

Fourth Middle East and North Africa
Renewable Energy Conference

MENAREC 4

Damascus 21-24 June 2007



المؤتمر الدولي الرابع لدول الشرق الأوسط
و شمال إفريقيا للطاقة المتجددة

MENAREC 4

دمشق ٢١-٢٤ حزيران ٢٠٠٧

Renewable Energy Partnership for Europe - Middle East - North Africa



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NOKRASCHY ENGINEERING
Mechanical Vibrations and Infrasound under Control
Solar Power for Sustainable and Everlasting Energy

Transmediterranean Renewable Energy Co-operation, TREC is:



- a network of devoted scientists from Europe, North Africa and the Middle East.
- Working to create a real Partnership.
- TREC does not only point out problems.
- It offers a strategy to solve fossil fuel scarcity, realise prosperity, security of energy supply and safety of peoples.
- Through an energy and technology exchange pool around the Mediterranean.



WBGU

GERMAN ADVISORY COUNCIL ON GLOBAL CHANGE
WISSENSCHAFTLICHER BEIRAT DER BUNDESREGIERUNG GLOBALE UMWELTVERÄNDERUNGEN

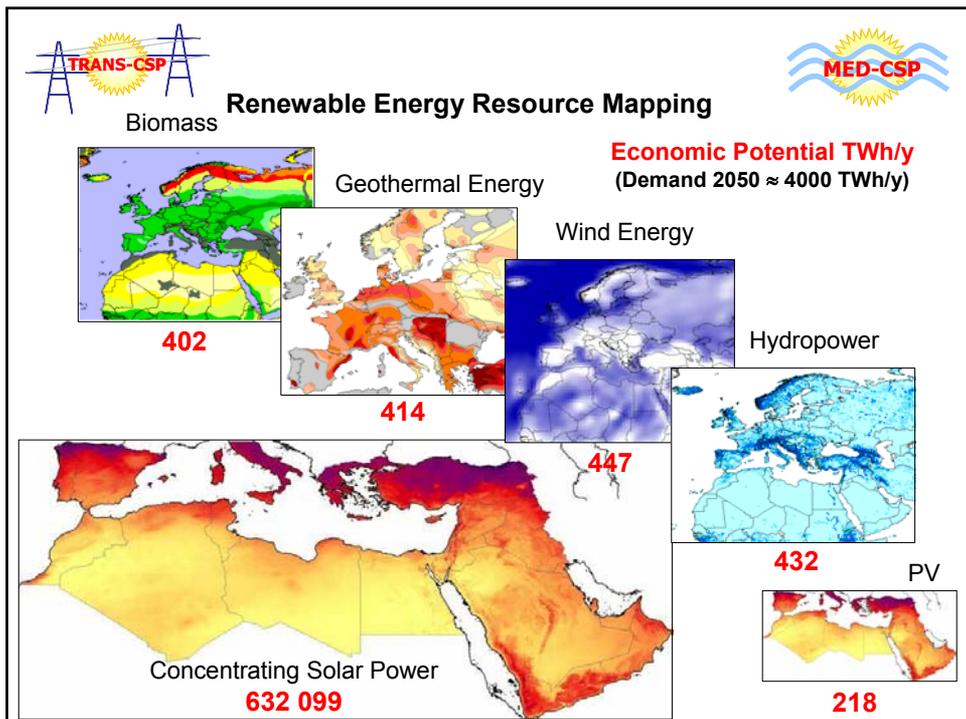
Policy Paper No. 5 (2007)

A European Supergrid

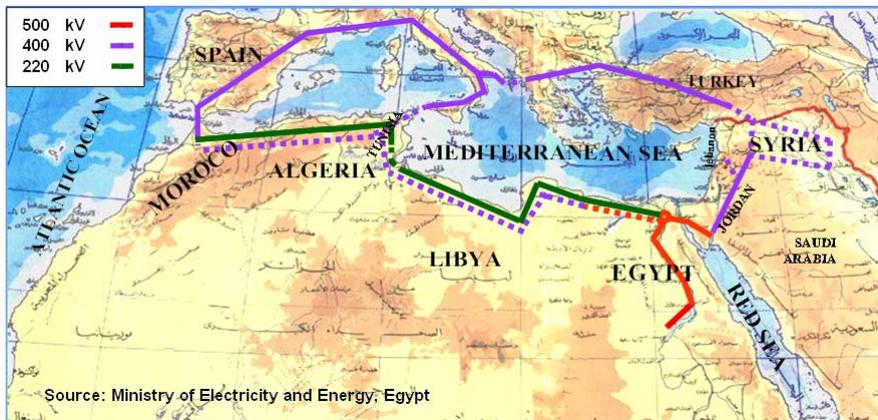
A trans-European high-capacity power grid is proposed.....

This grid, with a transmission capacity of around 10 GW, would carry power to wherever it is needed

.... the same applies to hookups to on-shore **wind farms in regions of Africa** with very high wind speeds or to **solar thermal plants** in regions with intense solar irradiance.



