Financing Research and Innovation in the Cement Sector

LafargeHolcim CO_2 Reduction Projects 2020-2030

CEMBUREAU
24th June 2019

LafargeHolcim

We are on a trajectory towards a Low Carbon Building Materials Industry

LH is at the forefront of efforts to mitigate Climate Change

- In 2018, our net CO_2 emissions per tonne of cementitious material equal to a 25 percent reduction compared with 1990 emissions
- CO_2 reduction target of 520 kg CO_2/tonne of cementitious by 2030

CO_2 Reduction Projects:

- Project: 'Westküste100' - Carbon capture
- Project: Calcined Clay
- Project: Alternative Clinker

Sustainability pillars	CLIMATE AND ENERGY
Objective	Reduction of CO_2 emissions
Lead metric	CO_2 emitted (kg CO_2/t cementitious)
Performance 2018	576
2017 restated with 2018 scope	582
Target 2022 restated with 2018 scope	560
Target 2030 restated with 2018 scope	520

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Project: 'Westküste100'- Carbon Capture

Turning CO_2 into a Raw Material

Objective

- CO_2 capture from cement plant using Oxyfuel technology
- Production of fuels combining CO_2 and Hydrogen from surplus offshore wind energy

Key Opportunities

- Integrated project across sectors covering the entire value chain
- Consortium of partners established

Project Duration
5 years
2020-2025

Targeted Carbon Impact at Cement Plant*:
- 100%

Technology Readiness level: **6**

Resources Needed for Carbon Capture
150 Mio €**

* staged implementation
** based on CEMCAP study, to be confirmed by Feasibility Study

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Project: 'Westküste100'- Carbon Capture

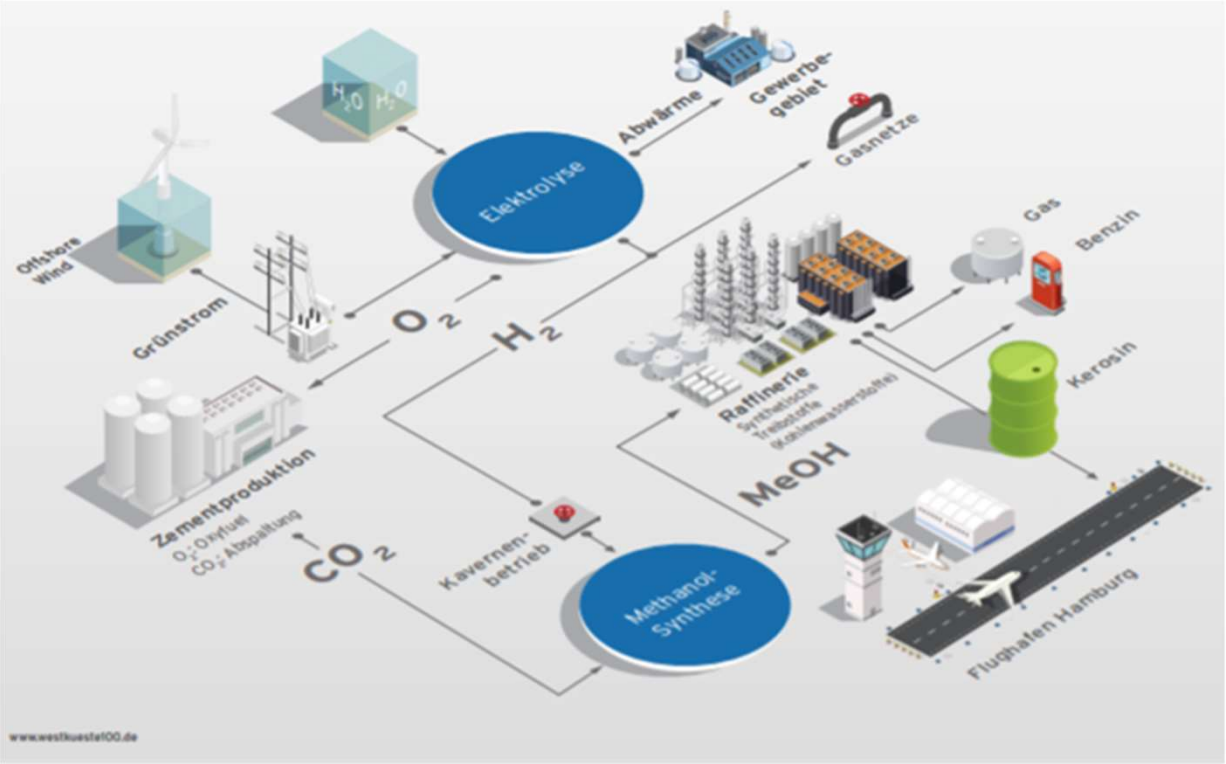
Green Hydrogen and Decarbonisation on an Industrial Scale

