

4th Arab-German Energy Forum, Berlin

DLR's portfolio of Teaching Materials and Training Workshops for CSP Technology

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Knowledge for Tomorrow



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

www.dlr.de/enerMENA

Background



Towards a Sustainable Implementation of Solar Thermal Power Plants Technology in the MENA

DLR initiative, supported by the German Federal Foreign Office

enerMENA (since 2009) follows the DESERTEC concept and supports the *sustainable implementation of concentrating solar power plant technology in Europe and MENA*

by

- Improvement of Technology
- Development of PEOPLE capacities
- Support of PROJECT DEVELOPMENT activities



Graphics: Desertec Foundation



Methodology

- engagement of MENA Partner to achieve the project objectives through constructive cooperation
- co-operative development and implementation of integrated high quality training programs
- widen the dissemination (> 45 Partner)
- Implementation of joint R&D activities
- Initiate long term co-operations



Training course at the PSA, Spain



enerMENA Network

Morocco

- Moroccan Solar Energy Agency (**MASEN**)
- Institut de Recherche en Energie Solaire et Energies Nouvelles – (**IRESEN**)
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Algeria

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-

Tunisia

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-

Egypt

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-

Jordan

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-

International and Regional Organisations

- PSA Plataforma Solar de Almeria
-

Partners in Germany

- SIJ – Solar Institut Jülich
- CSP – Services
- Fichtner Solar
- Flagsol
- Lahmeyer
- NOVATEC BIOSOL AG
- Solarlite

enerMENA: Network with over 50 Partners from 5 MENA Countries, Germany and EU



enerMENA Capacity Building Program

Module **A** - Training Program for *Field Engineers* and *Technicians*

Need: Establish CSP technical expert teams in the partner countries.

Teams mainly responsible for

- the **technical optimization** of the existing and planned power plants
- the organization of **training courses for technical staffs** in their countries ([Train-the-Trainers](#)).

Actions

- Each Country team provided with a mobile laboratory.
- Technical training courses organized at PSA and CSP plants
- Long term support by DLR experts.

30 expert lectures available as video tutorials !

