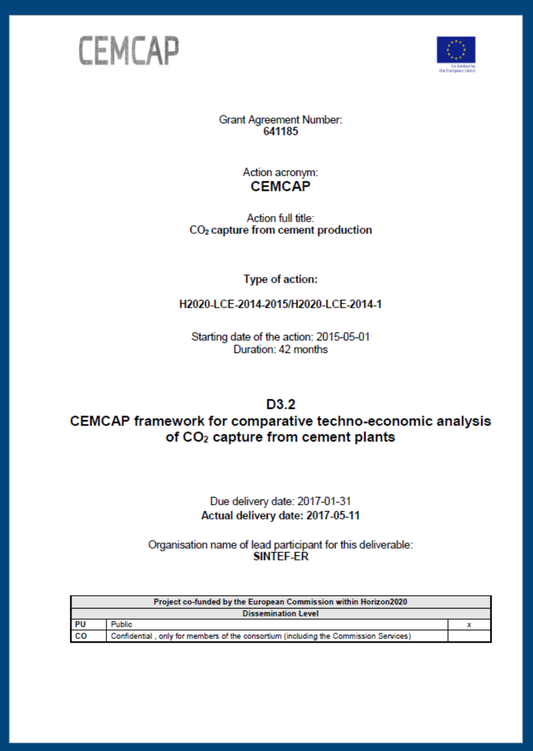
# CEMCAP framework and comparative capture process analysis

CEMCAP

*CEMCAP is a Horizon 2020 project with the objective to prepare the grounds for cost- and resource-effective CCS in European cement industry.*

*Key deliverable so far:*



CEMCAP

Grant Agreement Number:
641185

Action acronym:
CEMCAP

Action full title:
$CO_2$ capture from cement production

Type of action:

H2020-LCE-2014-2015/H2020-LCE-2014-1

Starting date of the action: 2015-05-01
Duration: 42 months

**D3.2**
**CEMCAP framework for comparative techno-economic analysis of $CO_2$ capture from cement plants**

Due delivery date: 2017-01-31
**Actual delivery date: 2017-05-11**

Organisation name of lead participant for this deliverable:
SINTEF-ER

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|---|---|---|
| Dissemination Level | | |
| PU | Public | x |
| CO | Confidential , only for members of the consortium (including the Commission Services) | |

Available at: https://www.sintef.no/projectweb/cemcap/results/


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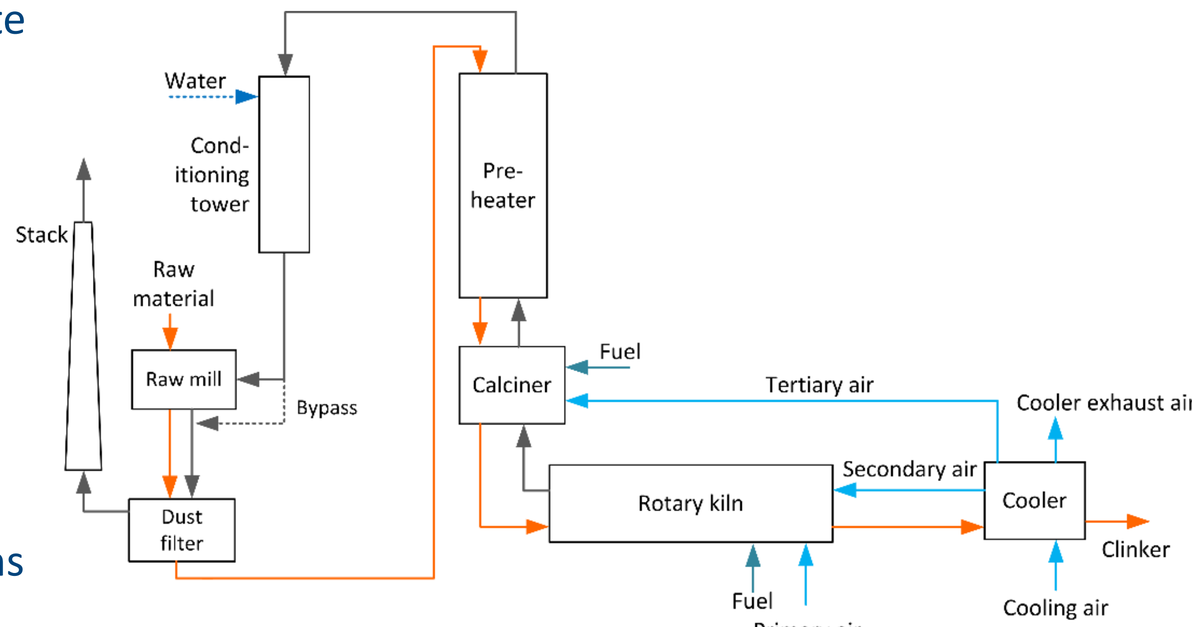
## Objectives

