

Driving Sustainable Business and Society for a Better Future

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Thailand's Commitment to a Low-Carbon Future SCG's Net Zero Cement and Concrete Vision for 2050 Innovations Driving Inclusive Green Growth







1913

Siam Cement Group (SCG)

was founded under the Royal Decree of His Majesty King Rama VI in 1913, to produce cement for domestic consumption, reducing reliance on cement imports, and laying a ground work of country development.

112 Years







SCG Business Purpose

In a world facing crises, both in terms of fluctuating energy prices and international conflicts, the world has become more concerned with sustainability. SCG is continuously developing its business, adapting to the global context at all times, aiming to create long-term stability through green innovation with Deep Tech to reduce carbon emissions in all business groups, as well as working with all sectors in the supply chain to create growth together towards the goals of Low Carbon, Carbon Neutrality, and Net Zero 2050 in line with the "Inclusive Green Growth"

> Thammasak Sethaudom President & CEO

Low-Carbon Future

Cement is a fundamental material in construction, providing numerous benefits. Nevertheless, its production is associated

with substantial carbon dioxide (CO $_2$) emissions, posing significant environmental challenges. It has become crucial for

the industry to adopt practices that minimize CO₂ emissions. By investing in innovative technologies and more sustainable production methods, businesses can maintain the superior performance characteristics of cement while actively reducing their environmental impacts and fulfilling their **social responsibilities for a better future.**





Transforming Thailand toward a Low-Carbon Society

"Thailand aims to reach carbon neutrality by 2050, and net zero greenhouse gas emissions by or before 2065"











SCG Aiming for Net Zero Cement & Concrete by 2050





Low Carbon Products

"Develop cement formular by reducing clinker ratio without compromising quality such as strength"

Low Carbon Cement , Mortar & Concrete



G = Gypsum, LP = Limestone Powder, FA = Fly ash, CC = Calcined clay



	OPC	Gen I	Gen II	Gen III	Gen IV
CO ₂ Reduction	-	10% ↓	15-20% ↓	40-50% ↓	90% ↓
SCMs	-	Limestone*	+ Fly Ash**	+ Calcined Clay	+ Lime + New SCM
Clinker Ratio	0.92	0.86	0.81	0.65-0.50	0.10
Process	Inter-grind	Inter-grind	Separate Grind	Separate Grind	Separate Grind

*Inert materials but can enhance clinker phase hydration

**Reactive materials (pozzolanic) contribute to latent hydraulic reaction

Green Process (Energy Transition)

The Action to Reduce Fuel & Power Consumption and Shift from Fossil Fuel to Green Fuel such as Alternative Fuel, Renewable Energy

Source of Green Fuel – Alternative Fuel, Renewable Energy



RDF = Refuse Derived Fuel (from municipal solid waste)

Shift from Fossil Fuel to Green Fuel

AF = Alternative Fuel RDF = Refuse Derived Fuel (from municipal solid waste)

waste)



Renewable Energy



Low Carbon Cement/Concrete

Develop cement with lower clinker factor (+ green process) without compromising strength (Strength class = 42.5 MPa) and properties similar to OPC when using in concrete.





Ready Mixed Concrete (RMC) plant

- Optimize mix-design, using Low Carbon Cement and suitable chemical admixture, improve quality control and plant efficiency by using Machine Learning.
- Increased share of RMC, decreased share of bagged cement

Turn the Fossil fuel to EV car



The 1st EV mining truck in Thailand



New SCMs e.g. Calcined Clay , Synthesis Pozzolan



Low Carbon Cement Gen I & II

2020 - 2021 Target : Reduce CO₂ 300,000 t-CO₂ by 2022





Collaboration with 5 Ministries and 21 alliances.

2022 - 2023 Target : Reduce **CO2 1,000,000** t-CO₂ by 2023



TCMA together with 6 Ministries, 25 alliances

2024 Thailand's New Era of Low Carbon Cement : Hydraulic Cement"



100% Hydraulic Cement



Accelerate using of hydraulic cement, which is low carbon product through procurement process for government construction.



SCG Low carbon cement GEN1

15%



- North in Jan 2024
- Central & Northeast in Mar 2024
 - South in Oct 2023

Green Product: The first in Thailand to be certified with the EPD North America standard.

THIRD-PARTY VERIFIED EPDD ISO 14025 and EN 15804 ISO 14025 and EN 15804

THE FIRST LOW-CARBON BULK EXPORT SHIPMENT CERTIFIED WITH AN EPD (ENVIRONMENTAL PRODUCT DECLARATION)

NORTH AMERICA







CollER Type 5, (Hydroxet: Connect) Moannelixeue Environmental Product Declaration (Encurves)nu ISO 14020, ISO 14025, ISO 21930 str: ASTM International General Progra CO₂ Reduction **30,240** Ton CO₂

Green Product: Cement and ready-mixed concrete products certified with environmental labels.

Carbon Footprint (CFP) and Carbon Footprint Reduction (CFR)



Green Society: Collaborating with top real-estate developers and contractors to use low-carbon products in the construction to drive green building innovations toward a low-carbon society.



