

# Decarbonising the global cement & concrete sector

FICEM - Congresso CO2  
Guatemala City, May 6<sup>th</sup> 2024

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CEO GCCA

gcca

Global Cement and Concrete  
Association

CONCRETE  
FUTURE

## Concrete is essential... But needs to be decarbonised



Three quarters of the infrastructure that will exist in 2050 has yet to be built. Without credible action now, future generations will have no liveable planet to build upon.

The United Nations stands ready to support you in accelerating the transformation of your industry. I invite all cement [sector] companies to join this vital endeavour.

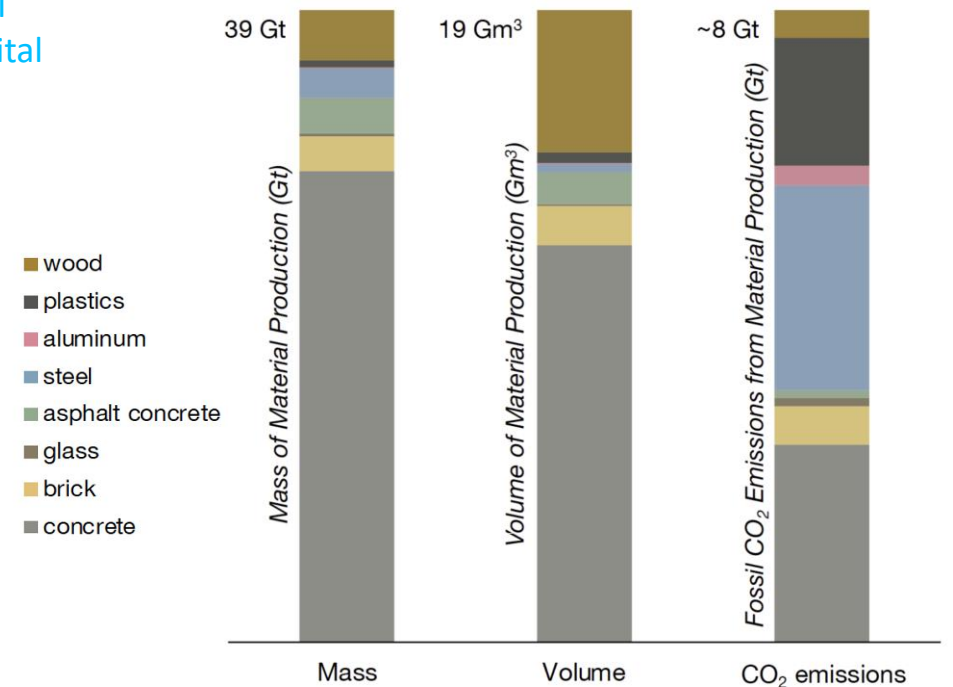
**António Guterres**  
Secretary-General of the United Nations



Concrete is essential to our lives – but we have to reduce its emissions.”

**John Kerry**  
United States Special Presidential Envoy for Climate

### Concrete in construction In mass, volume and proportion of CO<sub>2</sub>



# OUR MEMBER COMPANIES AND NATIONAL PARTNERS OPERATE IN ALMOST EVERY COUNTRY OF THE WORLD

## Our Members

- Asia Cement Corporation
- **Arkan Cement**
- Breedon Group
- **BUA**
- Buzzi Unicem
- **Cimenterie Nationale**
- Cementir Holding
- Cementos Argos
- Cementos Moctezuma
- Cementos Molins
- Cementos Pacasmayo
- Cementos Progreso
- CEMEX
- Çimsa Cement
- CNBM
- CRH
- Dalmia Cement
- Dangote
- **Fletcher Building**
- GCC
- Heidelberg Materials
- Holcim
- **Huaxin Cement**
- JK Cement
- JSW Cement
- Medcem
- **MISR Cement Group**
- Neshier Israel Cement Enterprises
- **Norm Cement**
- **Northern Region Cem Co**
- Orient Cement
- **PT Solusi Bangun Indonesia**
- **Sarraï Group**
- SCHWENK Zement
- Secil
- Siam Cement Group
- Siam City Cement
- Taiheiyo Cement
- Taiwan Cement Corporation
- TITAN Cement Group
- **TPI Polene**
- UltraTech Cement
- UNACEM
- Vassiliko Cement
- Votorantim Cimentos
- **Yura Cement**
- YTL Cement

