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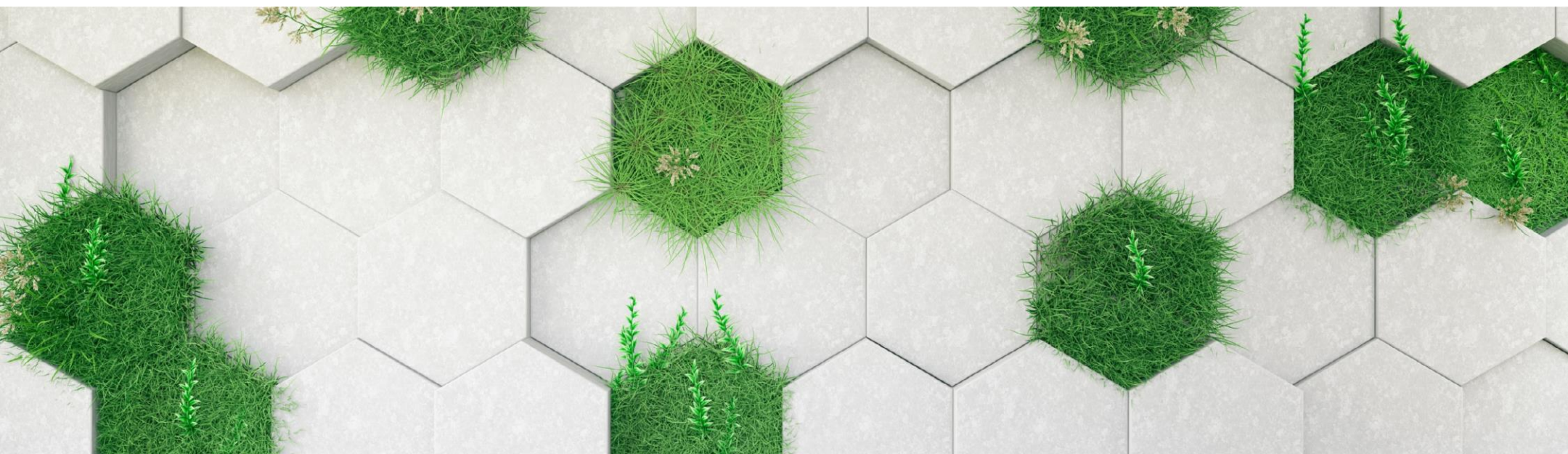
MEETING DOCUMENT

From:	General Secretariat of the Council
To:	Working Party on Competitiveness and Growth (Industry)
Subject:	Reaching carbon neutrality - Technologies for low carbon emissions in the cement industry - Powerpoint presentation (Compro WP 07.09.2020)

