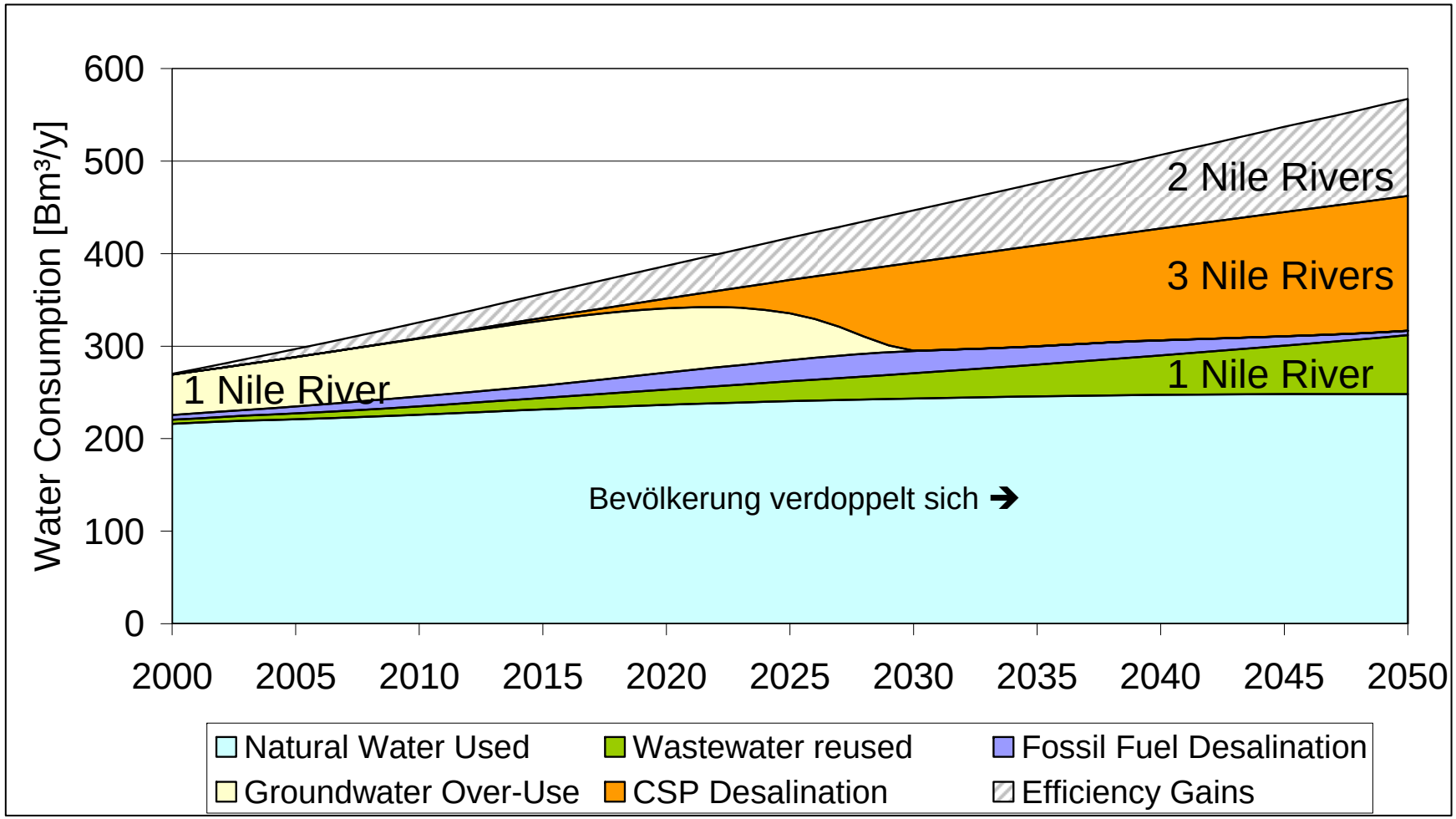
Solarthermische Kraftwerke für die Meerwasserentsalzung – Ergebnisse des MED-CSD Projekts