## Our national and regional industry associations partners

- Asociación de Fabricantes de Cemento Portland – Argentina
- Asociación de Productores de Cemento – Peru
- Associação Brasileira de Cimento Portland – Brazil
- Association of German Cement Manufacturers (VDZ) – Germany
- Association Professionnelle des Cimentiers – Morocco
- Betonhuis – Netherlands
- BIBM – Europe
- CANACEM – Mexico
- Canadian Precast Prestressed Concrete Institute
- Cement Association of Canada
- Cement Concrete & Aggregates Australia
- Cement Industry Federation – Australia
- Cement Manufacturers Association – India
- Cement Manufacturers Ireland
- **China Cement Association**
- Concrete NZ – New Zealand
- European Cement Association (CEMBUREAU)
- European Federation Concrete Admixtures
- European Ready Mixed Concrete Organisation
- Federación Iberoamericana del Hormigón Premezclado – LatAm
- Federación Interamericana del Cemento (FICEM) – LatAm
- Japan Cement Association
- Korea Cement Association
- Mineral Products Association United Kingdom
- National Ready Mixed Concrete Association – USA
- Portland Cement Association – USA
- Thai Cement Manufacturers Association
- The Spanish Cement Association (Oficemen)
- Turkish Cement Manufacturers Association (TürkÇimento)

**New members 2023 / New members 2024**

## GCCA MEMBER ACTIONS

GCCA members actions are driving decisive progress on our industry mission to fully decarbonise. In the last year a myriad of actions, projects, investments are underway.



Breedon Group – CEM II /A-L rollout



CANACEM – Mexico-FICEM  
2030 Roadmap



Cementos Argos – Technical and Financial  
Roadmap



Cementos Moctezuma –  
Replacing Clinker



Cementos Pacasmayo – EcoSaco  
– Sustainable Packaging

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CEMEX – Solar Clinker



Cimsa Cement – Optimising clinker and fuels



CNBM – New WHR Power Generation technology



CPCI – 2030/2050  
Net-zero Roadmap Initiative



CRH – ZIN Project in Brussels

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Heidelberg Materials – CCUS driving deep decarbonisation



Holcim – Calcinated Clays



JK Cement – Steps Towards Net Zero



JSW – Decarbonisation efforts towards net zero



MPA – State of the Art Net Zero Fuel Mix

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Orient Cement – Renewable and Alternative Fuels



SCG – 3D Printed Coral Reef



SECIL – The Clean Cement Line



Taiheiyo Cement – Carbon Circulation Technology



YTL Cement – Net Zero Initiatives

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Taiwan Cement Corp. – Ultra-High Performance Concrete



TCMA – Working with Stakeholders



UltraTech Cement – Harnessing Green Energy



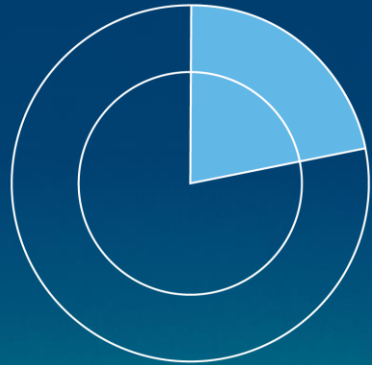
3D Printed Concrete



Votorantim Cimentos – Renewable Energy



## KEY PROGRESS: CO<sub>2</sub> REDUCTION – GNR



CO<sub>2</sub> emissions\*

**23%**

Reduction in Net CO<sub>2</sub> emissions  
per tonne cementitious  
(1990 baseline)



Fossil Fuel

**18%**

Reduction in fossil fuel consumption  
(1990 baseline)



Energy Efficiency

**19%**

Energy efficiency improvement  
(1990 baseline)

\* Note 23% is a rounded figure – actual figure, accurate to 1 decimal places, is 22.7%

