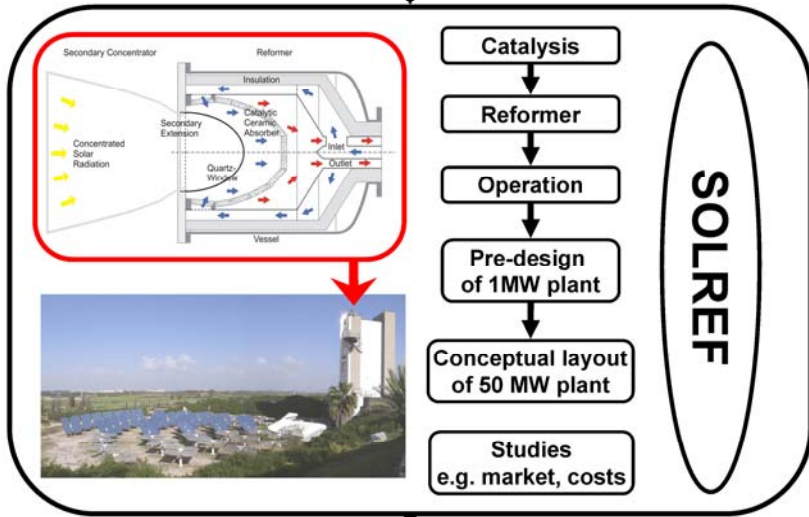
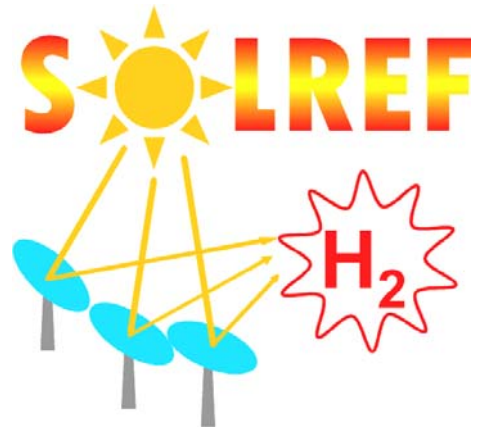


Past: SOLASYS



Future: 1 MW Prototype Plant
e.g. in Southern Italy



Partners of the consortium



Deutsches Zentrum
für Luft- und Raumfahrt e.V.
in der Helmholtz-Gemeinschaft



מכון ויצמן למדע
WEIZMANN INSTITUTE OF SCIENCE



Swiss Federal Institute of Technology Zurich



SOLREF: Solar Steam Reforming

Outline

The main purpose of SOLREF is to develop and to operate an advanced 400 kW_{th} solar reformer based on the experiences in the previous project SOLASYS. The solar reformer can be applied for hydrogen production or electricity generation. Depending on the feed source for the reforming process CO₂ emissions can be reduced significantly (up to 40% using NG) as the process heat needed for this highly endothermic reaction is provided by concentrated solar radiation. The pre-design of a 1 MW_{th} prototype plant in Southern Italy and a conceptual layout of the commercial 50 MW_{th} reforming plant complete this project.

Main goals

- Develop an advanced 400 kW_{th} solar reformer.
- Investigate various catalyst systems.
- Simulate mass and heat transport and reaction in porous absorber.
- Perform thermodynamic and thermochemical analyses to support the system design phase.
- Operate the reformer with gas mixtures which represent the variety of possible feedstock on the solar tower at WIS, Israel.
- Evaluate new operation strategies.
- Pre-design of a 1 MW_{th} prototype plant in Southern Italy.
- Conceptual layout of a commercial 50 MW_{th} reforming plant.
- Assess on potential markets including cost estimation and environmental, socio-economic, and institutional impacts.

Acknowledgment

The authors would like to thank the European Commission for funding the project SOLREF (Contract No. SES6-CT-2004-502829).



Deutsches Zentrum
für Luft- und Raumfahrt e.V.
in der Helmholtz-Gemeinschaft

Institute of Technical Thermodynamics, Solar Research

S. Moeller*

*PHONE: +49-711-6862-640; FAX: +49-711-6862-747
E-MAIL: stephan.moeller@dlr.de ;
URL: <http://www.solref.dlr.de/>

Co-authors:

- A. Konstandopoulos - Center for Research and Technology-Hellas, Chemical Process Engineering Research Institute (EL)
- M. Epstein - Weizmann Institute of Science (IL)
- A. Steinfeld - ETH-Swiss Federal Institute of Technology (CH)
- M. Feaviour - Johnson Matthey Fuel Cell Ltd. (UK)
- M. Walter - HyGear B.V. (NL)
- T. Caselli - SHAP S.p.A. (I)