Franz Trieb, Massimo Moser, Jürgen Kern, Beate Traub

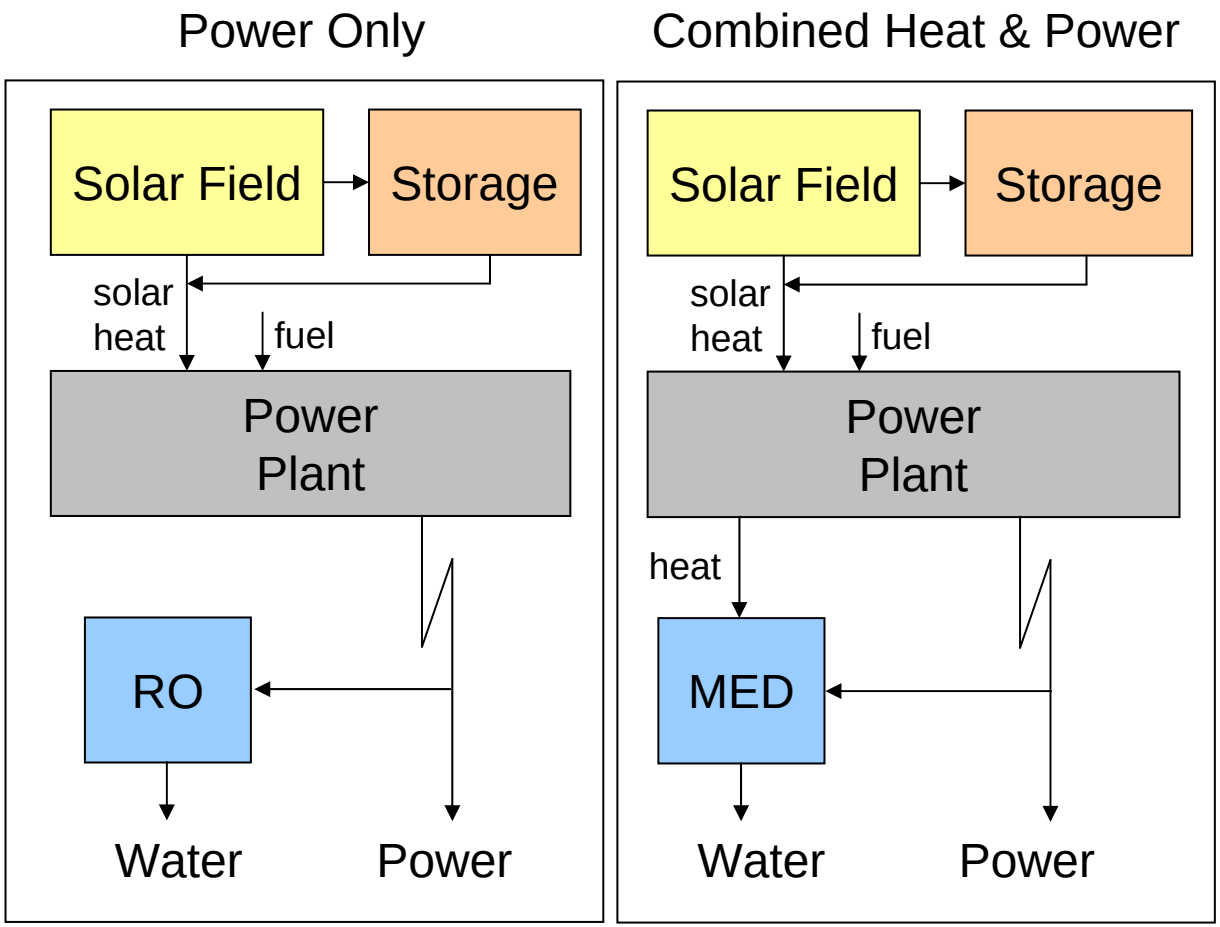
13. Kölner Sonnenkolloquium, 29.06.2010

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

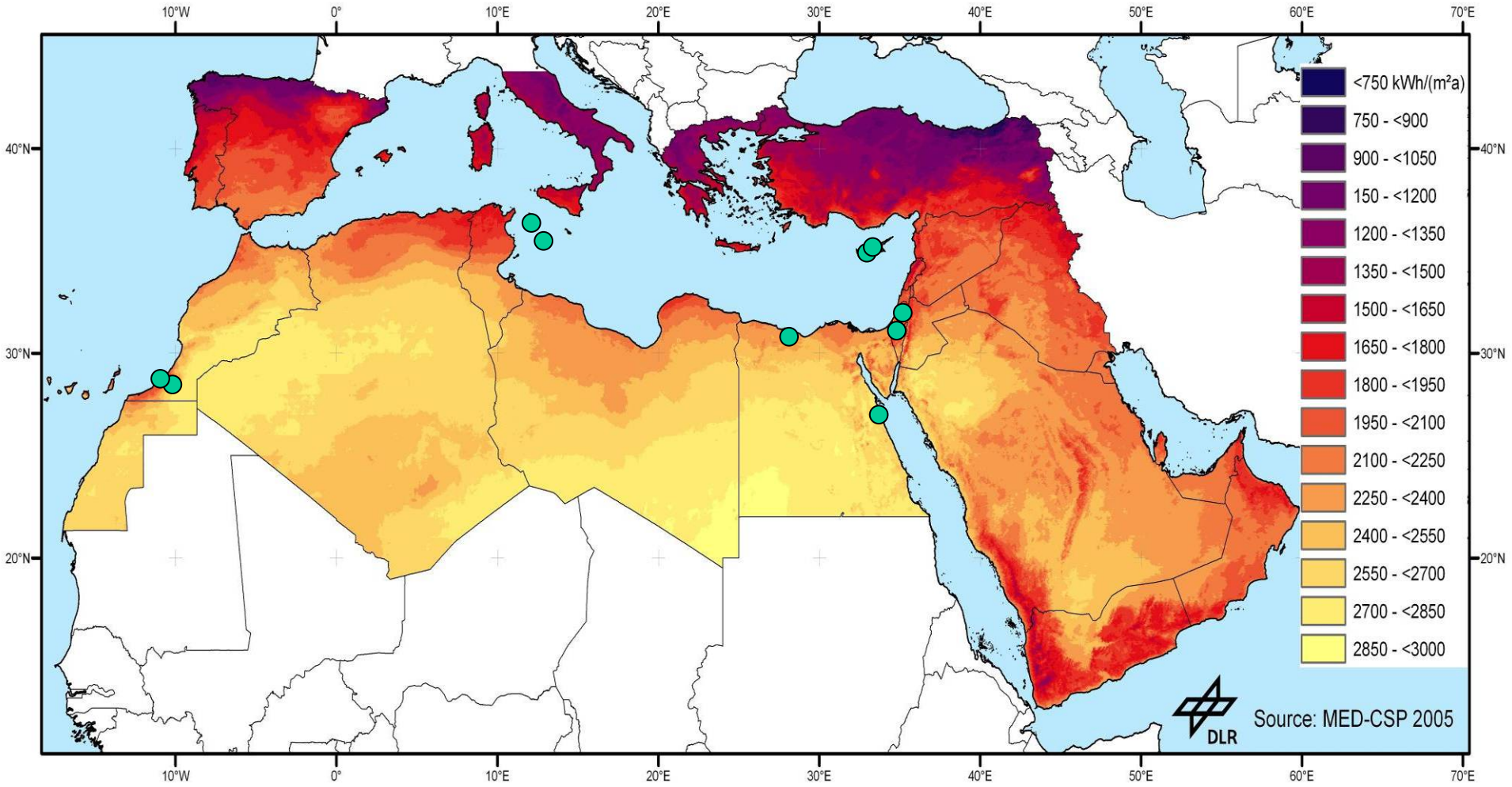
AQUA-CSP Szenario for Middle East & North Africa



CSP-Desalination Plants



MED-CSD Standorte



Annual Sum of DNI for the year 2002

8 Systemvarianten x 10 Standorte

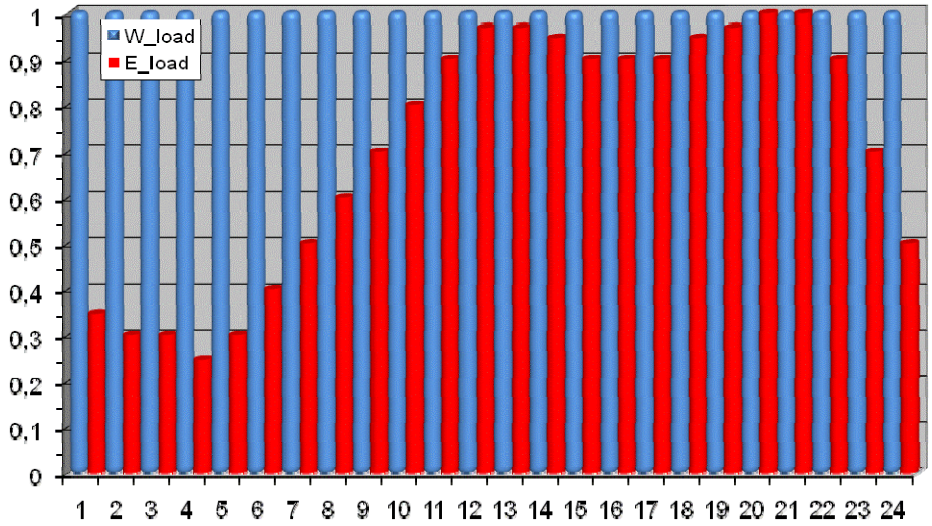
DNI data	Solar field	Storage	Power block	Desalination
match	Parabolic trough	Molten salt	Steam turbine	MED
gacp	Linear Fresnel			Dry cooling + RO