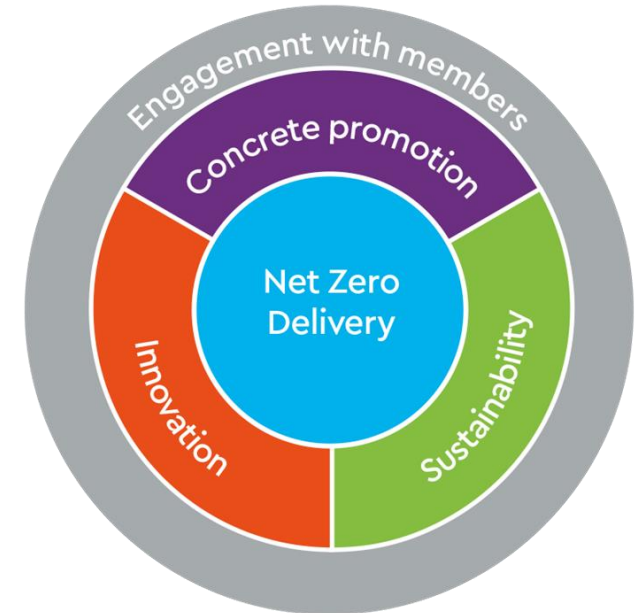
## GCCA COMMON VISION AND OBJECTIVES

Together, we are committed to building a bright, resilient and sustainable concrete future for our industry and for the world.



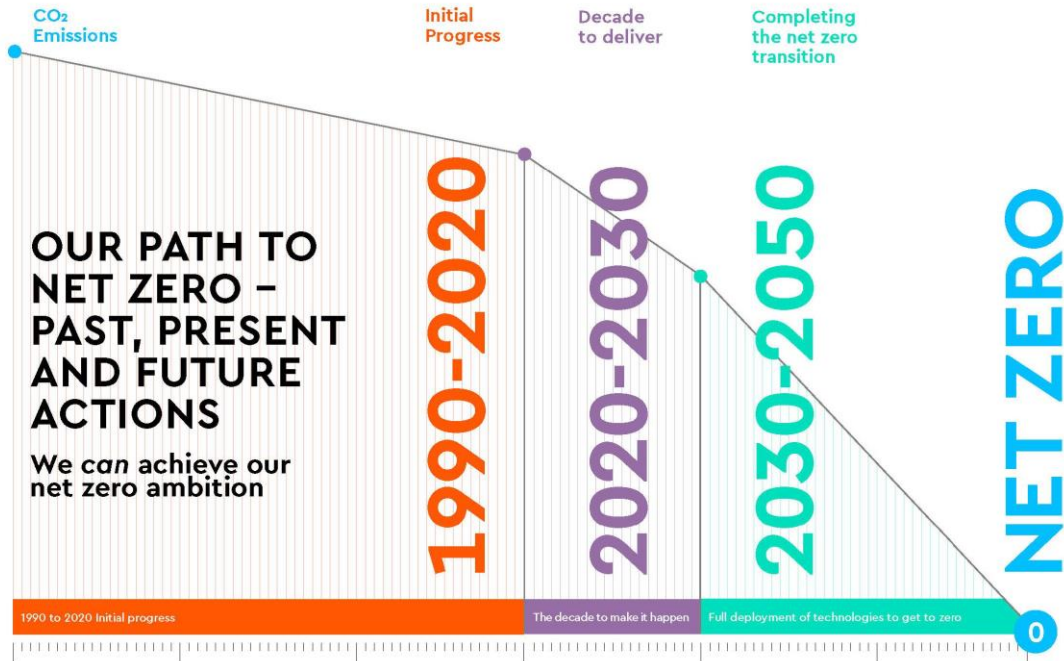
## GCCA STRATEGIC PILLARS

Net Zero delivery is central to GCCA mission,  
Innovation is a key enabler



# GCCA 2050 ROADMAP

Our path to net zero – past, present and future actions



**Savings in clinker production**

- thermal efficiency
- savings from waste fuels ("alternative fuels")
- use of decarbonated raw materials
- use of hydrogen as a fuel

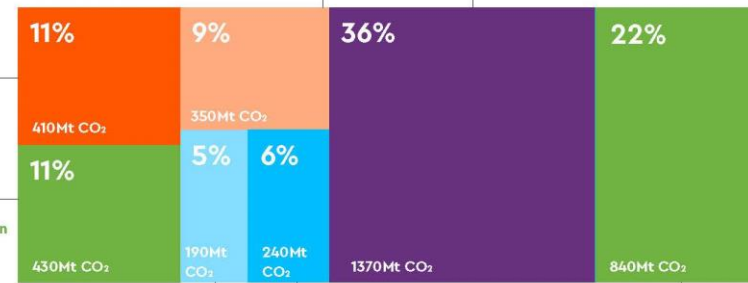
**Savings in cement and binders**

- Portland clinker cement substitution. Also expressed through clinker binder ratio
- alternatives to Portland clinker cements

**Carbon capture and utilisation/storage**

- carbon capture at cement plants

PERCENTAGE CONTRIBUTION TO NET ZERO AND CO<sub>2</sub> EMISSION SAVINGS IN 2050



**Efficiency in concrete production**

- optimised mix design
- optimisation of constituents
- continue to industrialise manufacturing
- quality control

