



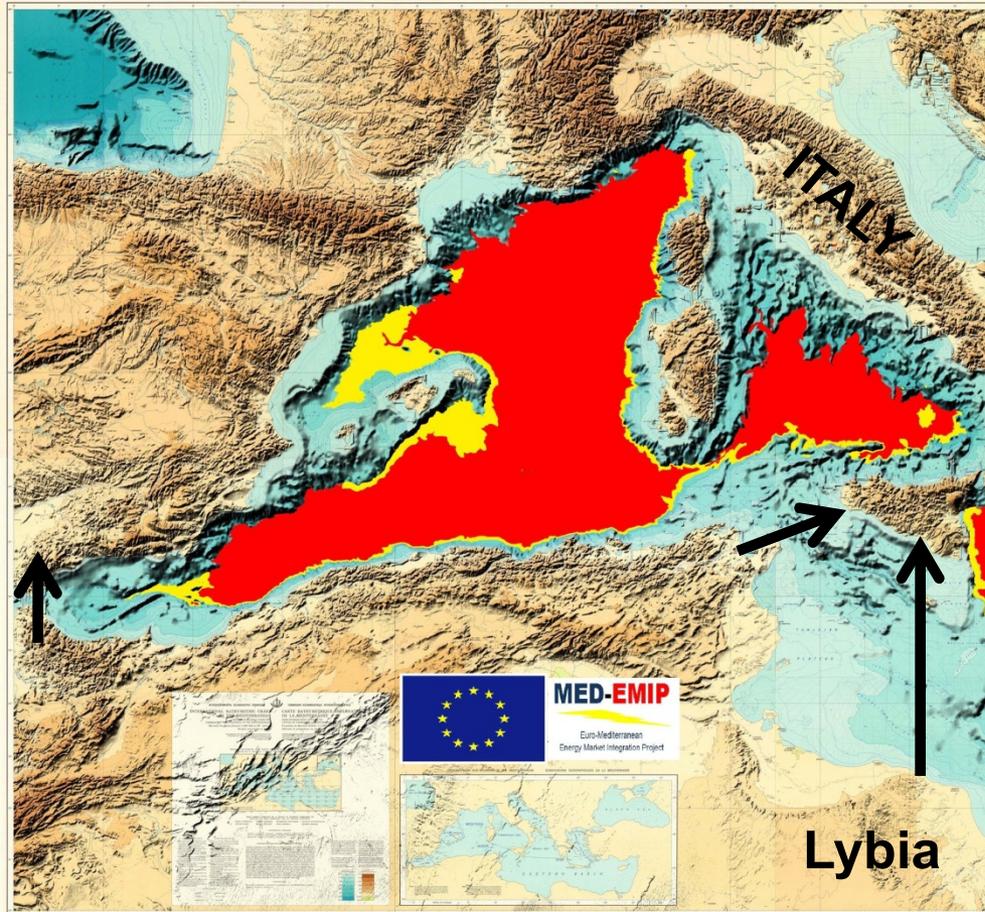
# CAIRO CLIMATE TALKS

**“DESERTEC – Energy from the Desert Opportunities for Egypt”**  
*5 June 2012, Cairo, Egypt*

*by*

*Albrecht Kaupp*





**Electricity export by submarine cable into the EU is only realistic for the left shown 4 countries of Morocco, Algeria, Tunisia, Libya .**

**Challenges due to sea depth and steep coast lines will remain for many years to come for Egypt, Israel, Syria, occupied Palestinian Territories and Lebanon.**

**Terrestrial path through Turkey and Bosphorus may not find a electricity buyer .**



## Photovoltaic power plants



## and Wind power



are already competitive in Egypt, calculated against the **real** cost of electricity generation from gas and heavy fuel oil. The cost/benefit for Egypt's treasury may be better if RE based electricity is not **physically** exported but consumed domestically or traded in another way.



**of the electricity power plant gate prices among those 3 major RE technology system groups CSP, PV, Wind . The gap will not be easily narrowed since all 3 continue with technology improvements**