- Provide a consistent framework for the pilot testing, process simulations and comparative analysis
- Develop consistent process simulations for the three post combustion technologies investigated in CEMCAP
- Determine sizes and costs for all four CEMCAP technologies
- Perform a comparative techno-economic analysis of the CEMCAP technologies
- Perform a comparative evaluation of retrofitability

## CEMCAP framework (WP3)

The CEMCAP framework contains specifications about the following subjects:

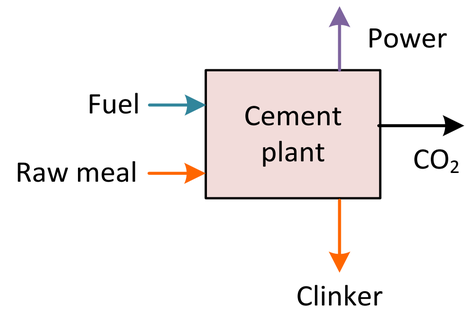
- Reference cement kiln
- Utilities – cost and climate impact
  - Steam
  - Electricity
  - Integrated power generation
  - Oxygen supply
  - Refrigeration
- Process unit specifications
- $CO_2$ specifications
- Economic parameters
- Key performance indicators



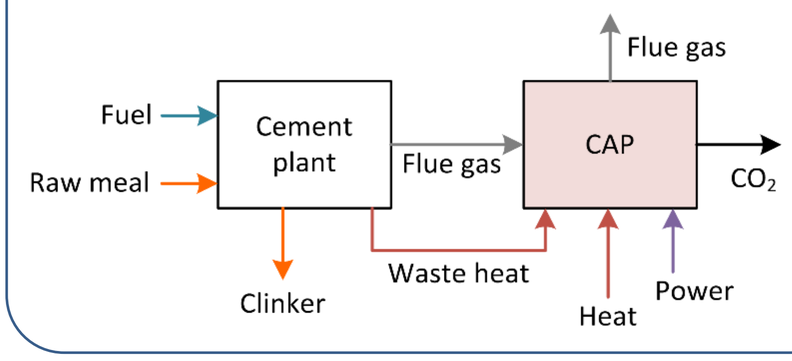

## Comparative capture process analysis (WP4)

Four capture technologies with the following characteristics are investigated:

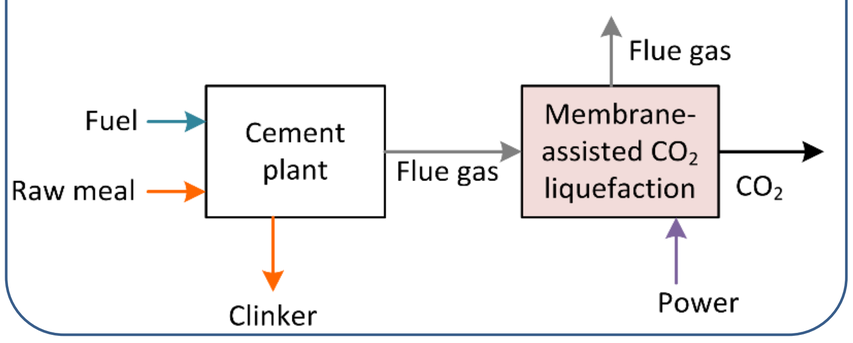
**Oxyfuel**
- Combustion in $O_2$ (not air) gives $CO_2$-rich flue gas
- Require: oxygen
- Generate: power from waste heat




**Chilled ammonia process (CAP)**
- $NH_3$/water mixture as liquid solvent
- Require: heat for solvent regeneration, electricity for refrigeration




**Membrane-assisted liquefaction (MAL)**
- Polymeric membrane for flue gas $CO_2$ enrichment followed by $CO_2$ liquefaction
- Require: electricity for refrigeration and compression




**Calcium looping (CaL)**
- CaO reacts with $CO_2$ to form $CaCO_3$
- Require: heat for sorbent regeneration, oxygen
- Generate: power from waste heat