



## Dutch - Tunisian Solar Energy Plan

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The latest publication by the IPCC (March 2014) confronts humanity with an immense problem, possibly the greatest problem ever. The reduction of greenhouse gas emissions, requiring the replacement of oil, coal and natural gas by sun, wind, geothermal energy, biomass etc. deserves the highest priority, and all countries should do their utmost to achieve this.

The Dutch - Tunisian Solar Energy Plan is a bilateral treaty between the Netherlands and Tunisia intending to accelerate the transition towards renewable energy.

Comparing Tunisia and the Netherlands we see a high degree of complementarity. Due to its high population density there is no way that the Netherlands can generate all the energy it needs on its own territory, even if drastic energy saving measures are implemented. The same applies to the other countries in north western Europe, see e.g. the highly informative book by David MacKay "Sustainable Energy - Without the Hot Air", freely available through the internet, ref.1. Thanks to their huge area and much more intense solar irradiation the Tunisian deserts can supply electricity to a part of Europe if they are covered with solar mirrors and solar panels.

The generation costs of solar mirror systems in Tunisia are lower than those of wind farms in the North Sea and the price advantage is expected to further increase due to the learning curve effect. The inclusion of high-temperature heat storage ensures that the dispatchability of the electricity is much higher.

A reliable and mostly renewable electricity supply system can be realized in Tunisia by combining solar mirror power plants equipped with heat storage (CSP = Concentrating Solar Power) with solar panels (PV = Photovoltaics) and wind farms. Some of the existing gas-fired plants will be maintained for back-up purposes and will only be needed on rare occasions, and mainly in the winter.

Dutch companies and organizations have much experience with large and technically complex projects in foreign countries.

The construction of utility scale power projects requires large local labour pools, and this is especially true in the case of concentrating solar power systems. There is much more labour available in Tunisia than there is in the Netherlands.

Dutch institutional investors such as pension funds and insurance companies have started a process of divesting themselves of shares in fossil energy sources, and are hence on the lookout for sustainable and

climate neutral long term investments. Besides offshore wind farms, solar power plants in Tunisia suit the requirements of this kind of investor very well.

We propose a cooperation between the Netherlands and Tunisia, laid down in a bilateral treaty bearing the name Dutch Tunisian Solar Energy Plan. This plan should enable renewable energy projects in Tunisia that fulfill certain conditions to profit from the Dutch SDE+ regulation.

The first phase of the Plan is the realization of an almost 100% renewable electricity production in Tunisia within 15 years. All relevant technologies, large or small scale, including wind, can be included in the Plan, however the proposed name is deemed appropriate considering the fact that solar energy is dominant in a country such as Tunisia. During the global transition from fossil to renewable energy, solar energy is the low hanging fruit from which Dutch companies can only profit when there is a good cooperation with such a sunny country.

In the second phase new High Voltage Direct Current conduits will transport electricity to Europe. Furthermore energy intensive industry such as aluminium factories can be established in Tunisia. In our vision of the future “solar oil” will be made from solar energy and CO<sub>2</sub> which is captured from the atmosphere. This solar oil will replace the diesel and petrol fuels made from petroleum. Tunisia is an eminently suitable location for this new industry.

In more detail the Dutch Tunisian Solar Energy Plan can comprise the following subjects:

1. Making an inventory of the geographical, climatological, economical, sociological, and legal potentials of solar energy in Tunisia, including the utility scale variants.
2. Making an inventory of the existing initiatives for Tunisia, such as that by NUR Energy (ref. 2)
3. Making up a plan to make the electricity supply for Tunisia almost completely renewable within 15 years so that the CO<sub>2</sub> emissions of the existing Tunisian gas fired power plants will be decimated. This plan is more ambitious by a factor 3 than the Intended Nationally Determined Contribution (INDC) that has been submitted by Tunisia for the climate conference COP21 in Paris, see ref. 3.
4. The creation of a single legal space in the Netherlands and Tunisia, more specifically: the SDE+ regulation should also apply in Tunisian territory.
5. Collaboration between Dutch and Tunisian universities and colleges in the field of solar energy, collaboration between ECN and TNO and their sister organizations in Tunisia, creation of joint solar energy laboratory in Tunisia.
6. Creation of a revolving Dutch - Tunisian solar energy investment fund, to be financed from Dutch natural gas income.
7. Stimulation of the Dutch and Tunisian solar energy industry, including the CSP industry
8. Construction and operation of a CSP power plant of at least 100 MW, for example a solar tower plant from the Dutch NEM company (ref. 4) by a Dutch - Tunisian syndicate, with a PPA (power supply contract) that is paid for by the Dutch SDE+.
9. Registration of this CSP power plant as contribution towards the compulsory 14% renewable Dutch electricity generation as per 2020. The relevant European guideline, EU Electricity Guideline 2009/28/EG art. 9, allows this within the framework of a bilateral treaty, on condition that the electricity is delivered through a high voltage line to a European member state, e.g. Italy.

The Dutch Tunisian Solar Energy Plan should complement and strengthen existing international collaborations and initiatives such as the Mediterranean Union, Desertec and EUROSUNMED.

The Dutch Tunisian Solar Energy Plan will turn Tunisia into an energy exporting country towards which Dutch industry can supply a sizable contribution.

By combining their efforts, the Netherlands and Tunisia can deliver a much bigger contribution towards the necessary global reduction of the CO<sub>2</sub> emissions than will be the case when the two countries continue to act separately.

In the 19th century enterprising Americans migrated to the desert in the West and gave that dynamic nation new mental energy. Let the Europeans, this time in harmony with the Tunisians, Moroccans, Algerians, Libyans and Egyptians, exploit the Sahara in the good, sustainable way. This perspective can give the Europeans, guided by the Dutch, the new élan that is needed for solving the biggest problem confronting humanity - climate change.

This the English translation of the original document:  
Nederlands-Tunesisch Zonne-Energie Plan, oktober 2015, published by GEZEN Foundation for Utility Scale Solar Energy, [www.gezen.nl](http://www.gezen.nl).

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## References:

1. David J.C. Mackay “Sustainable Energy - without the hot air”, <http://www.withouthotair.com>
2. <http://www.nurenergie.com>
3. Intended Nationally Determined Contribution ((INDC) of Tunisia:  
<http://www4.unfccc.int/submissions/INDC/Published%20Documents/Tunisia/1/INDC%20Tunisie%20VF%205%20aout%20Valid.pdf> (French), and  
<http://www4.unfccc.int/submissions/INDC/Published%20Documents/Tunisia/1/INDC-Tunisia-English%20Version.pdf> (English)
4. <http://www.nem-group.com>