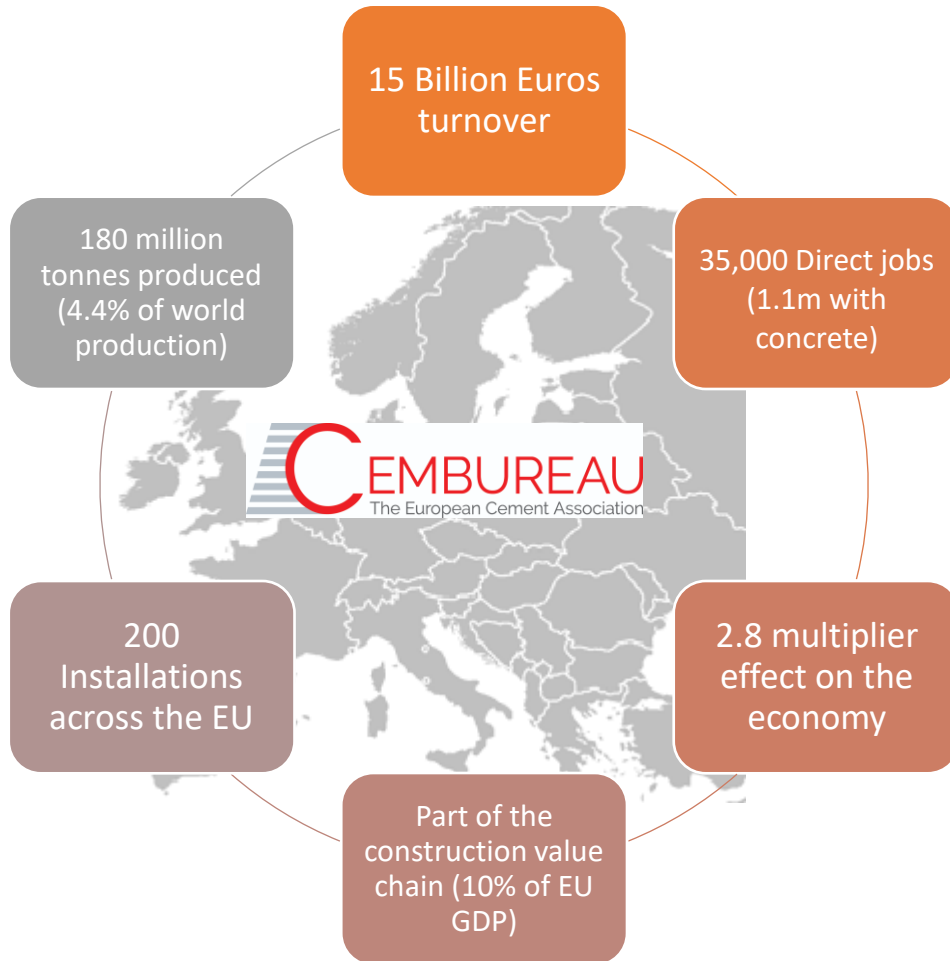
REACHING CARBON NEUTRALITY

TECHNOLOGIES FOR LOW-CARBON EMISSIONS IN THE CEMENT INDUSTRY

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The European cement industry



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- Cement “*indispensable to Europe’s economy, as they supply several key value chains*” (European Green Deal)
- Building and renovation will require significant amounts of cement and concrete (European Green Deal)



- Strategic value chain fitting into construction ecosystem
- Enable reduction of emissions in other sectors of the economy
- Essential to economic and social fabric of countries in Europe / local



- Clinker and cement production is CO₂ and energy intensive
- Innovation is at the core of what we do with Europe taking a leading role globally
- Ambition of carbon neutrality along the cement & concrete value chain by 2050 in line with the Green Deal
- This will require significant capital investments – we need to build viable business cases with measurable ROI



What we need from policy makers

- Long-term legal certainty/predictability in line with our investment cycles
- Comparable cost basis with third countries without similar CO2 constraints (a workable and fair CBA)
- Proper incentives for CO2 capture, whether subsequently stored or used
- CO2 pipeline and storage infrastructure
- Affordable electricity (increased OPEX in decarbonisation pathway)

“Low CO2 Industrial Alliance” steel, chemicals, cement under discussion as a platform to engage with Member States & Commission on technological pathways and regulatory needs

CEMBUREAU 2050 roadmap

CO₂ reduction along the cement value chain (5Cs: clinker, cement, concrete, construction, re-carbonation)





Main Policy Requests

Carbon Capture, Use and Storage (CCUS) will account for **42% of the CO₂ emissions reduction** in the sector. The EU should urgently look at developing a **pan-European CO₂ transportation and storage network**, provide continued **funding to demonstrators** and **support the business case** of the technology through State Aid.



The replacement of fossil fuels by non-recyclable and biomass waste, and the use of alternative raw materials, will deliver another **15% of the emissions reduction in the cement industry**. Policies should support this circular approach by **facilitating waste shipment** between EU countries, and **discouraging both landfill and exports** of waste outside of the EU.

Bringing low carbon-cements products to the market will deliver an additional **13% emissions reduction**. Upcoming policies should aim to reduce European building's CO₂ footprint, be based on a **life-cycle approach**, and **incentivise the market uptake** of low-carbon products.

