BREAKTHROUGH TECHNOLOGIES TO MAINTAIN A SUSTAINABLE COMPETITIVE CEMENT INDUSTRY IN EUROPE

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Koen Coppenholle, CEMBUREAU Chief Executive

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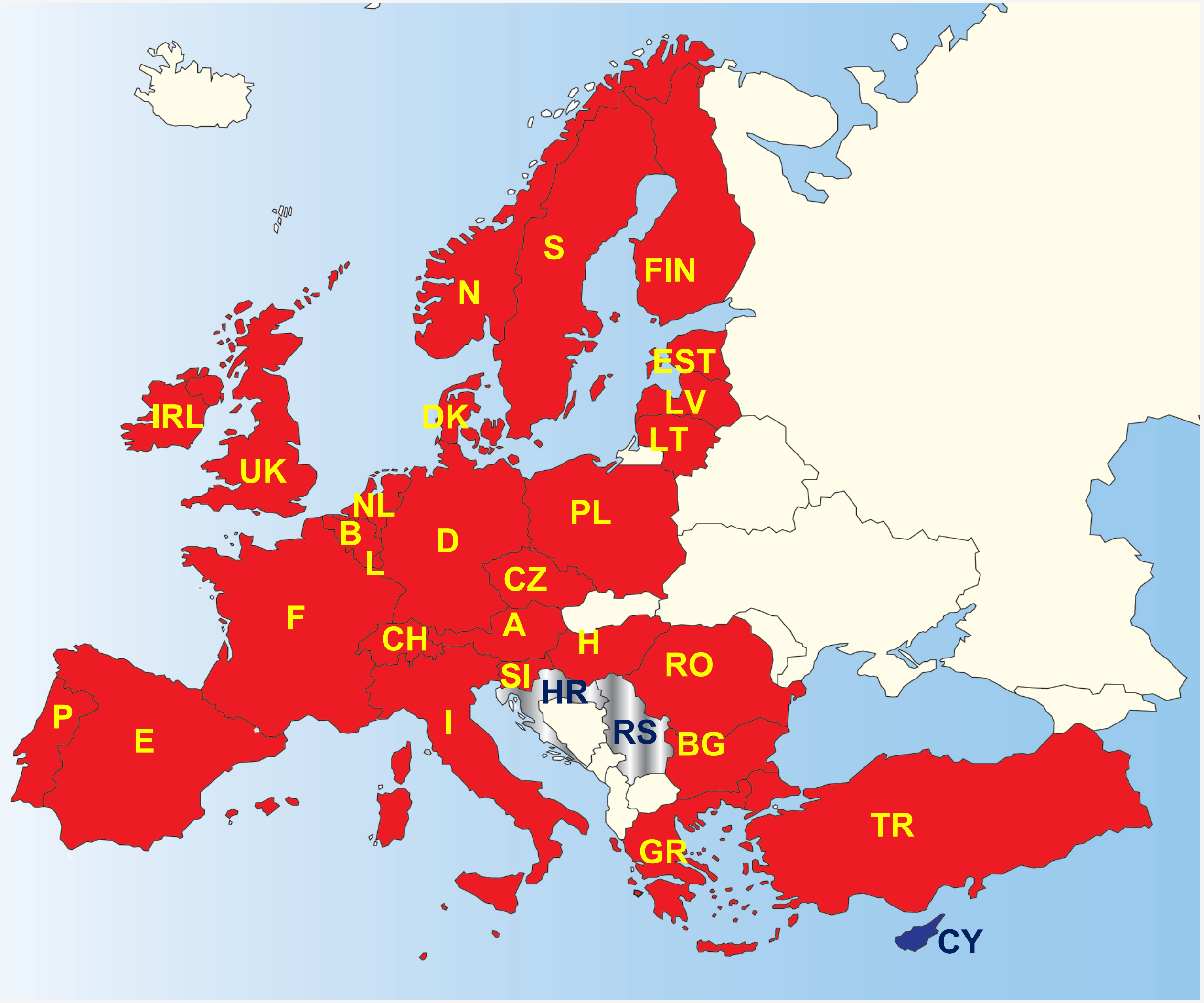
THE EUROPEAN CEMENT ASSOCIATION



Today: 29 Members
(27 full Members and 2 Associate Members)

Full Members = national cement industry associations and cement companies of the European Union (with the exception of Malta and Slovakia) plus Norway, Switzerland and Turkey

Croatia and Serbia are Associate Members of CEMBUREAU

Cooperation agreement with Vassiliko Cement (Cyprus)

The concrete and cement industry generates a multiplier effect of 2.8 for the economy of the EU28

Le BIPE

	Direct impact	Direct and Indirect impact	Direct, Indirect and Induced impact
Value added	20 bn€	45 bn€	56 bn€
Jobs	384 Thousand	848 Thousand	1.08 Million

x 2.8

Multiplier effect of the concrete and cement industry in the EU28. For each euro of value added generated in the concrete industry, 2.8 euros of value added are generated in the economy as a whole of the EU28 countries.

