Decarbonization in Thailand's Cement Sector

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Shift in Doing Business

Climate Change and Nature Loss

- Global boiling and carbon budget of 1.5C
- Resource scarcity, biodiversity loss, air quality, water stress

Energy Transition and ESG Investment

- Renewable energy investment
- Green infrastructure policy
- ESG standards
- Data integrity

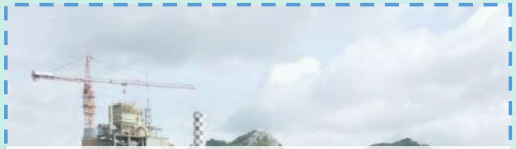
New Rules of the Game

- NDC, carbon neutrality and net zero target
- Polluter pays principle
- Taxonomy
- Carbon tax/ETS/CBAM
- Carbon footprint products
- Carbon market

Key Challenges of Cement Business on Decarbonization

Cement production in the Global South faces challenges in achieving net-zero emissions due to high demand, limited resources, and costly carbon capture technology.

Cement in Demand



5X by **2050**

Mostly used in the **Global South**

Carbon Capture and Storage (CCS)

Impossible

to reduce emissions to zero without CCS

Sufficient capacity

→ Technically challenging
→ Expensive, cost of production

2-4X

Resource Scarcity

Limited supply of **limestone** and other essential raw materials

Technological and Economic Barriers

Regenerative technology

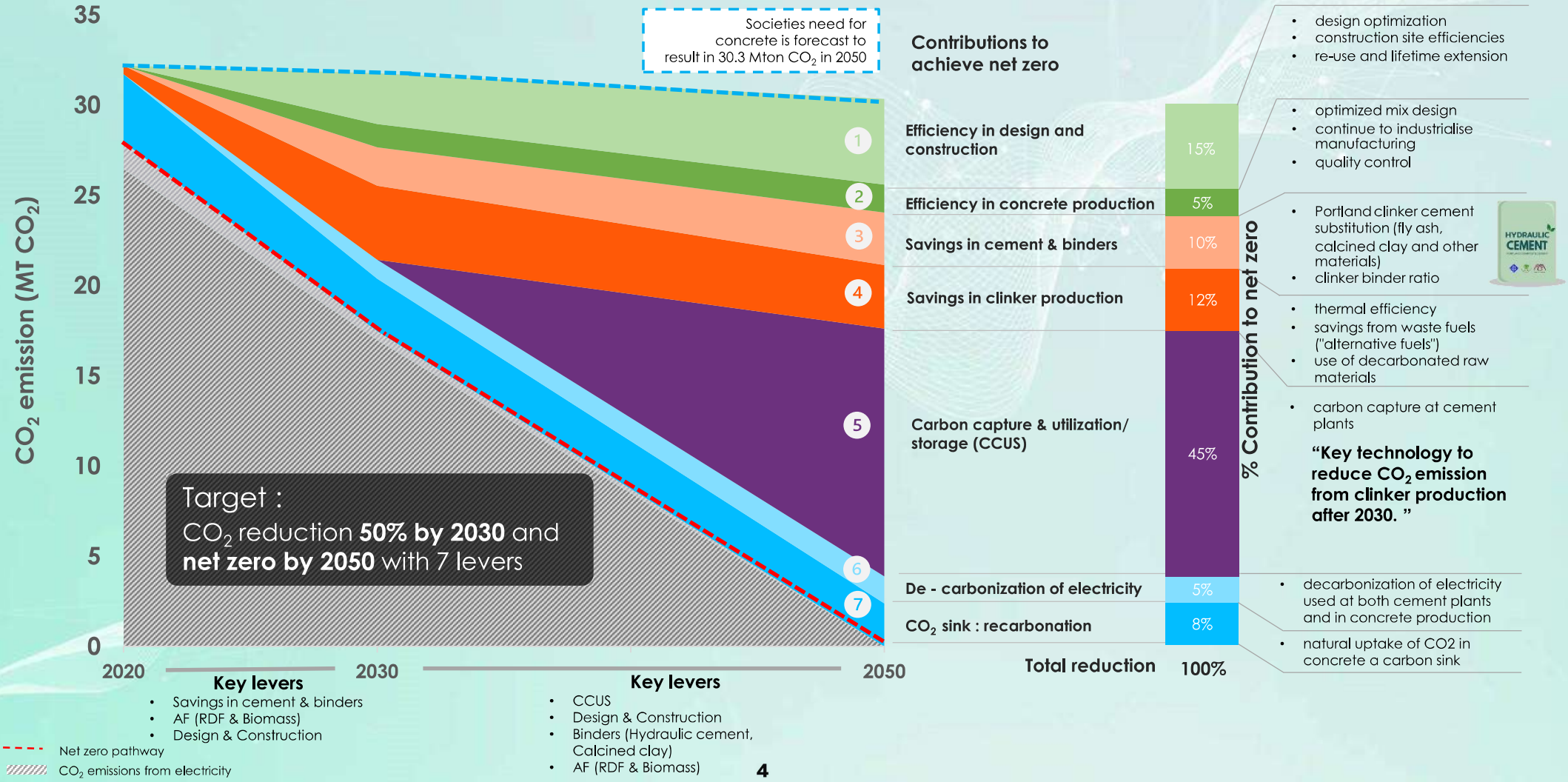
still **not available** at scale globally