**Decarbonisation of electricity**

- decarbonisation of electricity used at both cement plants and in concrete production

**CO<sub>2</sub> sink recarbonation**

- natural uptake of CO<sub>2</sub> in concrete – a carbon sink

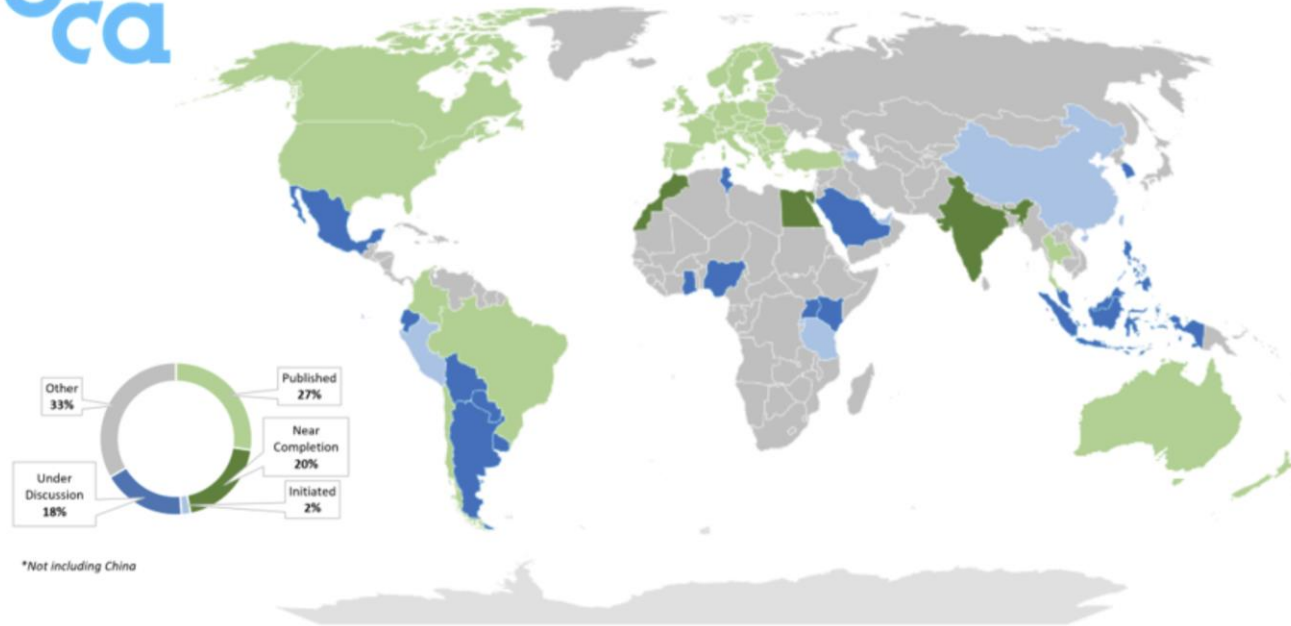
**Efficiency in design and construction**

- client brief to designers to enable optimisation
- design optimisation
- construction site efficiencies
- re-use and lifetime extension

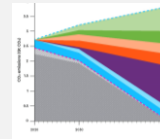
# NET ZERO DELIVERY: NET ZERO ACCELERATOR WITH GOOD PROGRESS



## Country Roadmaps - Net Zero Accelerator Initiative



### KEY DELIVERABLES



**Roadmap Levers and CO<sub>2</sub> impact**  
Per lever, quantification of potential CO<sub>2</sub> reduction 2030 & 2050



**Policy**  
Per lever, identification of enabling policies



**Lighthouse Projects**  
Per lever, identification of lighthouse projects

## INTERNATIONAL COLLABORATION – GCCA SITS AT THE TOP TABLES

### UN Sec Gen / UNIDO / UN CTCN/ UNFCCC / COP / INC

GCCA has official Observer Status at COP, MOU / partnership agreement with various UN bodies. GCCA is a key partner with UN to represent the industry.

### Breakthrough Agendas - Cement and Buildings

GCCA is engaged with two key breakthroughs – global initiatives to drive government support for industry transitions.

### Climate Club (International Energy Agency)

hosted by the IEA the Climate Club is a forum of 38 climate-ambitious countries with the goal of supporting the effective implementation of the Paris agreement. Focus on policy transformation.