The Partnership needs a Structure

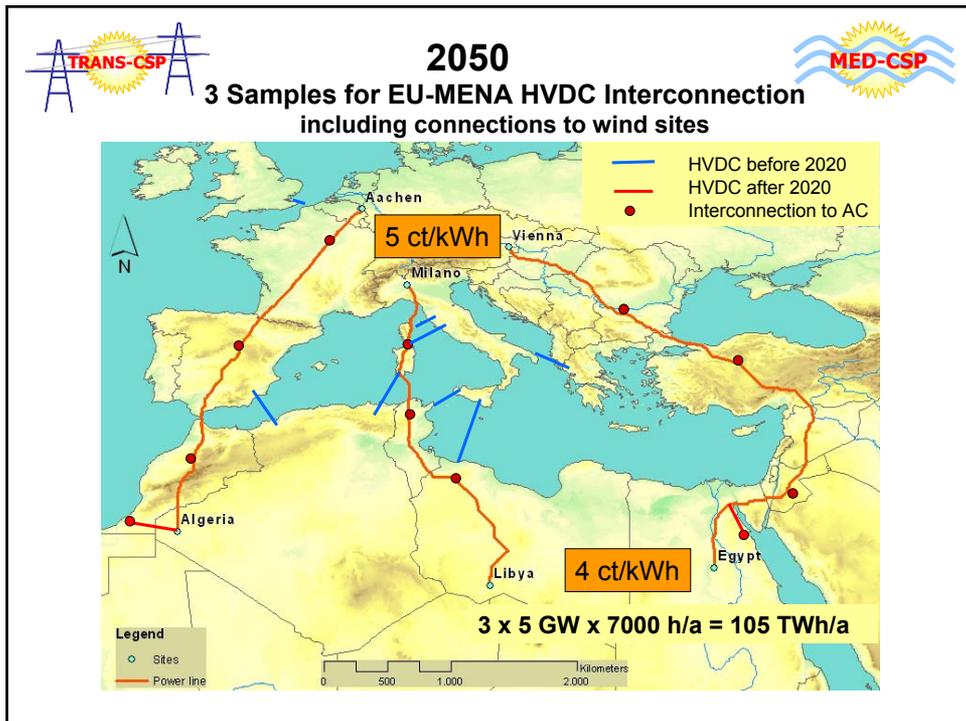


Transmission lines around the Mediterranean are almost complete.
Beside compensating peaks, clean energy can be transported to Europe.
The central connection Tunis-Sicily is under construction, due end of 2007

Let us imagine a practical case:

- Taking advantage of **CDM certificates** to compensate power generation from coal in Europe.
- A European company establishes together with a company from MENA a **Low Cost Solar Power Station** in a MENA country.
- **Solar-Hybrid** concept is preferred to ensure supply on demand.
- The solar electricity share of at least **20%** will be transmitted to Europe (**Transmission costs 1 ct/kWh with HVDC lines**) while the conventional share will be consumed in the MENA country.
- Beside electricity, **desalted water** will be produced from the waste heat of the power station, thus boosting the economies.
- Electricity may be used to produce **clean Hydrogen**

**A framework shall govern
such a co-operation**



General Ideas for the Framework

- Renewable energy shall be produced where it is most economical. For example in MENA countries
 - Wind 10 m/s (gulf of Suez and Atlas mountains)
 - Sun 3000 kWh/m²/y (nearly all over the Sahara)
- Agreements between country groups or bilateral agreements are suitable to reach the goal.
- Mutual benefit is aimed in this co-operation.
- At the start phase strong support from the European country to the MENA country will accelerate the development.
- Clean electricity and Hydrogen from MENA shall cover about 15% of Europe's demand.

What can the MENA-country do?

- Offer free land and infrastructure.
- Buy the conventional electricity share
(for example at 2.5 ct/kWh depend. on fuel price)
- Buy the desalted water produced from waste heat (for example at 50 ct/m³)
- Guarantee by law capital security.
- Free from taxes for the first 10 years.

What can the European country do?

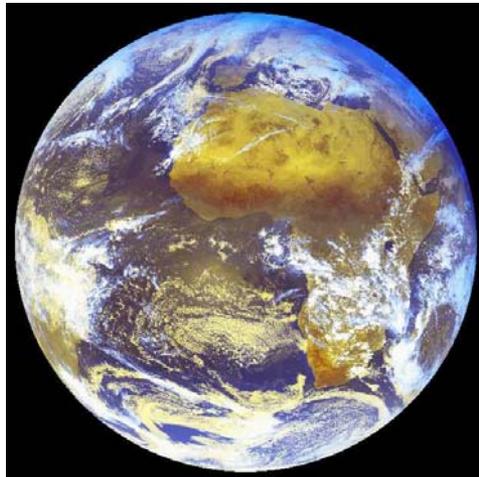
1. Set a quota for clean electricity, which is increased each year by 1% points over the actual value for each electricity producer. This is compatible with the target of 20% in 2020.
2. Extend support to clean electricity and clean Hydrogen for supplies from outside the country.
3. Set incentive prices for clean electricity import:
 - for example 12 ct/kWh for solar electricity
 - for example 8 ct/kWh for wind electricityTo cover the initial costs of production and transmission.
4. The incentive price is valid only for the clean share of a hybrid system.
5. The incentive price is guaranteed for 10 years.
6. After 10 years it is reduced by 10% points each year.

What are the „Win-win-objectives“?

- **Europe wins:**
 - Clean and cheaper electricity and Hydrogen.
 - **Employment** due to machinery export.
 - Diversification of energy sources.
- **MENA wins:**
 - **Water**.
 - Sells electricity and Hydrogen for a reasonable price.
 - Social and economic development.
- **Environment wins:**
 - **Less CO₂** emission.
 - This system encourages developing low cost equipment and extending solar share to 100% using heat storage.

Thanking you for your attention

www.nokraschy.net



Source:
MeteoSat
EUMETSAT

This picture shows how sunny is MENA