These figures correspond to 2012, maximum estimate, with input-output ratios calculated as an average over the 2008-2011 period (latest data available).

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THE CEMENT SECTOR

- Capital intensive / long investment cycles

- CO_2 intensive in manufacturing

limestone

Decarbonation
70% of emissions (process)

clinker

cement

+ fuel emissions to heat kiln

- CO_2 low and energy efficient in application

cement (10%-15%)

+

water (15%-20%)

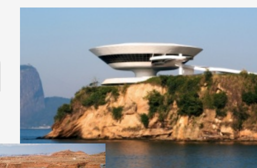
+

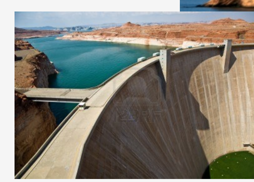
aggregates (65%-75%)

=

concrete

=





sustainable construction

BRIEF REMINDER

SUSTAINABILITY INCLUDES COMPETITVENESS

THREE PILLAR APPROACH
SUSTAINABLE

Economic
- ROI ?

Environment
- Which measurable benefit? CO_2? Energy? Air? Water?

Social
- New skills?
- Training?

WE BRING EXPERIENCE & INNOVATION

RESOURCE EFFICIENCY CIRCULAR ECONOMY

- Alternative fuel use (41% in EU)
- Clinker substitution
- Recycling of concrete (C&DW)

ENERGY EFFICIENCY

- Electrical energy efficiency
- Thermal energy efficiency
- Waste heat recovery

INNOVATION/ BREAKTHROUGH

- Carbon capture & use
- Novel cements

CONCRETE

- Low carbon concrete
- Recarbonation of concrete
- Thermal mass / energy storage capacity of concrete

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FIVE PARALLEL ROUTES TOWARDS 2050

1	2	3	4	5
Resource efficiency	**Energy efficiency**	**Carbon sequestration and reuse**	**Product efficiency**	**Downstream**
Alternative fuels	Electrical energy efficiency	Carbon sequestration and reuse	Low carbon concrete	Smart buildings & infrastructure development
Raw material substitution	Thermal energy efficiency	Biological carbon capture		Recycling concrete
Clinker substitution				Recarbonation
Novel cements				Sustainable construction
Transport efficiency				

- 32% by 2050

- 80 % by 2050

CCS/CCU IS ESSENTIAL TO ACHIEVE SUBSTANTIAL CO_2 REDUCTIONS

Leilac

- Carbon capture
  - Post-combustion: Norcem Brevik project (pilot testing); CEMCAP prototypes
  - Oxyfuel: ECRA, LafargeHolcim/Air Liquide/FLSmidth, CEMCAP prototypes
  - Move to industrial scale oxyfuel / EUR 90 MM funding required
  - Calix's Direct Separation technology to cement and lime plants: LEILAC
  - Calcium looping

HEIDELBERGCEMENT CEMEX CEMCAP ecra european cement research academy

- Carbon re-use → **algae cultivation, methane, CO_2 carbonation**

LafargeHolcim Solidia Technologies

R&D with support of EU funding

Life

- **develop non-hydraulic binder to produce cement (less limestone / lower kiln temperatures) / 30% less CO_2**
- **concrete production through mineral carbonation of non-hydraulic binder, capturing 300 kg CO_2/t cement**

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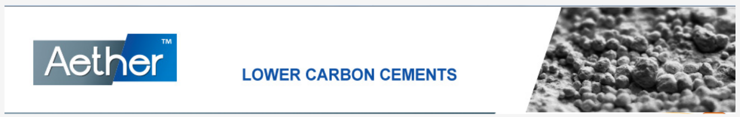
NEW BINDERS, CLINKER SUBSTITUTION, PRODUCT QUALITY

➢ Clinker substitution / Lower Carbon Cements

- Continued reduction efforts but constraints (availability of raw materials; product quality,…)



ECO BINDER

➢ New binders / Novel cements

- Low energy demand / CO_2 reduction (around 50%)
- Niche applications / early development
  - ➢ **CSA cements, Celitement, Carbonation hardening cement, Magnesium based cements,...**

➢ Product durability remains key (www.nanocem.org)

- Research on impact of different cement types or materials in concrete mix on product quality

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WE NEED A TWO PILLAR APPROACH

COMPETITIVE GROWTH

EU ETS incentivising CO_2 emission reduction

Best performing plant has invested in benchmark technology and frees up funds to further invest in innovation

Private funds →

← **Public funds**

Innovation boost

Transparent, coordinated risk financing approach by EU Commission, EIB, Member States

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ENDORSED STRATEGY

- EU - ETS MRR: **only what is physically emitted** should be accounted for
- EU- ETS innovation: advocate for CCU to be eligible for the innovation fund along with CCS
- Innovation fund criteria, ensure that funding is not only directed to CCU but also to CCS. CCU with “permanent” storage (mineralisation) should be favoured over CCU with “temporary” storage (renewables). Use LCA approach to demonstrate a kind of CCU / CCS hierarchy
- As a golden rule, emissions shall be accounted in the sector where they occur (except for LULUCF sector)

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