WORKSHOP EU Projects

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Acronym: LEILAC (Low Emissions Intensity Lime and Cement), is a European Union Horizon H2020 research and innovation project. Ends in Dec 2020.

Site: https://www.project-leilac.eu/

Technology Readiness Level (TRL): 7

Project ends: 31 December 2020.

Investment: 21 M€ (12 M€ EU funds).

Reference: Prototype was Installed in Belgium Lixhie plant owned by HeidelbergCement.

Target:

- Pilot plant is a large scale 240 t/d.
- It will target the 60% of the total CO_2 able to be recovery for a cement plant
- Part of the evaluation is to identify opportunities to be applied as DS technology.

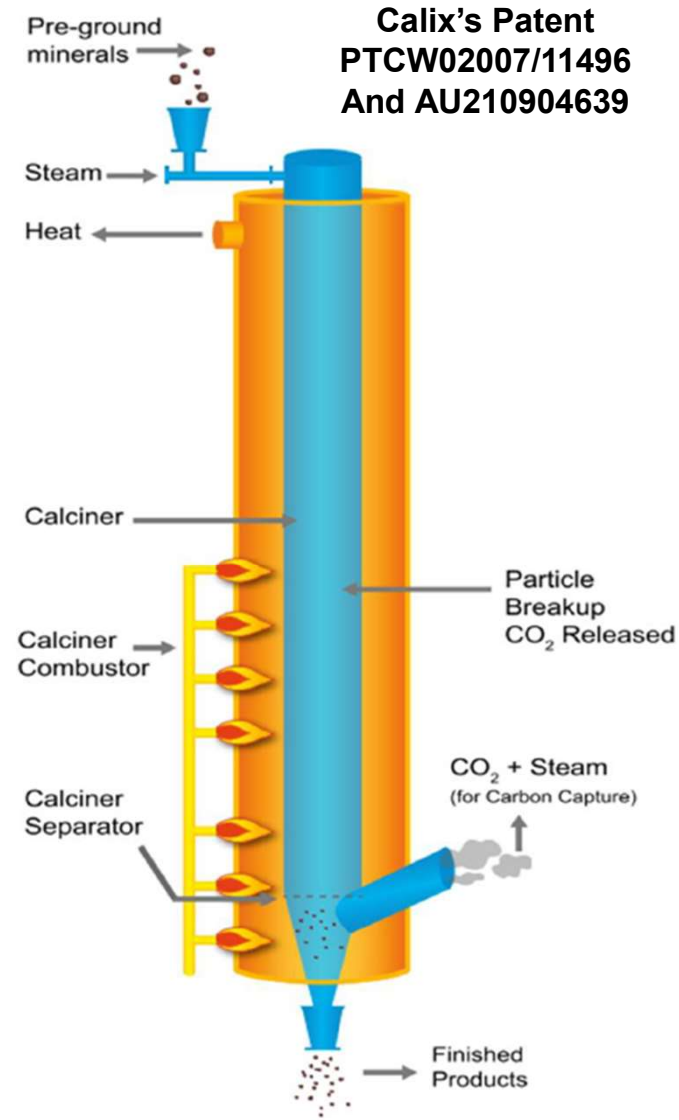
Trials:

- Commissioning activities in progress to be finished.
- Handover to operation it is being started.
- Starting trials are being with lime as first part of the process, later on will be raw meal.

Consortium partners:

Core Technology: based in Direct Separation. DS Technology

Calix's Patent PTCW02007/11496 And AU210904639



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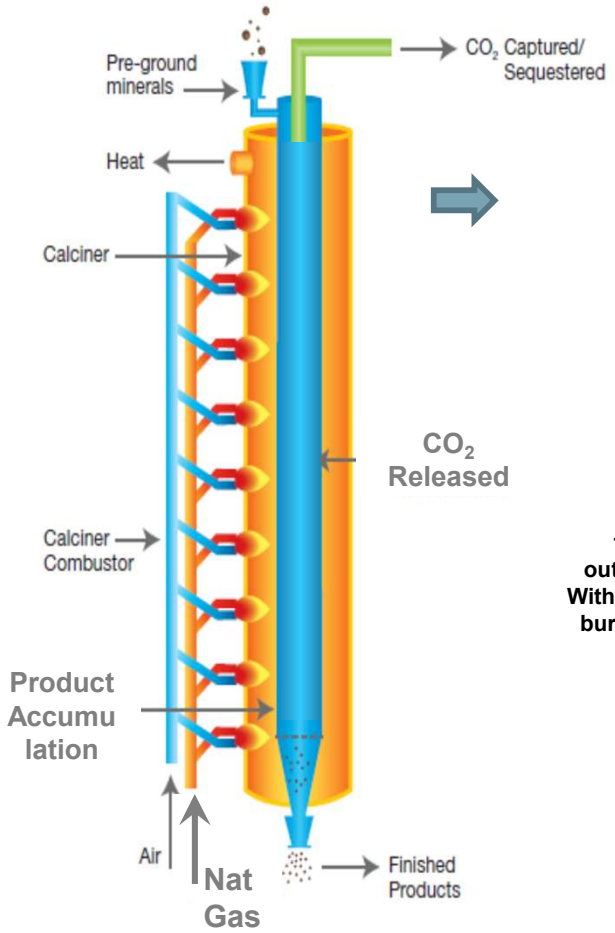
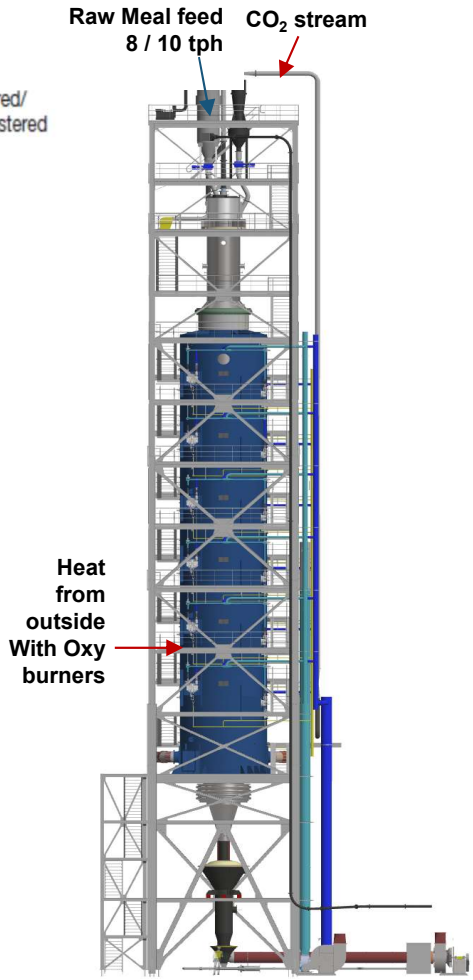
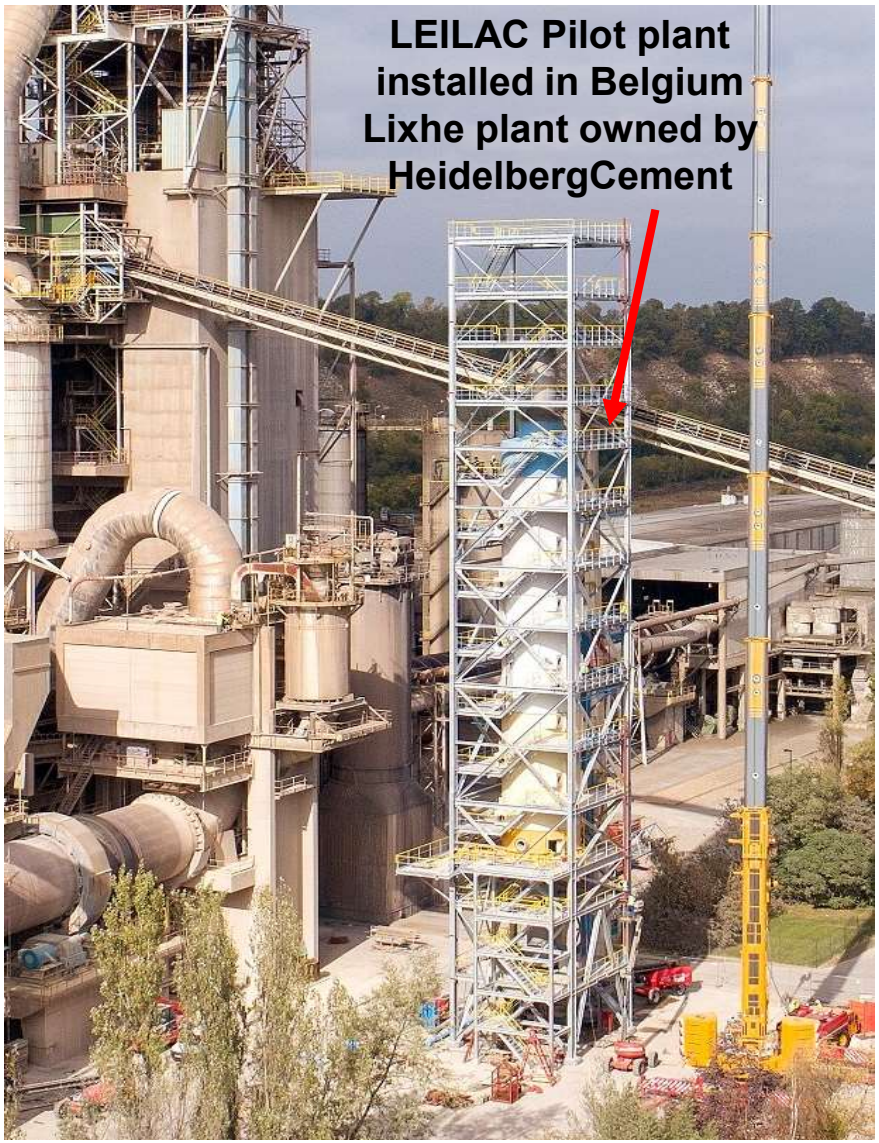
Leilac