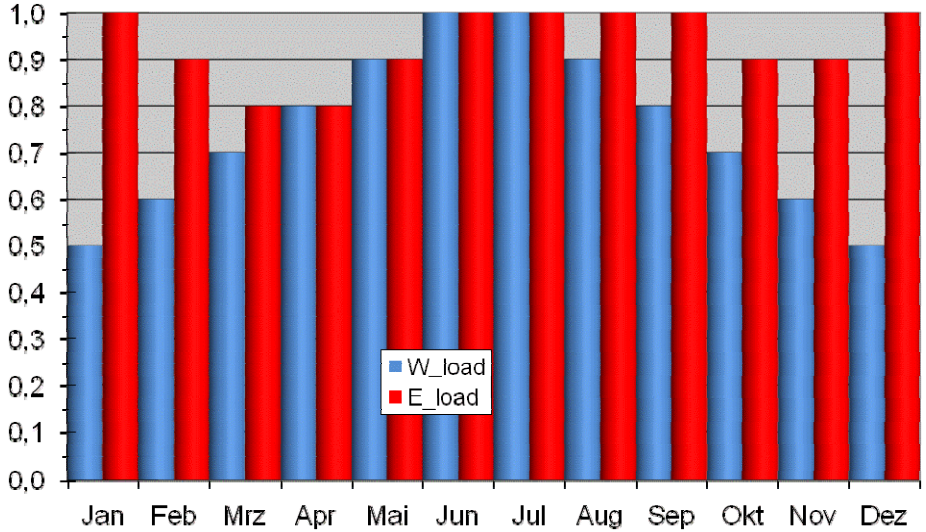





Tägliches Lastprofil



Saisonales Lastprofil

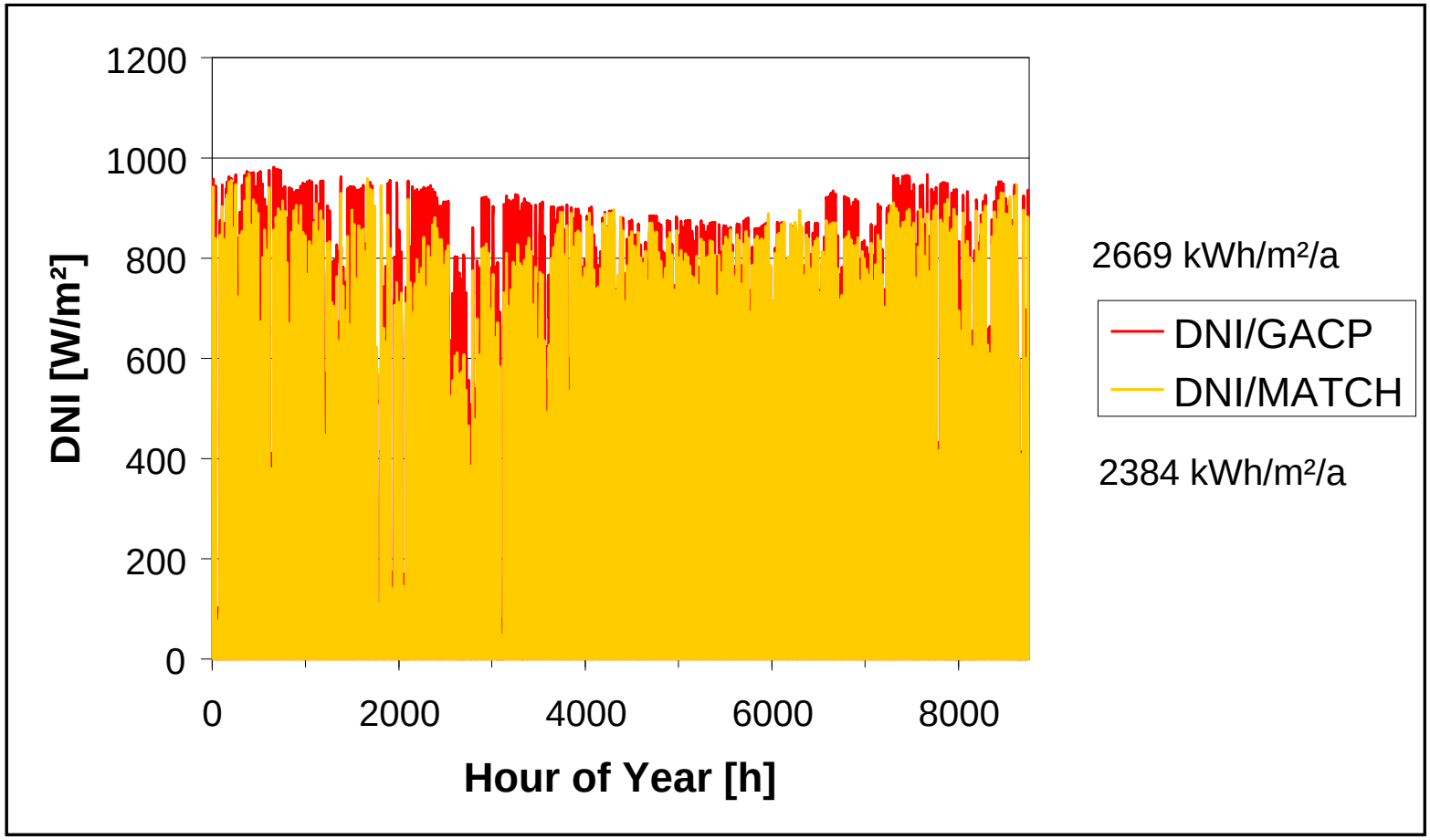


Input Daten

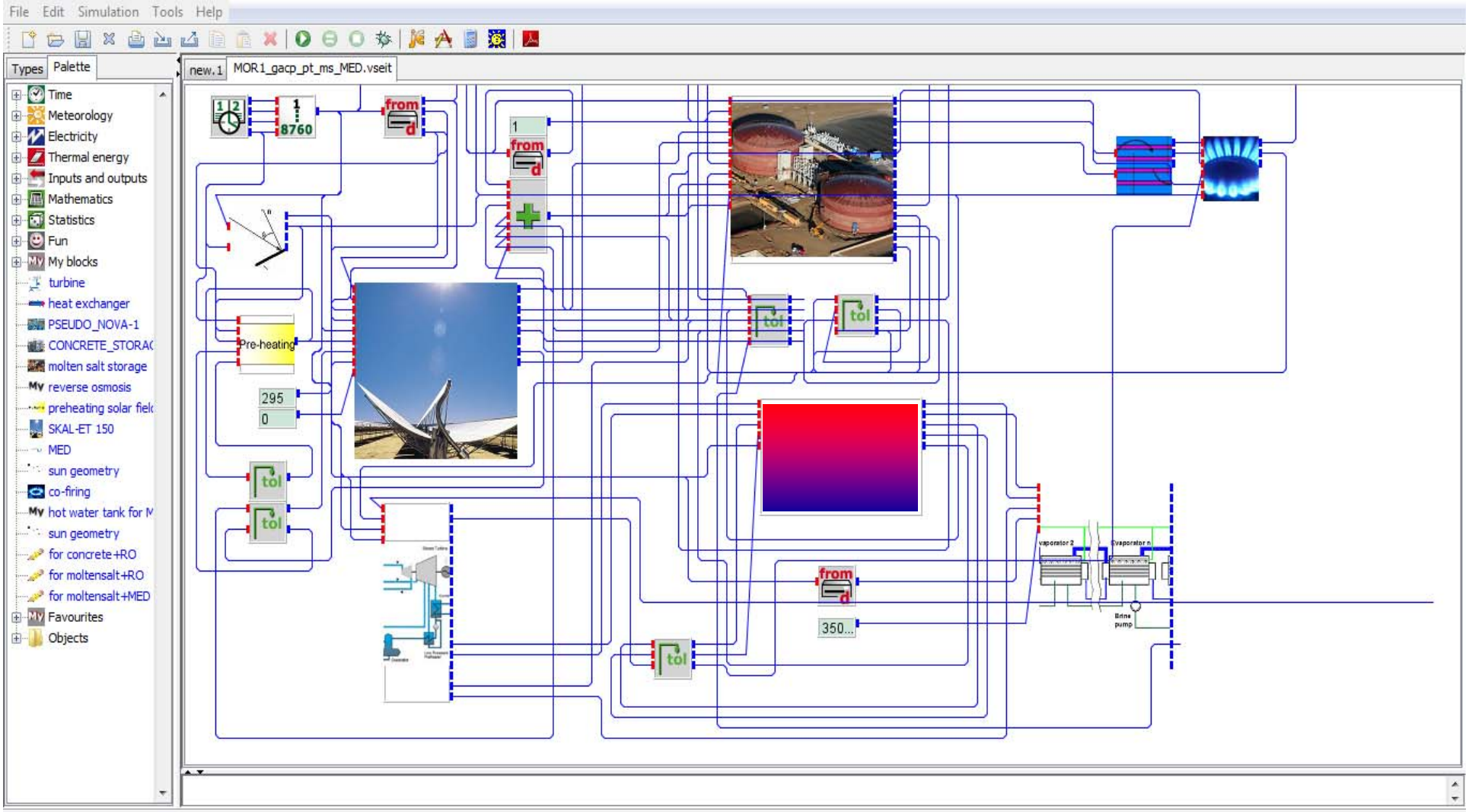
Direkt Normal Strahlung (DNI)
Umgebungstemperatur
Luftfeuchte
Windgeschwindigkeit

