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More information

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

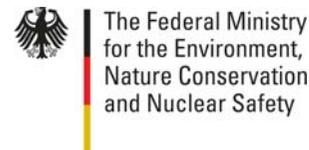
Concentrating Solar Power for Seawater Desalination

by

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

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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 m³/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.

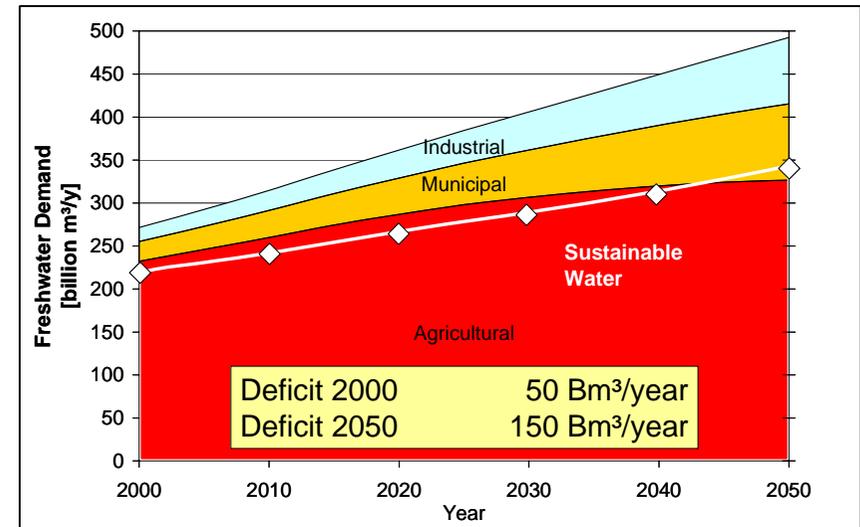


Figure 1: Freshwater demand versus sustainable natural water supply in MENA

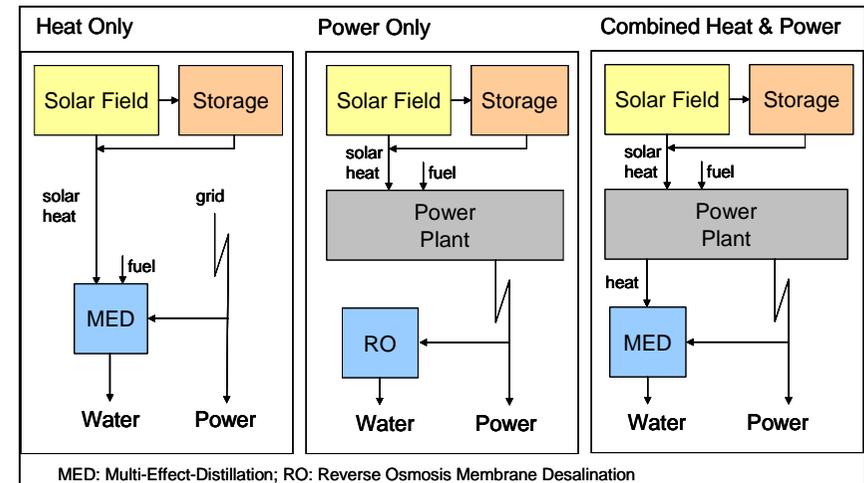


Figure 2: Three possible configurations for seawater desalination using concentrating solar thermal power technology