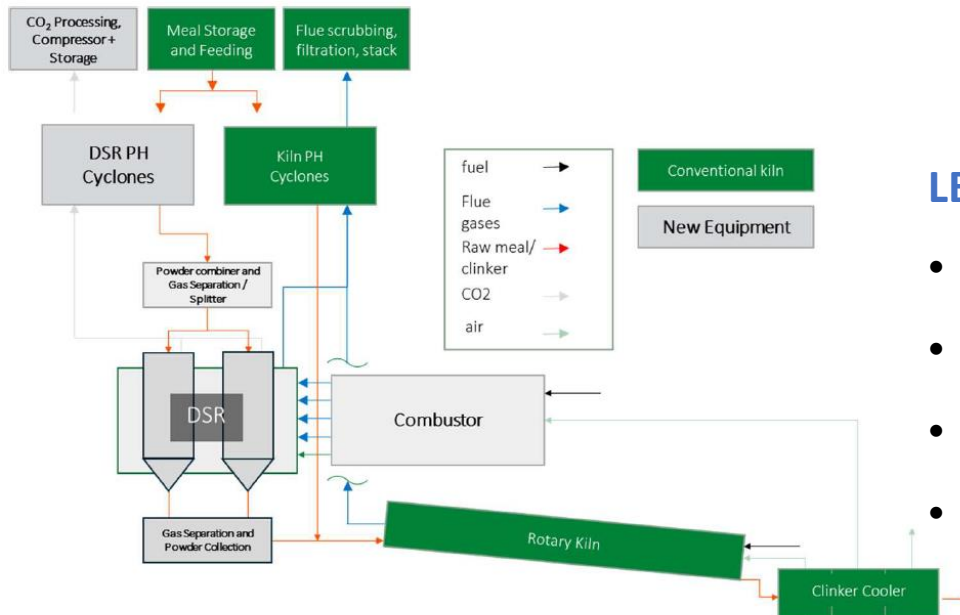


A level playing field on carbon, regulatory certainty as well as an ambitious industrial transformation agenda, will be **pivotal to deliver the investments needed** to achieve carbon neutrality.

A few selected projects: Integrated carbon capture - Indirect calcination LEILAC project

LEILAC 1 (H2020):

- Direct capture of process-related CO₂ (60% of total CO₂ emission from cement plant)
- 2016 - 2020
- Target: 95% capture rate of pure CO₂
- Pilot in HC Lixhe plant

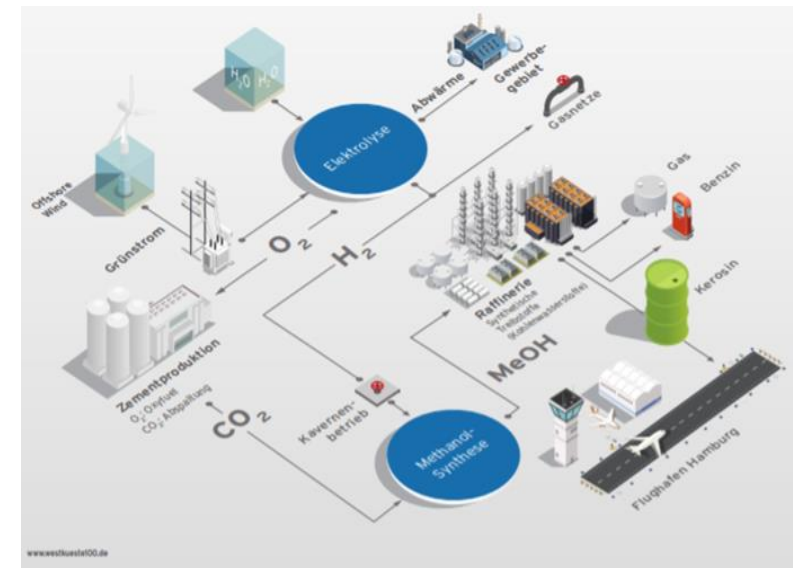


LEILAC 2 (H2020):

- 4/2020 – end of 2024
- Four-fold scale-up of LEILAC 1 pilot, 100 kt CO₂/year
- New pilot in HC plant, Germany
- Electrification to be tested in Lixhe pilot