16 MW netto
8000 m³/d
Solar Multiple 2

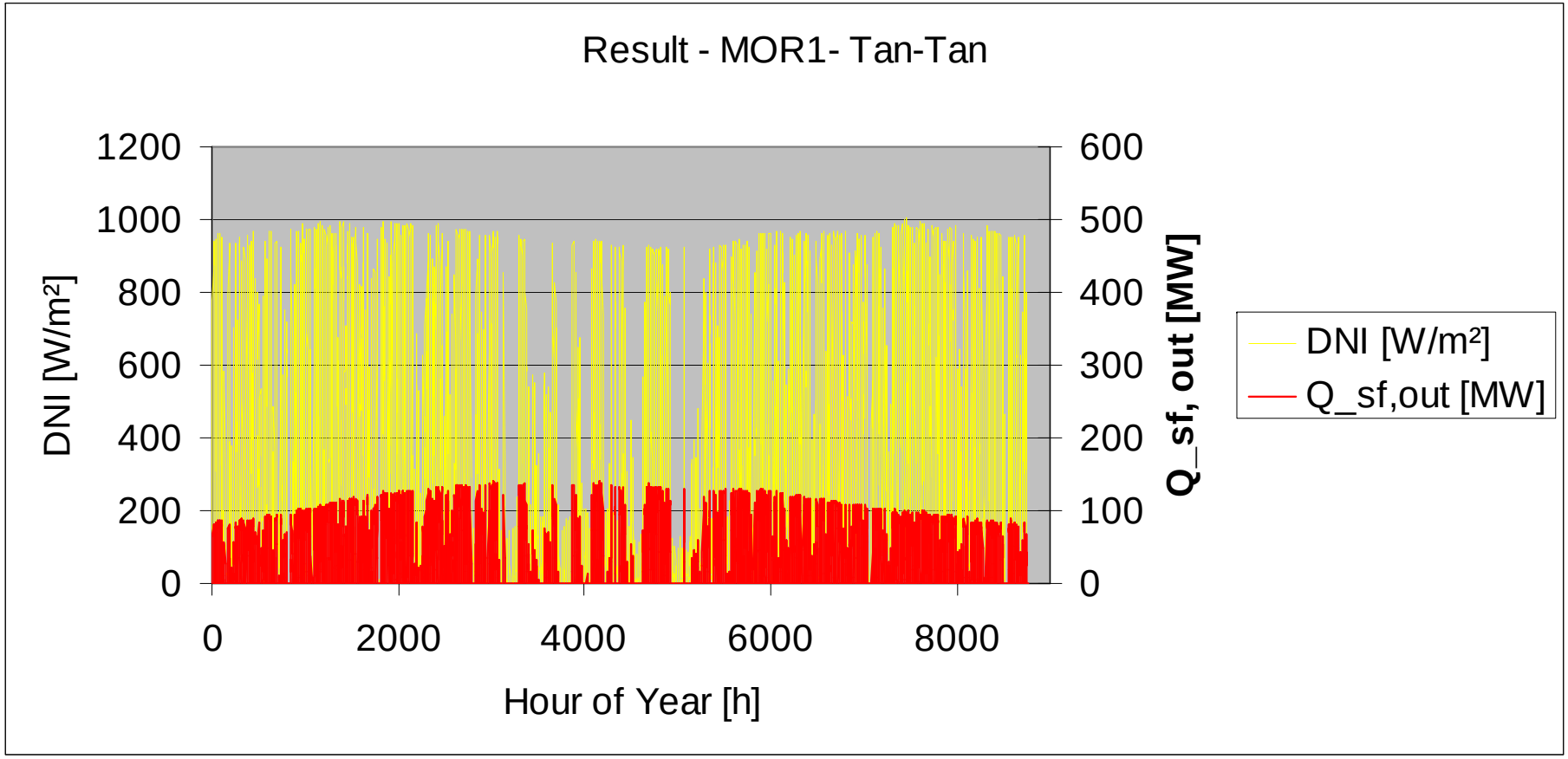
Verschiedene DNI Datensätze



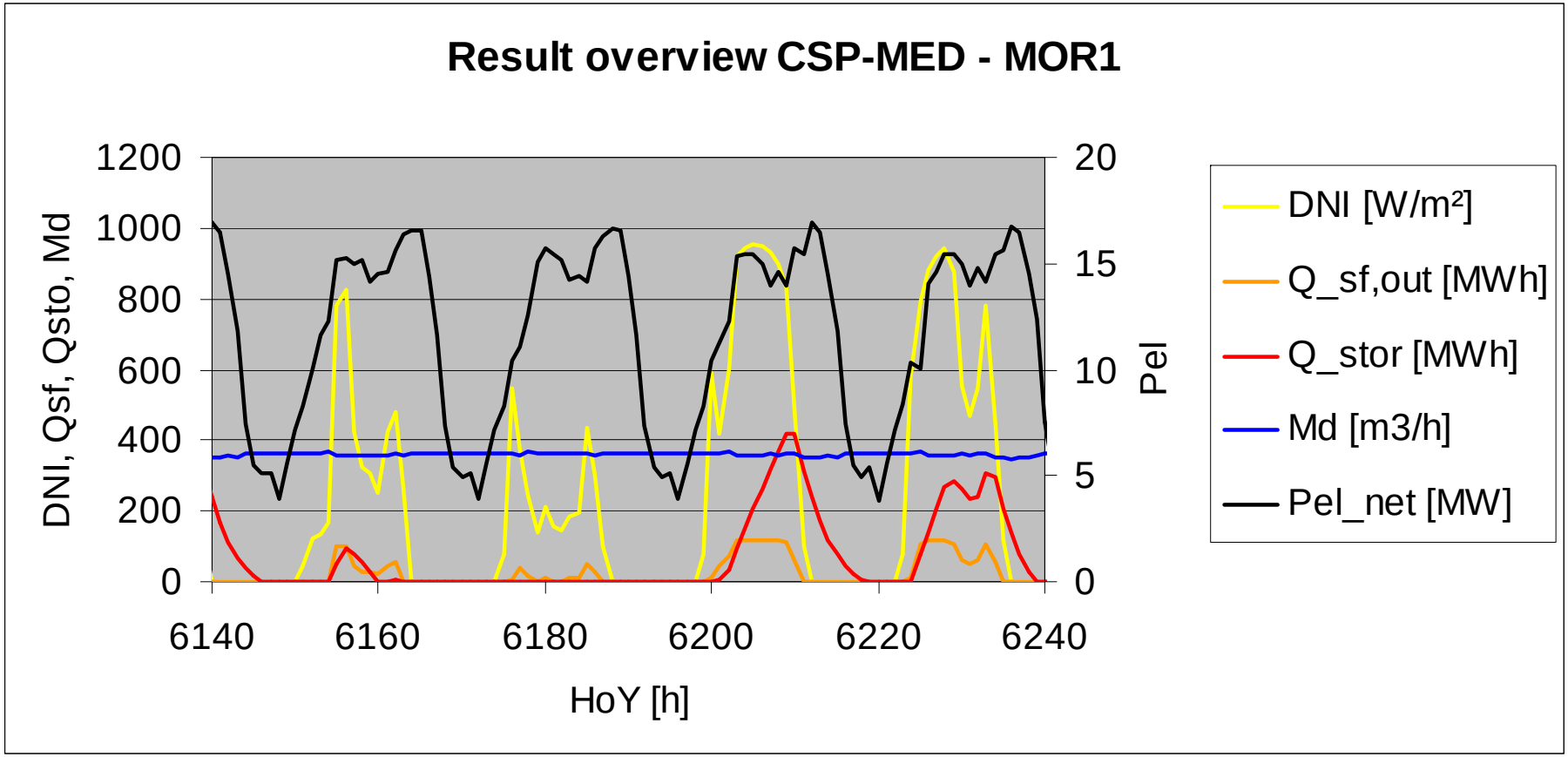
Ertragsmodellierung mit INSEL Vers.8



