



CSP ERA-NET has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No. 838311



SI-CO: High performance parabolic trough collector and innovative silicone fluid for CSP power plants



Marina Casanova
ACCIONA
Alcobendas, Spain
mcasanovamolina@acciona.com

“Exchange of Experiences” Webinar – 28 September 2023





SI-CO Project

Objectives:

Si-CO will develop innovations in order to achieve the following objectives:



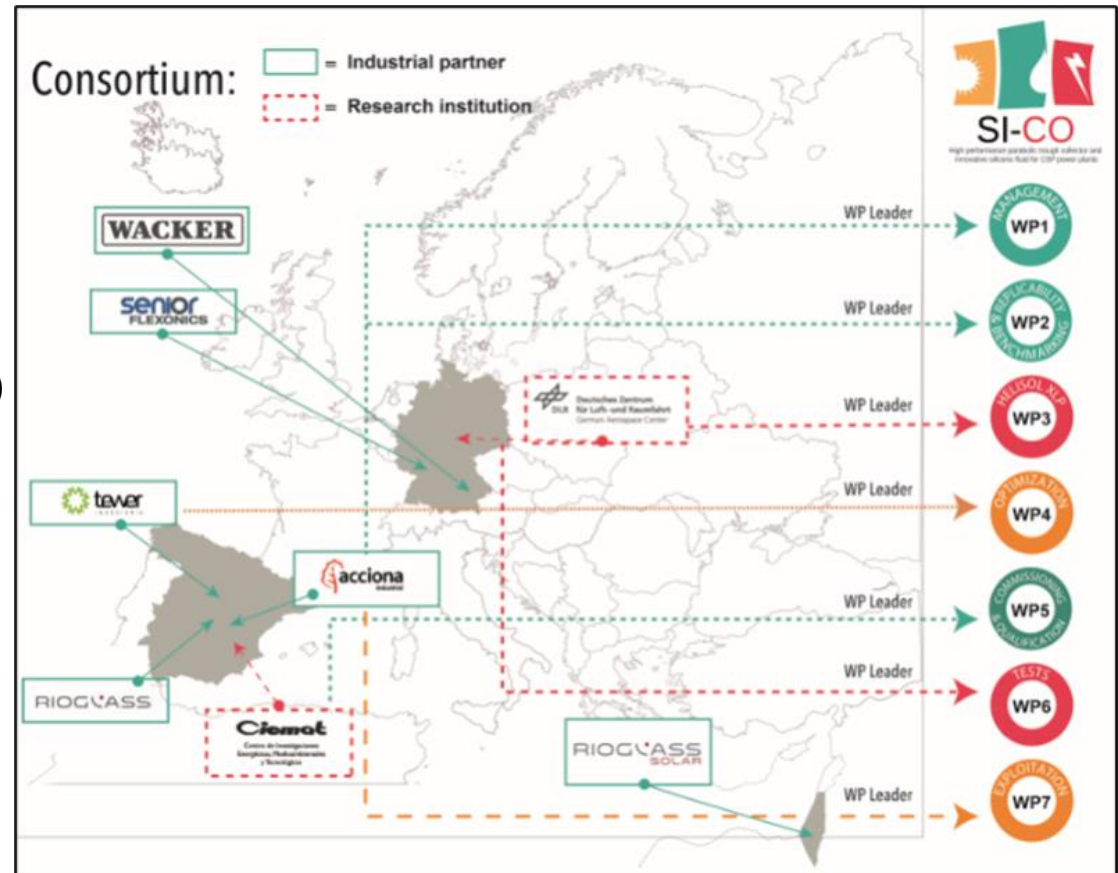
- Increase the operation temperature of PTC plants to 430°C by using silicone fluid
- Validate and demonstrate the Si-CO collector performance using a new silicone fluid
- Remove the existing technical and industrial barriers to optimize parabolic trough designs to reduce CAPEX
- Develop and demonstrate new HCEs with H2 barriers and larger length and improved PTC's components for 430°C.
- Substitute existing BP/DPO (biphenyl/diphenyl oxide) HTF used in state of the art (SOA) PTC power plants, with a new silicone fluid.



SI-CO Project

The Consortium:

1. Acciona Industrial
2. TEWER
3. Rioglass Solar (Spain & Israel)
4. CIEMAT-PSA
5. DLR
6. Senior Flexionics
7. WACKER Chemie





Outcomes:

Si-CO project is an innovative solution that aims directly at **cost reduction of PTC with silicone fluid technology**.



- Enhancement of the reliability and the operation temperature of CSP PTC applications using HELISOL® XLP at 430°C
- New Si-PTC with optimized geometry and reduced costs, demonstration to work with HELISOL® XLP at 430 °C
- Validation of the Si-PTC performance using HELISOL®XLP at 430°C
- HCEs and REPA demonstration with selective coating optimized to work with HELISOL® XLP at 430 °C
- Demonstration of the applicability of Si-HTF for existing PTC power plants to prove environmental and O&M advantages





