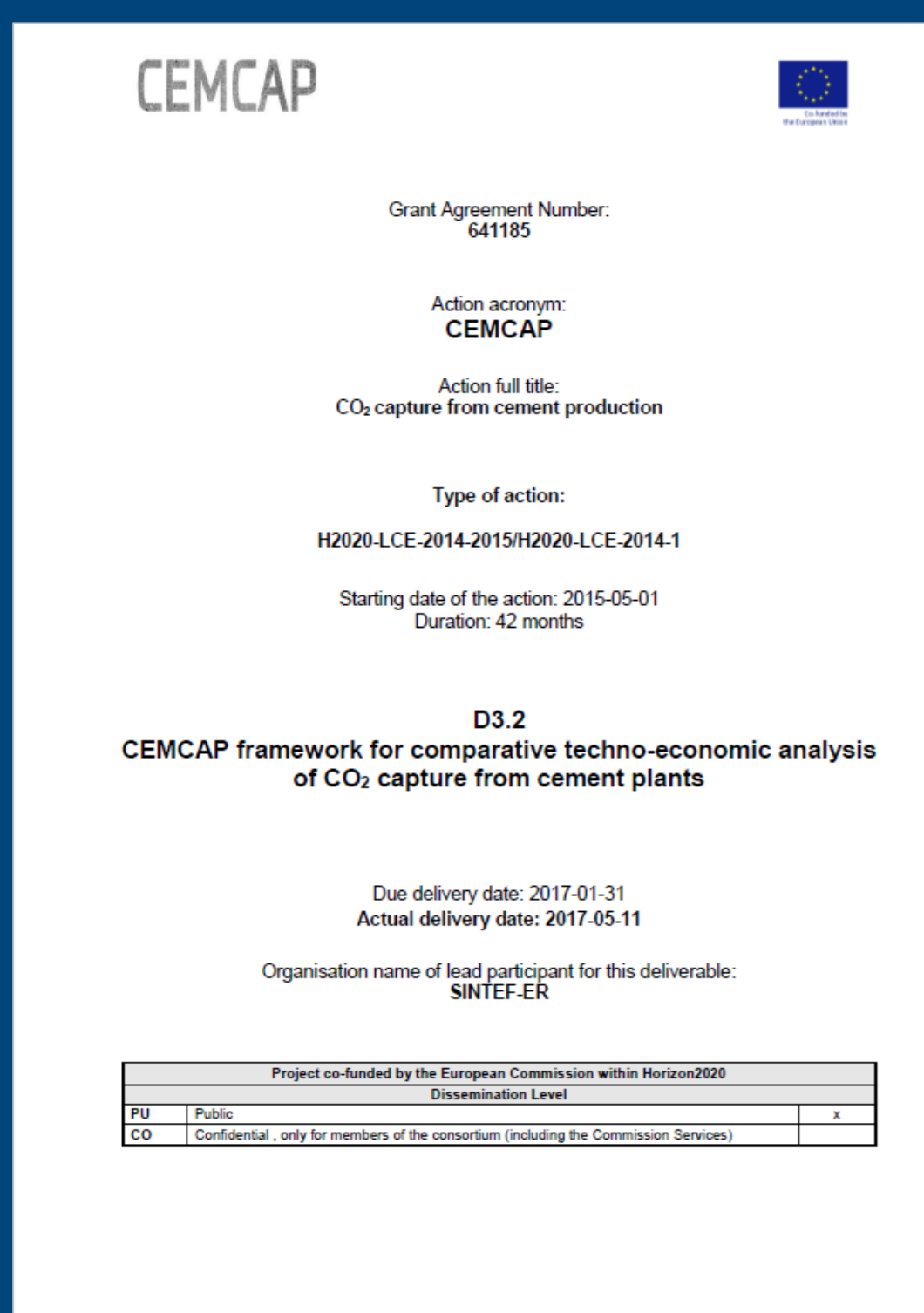


# CEMCAP

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:



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



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# CEMCAP framework and comparative capture process analysis

