



## **AQUA-CSP Team**

German Aerospace Center (Germany)  
National Energy Research Center (Jordan)  
University of Aden, (Yemen)  
University of Sana'a, (Yemen)  
University of Bahrain, (Bahrain)  
Prof. Abdelaziz Bennouna, (Morocco)  
Intern. Forschungszentrum für Erneuerbare Energien e.V. (Germany)  
Kernenergien – The Solar Power Company (Germany)  
Nokraschy Engineering GmbH (Germany and Egypt)  
Deutsche Gesellschaft Club of Rome (Germany)  
House of Water and Environment (Palestine)  
Center for Solar Energy Studies (Libya)  
Centre de Developpement des Energies Renouvelables (Morocco)

## **Project Management and Contact**

Dr. Franz Trieb  
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)  
Institute of Technical Thermodynamics  
Systems Analysis and Technology Assessment  
Pfaffenwaldring 38-40  
D-70569 Stuttgart  
Germany  
Tel.: ++49-711 / 6862-423  
Fax: ++49-711 / 6862-783  
Email: [franz.trieb@dlr.de](mailto:franz.trieb@dlr.de)

## **More information**

The full study report can be downloaded after 12/2007 at:  
<http://www.dlr.de/tt/aqua-csp>

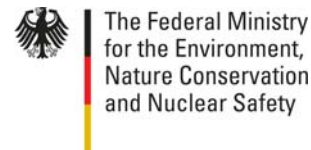
# **Concentrating Solar Power for Seawater Desalination**

by

German Aerospace Center (DLR)  
Institute of Technical Thermodynamics  
Section Systems Analysis and Technology  
Assessment

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Conservation and Nuclear Safety, Germany



## Scope and First Results of the AQUA-CSP Study

The AQUA-CSP study analyses the potential of concentrating solar thermal power technology for seawater desalination in the Middle East and North Africa. The study will provide a comprehensive data base on technology options, water demand and water deficits of the MENA countries, water resources, solar energy resources and the potential markets for solar powered desalination. A long term scenario until the year 2050 for each of the twenty analysed countries will evaluate the socio-economic and environmental impacts resulting from a possible broad dissemination of this concept in the MENA region.

There are several good reasons for the implementation of such systems:

- Thermal energy from concentrating solar collectors is already competitive with fuel oil at 50 \$/barrel and heading for competitiveness with natural gas, without creating any emissions to the atmosphere,
- due to energy storage and hybrid operation with (bio)fuel, concentrating solar power plants provide around-the-clock firm capacity that is suitable for large scale desalination either by thermal or membrane processes,
- CSP desalination plants can be realised in very large units up to several 100,000 m<sup>3</sup>/day of desalted water,
- the huge solar energy potential of MENA can easily produce the energy necessary to provide the growing freshwater deficits in that region,
- within a decade, energy from solar thermal power plants will become one of the least cost options for electricity and desalted water in MENA,
- with support from Europe the MENA countries could immediately start to establish favourable political and legal frame conditions for the market introduction of concentrating solar power technology for electricity and seawater desalination.

The AQUA-CSP study provides a first information base for the political framework that is required for the initiation and realisation of such a scheme. It quantifies the available solar energy resources and the expected cost of solar electricity and water, a scenario of integration into the MENA water sector until 2050, and shows the environmental and socio-economic impacts of a broad dissemination of this concept.

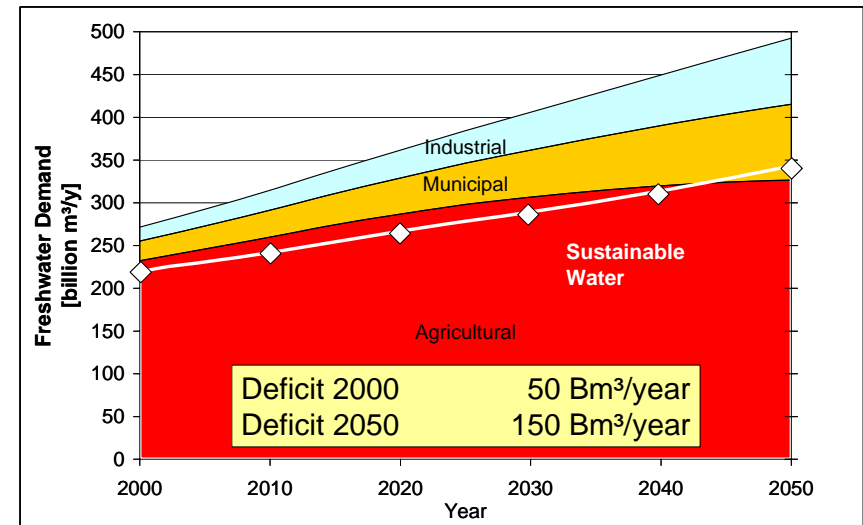


Figure 1: Freshwater demand versus sustainable natural water supply in MENA

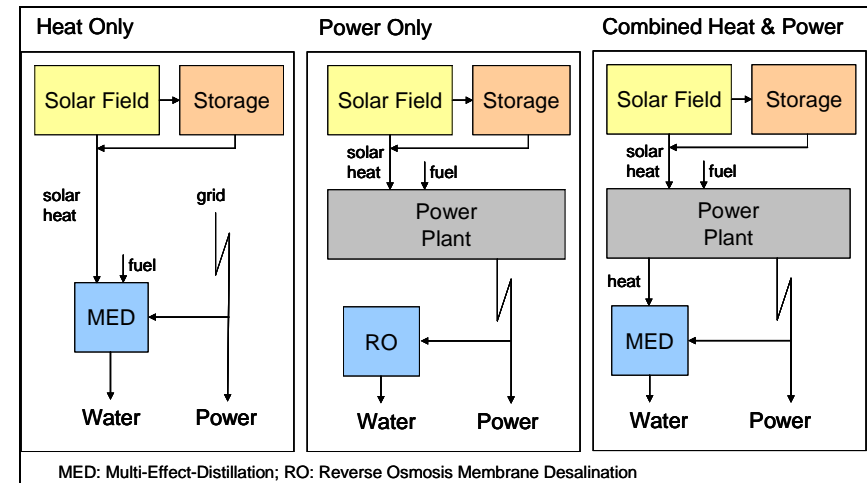


Figure 2: Three possible configurations for seawater desalination using concentrating solar thermal power technology