

TEMO – STPP

The TEMO Solar-Thermal Power Plant Project



مشروع محطة طاقة عن طريق الطاقة الشمسية الحرارية

شارك في الاستثمار لتطور الامة

Investment for Future

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

„Our profile is the combination of a cooperation structure with applied research institutes, the experience and the know-how of our engineers and the intercultural competence of our young international team“.



Welcome

The worldwide growth of economies creates an increasing demand for energy and fuel. On the other hand the demographic development both in Europe, where the working population is decreasing and in the North-African and Middle East region, where the amount of younger people who have a future working potential is increasing, it is necessary to find ways to offer future energy resources for Europe and the North-African and Middle East region. And in an increasing amount there must be found working possibilities for the growing up youth in the North-African and Middle East region especially now in background of the political changes in the region.

So it is very important to implement one of the key technologies – energy producing technology – in this region on the one side and on the other side implementing a future energy resource for Europe when the conventional resources will be over and especially nuclear energy is not any more a desirable choice for European people after Fukushima accident.

So the TEMO-STPP project produces energy, which can be used by the producing country and also transported to Europe and on the other hand creates working possibilities for the young educated people in the North-African and Middle East region. And with the help of God, the Almighty, this will be a big effort for a better and peaceful future for the two neighbour regions Europe and North-Africa/Middle East.



Samir Mourad, Electrical Engineer
AECENAR President & TEMO e.K. CEO

Our Team



Samir Mourad,
Project Management &
Mechanical Engineering



Abdulfattah Ammar,
Component Integration &
Finance



Hussam Mourad,
Senior Partner



Said Elmsaadi,
Electrical Device Installation &
Process Control System



Abdurrahman Mourad,
Abdullah Mourad,
Construction/Simulation



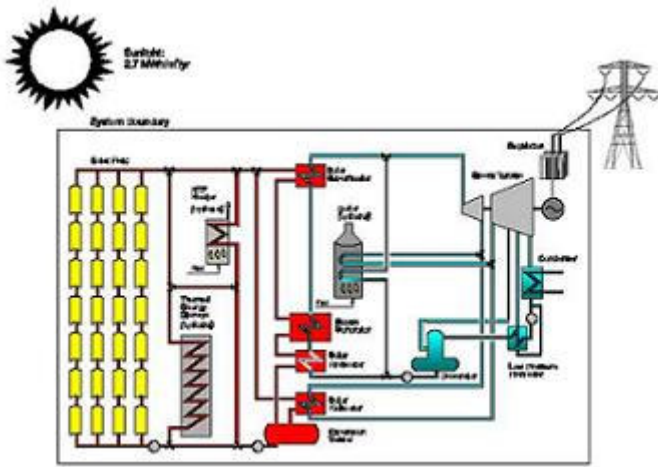
Nebil Messaoudi,
Technical Documentation



Hassan Derbani, Logistics

What is a “Solar Thermal Power Plant” (STPP)”?

A solar thermal power unit uses rays of the sun to heat thermal oil through mirrors. Thus water turns into water vapor. The water vapor is then conducted into a turbine that activates a current generator. This generator produces electric current, which is injected into the power supply system. For night operation storage salt is being used that was heated at daytime. The STPP operates without any photovoltaic, which use resource silica. Thus this technology is 100% sustainable and does not spend any of our most precious resources. Furthermore it is a very good alternative for regions rich of sun's rays instead of conventional power stations, such as coal-fired and nuclear power stations.



Block diagram of a solar thermal power plant



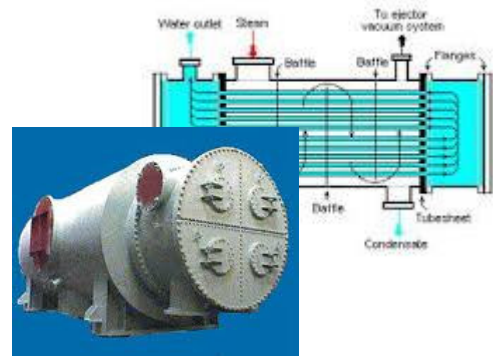
Solar collector array



Steam Turbine



Generator



Condenser

Conventional Main Power Plant Elements which are Reusable from Out of Service Conventional Power Plants

Efficiency and financial risks

According to a study of the AECENAR member institute VaEf (Institute for Alternative Energy Research) which is based, among other things, on studies of the world bank in 1999, the estimated costs of such a unit will be starting at 2010 about 3-4 Cent a KWh. Thus such a unit is competitive.

The TEMO-STPP project

It is planned to install a 7 MW power station.

The STPP is going to be completed by the end of 2013, so God will.

To gain major investors, in cooperation with scientific institutes (Assoc. for Alternative Energy Research (VaEf), Karlsruhe as well as the Institute for Nuclear Technology and Reactor Safety at the University of Karlsruhe) a model of the STPP as big as a table was installed.

For initial kernel team building a 40 kW test rig is developed actually.

