High Temperature Solar-Heated Reactors for Industrial Production of Reactive Particulates

Fact Sheet

Project Information

SOLPART
Grant agreement ID: 654663

Project website

Status
Closed project

Start date
1 January 2016
End date
31 December 2019

Funded under
H2020-EU.3.3.2.4.
H2020-EU.3.3.2.2.
H2020-EU.3.3.2.1.

Overall budget
€ 4 558 687,50

EU contribution
€ 4 366 562,50

Coordinated by
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
CNRS
France

This project is featured in...
Objective

The main objective of the SOLPART project is to develop, at pilot scale, a high temperature (950°C) 24h/day solar process suitable for particle treatment in energy intensive industries (e.g. cement or lime industries). The project aims at supplying totally or partially the thermal energy requirement for CaCO3 calcination by high temperature solar heat thus reducing the life cycle environmental impacts of the process and increasing the attractiveness of renewable heating technologies in process industries. This will be achieved by the demonstration of a pilot scale solar reactor suitable for calcium carbonate decomposition (Calcination reaction: CaCO3 = CaO + CO2) and to simulate at prototype scale a 24h/day industrial process (TRL 4-5) thereby requiring a high-temperature transport and storage system. The system will operate at 950°C and will include a 30 kWth solar reactor producing 30 kg/h CaO and a 16h hot CaO storage. Life cycle environmental impacts of the solar-based solution in comparison with standard processes will be developed as well as economic evaluation.

The project develops and merges three advanced technologies: high temperature solar reactor, transport of high-temperature solid materials and high temperature thermal storage. The synergy between these technologies lies in using the solar-treated particles as storage medium. The development of a such innovative technology for continuous particle processed by concentrated solar energy at about 950°C is unique in the world. Thanks to the solar unit integration in the industrial process (potentially combined with CO2 capture), this should result in the considerable reduction of the carbon footprint of the CO2 emitter industries and open a new market for renewable energies.

Field of science

/social sciences/economics and business/economics/sustainable economy
/engineering and technology/environmental engineering/energy and fuels/renewable energy
/engineering and technology/environmental engineering/energy and fuels/renewable energy/solar energy
/social sciences/social and economic geography/transport
Programme(s)

Topic(s)

Call for proposal

H2020-LCE-2015-1-two-stage

Funding Scheme

RIA - Research and Innovation action

Coordinator

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS

Address
Rue Michel Ange 3
75794 Paris
France

Activity type: Research Organisations

EU contribution: € 1 078 392,50

Website
Contact the organisation

Participants (10)

CEMEX RESEARCH GROUP AG

Address
Romerstrasse 13
2555 Brugg Bei Biel
Switzerland

Activity type: Private for-profit entities (excluding Higher or Secondary Education Establishments)

EU contribution: € 0

Website
Contact the organisation

DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV

Address

Website
Contact the organisation
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<td>ABENGOA RESEARCH SL</td>
<td>Spain</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>41014 Sevilla</td>
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<td>THE UNIVERSITY OF MANCHESTER</td>
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<td>Oxford Road M13 9PL Manchester</td>
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<td>EUROPEAN POWDER AND PROCESS TECHNOLOGY BVBA</td>
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<td>UNIVERSITE CADI AYYAD</td>
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ABENGOA ENERGIA SA

Spain

EU contribution

€ 250 139,12

Address

Calle Energia Solar, 1,
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41014 Sevilla

Activity type

Private for-profit entities
(excluding Higher or
Secondary Education
Establishments)

Contact the organisation

Last update: 19 August 2020
Record number: 199440

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