Calix Patent PTCW02007/11496 And AU210904639



Counterflow concept Developed to be implement in Cement industry through EU project



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Leilac → Leilac 2

Next step:

LEILAC-2 Scope:

- From 10tph, 8mx8m footprint (LEILAC-1) to 40tph, 10m x 10m footprint (LEILAC-2)
- Capture 20% of 1mtpa process emissions
- Expected funding to cover are around 23 M€ considering as follows:
  - 15 M€ coming from EU funds
  - 8 M€ coming from Industrial partners funds.
- 10 M€ coming from In-kind contribution from all the consortium partners.
- In the reference of cost estimated it is only included the separation of CO_2. It is not included the part of the CCUS or CCS.

LEILAC-2 Key Success Factors:

- Possibility to join for other industries that are able to handle and implement the utilization of CO_2 (CCUS) or handle the Storage process (CCS).
- Furnace / Burner evaluation and development to be implemented also alternative fuels use.
- Preferred option is to target August 2019 H2020 bid, for operational deployment by 2023.
- Option to start with the project in the following year, 2020 and it could be ended with operations at 2024.
- Needs a site and CCUS options.

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Acronym: SOLPART High temperatures Solar-Heated Reactors for Industrials Production of Reactive Particles.

Site: https://www.solpart-project.eu/
Grant agreement reference: 654663

Technology Readiness Level (TRL): 5/6

Project ends: 31 December 2019.

Investment: 4.6 M€ EU funds.

Reference: CNRS-PROMES in France and DLR Germany, Abengoa in Spain.

Target:

- Develop at pilot scale a high temperature (800 – 1000 C) 24 h/d industrial process.
- Produce the calcination with a solar reactor:
  - Solar Fluidized Bed Reactor (PROMES technology)
  - Solar Rotary reactor (DLR technology).

Trials comments:

- It has been tested raw meal to be calcined in both reactors.
- Best performance operation of the raw meal calcinated for the Solar Rotary Reactor was with a flow of 7 kg/h and reaching levels of calcination > 90%.

Consortium partners

Life Cycle Assessment of the Process as study consist:

- Cement plant able to operate at 3500 mtpd of clinker produced.
- Considering a Solar reactor to give an operation for 8 hours/day with an energy storage to complete the 24 hours.
- Hot storage as reference was once before and after the Solar reactor.
- Estimated Heliostats is 4337 required (land of 121 Ha).
- Solar tower height of 160 m.
- Solar field efficiency expected in 60% is considered for the study proposes.

