Power from the Sahara

The desert power project DESERTEC could develop to an important source of income for North Africa and promote the economic integration of the continent.
By Abdelaziz Bennouna

The desert power project DESERTEC has proponents and opponents. Its advocates see a huge change for the future in it. Opponents accuse it of gigantism. They defend the decentralized power generation as a future- and consumer-oriented production form.

Solar electricity production is a new form of agriculture, the energy agriculture. It has a very old and experienced sister in the food agriculture, which converts sunbeams and produces primary digestible sources of energy (like grain, vegetable and fruit), and produces secondary digestible sources of energy (like meat, eggs, milk and cheese). Grain can be produced on large fields most economically and healthiest for humans and nature. It is similar with solar power.

Electric current is a basic source of energy. At the beginning of the twentieth century Electricity was still a rare luxury good, which only rich people could afford. At the beginning of the 21th century electricity became an indispensable basic supply commodity. This is valid not only for Europe and other industrialized countries, but also for North Africa.

The project DESERTEC opens the chance for North Africa for a long-lasting basic electricity production from a resources available in abundance here: solar radiation. On top of that, it makes the export of this solar electricity possible also to Europe and represents thereby a lasting source of income for North Africa. Through diversification of the production locations on several North African countries, investment and supply risks are decreased. In addition the connection to Europe is divided to several possible passages and optimized thereby. This form of the binding to Europe will lead to better understanding between the regions and also to a better economic integration of North Africa into the Mediterranean area. The East -West distribution of the plants extends and stabilizes direct solar electricity production on the day and reduces the storage need.

A plant at Ouarzazte or Zagora in Morocco has for example the three-times annual electricity production of a comparable plant with Munich or Stuttgart. In winter it reaches the six to eightfold monthly production. That has a very large influence on the balance of power capacities and loads, of production and storage and, of course on the production costs.

Large solarthermal power stations with energy storage can make possible operation around the clock and, thus, provide base load electricity. Seasonal differences between generation of power and demand cannot be balanced, however, not even by the heat storage. Solar and wind-power plants can partly complement each other, though in their production profiles, contribute also seasonally, and through cooperation reduce somewhat the electricity storage requirement.

With increasing market penetration of solar power generation in a given energy system it will be however become necessary, to store with chemical technologies occasionally considerable quantities of electricity over several days, weeks or months in order to make them again available for the later use. Nothing else does Central Europe today with natural gas storage in underground storage, because the natural gas is supplied continuously over the year, whereas two thirds of it is used during the winter term.

Since solar thermal power stations are only effective with a high direct radiation portion and economically efficient, they must be established in southern degrees of latitude. Thus North Africa is an ideal location. Solar power stations are suitable also in ideal way for the thermal seawater desalination. This becomes necessary in ever more countries and is in the long-run indispensable as replacement for fossil energies used today. In the southern countries there are thus good conditions, to use the solar radiation for the own population, in addition, for the countries of Europe. These favorable conditions should be used as fast as possible.

It is not conducive to debate whether renewable power is only meaningful when produced decentralized (thus locally self-sufficient) in Europe or also using centralized production components in North Africa. There has always been dependence in the supply of raw materials and energy in the past centuries. It and such dependence will exist to a certain degree also in the coming centuries.

The DESERTEC plan foresees power stations in many North African countries and distributes geographical and political dependence and risks in the best possible way. Why for example should the purchase of solar electricity from Libya be riskier than a purchase of crude oil? Libya finally is since decades one of the most important oil suppliers of Germany. A ton of oil, which is not exported, remains stored for later. One megawatt hour of produced solar electricity, which is not sold, is lost for the exporter.

An import share of approximately 15 per cent of electricity supply envisaged by DESERTEC for the middle of the century will not increase the energy import dependence of Europe compared to today. A fruitful co-operation can make possible give and take between Europe and North Africa within this interdependence and promote acceptable living conditions as well as a stabilization of the North African societies by these dependence. A Moroccan proverb says: A hand does not applaud alone. We are all responsible, although surely on different levels. But we must start today, since unfortunately we missed it yesterday.

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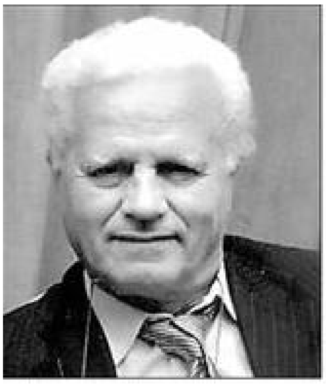

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