Ertragsmodellierung – Tan-Tan, Marokko

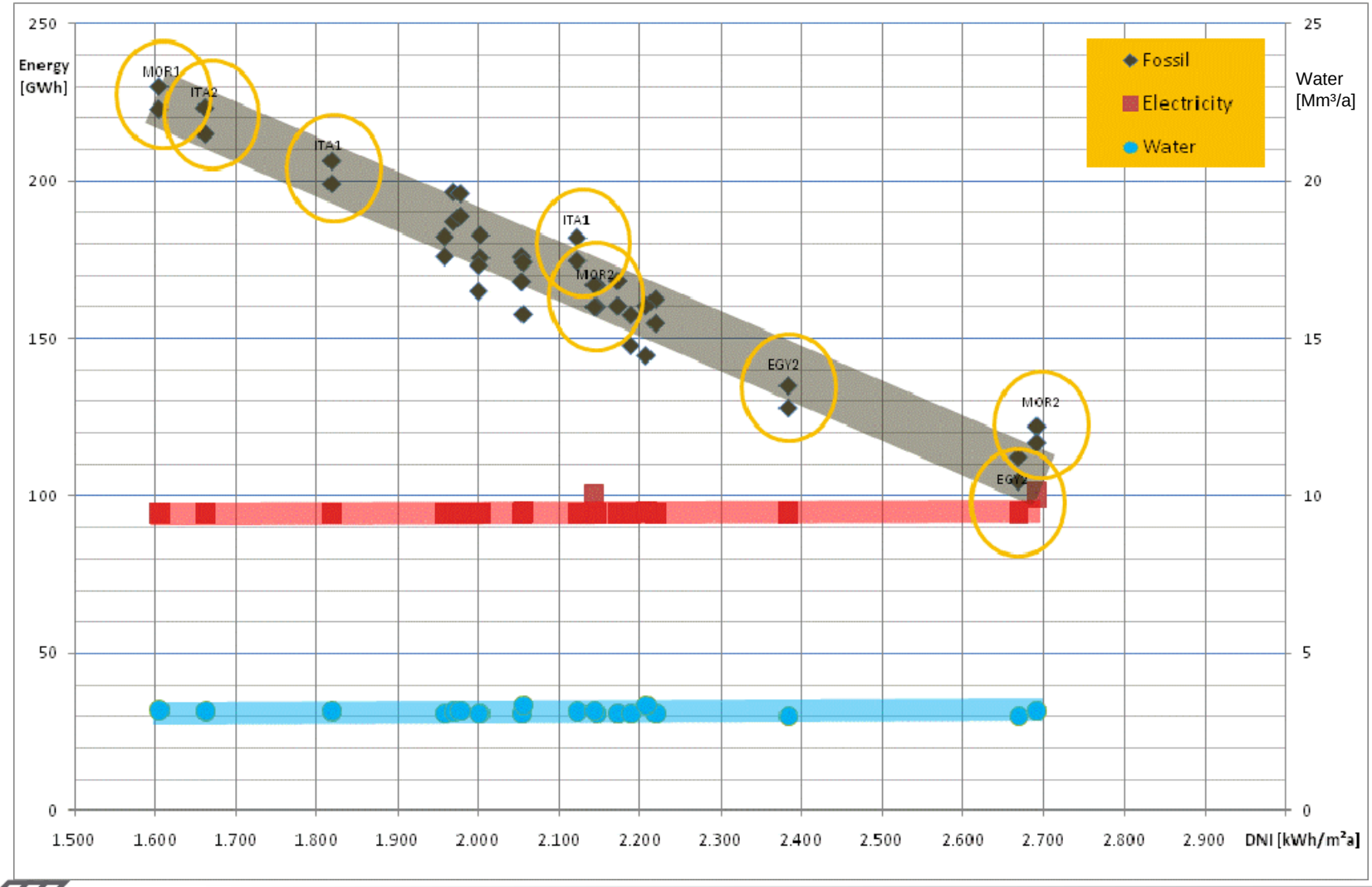


Ertragsmodellierung

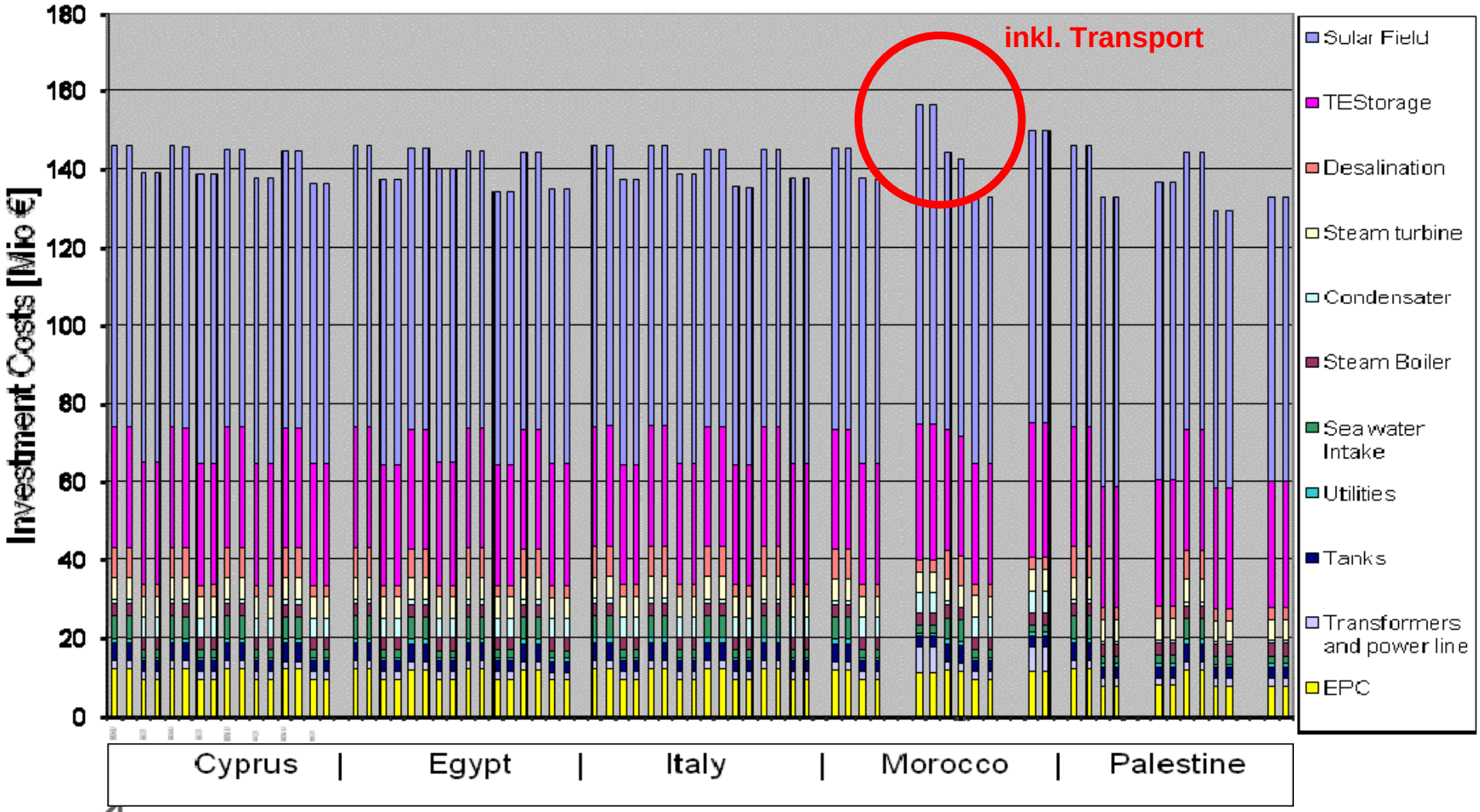


Nettostrom/Brennstoff

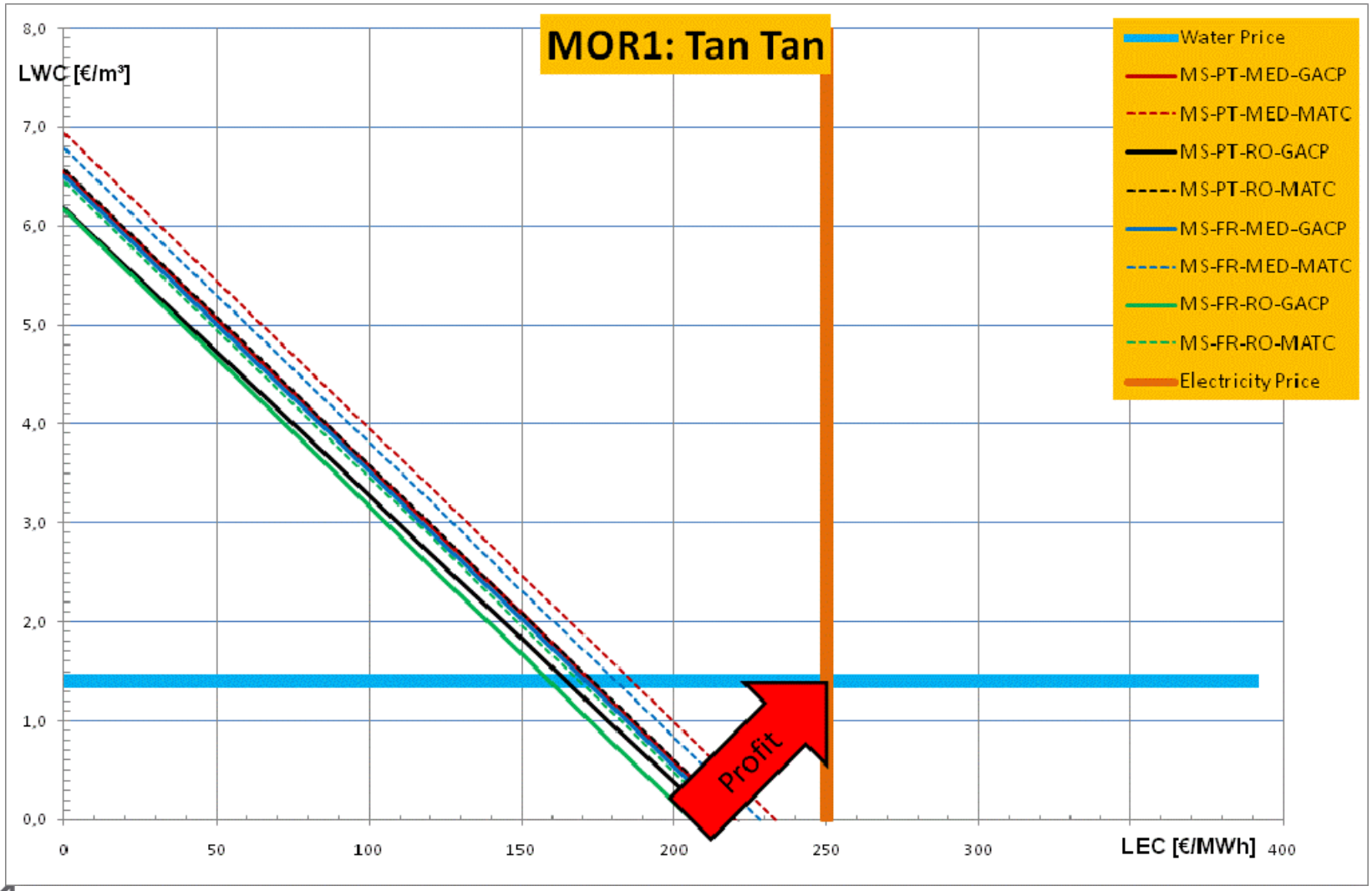