### Industrial Transition Accelerator - ITA

GCCA is leading Cement & Concrete sector in global COP presidency/UNFCCC initiative aiming at developing action plan, projects and other decarbonisation actions.

### Clean Energy Ministerial – CCUS

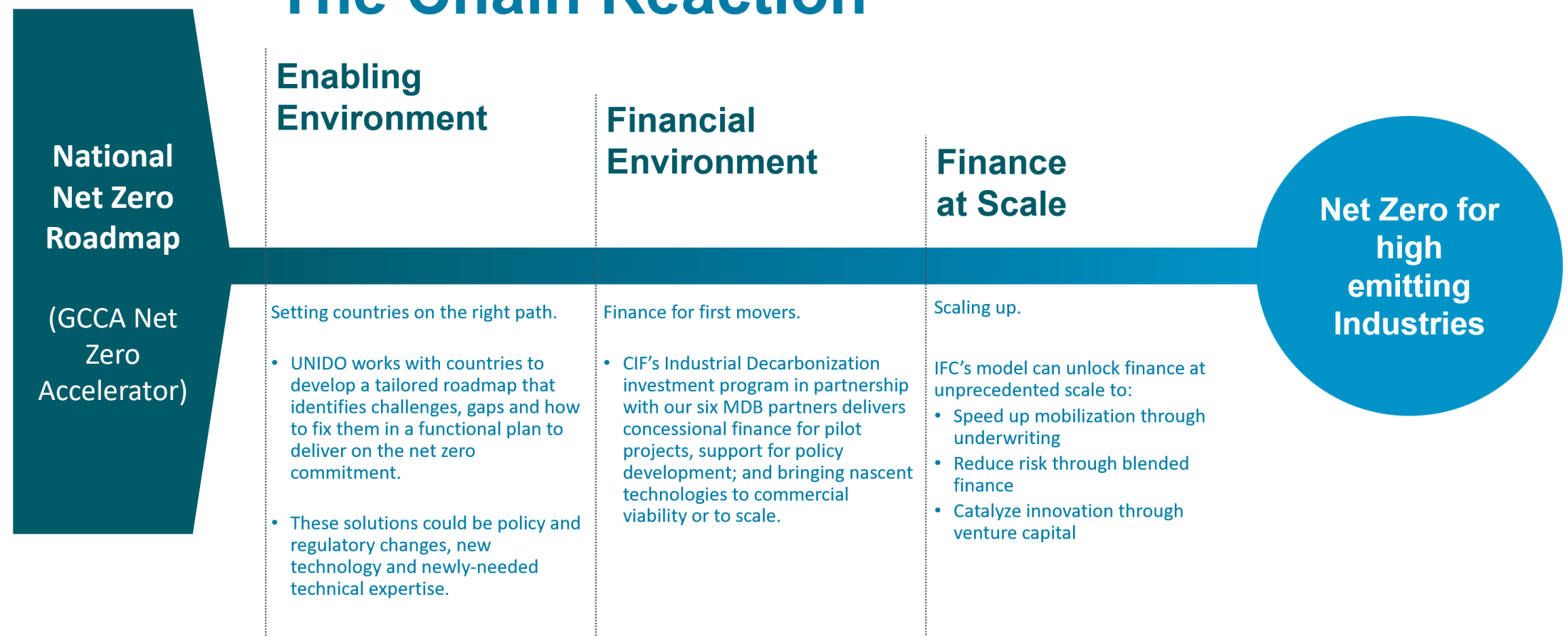
GCCA & CEM CCUS have signed a partnership to cooperate on joint initiatives and advocacy program to foster the development of Cement CCUS projects around the world.



# NET ZERO DELIVERY: EXAMPLE OF INTERNATIONAL COLLABORATION

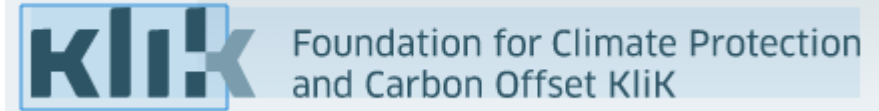
UNIDO chain reaction: a vision for finance mobilisation on climate transition