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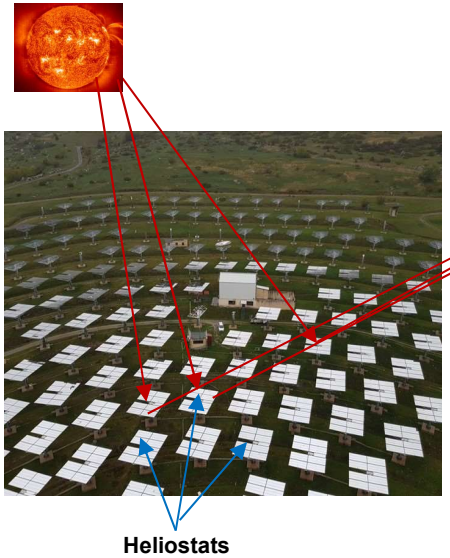
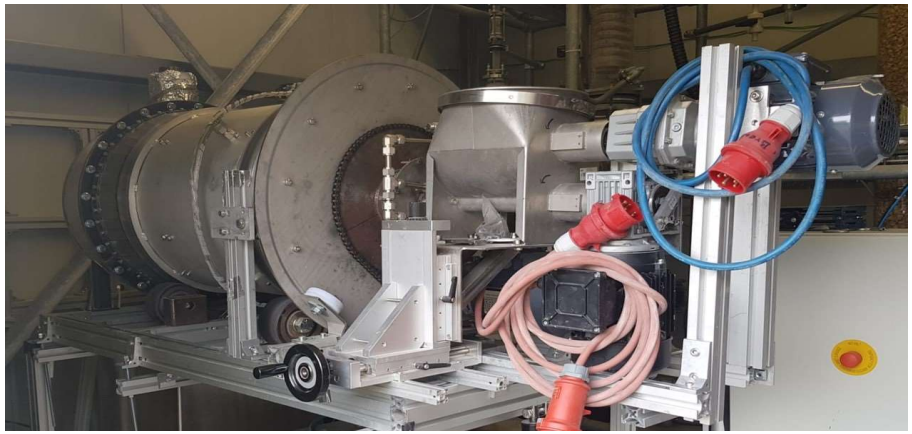


DLR Solar Rotary Kiln Reactor (Back View)



CNRS-PROMES Fluidized Bed Solar Reactor (Back View)

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Next steps in SolPart project:

- As results of the previous study, it will be included the study cases of next clinker production capacities:

  3500 mtpd
  1000 mtpd
  500 mtpd

- Finishing the LCA to complete the assessment.

- Eliminate the use of fuels in the calcination process, and replacing the 60% of the thermal energy with a renewable energy source. CO2 reduction target

- Optimize results and analysis of them to be implemented in a second phase project.

Next steps in SolPart 2 project:

- In order to take this project to an TRL 7, it is proposed to consider a develop prototype that could be able to provide 10 MW thermal for calcination of the raw meal and it will be required to be install it close to cement plant where could be feasible.

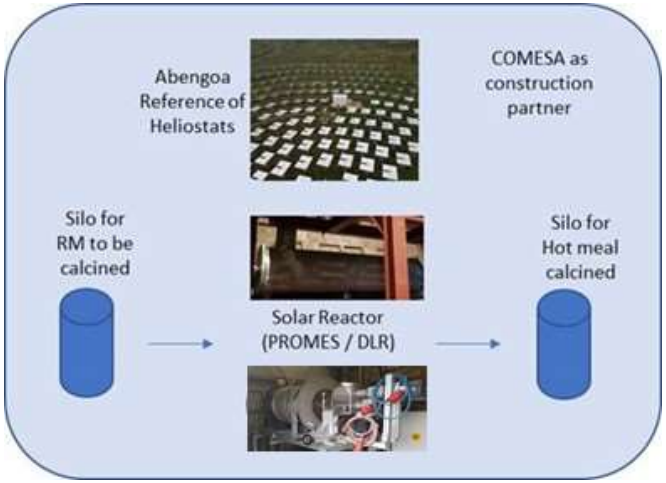
- Two Solar reactors technology could be able to developed.

- Main Concern still in the developing of the energy storage required to operate when sunlight is not available to complete the 24 hours of operation continues.

Prototype (10 MW Thermal):

- 10 MW Thermal will be used for the calcination of the raw meal, in order to demonstrate the technology.

- Next scheme is referring to the technology:



- Preliminar funding required: 25 MEuros considering the two reactors technology to be developed and applied.

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THANKS for your attention

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