluding the emissions from the incineration of secondary fuels at clinker production) is 9.12E2 kg CO2–eq. The net GWP-fos is 9.12E2 kg CO2-eq. The net GWP-bio is 7.18E-2 kg CO2-eq.

[1]The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

It should be noted that the net/gross differentiation applies to GWP indicators only and is ignored for other indicators where gross is applied by default.
EN 15804+A2 disclaimer for Ionizing radiation, human health.

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.

Additional environmental impact indicators

Indicator	Abbrevation	Unit	Total A1-A3
Global Warming Potential	GWP-GHG	kg CO_2 eq.	9.15E2 **
Potential incidence of disease due to PM emissions	PM	Disease incidence	4.36E-5
Potential Human exposure efficiency relative to U235	IRP	kBq U235 eq.	2.37E+0
Potential Comparative Toxic Unit for ecosystems	ETP[1]	CTUe	1.07E+3
Potential Comparative Toxic Unit for humans - cancer	HTPC[1]	CTUh	1.31E-6
Potential Comparative Toxic Unit for humans - non-cancer	HTPNC[1]	CTUh	4.47E-5
Potential soil quality index	SQP[1]	dimensionless	1.69E+3

** The indicated values (gross values) include the greenhouse gas emissions from the incineration of secondary fuels at clinker production. The net GWP-GHG (excluding the emissions from the incineration of secondary fuels at clinker production) is 9.12E2 kg CO2–eq.

[1]The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Parameters describing resource use

The energy balancing as per PCR 2019:14 Construction Products v1.3.2 is performed according to Option B (see Annex 3 of the PCR).
Disclaimer: No energy balancing is performed in modules A1-A3 for the resource use indicators, in order to avoid double counting in case such EPD is used as input in another EPD. It is recommended to proactively indicate the quantities and qualities (bio-based and fossil-based) of packaging materials in the EPD report so interested parties have the relevant information at hand to perform the energy balancing downstream.

Indicator	Abbrevation	Unit	Total A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ, net calorific value	1.77E+2
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ, net calorific value	4.69E+3
Use of secondary materials	SM	kg	6.3E+1
Use of renewable secondary fuels	RSF	MJ, net calorific value	1.43E+2
Use of non-renewable secondary fuels	NRSF	MJ, net calorific value	4.6E+0
Use of renewable primary energy resources used as raw materials	PERM	MJ, net calorific value	0E+0
Total use of renewable primary energy resources	PERT	MJ, net calorific value	1.77E+2
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ, net calorific value	1.01E+2
Total use of non-renewable primary energy resources	PENRT	MJ, net calorific value	4.79E+3

Indicator	Abbrevation	Unit	Total A1-A3
Net use of fresh water	NFW	m^3	8.71E-1

Other environmental information describing waste categories

The 'Non-hazardous waste disposed' (NHWD) and 'Hazardous waste disposed' (HWD) indicators in the tool relate only to the foreground of the clinker, cement and concrete, where cement inherits the impacts from clinker and concrete inherits the impacts from cement.

Indicator	Abbrevation	Unit	Total A1-A3
Hazardous waste disposed	HWD	kg	0E+0
Non-hazardous waste disposed	NHWD	kg	1.09E-2
Radioactive waste disposed	RWD	kg	5.8E-4

Environmental information describing output flows

Indicator	Abbrevation	Unit	Total A1-A3
Components for re-use	CRU	kg	0.00E+00
Material for recycling	MFR	kg	0.00E+00
Materials for energy recovery	MER	kg	0.00E+00
Exported electrical energy	-	MJ per energy carrier	0.00E+00
Exported thermal energy	-	MJ per energy carrier	0.00E+00

Differences versus previous versions

This is the first EPD version – No previous versions

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References

1. Electricity Generating Authority of Thailand (2022) – Annual power consumption report.
2. Energy Regulatory Commission of Thailand (2022) - Annual report.
3. EPD INTERNATIONAL (AB) (2024) Product Category Rules (PCR) 2019:14 - Construction Products; version 1.3.4
4. European Committee for Standardization (2021) EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations - Core rules for the product category of construction products
5. European Committee for Standardization (2022) Complementary Product Category Rules c-PCR-001 - Cement and building limes.
6. United Nations (2015) United Nations Central Product Classification (UN CPC); version 2.1
7. Global Cement and Concrete Association (2023) - GCCA Industry EPD Tool for Cement and Concrete
    - User Guide (v5.1, International version, 30 March 2025)
    - LCA Model (v5.1, International version, 31 March 2025)
    - LCA Database (v5.1, 18 March 2025)
    - Verification Report (30 April 2025)
8. International Organization for Standardization (2000) ISO 14020:2000 - Environmental labels and declarations - General principles.
9. International Organization for Standardization (2006) ISO 14025:2006 - Environmental labels and declarations - Type III environmental declarations.
10. International Organization for Standardization (2006) ISO 14044:2006 - Environmental management - Life cycle assessment - Requirements and guidelines.
11. International Organization for Standardization (2017) ISO 21930:2017 - Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services.
12. Office of Natural Resources and Environmental Policy and Planning (2022) – Annual Power data report.
13. United Nations (2015) United Nations Central Product Classification (UN CPC); version 2.1 Product Environmental (PEF) Guide. European Commission (EC), Joint Research Centre (JRC), Institute for Environment and Sustainablility (IES), 17 July 2012.
14. The International Tracking Standard Foundation. (2025). I-REC(e) Residual Grid Mix. https://www.trackingstandard.org/i-rece-residual-mix/

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