3400 kWh/kW



x 2 =

1700 kWh/kW



x 1.7 =

2100 kWh/kW



WIND = ~7 ¢ / kWh

PV = ~14 ¢ / kWh

CSP = ~24 ¢ / kWh

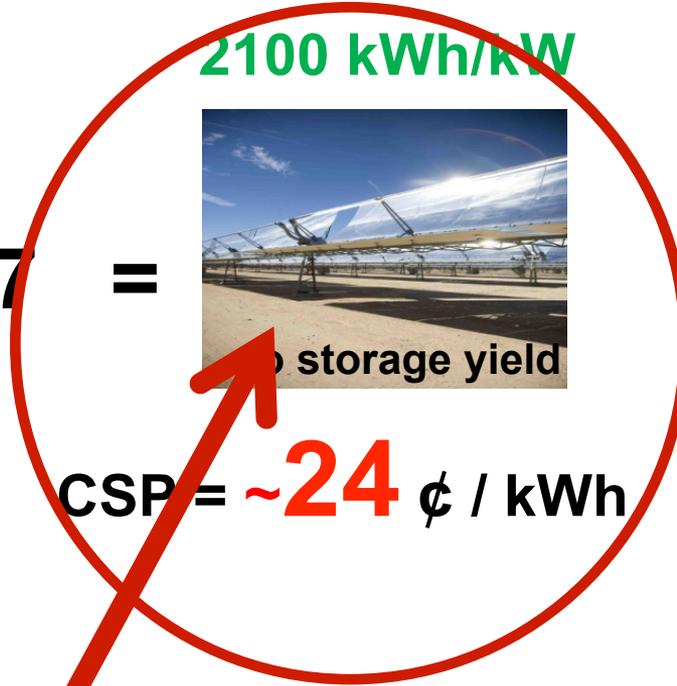


**IF**



- ❖ Each technology is located at a “good location”, and
- ❖ Each technology enjoys the same financial conditions, and
- ❖ Each technology has the same perceived or real risks, but
- ❖ Electricity buyers will value the “quality” of the electricity.

**Commercial Financing at 12% WACC**





**Wind**

**PV**

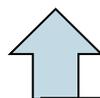
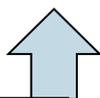
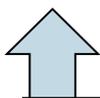
**CSP**



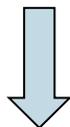
**x < 2 =**



**x 1.5 =**

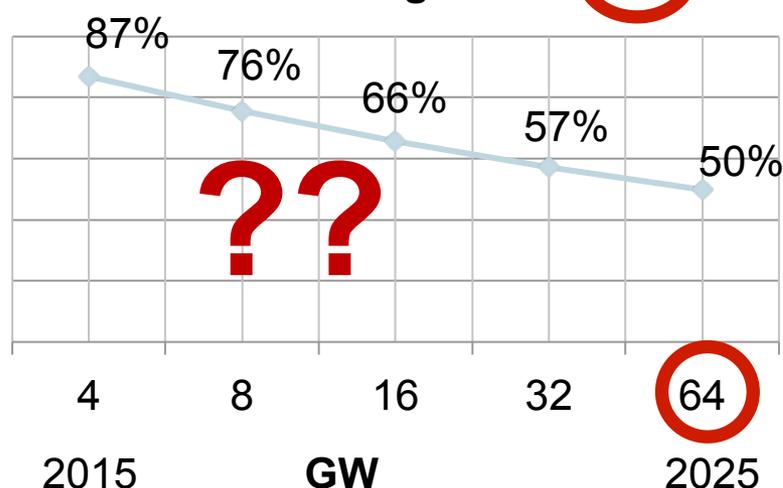


- Net yield kWh difference may change
- Investment cost per kW in favor of PV



Factor **2** will be challenged by PV and may drop to **1.5** due to faster falling PV system costs.

**CSP Learning curve 15%**

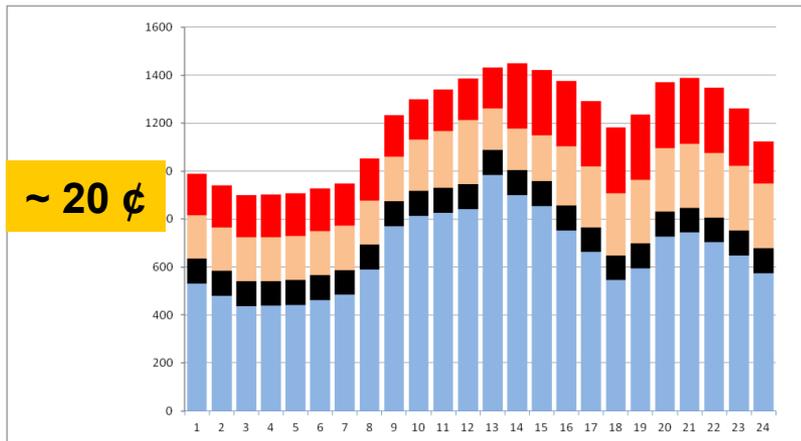




Solar and Wind based electricity generation is already financially competitive if promoters would avoid the practice of

- Selecting the wrong technology, or
- Putting it into the wrong places, or
- Operating it in the wrong application setting