40% **55%** **85%**



Overview – Cost Models



Levelized Water Cost vs. Levelized Electricity Cost



Andere „least cost“ Optionen:

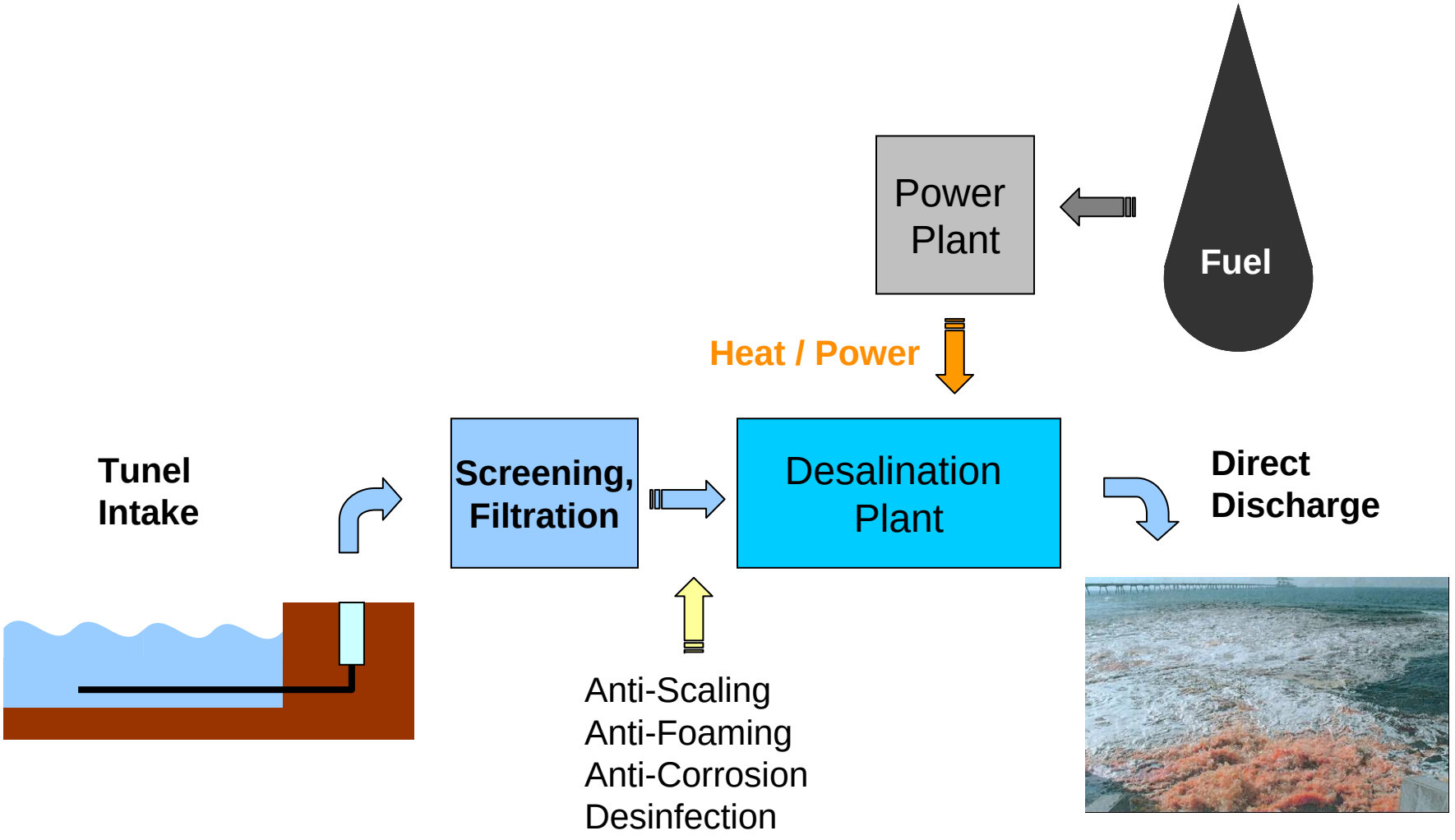
