Workshop European Commission – CEMBUREAU
Financing Research & Innovation in the cement sector

Input HeidelbergCement

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Abating climate change can't be done by one actor only

Politics

Stable stimulating and supporting measures

Ensure level playing field

Industry

Technology and market development

Entrepreneurship

Society

Awareness need for action

Trust in measures politics and realism technologies

This meeting should be a good start

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Vision: Carbon neutral concrete by at least 2050

Levers

Reduce CO_2 content of clinker

- Improve energy efficiencies of plants
- Increase use of alternative fuels (biomass), raw materials and binder concepts

Lower CO_2 content of cement and concrete

- Use low-CO_2 clinker and secondary cementitious materials in cement production
- Optimize concrete recipes with limestone filler material

Capture process CO_2 and recycle through carbonation

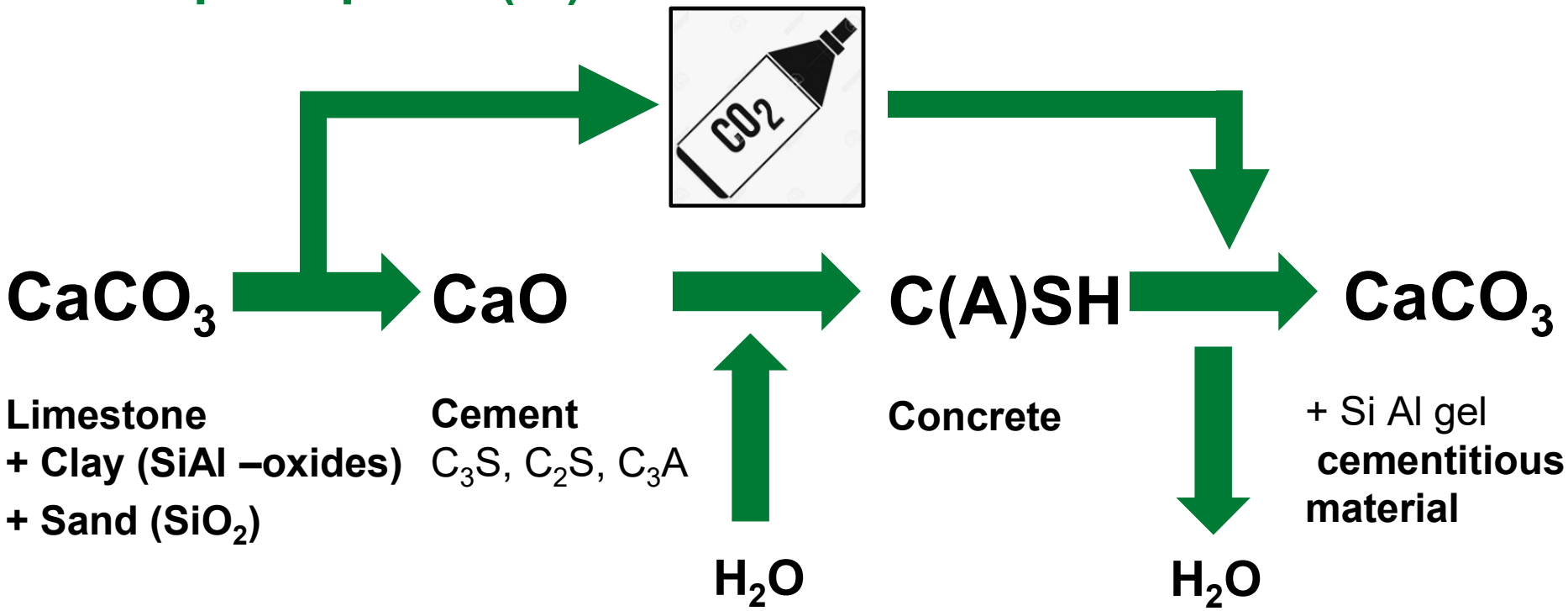
- Process integrated CO2-sequestration in clinker production
- Carbonation of recycled concrete fines and other mineral waste

HeidelbergCement best positioned to realize carbon neutral concrete vision

- Leading in R&D: Alternative binder concepts, Carbon Capture technologies, Carbonation
- Technical expertise and investment in modern plant upgrades (e.g. Masterplan Germany)
- Leading vertically integrated player with activities along the value chain