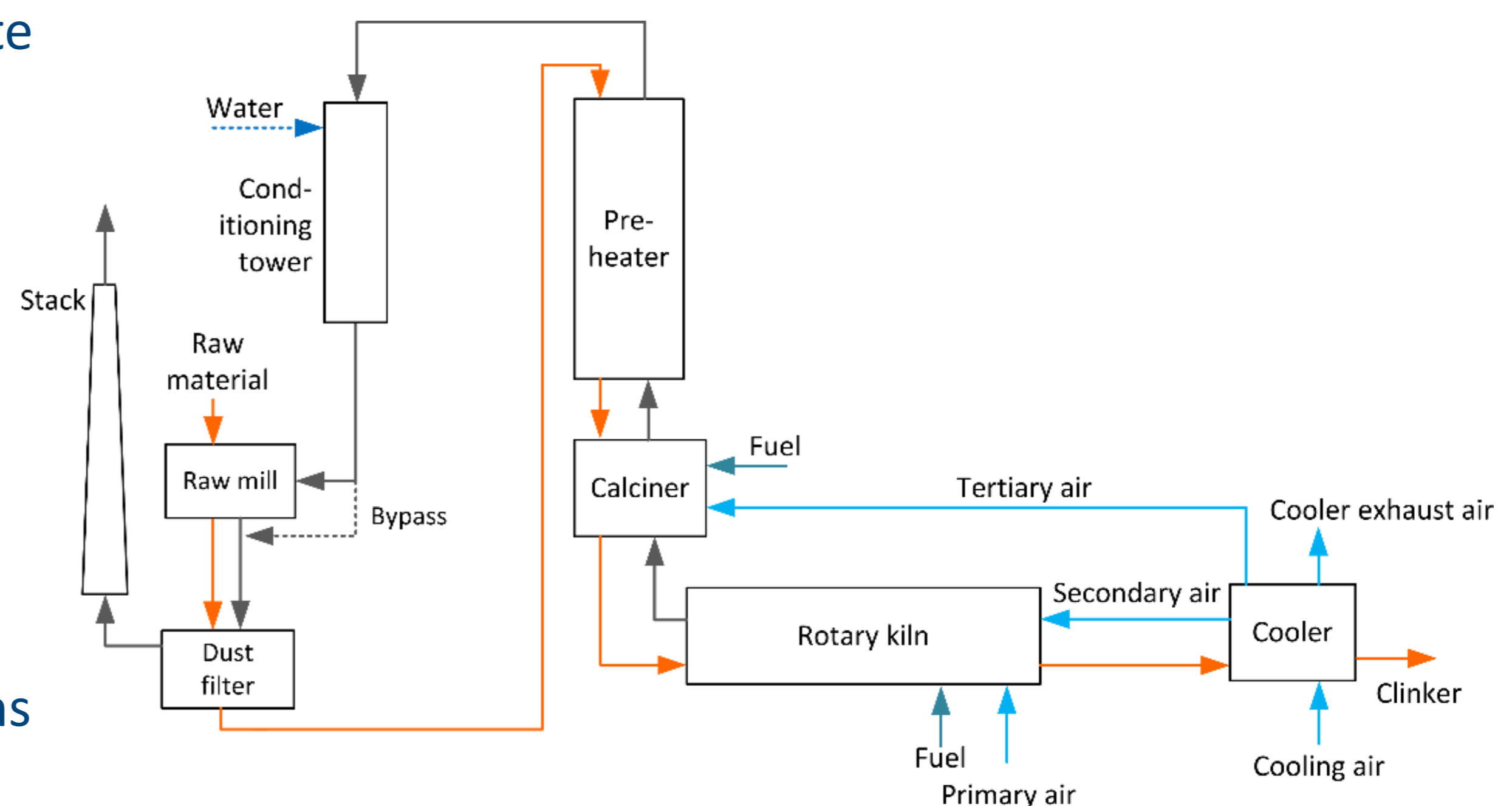
## Objectives

- 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<sub>2</sub> specifications
- Economic parameters
- Key performance indicators