CSP ERA-NET has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No. 838311

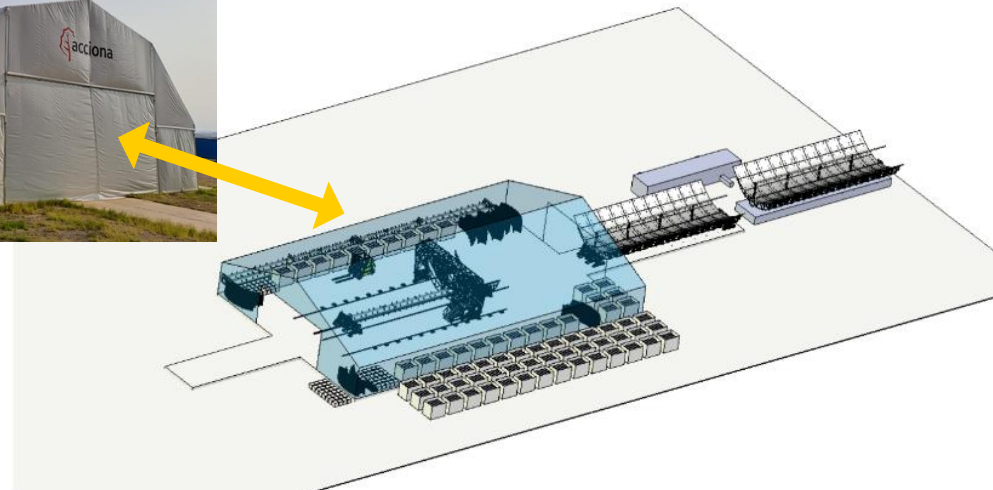


Exchange of experiences Webinar 230928



SI-CO

High performance parabolic trough collector and innovative silicone fluid for CSP power plants





Outcomes:

New Parabolic Trough Collector

A technical-commercial evaluation of the main commercial components with influence in the geometrical definition of the collector has been performed.

1. Parabola aperture of 8 m, defined by 6 mirrors per section with 4 support points. Mirror width of 1469 mm approximately.
2. Use of absorber tube with external diameter of 90 mm and length of 4.49 m for the optimization of the thermal gain ratio, pressure drop and solution cost.
3. SCA configuration with a total length of 181 m, thus maintaining a pressure drop in the loop similar to the reference case and current plants.



CAPEX and OPEX Reduction

1. The new PTC using HELISOL[®]XLP will allow to **reduce the CAPEX** in Solar Field, HTF and TES systems by **16.5%** (26.4M€ out of 160M€).
2. Reduce **OPEX costs by 14%** savings of 0.7M€/year out of 4.8M€.



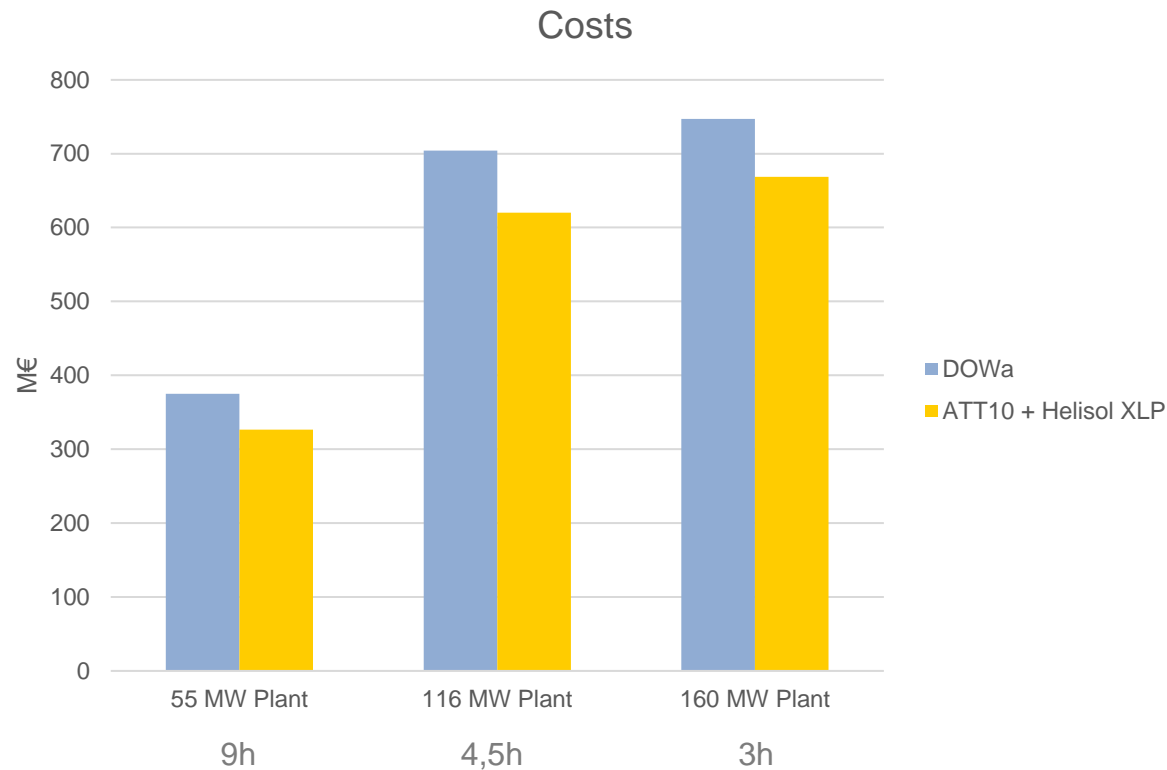


CSP
CONCENTRATED
SOLAR POWER

CSP ERA-NET has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No. 838311



Exchange of experiences Webinar 230928



Storage:

Reduction CAPEX:

-13%

-12%

-11%





- Experiences gained:
 - Knowledge acquired and experience in different technical areas
- Critical factors and lessons learned:
 - Funding agencies in different countries should be better coordinated in terms of timing
 - Having different grant conditions for countries makes more difficult the coordination and the participation of partners from other countries





CSP
CONCENTRATED
SOLAR POWER

Exchange of experiences Webinar 230928

Thank you!!

Presented by Marina Casanova (ACCIONA, 2023, Spain)

mcasanovamolina@acciona.com

CSP ERA-NET has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No. 838311