Strom aus mit Diesel betriebenen Gasturbinen
Tan-Tan, Marokko, Sommer 2008: 29 €ct/kWh

Trinkwasser heute aus Tanklastwagen in Gaza, Palästina: 8 €/m³

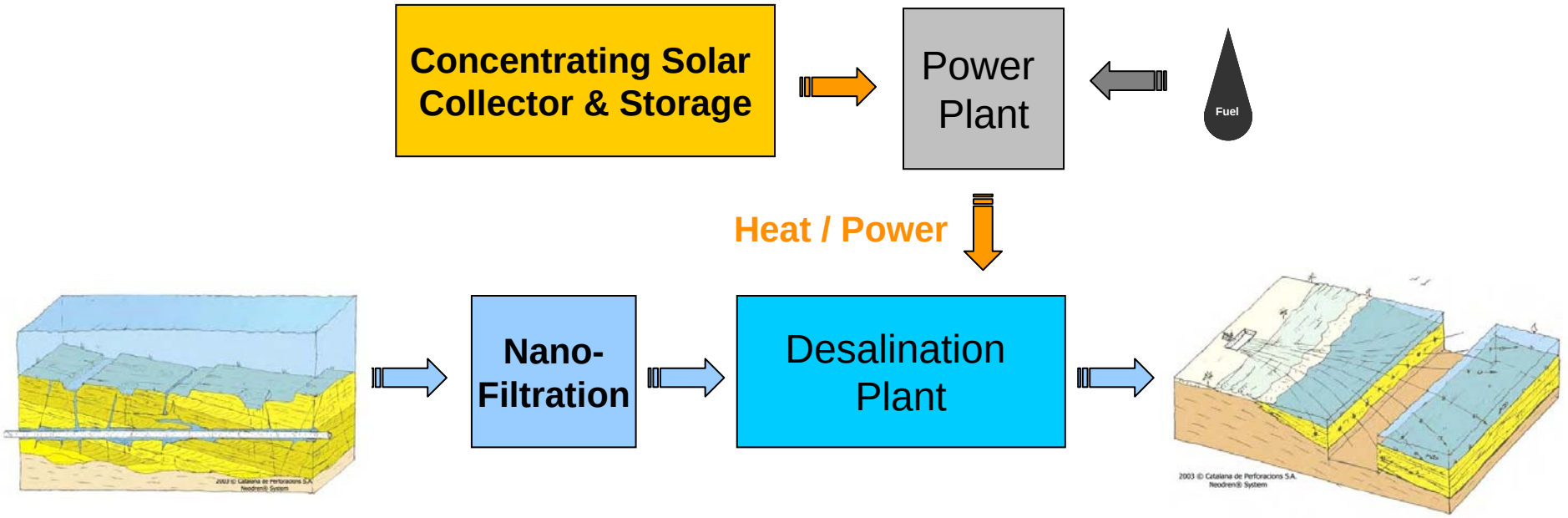
Zu arm für Sonnenenergie?