Electrolysis

- Green Hydrogen is produced from surplus **offshore wind energy**

Methanisation

- Methanol (kerosene,...) is produced at a **refinery** with hydrogen and CO_2 from **cement production**



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Project: 'Westküste100'- Carbon Capture

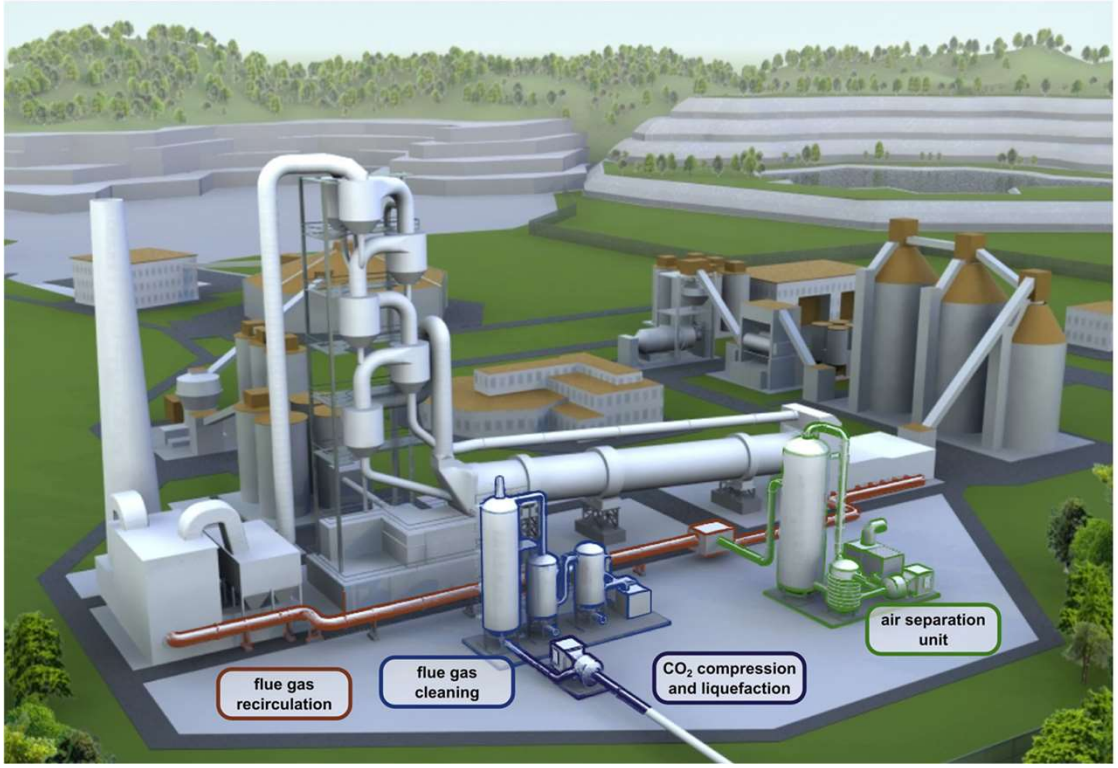
Carbon Capture at Cement Plant as part of the entire Value Chain

Oxyfuel Technology

- CO_2 is captured in the cement plant using oxygen from electrolysis
- Feasibility study in Lägerdorf plant ongoing

Post Combustion

- Alternative CO_2 capture technology e.g. by amine scrubbing (MEA)



Oxyfuel Technology, source:ECRA

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Project: Calcined Clay

Manufacture In-house Clinker Replacement Material

Objective

- Produce low carbon cements based on a high-performance blend of calcined clays and limestone to mitigate diminishing volumes of industrial by-products

Key Opportunities

- Existing technologies can be adapted
- New cement standards will allow use of this cement with even lower clinker contents
- Circular Economy: waste clay from quarries can be used as raw materials

Project Duration
2 - 5 years

Carbon Impact compared to OPC:
- 30%

Technology Readiness level: **7**

Resources Needed
20 Mio €

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Project: Alternative Clinker

Clinker with Lower Carbon Footprint & Additional Features/Benefits

Objective

- Produce clinker types such as calcium sulphoaluminates with significantly lower Carbon emissions
- Less process emissions from the decarbonisation of limestone and lower clinkering temperatures

Key Opportunities

- Usage of more sustainable raw materials
- Differentiated product portfolio (tile adhesives, repair mortars)

Project Duration
2 - 5 years

Carbon Impact compared to OPC clinker:
- 30%

Technology Readiness level: **6**

Resources Needed
20 Mio € for four plants

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