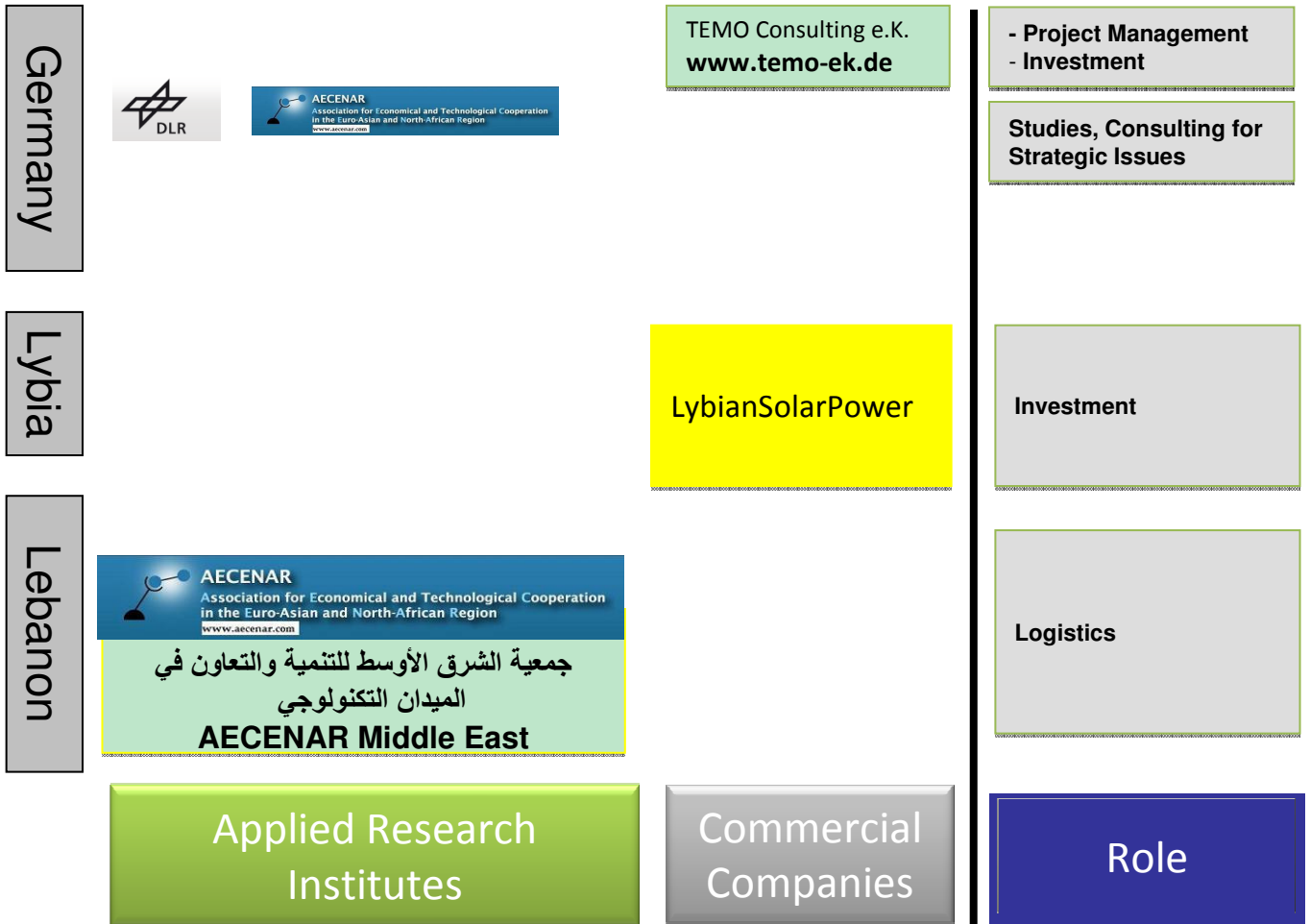
Time scale

| | 2004 - 2008 | 2008 – (planned) June 2012 | (planned) July 2012 – December 2013 |
|------------|--|-------------------------------|--|
| Activities | Studies and Pre-Development | Development of Test rig | Installing the 7 MW STPP in North Africa (Zawia/Lybia) |
| Partners | TEMO, VaEf (institute of AECENAR), KIT (Karlsruhe Institute of Technology (former name of KIT: University of Karlsruhe)) | TEMO, AECENAR, KIT | TEMO, AECENAR, Lybian Solar Energy Company |

Connections between Europe and Middle East/North African Region



Actual Partners and Roles in the TEMO-STPP (Solar Thermal Power Plant) project



Next Steps Overview

Dec.2011 – June 2012

July 2012 – December 2013

**Placement Studies,
Contracting with
Partners**

Installation in Lybia

Costs: 361.000 EUR

**Task:
Installation of a 7 MW power plant in the
Lybian Desert**

Time span: 18 months

Costs: 18 Mio. EUR

Amortization time: until 2028 insha Allah

Selling Price of 1 kWh: 7 EUR-Cent

TEMO-STPP (Solar Thermal Power Plant) project – Installation in Zawia/Lybia

Time span:

**18 months
(Aug. 2012
– Dec. 2013)**



Material

| | |
|---|---------------|
| 7 MW Turbine&Generator | 1.000.000 EUR |
| Heat exchanger, condensor, Pipes, pumps, ... | 200.000 EUR |
| 400m x 400m solar collector field (100x30x5.000 EUR) | 15 Mio. EUR |

Personal

Project Management & Leadership
5 Engineers

About 50 technicians and workers

Personnel costs: **1.200.000 EUR**

**Total installation cost:
about 18 Mio. EUR**

7 MW Solar Thermal Power Plant

Operated
and lead by
experts from
Lybia and
neighbour
countries

**Activities:
Installation of the
Power Plant**

Costs

Output / Win

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AECENAR Middle East

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