

# Évora Molten Salt Platform (EMSP) – Current Status and Perspectives

Jana Stengler, Pedro Horta, Dorin Golovca, Paula Martins, Mirko Meyer-Grünefeldt, Raphael Detzler, Frederico Felizardo, Diogo Canavaro, Michael Wittmann, Klaus Hennecke

## Summary

The construction of a molten salt test facility in Évora (Portugal) is converging to the finalization of its erection and commissioning phase. It aims at the development of applied research in molten salt-driven CSP, SHIP and thermal energy storage components, systems and technologies. The EMSP is jointly managed and operated by the Renewable Energies Chair of the University of Évora and the DLR Institute of Solar Research. Here, we present the projects which are currently set up at the EMSP.

## Contact

Dr.-Ing. Jana Stengler  
 German Aerospace Center (DLR), Institute of Solar Research,  
 Solar High Temperature Technologies, Stuttgart, Germany  
 +49 711 6862-8238 | jana.stengler@dlr.de



### HPS2 High Performance Solar 2, 2016 – 2021

**Motivation and objectives**  
 Demonstration of the safe and efficient operation of a parabolic trough plant with molten salt as heat transfer and storage medium, including operation of a steam generator.

- 2.7 MW<sub>th</sub> solar field design power
- plant design temperature up to 565 °C
- once-through steam generating system (1.8 MW<sub>th</sub>, 140 bar steam pressure)
- 2-tank thermal energy storage (3 hours capacity @ ΔT = 280 K)
- commissioning ongoing
- 1<sup>st</sup> operation phase with ternary salt mixture up to 500 °C

**Partners**

- DLR Institute of Solar Research
- University of Évora
- TSK Flagsol
- eternm
- Yara
- Steinmüller Engineering
- Rioglass
- RWE Renewables

### ALFR Alentejo Advanced Linear Fresnel Reflector, 2019 – 2022

**Motivation and objectives**  
 Design, construction and testing of an Advanced Linear Fresnel (ALFR) reflector for operation with molten salt up to 500 °C.

**Innovation:** new Non-Imaging optics concept for secondary concentrator; use of molten as heat transfer fluid (HTF) in ALFR solar field

**Relation to EMSP:** behavior of ALFR vs. parabolic trough collector; experience with use of molten salt as HTF in Fresnel solar field

**Partners**

- University of Évora

For more information, visit [www.alfr-alentejo.uevora.pt](http://www.alfr-alentejo.uevora.pt)

### NEWSOL New latent and sensible storage concept for high efficient CSP plants, 2017 – 2021

**Motivation and objectives**  
 Study, design, construction and testing of concrete based thermocline storage with filling material for molten salt up to 500 °C

**Innovation:** use of new ternary salt mixture; study and use of thermal insulating concrete; use of mixing slugs as filling material

**Relation to EMSP:** behavior of thermocline vs. 2-tank system; experience with filling and draining procedures; behavior ternary salt mixture

**Partners**

- University of Évora
- DLR
- CSIC - Consejo Superior de Investigaciones Científicas
- Rioglass
- Universidad Complutense Madrid
- Acciona Construcción S.A.
- Acciona Ingeniería S.A.
- Acciona Industrial S.A.
- SECIL-Companhia Geral de Cal e Cimento, SA
- Selsol Services SRL
- Laboratorio Nacional de Energía e Geología, I.P.
- EITB Zurich
- Institute of Applied Economics ARES
- amem - Asociación de Investigación Meteorología del Noroeste
- Yara International ASA
- STIF TELSEN SINTEF

### MSOpera Optimising the operation of molten salt-based parabolic trough systems, 2019 – 2022

**Motivation and objectives**  
 The MSOpera project aims to further accelerate the market launch of molten salt parabolic trough systems. Based on the basic functional verification in the HPS2 project, the project partners of MSOpera will

- demonstrate operation with SolarSalt at 550 – 565 °C
- advance the degree of automation
- optimize solar field components
- reduce overnight heat losses
- develop innovative solar field control

**Partners**

- TSK Flagsol (coordination)
- DLR Institute of Solar Research
- University of Évora
- RWE Renewables

### CSP-ERA NET EuroPaTMoS European Parabolic Trough with Molten Salt, 2020 – 2023

**Motivation and objectives**  
 Pull together the European expertise and testing infrastructure for parabolic trough with molten salt, to

- close the gaps between R&D and commercial deployment
- prove to IPFs, project developers, owner's engineers, insurance companies and lenders that the technology is ready for the market

**Partners**

- DLR Institute of Solar Research
- University of Évora
- Universidad Complutense de Madrid
- University of Extremadura
- ENEA
- TSK Flagsol
- Rioglass
- CSP Services GmbH
- Ducotex SL CSP Services Espana SL

**Website**  
 Visit <http://www.emsp.uevora.pt/> for further information on projects and events.



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