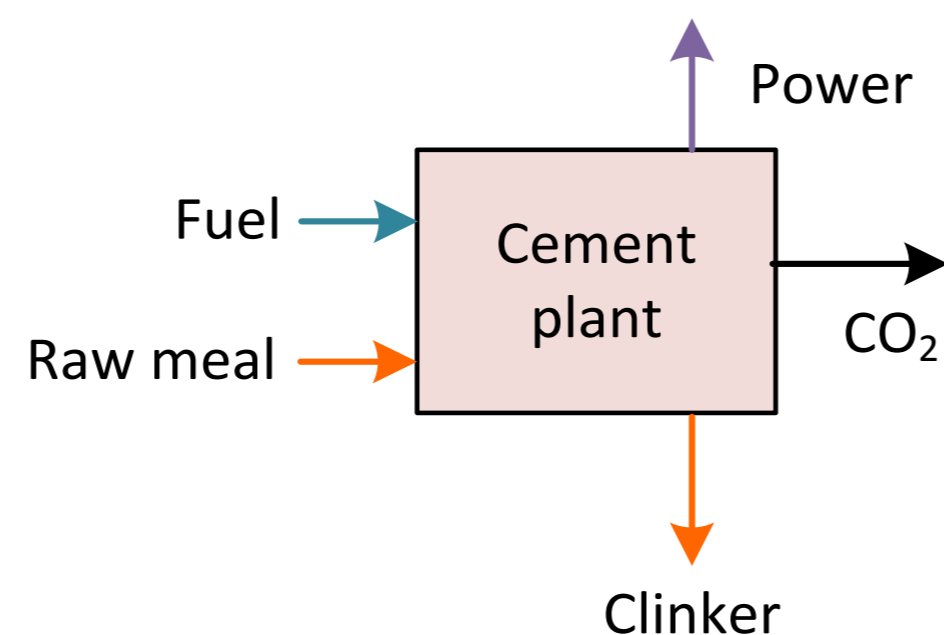


## Comparative capture process analysis (WP4)

Four capture technologies with the following characteristics are investigated:

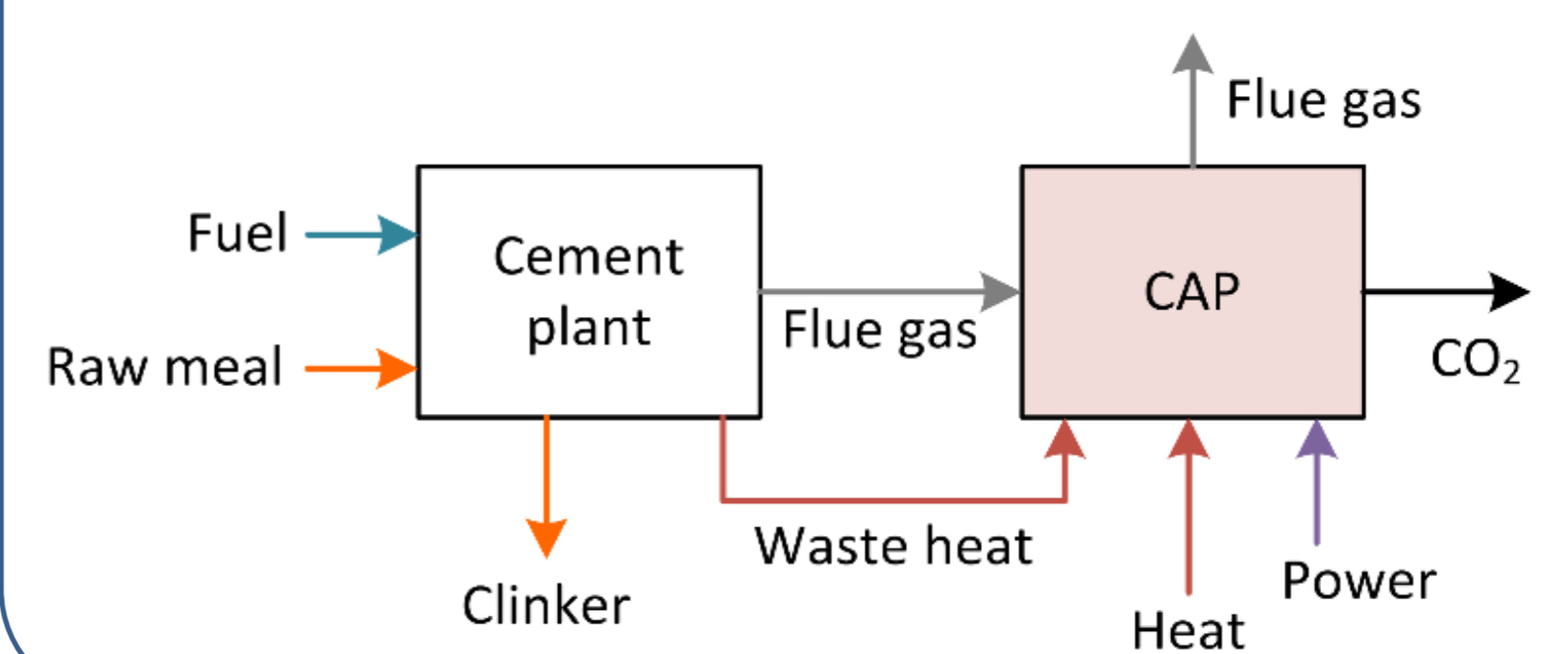
### Oxyfuel

- Combustion in O<sub>2</sub> (not air) gives CO<sub>2</sub>-rich flue gas
- Require: oxygen
- Generate: power from waste heat