Economic incentives

for industry to invest in R&D are **limited**

Source: GCCA Concrete Future: Cement Industry Net Zero Progress Report

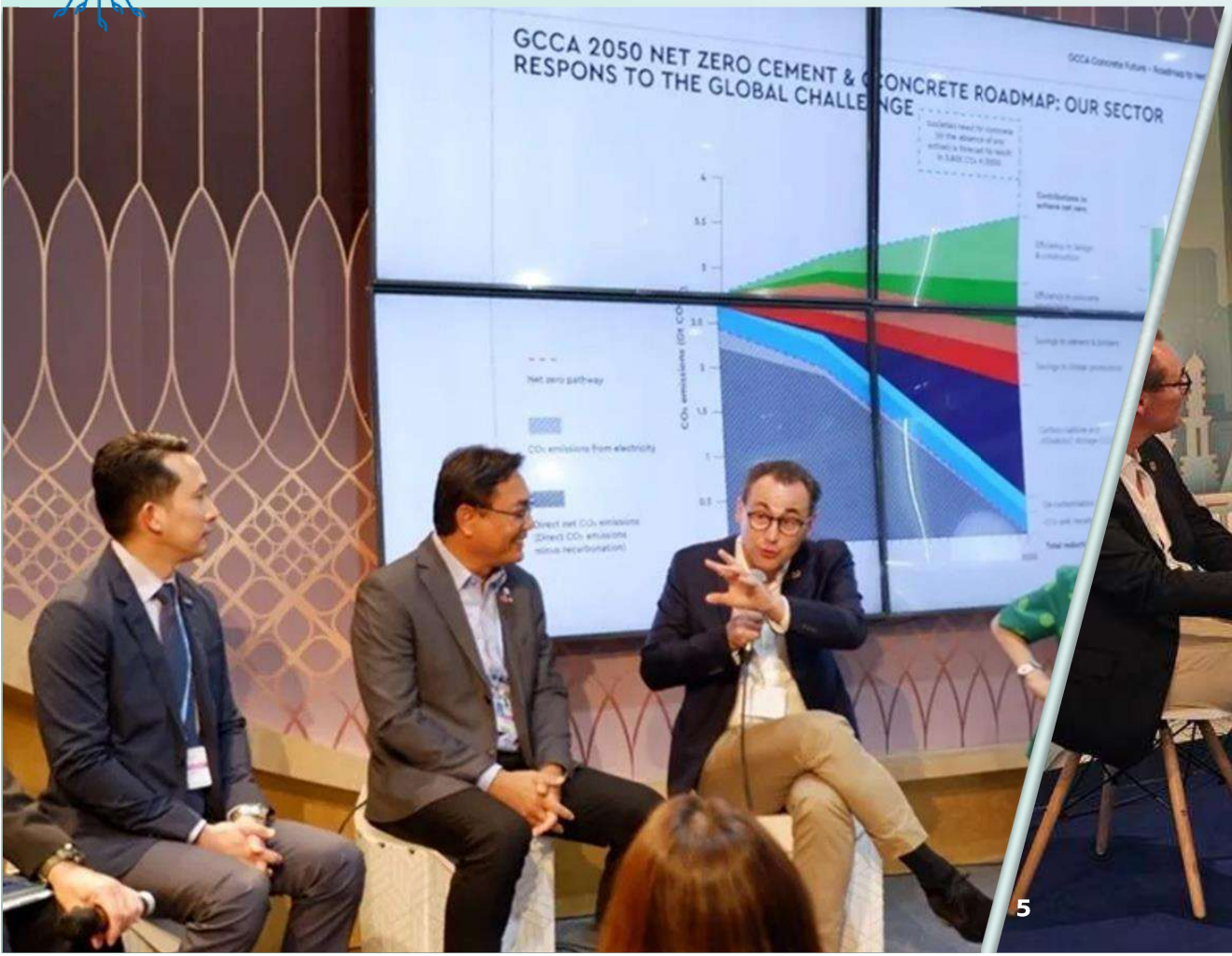
Thailand 2050 Net Zero Cement & Concrete Roadmap