Tan-Tan Power Station

Conventional Desalination Plant



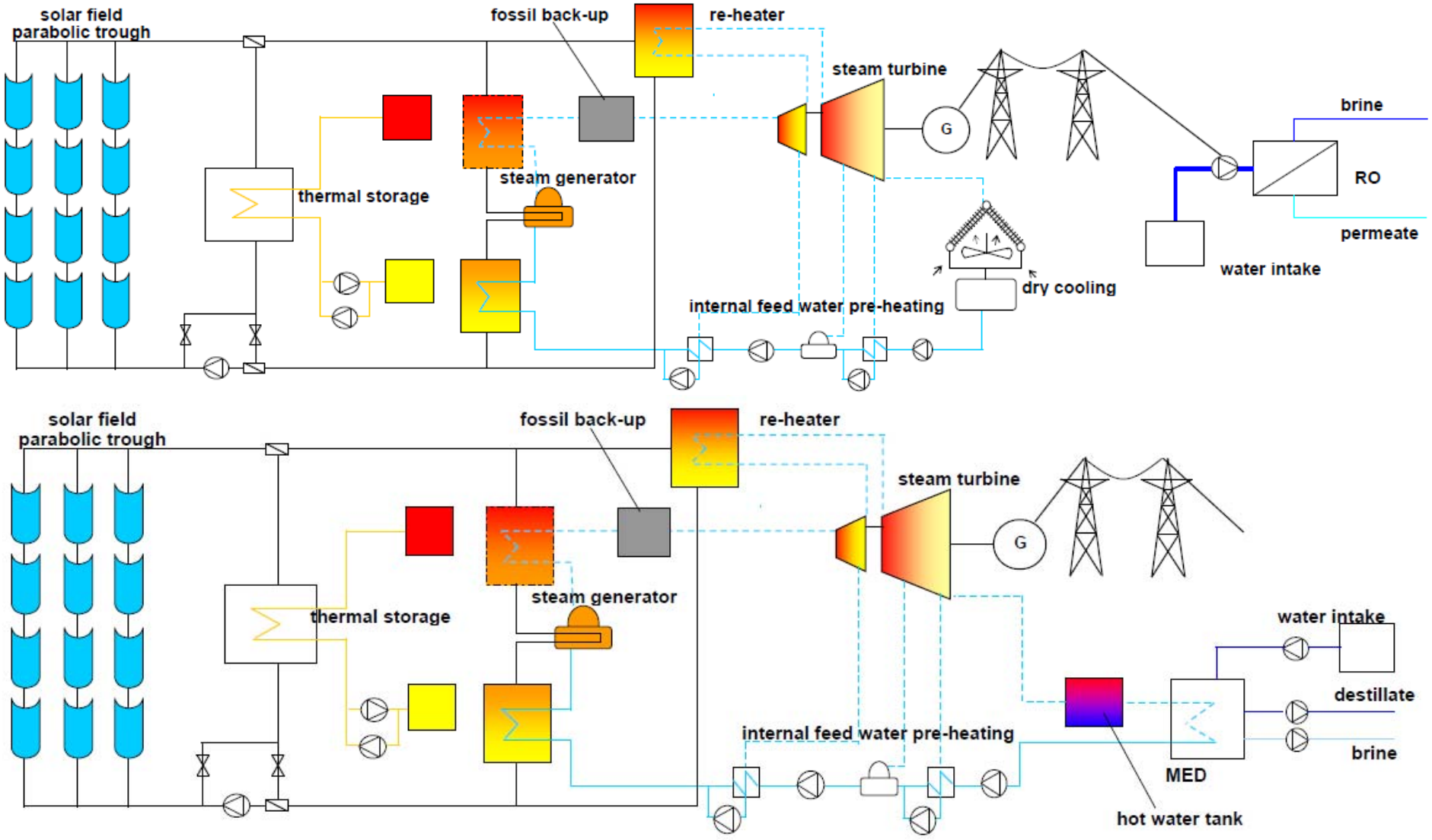
Advanced CSP-Desalination Plant



Horizontal Drain Intake or Micro- & Ultrafiltration

Multiport Diffuser Discharge

Systemkonfigurationen



Combined solar power and desalination plants: technico-economic potential in Mediterranean Partner countries

MED-CSD Project

Grant agreement 213824

SEVENTH FRAMEWORK PROGRAMME

MED-CSD

MED-CSD Consortium

Project coordinator

OME – France
Observatoire Méditerranéen de l'Energie

Partners

CDER – Morocco
Centre de Développement des Energies Renouvelables

DLR – Germany
Deutsches Zentrum für Luft-und Raumfart e.V.

EDF – France
Electricité de France

INVEN – Germany
INVEN Engineering GmbH

KERNENERGIEN – Germany
Kernenergien the solar power company

MEKOROT – Israel
Mekorot Water Company Ltd.

NREA – Egypt
New and Renewable Energy Development and Utilization Authority

NERC – Jordan
National Energy Research Center

ONEP Morocco
Office National de l'Eau Potable

PEC – PNA
Palestinian Energy and Environment Research Centre

TECHINT – Italy
The Techint Group

The Cyprus Institute - Cyprus

Funding

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The partner share their results and their experience. The project structure is build by a number of work packages.
Each partner is responsible or involved in different tasks:

- Technology review and selection of CSP and desalination configurations:
  - CSP Plants Technolgy Review
  - DES Desalination (DES) Technology Review
  - CSP & DES Technological integration (feed back and lessons from existing projects)
- Feasibility Studies of hybrid CSP water desalination plants:
  - Cyprus,
  - Egypt,
  - Italy,
  - Morocco,
  - PNA.
- Assessment of the technico-economic potential of CSP for electricity and desalination in Mediterranean partner countries.

MED-CSD

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