CLEANKER is a Horizon 2020 project with the ultimate objective of demonstrating the applicability of the calcium looping (CaL) process to the cement production.

**Calcium Looping CO₂ Capture**

- CO₂ capture by cyclic calcination and (re)carbonation of CaO containing sorbent
- High energy efficiency due to high temperature level, beneficial heat integration
- Synergies arise from common feedstock of clinker manufacturing and CaL

**Research objectives (Comparative raw meal characterization for CaL)**

- Determination of entrained flow calcination and carbonation kinetics and conversion rates for various cement raw meals to transfer demonstration results at Vernasca plant to other cement plants
- Development of a guideline on raw meal characterization in respect to suitability for CaL applications

**Research Statements**

- Simulations of EF carbonator show that high CO₂ capture is achievable with proper solid/gas ratio
- Sorbent CO₂ carrying capacity depended on Belite side reaction
- Sorbent CO₂ uptake increases in moist conditions and with increasing $X_{\text{avg}}$ and CO₂ partial pressures
- EF CaL concept proofed in lab scale conditions (CEMCAP)

**Ongoing Research Activities**

- Assessment of different raw meal qualities regarding CaL suitability by lab and mini-pilot scale experiments
- Determination of relevant kinetic data for demonstrator design and proceeding simulation activities

**Integrated EF CaL – cement plant integration**

- Use of EF reactors beneficial
- No additional milling step/sorbent cooling required
- Reduced energy consumption ~ 2.3 MJ$_{\text{LHV}}$/kg$_{\text{CO₂}}$

This project is funded by the European Union's Horizon 2020 Framework Programme for research and innovation under Grant Agreement n° 764816 and n° 641185