## The Chain Reaction

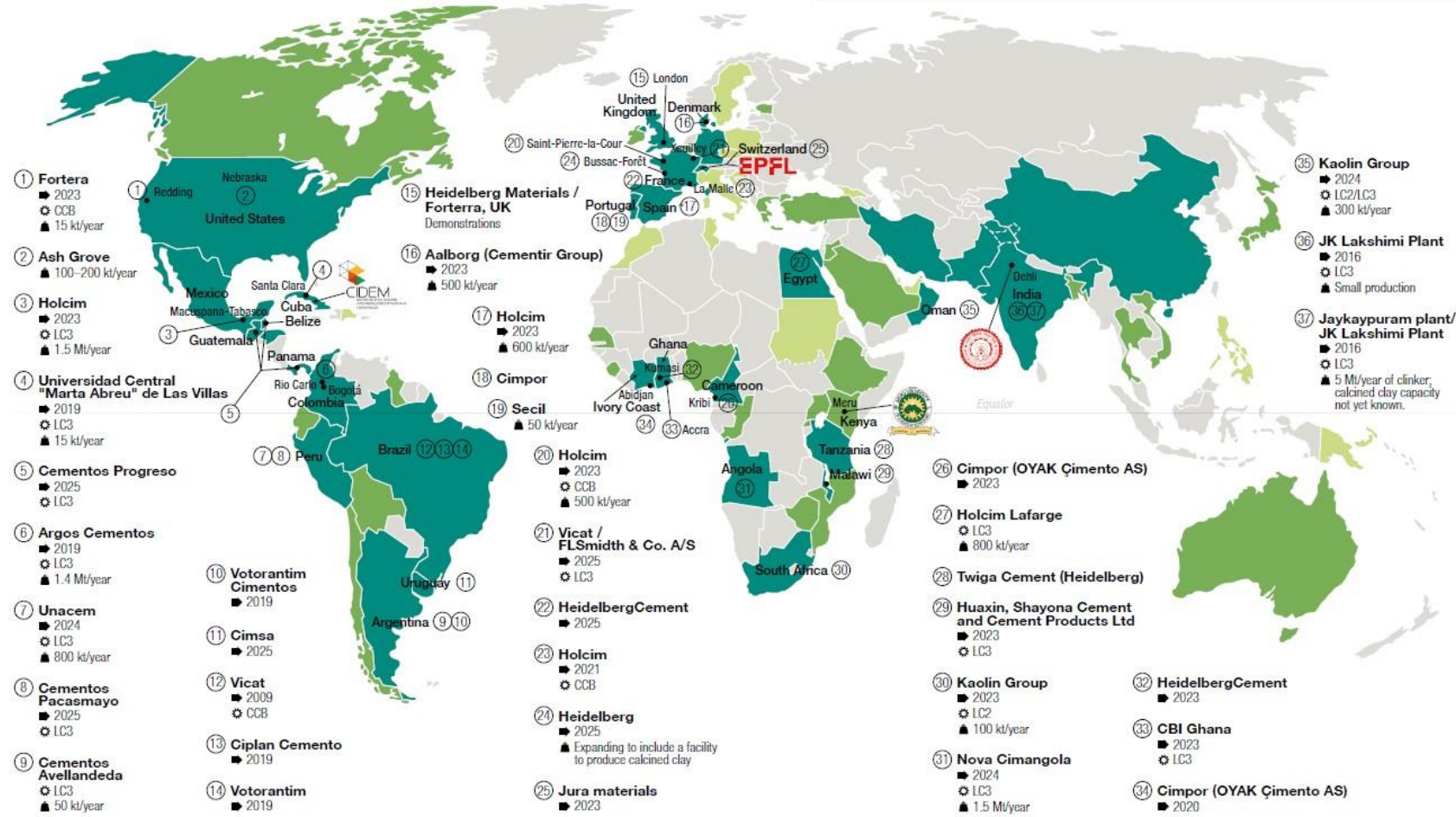


# Financing opportunities

- GCCA building strong relations with developments banks such as the ADB, World Bank and IFC.
- GCCA also keeping an eye on grant opportunities
- GCCA evaluating the role of international programs (KliK from Switzerland, Japanese program, ...)
- GCCA monitoring developments on Paris Agreement article 6 and links to carbon credits – focus on CCUS



# Mapping Calcined Clay Plants



LC3-activities across the world

- Permanent and trial production or feasibility studies conducted
- High interest in LC3
- First contact or academic exchange
- No activities