Low Carbon Cement Gen III



Reduction

40-50%

Normal Concrete Application Stockpile @ cement plant (May'24)



Special Concrete Application Industrial floor @ CPAC Bang Son (Jul'24)



Concrete Block @ASA'24 (Apr'24)

Landscape @ SCG Bang Sue (Sep'24)

Non Structural Wall @Harudot by NANA Coffee Roasters, Khao Yai (Jan'25)







Low Carbon Cement Gen III



40-50% Reduction @Harudot by NANA Coffee Roasters, Khao Yai (Jan'25)



SCG Aiming for Net Zero Cement & Concrete by 2050



Carbon Offset

50% of Remaining CO2 is Needed to be Managed with 3 Possibilities : Carbon Capture Utilization & Storage (CCUS), Nature Base Solution (NCS), or Buying Carbon Credits



"CCUS involves the capture of CO2, generally from kiln. Then use them on-site or inject into deep geological formations"

Key Challenge :

- Technology Readiness Level is Still Low with High Investment
- Utilization : Need to Explore What Material to be Produced
- Storage : Need to Explore Area to be Storage the Captured CO2

Nature-based solutions are coming to the fore, rooted in the protection, regeneration & sustainable management of ecosystems.

Key Challenge :

- Cost of Nature Base Solution (NCS) ex. Forest Restoration is High
- Beside New Forestry Process, the After Process is also Important and It is still difficult to Keep the Productive Forestry.

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Community forest in Lampang (2023)

Collaborating with the Royal Forest Department and the Lampang Community Forest Learning Association to conserve and restore the community forests in Lampang Province.

12,000 rai (~4,800 acre)



Community forest in Saraburi (2023) Support and promote the Saraburi community forest network, conserve and restore forests in Saraburi Province under the Saraburi Sandbox project.

45 Communities 15,000 rai (~5,900 acre)

Planting sea grass

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mpan

Saturul

Philiphobus

irong

CO.

Chorible

(CO)

Forest plantation project (2022)

National Park, Lamphun Province.

Collaborating with the Department of

National Parks to plant trees in the Mae Ping

400 rai (~158 acre)

TAU

(CO.) 🚭

Collaborating with the Department of Marine and Coastal Resources to plant seagrass in Trang Province.

NATURAL CLIMATE SOLUTION

Reduce global warming with natural methods

To be a source of carbon absorption

Planting mangrove (2023) Collaborating with the Department of Marine and Coastal Resources to plant mangrove in Rayong, Chonburi and Phetchaburi Province.

1,100 rai (~434 acre)

Planting mangrove (2023)

Collaborating with the Department of Marine and Coastal Resources to plant mangrove in Trang Province.

97 rai (~38 acre)



Wherever the factory is located, the forest must be green there.

Lampang Plant

Create jobs, foster prosperity, protect the environment, and be a good citizen of Lampang.



The forest has recovered, becoming moist

and generating water.

SCG



>120,000 Check Dam

3D PRINTING SOLUTION







WASTE REDUCTION (20%)

"Future of construction that combines innovation and digitization in construction results in faster schedule, reduce material waste and labor. 3D printing allow various applications such as decoration, construction and sculpture."





3D Printing Construction

Commercial

1&2 story building

44.4.

Modular

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CAFÉ' & CO-WORKING SPACE

On-site & Off-site Construction

G IN-IN-

195

Café Amazon @Bangson Location: Bangson, Bangkok Usable Area: 73 sq.m.

Caté Amazon

The 1st on-site 3D Printed Building in Thailand Location: Research and Innovation Center Saraburi, Thailand Usable Area: 102 sq.m.





EMBER CAFE

@ Rama9, Bangkok

Ember cafe Location: Bangkok, Thailand Usable Area: 150 sq.m.

> SCG BDP

4





@ SCG experience, Bangkok

3D modular space Location: Bangkok, Thailand Usable Area: 50 sq.m.

2rd floor







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THE REAL

CPAC 3D Modular **Space**

ARTIFICIAL CORAL REEF

CPAC 3D PRINTING x Department of Marine and Coastal Resources x CU

New model:









The initiative harnesses 3D printing technologies using leftover recycled concrete materials as 40% replacement of natural stones to create robust and well-attached artificial coral reefs that blend in with their surroundings. The artificial coral reef provides a safe haven for aquatic species and helps restore the marine ecosystem and sustainability.









Ultra High-Performance Concrete



- The first post-tensioned UHPC bridge in Thailand has been erected at the SCG Headquarter.
- The architectural design was a very low archshape, which the foundation on both sides has to be encountered to extremely high lateral forces from arching action.
- The bridge was re-designed by using two cantilever curved girders extending horizontally from each side of abutment. Therefore, the horizontal forces acting on both abutments has been eliminated.
- To maximize the moment capacity, SCG-UHPC material which has a 150 MPa compressive strength, with a capability to resist high tensile and shear stresses, was used for manufacturing the girders.

Awards winner

- The TCA Concrete Practice Award 2021 (Gold medal);
- ACI Excellence in Concrete Construction Awards 2022: First Place – Infrastructure.



Ultra High-Performance Concrete



"UHPC technology offers exceptional strength, durability, and design flexibility, making it ideal for modern, low-carbon construction. A key showcase is Thailand's first post-tensioned UHPC bridge at SCG Headquarters, featuring a cantilever girder design that eliminates lateral forces, reduces construction time, and minimizes material waste and manpower"



PATHWAY TO NET ZERO



SCG The Possibilities for Inclusive Green Growth



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