Cement Industry Decarbonization in Global Platform

COP27 SHARM EL-SHEIKH EGYPT 2022

COP28 UAE



Driving Systemic transformation to pave the way towards a low-carbon society

1

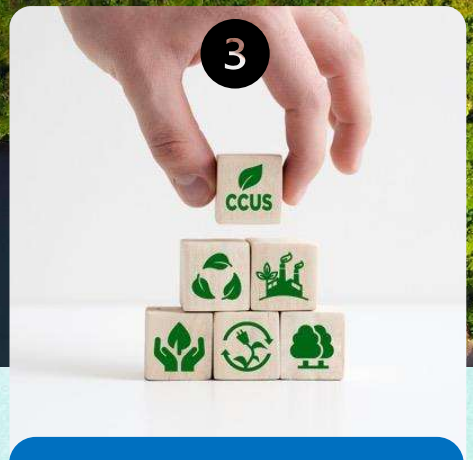
Policy, Law & Regulation

Constraints and redundancies between government agencies

2

Climate Funding

Channels and procedures of the green funds to support decarbonization projects



3

Technology

Feasibility of decarbonization technologies

4

Governance

Cross - collaboration among public-private-people partnerships

Energy Transition

Implementing Solar Energy Project to Promote the Using of Renewable Energy.
However, balancing ratio of Renewable VS Grid is still needed for Energy Security

40% *In 2024* → **47%** *In 2030*

Solar Roof

Solar Farm

Solar Float

INTERNATIONAL CEMENT CONFERENCE Cemtech PRODUCTION EXPERTISE · MANAGEMENT SKILLS ASIA 2024 SCG

Low Carbon Innovation towards Decarbonization

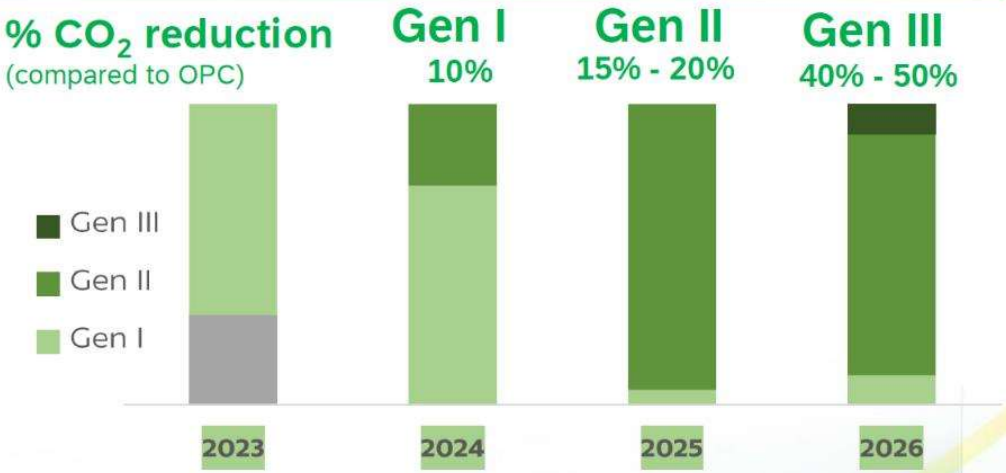
Low Carbon
Cement & Concrete

NEW GENERATION

Penetration rate approaching *81%*

(Thailand) in Q4-2023 and aiming to be 100% in 2024

LOW CARBON CEMENT: NEW GENERATION PLAN



- ***First Mover** Low Carbon Cement In Thailand*
- *Produced with **Less Fuel and Energy***
- ***CO_2 reduction** from 10%-40% compared to OPC*
- *Infused with **higher strength** formulation know-how*

Product - Solution Transition

Providing Green Construction Solution to Contractor and Developer via “Offsite construction Technology” : Precast Construction, 3D Printing Construction” to Minimize Waste, Improve Construction Efficiency and Utilize Green Materials

Precast Construction Technology

- DFMA Concept for Factory-Made Components
- Allows Flexible Building Shapes
- Panelized, Sectional Modules for Transportation

3D Printing Technology

- Digital Construction for both Off-Site & On-Site Work
- 3 Main Components : Printer, Design, Materials
- Future of construction : faster, Zero Waste, less labor

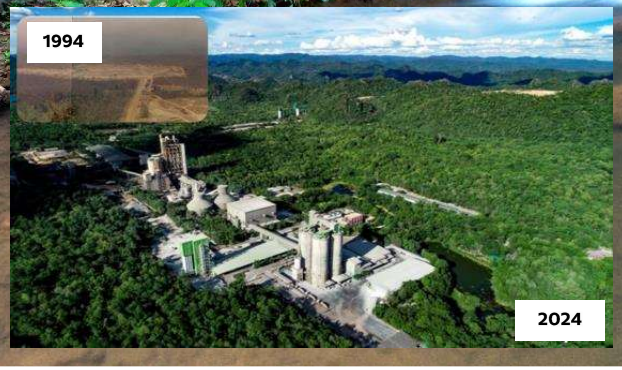
Sustainable Construction

The first large-scale property development project that features new design standard and follows sustainable construction practices under the concept of circular economy

Natural Climate Solutions

Restore Forests

Making communities more resilient with natural resources



Restore Ocean

by 3D printing cement technology

Thank you