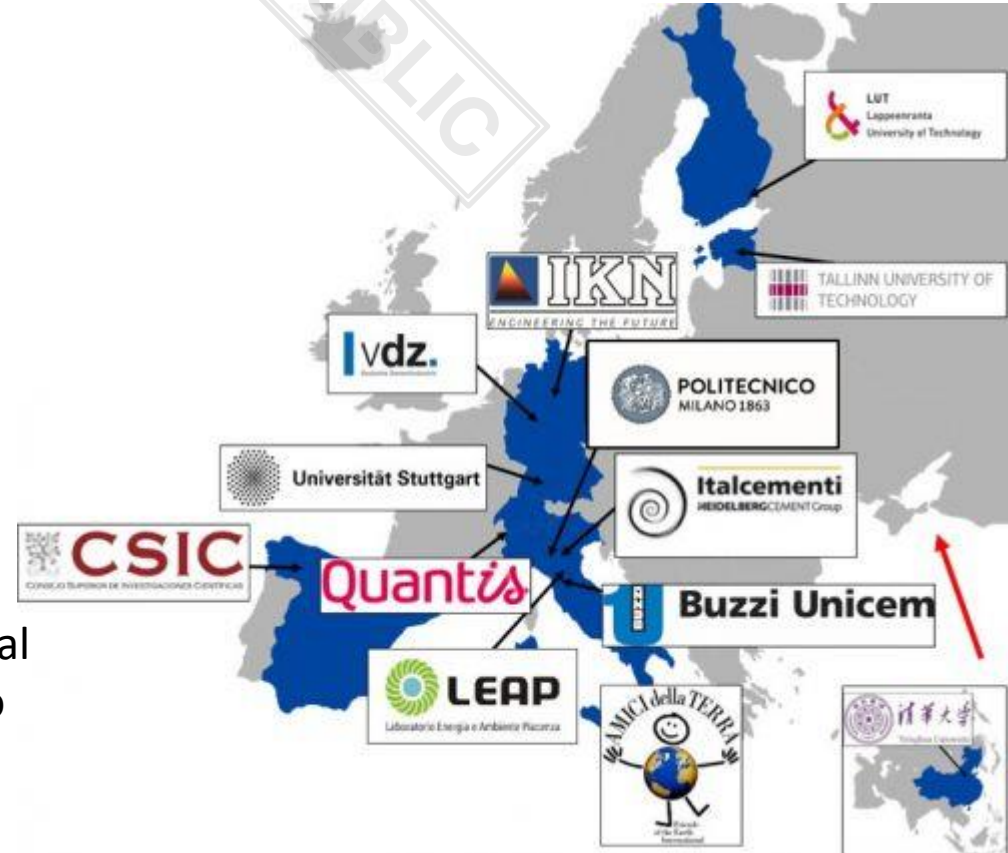
A few selected projects: CO₂ utilization from cement production - Westküste 100, Germany

- Complete sector coupling: Green hydrogen and decarbonisation on an industrial scale
- CO₂ capture from cement plant using oxyfuel technology at LH Lägerdorf plant
- Electrolysis to produce green H₂ from surplus offshore wind energy
- Methanol (kerosene,...) produced at a refinery with hydrogen and CO₂ from cement production



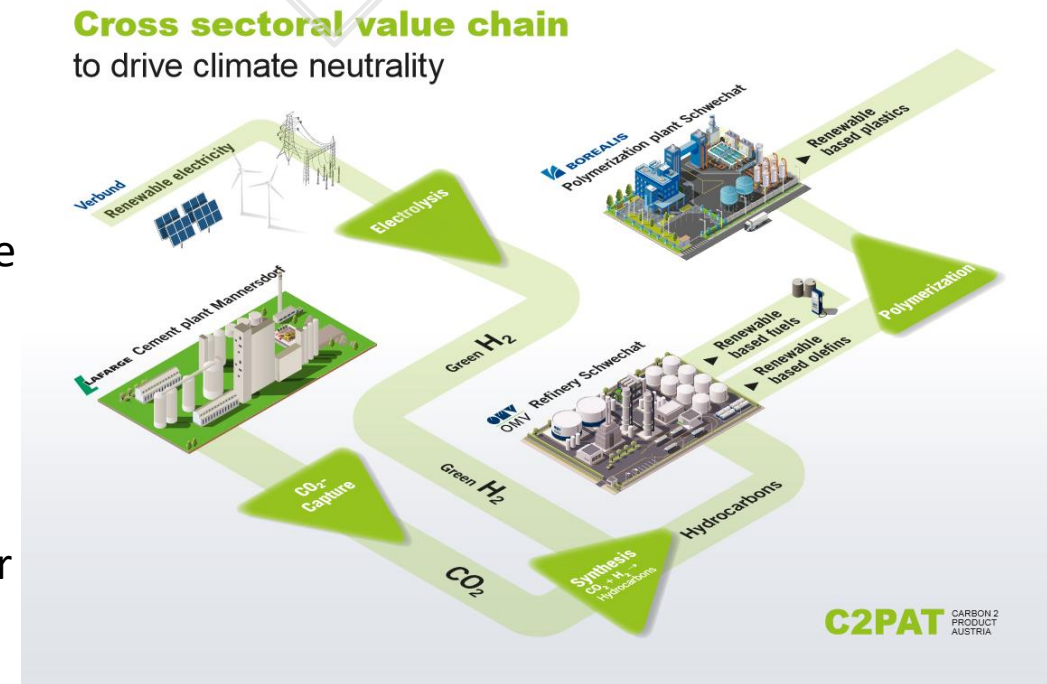
A few selected projects: CLEANKER Calcium looping capture technology