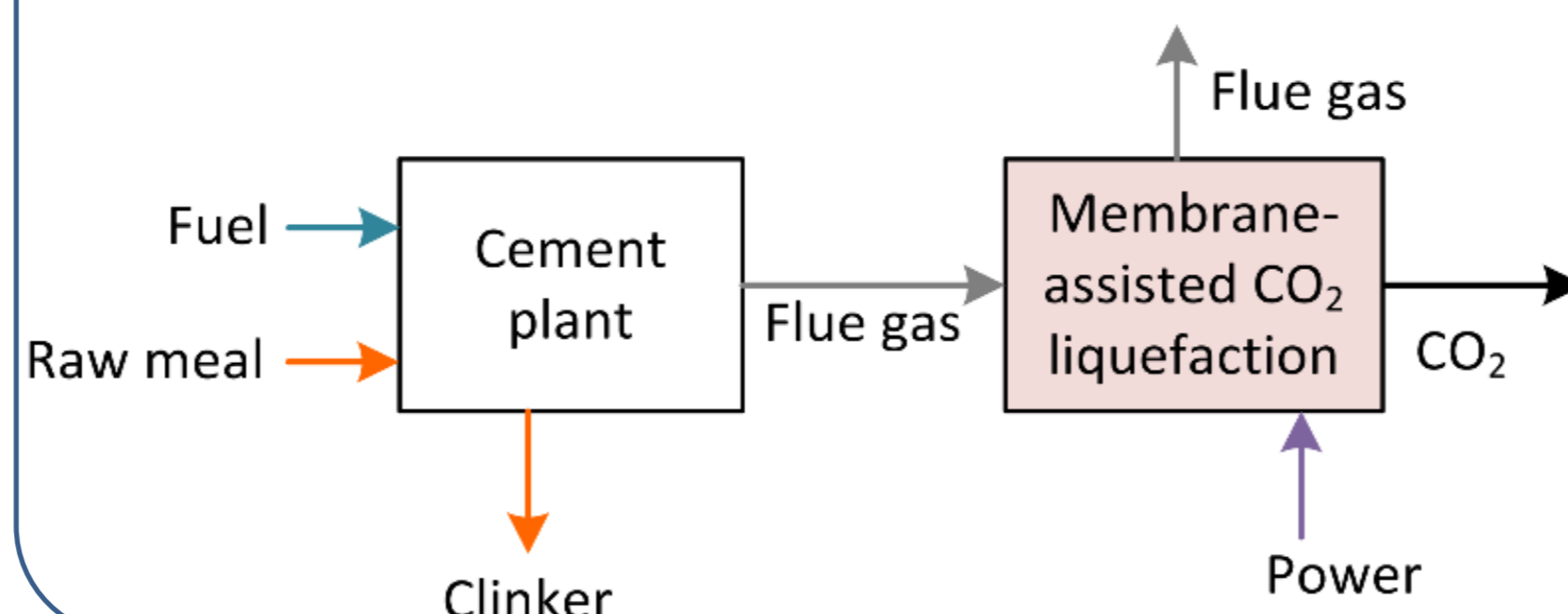
### Chilled ammonia process (CAP)

- NH<sub>3</sub>/water mixture as liquid solvent
- Require: heat for solvent regeneration, electricity for refrigeration



### Membrane-assisted liquefaction (MAL)

- Polymeric membrane for flue gas CO<sub>2</sub> enrichment followed by CO<sub>2</sub> liquefaction
- Require: electricity for refrigeration and compression



### Calcium looping (CaL)

- CaO reacts with CO<sub>2</sub> to form CaCO<sub>3</sub>
- Require: heat for sorbent regeneration, oxygen
- Generate: power from waste heat