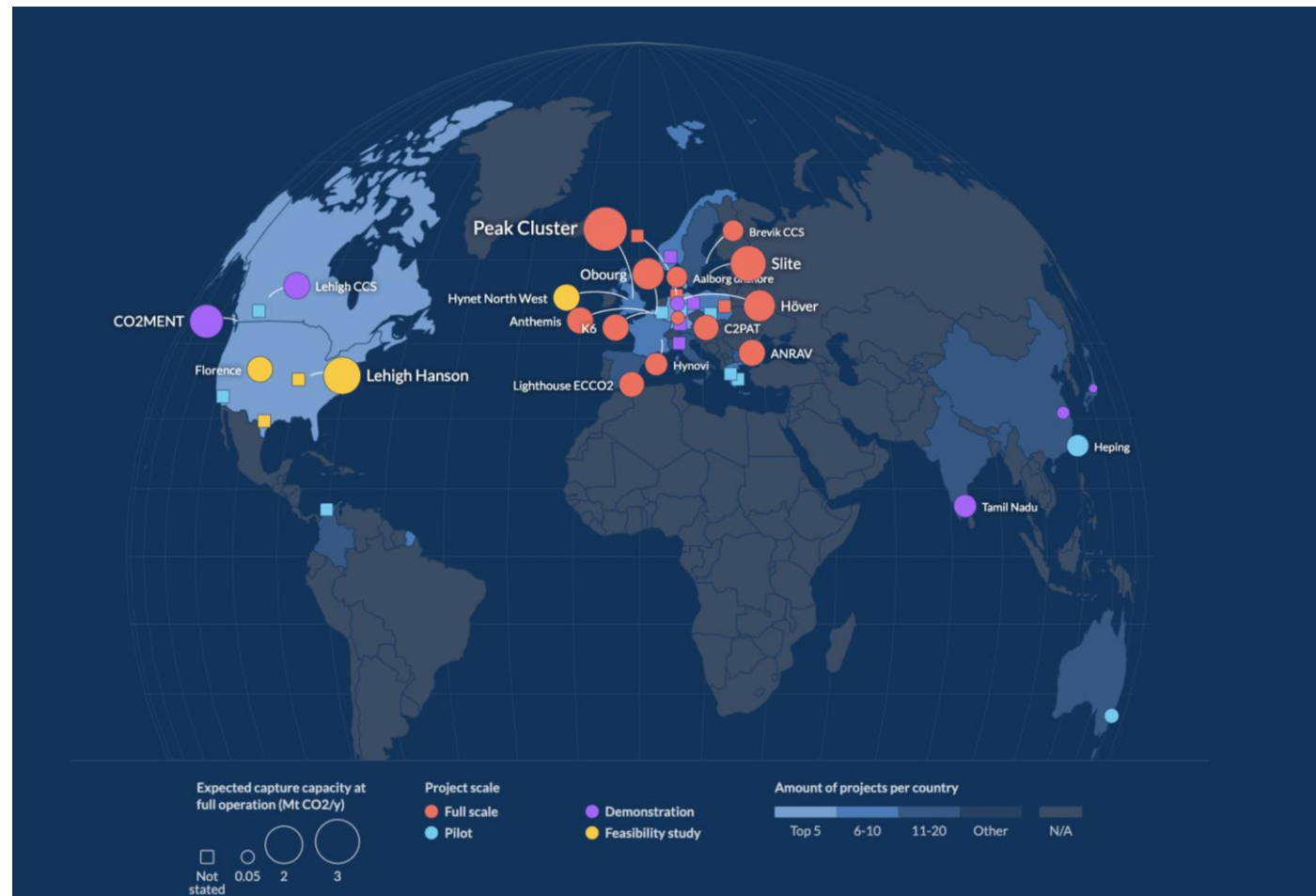
Production

- Start
- Amount
- Type



## Launch of Cement CCUS industry tracker with Lead IT

New industry tracker will increase transparency and visibility of industry efforts in developing carbon capture projects



<https://www.industrytransition.org/green-cement-technology-tracker/>

Europe, USA & Canada are investing significantly in carbon capture technology

- EU innovation fund: 8 Cement CCUS projects (+2 on Lime CCUS)
- In USA IRA is enabling a strong acceleration of project development (project call still in process)
- In other geography project execution will face financing challenges due to lack of legislation

## GCCA RUNS 3 WORLD CLASS INNOVATION PLATFORMS

### Driving Innovation:

Innovandi is the GCCA innovation arm, which runs 3 world class innovation platforms to accelerate and foster innovation to help the industry decarbonise and produce carbon neutral concrete by 2050.

### Collaboration with the academic world/ universities

75

PhDs working on essential Innovation matters

+10m

In million the equivalent cost of direct PhDs research members have access to.