- Multi-country project involving academia, research centers, technology providers, SMEs, environmental organizations, industry
- Aim: demonstrating CO₂ capture through calcium looping technology
- Demonstrate the storage of the CO₂ captured from the CaL demo system, through mineralization of waste material in a pilot reactor of at least 100 litres to be built in Vernasca (BuzziUnicem)
- Set the basis for industrial exploitation in Europe and abroad



A few selected projects: Re-using CO₂ from cement into synthetic fuel – the C2PAT project

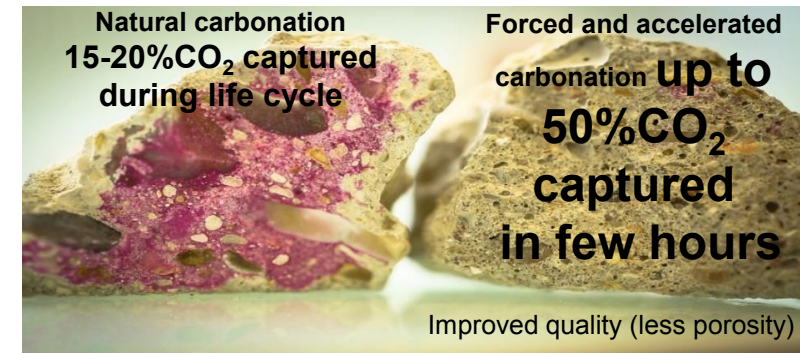
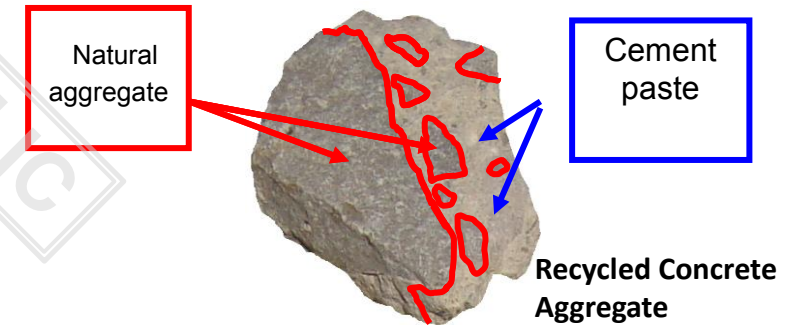
- In 6/2020, a MoU for a large-scale CCU project (C2PAT: Carbon2ProductAustria) has been signed
- Project partners: Lafarge Austria, OMV, Verbund and Borealis
- Phase 1: feasibility studies, phase 2: pilot trials (operational by 2023), phase 3: full-scale plant with the capture and utilisation of 700,000 t CO₂/a by 2030.
- CO₂ capture pilot at Lafarge Mannersdorf cement plant
- Production of synthetic fuels, plastics or other chemicals by the reaction of CO₂ and green hydrogen.



A few selected projects: Building on the mineralisation of concrete to store CO₂ – the Fastcarb project

- Fastcarb aims to accelerate a natural phenomenon, the carbonation of concrete:
 - Storing permanently significant quantities of CO₂
 - Promoting the use of Recycled Concrete Aggregates by improving their quality
- Industrial Pilots produced several tons of carbonated RCA
 - Using CO₂ directly from cement plants exhaust gas
 - ready to be used in new concretes

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Fastcarb carbonation pilot
In Cr chy Vicat plant
(France)



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