Concrete has the potential to become the most sustainable building material

The principle of (re) carbonization



From limestone to limestone

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One example: HeidelbergCement/Norcem part of the full scale CCS demonstration project in Norway

Intermediate storage for CO2 on shore: «Naturgassparken» in Øygarden

CO_2-STORAGE

- Planning by Equinor and partners
- Intermediate storage on shore
- Offshore storage in the North Sea
- Huge capacity

CO_2-TRANSPORT

- By ship
- Responsibility Equinor

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Key challenges

1. Business case for decarbonisation needed

- **<u>Public funding</u> of innovation projects is inevitable to kick off projects**
  - Examples: Norcem CCS project, Oxyfuel, Leilac, etc
  - R&D programs on new cements, low carbon cements, recarbonisation ,etc.
- **But……**
  Public funded demo scale projects will not decarbonize the whole cement industry of Europe

2. Integration of decarbonisation and circular economy

- **Cement and concrete industry will play a crucial role in the circular economy**

1. Concrete recycling	significant CAPEX and OPEX
2. Alternative fuels (including biomass)	availability / costs / permits
3. Alternative raw materials	availability / costs / permits
4. Clinker substitution with byproducts/wastes	availability / costs / norms

3. Supply of emissions free energy

- **For a typical cement kiln (3.000 tpd)**
  - Power to Gas 950 MW
  - Electrical kiln plus Carbon Capture and storage 300 MW
  - Oxyfuel including CO_2 transport and storage 50 MW

4. Infrastructure for CO_2 use and geological storage

- **Need for CO_2 hubs and pipeline grid**
  - To transport CO_2 from sources, e.g. cement plants
  - To supply CO_2 to chemical industry, concrete plants, etc.

Don't think about 400 Mtons CO2/a mention by CEFIC

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5. Changes in policies and regulations

1. **Long term focus**
   - Keep in mind that the EU ETS since its start in 2005 has seen every 6 months a significant change in rules, implementation, policies, etc.
   - What happens after 2030……. (investments in cement kilns are for 30 – 50 years)

2. **Competitiveness of EU industry**
   - *"There are no borders in the sky."*
   - Innovation in cement and concrete industry is started in Europe. Future improvements will be initiated in Europe or come much later.

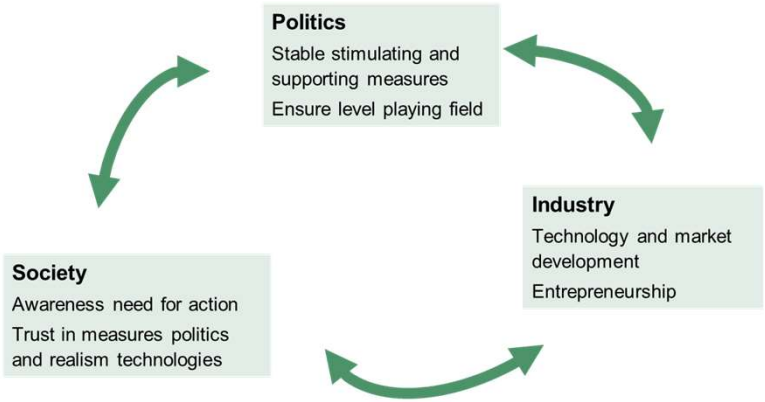
3. **Full life cycle coverage**
   - Non-ETS emissions will become the major source of Green House Gas emissions before 2050
   - Achieving a carbon neutral society in Europe is only possible when silo-thinking on industrial sectors and emissions is changed in life cycle thinking

Conclusions

1. **The cement industry has to decarbonize**
   - For achieving net carbon neutrality of the EU society the positive effects of concrete have to be taken into account: recarbonation, thermal mass in buildings, energy efficiency, etc

2. **For decarbonization of cement industry <u>three</u> conditions have to be fulfilled**
   1. Integration of decarbonization and circular economy
   2. CO_2 infrastructure
   3. Full life cycle coverage

3. **HeidelbergCement started already a long time ago and will continue**
   - <u>But</u> real decarbonization needs the involvement of all 3 players



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