65+15

Partner and Core innovation projects

INNOVANDI  
Global Cement & Concrete  
Research Network



450+

Scientists connected

### Collaboration with startups

70

Start-ups from around the world have applied to our 2023 Innovandi Open Challenge

INNOVANDI  
Open Challenge

INNOVANDI  
Entrepreneur Network

£6.8m

Paid Media equivalent for our Open Innovation Campaign

6

Selected Start-ups presenting at Demo Day

## CCUS: A KEY STRATEGIC AREA OF COOPERATION FOR THE GCCA MEMBERS

GCCA CCUS Collaboration Platform  
CCUS Task Force and collaboration with



INTERNATIONAL  
**CCS KNOWLEDGE**  
CENTRE  
GCCA Global Cement and Concrete Association



GCCA is involved into very important Work Program to help mature and deploy the CCUS technologies

### Advocacy

- GCCA CCUS policy paper
- CEM CCUS collaboration
- Other collaboration: GCCSI, OGCI, IEA GHG, UNIDO

### Innovation

- Innovandi
- Further collaboration on high TRL under the same model as the open challenge
- Financing new projects

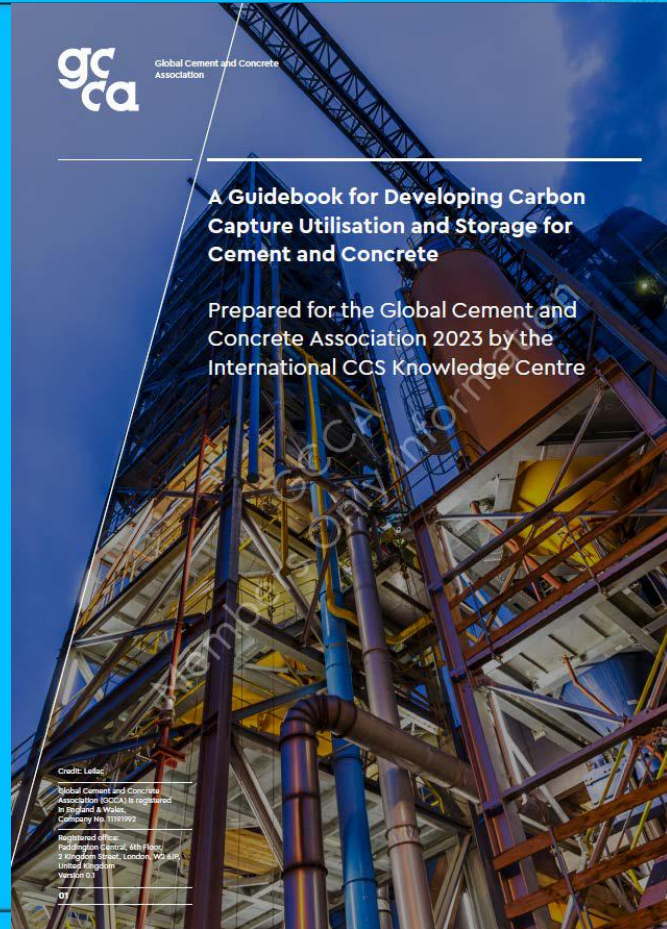
### Knowledge building

GCCA CCUS Guide/ Handbook :

- Good practices sharing
- Members capacity building
- Collaboration with CCS Knowledge Centre

### Support for national initiatives

- e.g., Nigeria, India, Brazil, Thailand...



## A Guidebook for Developing Carbon Capture Utilisation and Storage for Cement and Concrete

Prepared for the Global Cement and Concrete Association 2023 by the International CCS Knowledge Centre

Credit: Lefax  
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 Version 01  
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 Global Cement and Concrete Association

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# Cement Industry Net Zero Progress Report

We launched our Cement Industry Net Zero Progress Report on December 2nd, our key engagement at the start of COP28. This event formally launched our pavilion at COP, as well as the important report, which will be one of our key pieces of engagement material in the year ahead.

The report provides a comprehensive update on the decarbonisation progress our industry has made, two years on from the Concrete Future 2050 Net Zero Roadmap launch. It covers key areas such as advances in emissions reductions, innovation, nature and biodiversity, as well as interventions from key stakeholders including High Level Climate Champions, UNIDO, Government of Canada, LeadIT and Mission Innovation.

We welcomed over 80 attendees from across the world including from industry, government and the built environment.

You can download the report [here](#).

Thank you to members that contributed their case studies to showcase the breadth of progress across the sector.





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