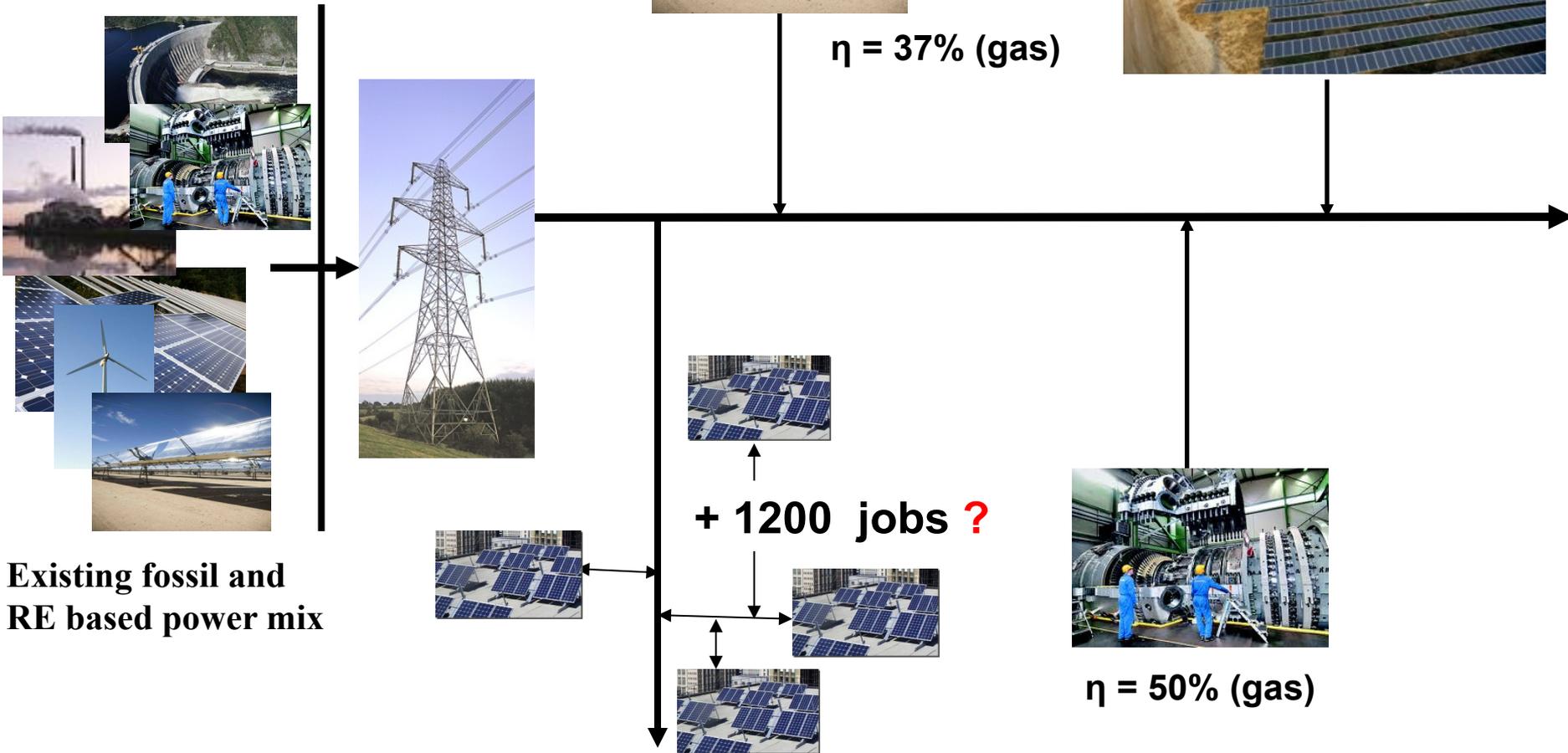
### 24 hour merit order of fuel usage



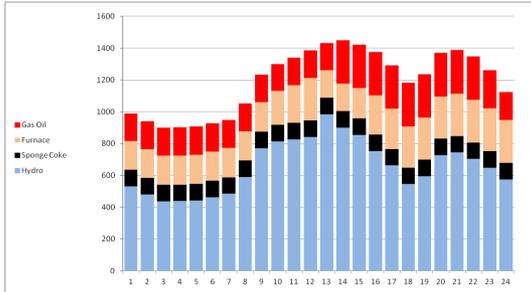
 Imported oil

The better project scenarios are power stations that.....

- Burn at least 6 hours oil during the day
- Egypt imports this oil
- Treasury pays “market” prices for oil



# Two Recommendations

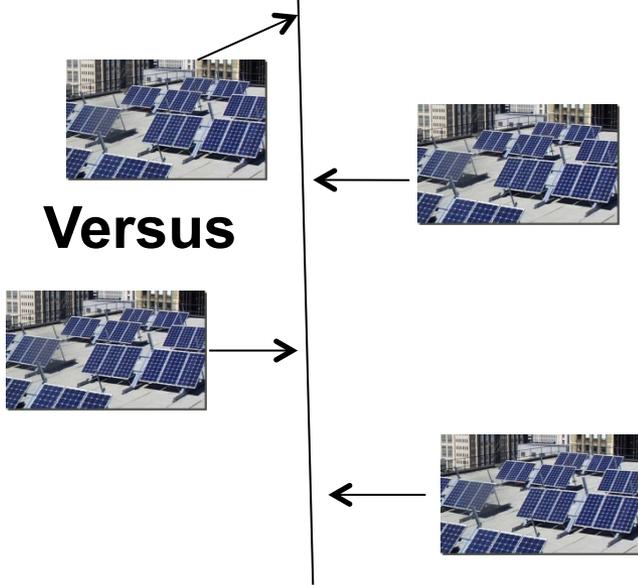


Identify and prepare a list of cases for stand alone fossil fuel saving plants replacing imported oil in the region. They are already cost effective no matter what economic test is used.

**PV Retrofit of Existing New Valley Water Pumping Stations**



**Versus**



Distributed PV versus central PV for all cases. No prefer economic vs. investment over investor's gains ?

**At least develop a strategy, design a plan and compare**