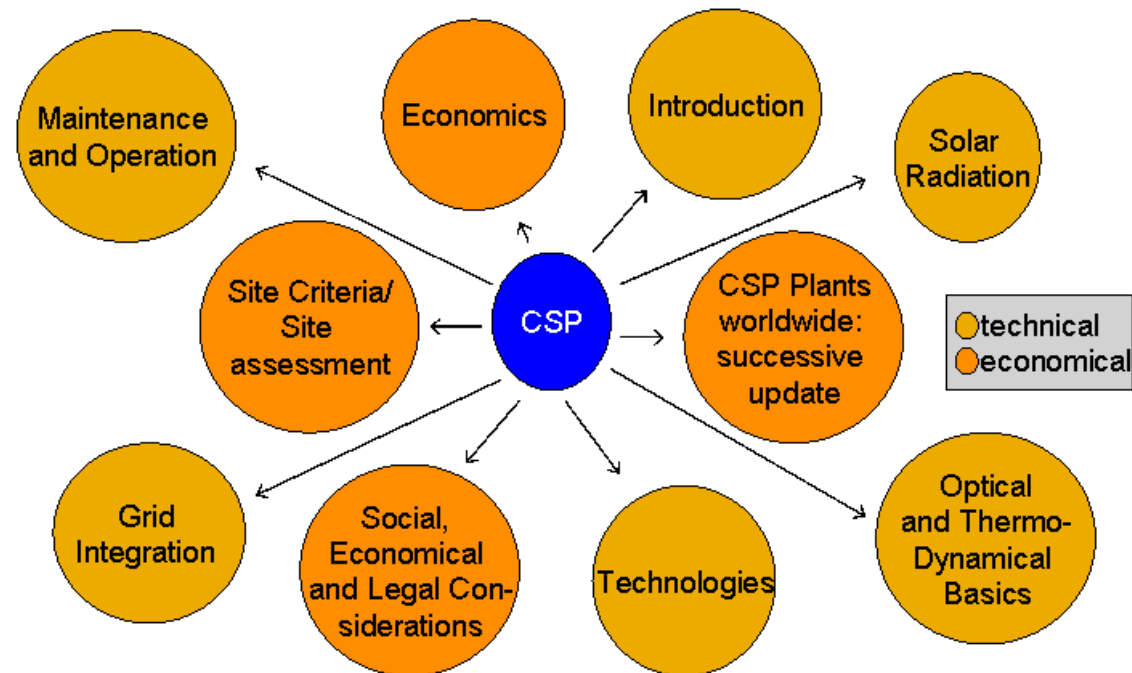


enerMENA Capacity Building Program

Module B - Educating *higher level university students* and *lecturers*

Need: Tailored education and creating CSP related ecological and economical consciousness

- CSP module developed for technical Master Degree programs
- two-stage review within EU-MENA university network
- Wide spectrum of topics covered including economics



Partners: Aachen University of Applied Sciences (SIJ), Kassel University, Cairo University (EG), GUC (EG), Jordan University (JO), JUST (JO), ENIT University (TN), CRTE n (TN), CDER (DZ), ENIT University (MA), UMP (MA)



enerMENA Capacity Building Program

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- Numerous implementation workshops organized



enerMENA Capacity Building Program

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- Wide spectrum of topics covered including economics
- Numerous implementation workshops organized
- Practical component included by hosting DLR-internships



enerMENA Capacity Building Program

Module C - Training of local *project planners and managers*

Need: coaching of local responsables in project planning and yield analysis of CSP plants.

enerMENA project planning courses include

- description of typical CSP project developments
- summarization of the different phases of the project development process and definition of required expertise
- presentation of CSP plant yield analysis tools as instruments for a proper assessment of the economic viability of possible CSP projects

5 expert lectures available as video tutorials !



enerMENA Capacity Building Program

Module **D** - Training courses for *professionals*

Need: dissemination of CSP expert knowledge among utilities, IPP and public institutions

- Standard three-days course includes:
 - Introduction to all CSP technologies
 - Optimization of CSP plants
 - Solar resource assessment
 - CSP Projects planning and implementation
 - Overview of the world market and projects.
- The organization takes place in cooperation with regional stakeholders, e.g. AUE, GIZ, AFREC, RCREEE, ONEE, STEG, NEPCO, etc



19 expert lectures available as video tutorials !





enerMENA Video Tutorial - Online Contact Form for Access Authorization

The enerMENA video tutorial about concentrating solar power is intended for personal e-Learning for engineers, technicians and students in the MENA region. Please fill out the following contact form:

Contact Details:

Register at www.dlr.de/enermena

Name: *

Professional Information: *

Address: *

Email: *

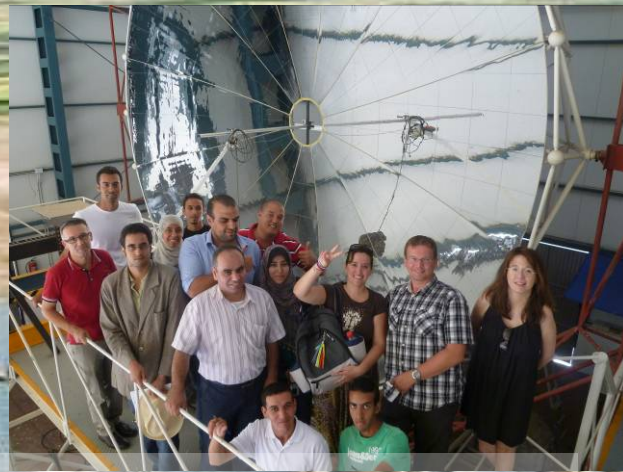
Phone:

Motivation

Why do you want to use the enerMENA video tutorial about Concentrating Solar Power:

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Thank you for your attention!

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