

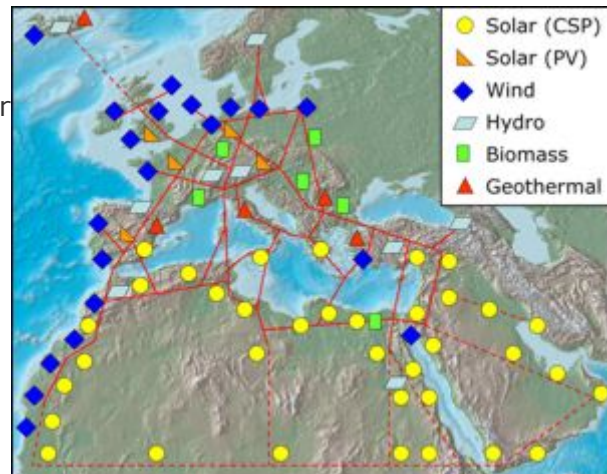
Plan to export African solar power to Europe

LAURA GRANT, DECEMBER 26 2007

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The European Union is considering spending £5-billion (R70-billion) on a solar power scheme that could provide up to a sixth of Europe's electricity needs.

The electricity would be generated by hundreds of concentrating solar power (CSP) plants situated in desert regions of North Africa and the Middle East and then transmitted by undersea cable to Europe, [The Observer](#) reports.



The project envisages that up to 100-billion watts could be generated by the desert stations. Two-thirds would be kept for local needs and the rest exported to Europe. The CSP plants will also act as desalination plants to provide fresh water for the host countries.

CSP technology is being assessed by Eskom for a large-scale, grid-connected solar project in South Africa.

The scheme in North Africa and the Middle East - developed by the [Trans-Mediterranean Renewable Energy Corporation](#) - could cost more than £200-billion (about R2.8-trillion) over the next 30 years, The Observer reports. The idea is that Europe would provide funds to develop the technology to run the project and to build a prototype station. Then banks, financial institutions and national governments would take over.

Gerhard Knies, a physicist and co-founder of the scheme, said that "it is proven technology. We have shown that it works on our test plants" .

Although only small plants have been tested it is thought that plants capable of generating 100MW could be built soon - one of them may be near Upington in the Northern Cape.

CSP in South Africa

In 2002, Eskom completed a pre-feasibility study for a large-scale, grid-connected concentrated [solar power generation project](#). The study found that Upington offers one of the world's best [solar resources](#) and that a CSP plant



built in South Africa could produce the lowest-cost solar electricity in the world to date. It also found that CSP plants could be designed to meet evening peak loads in South Africa.

Eskom decided to look into building a 100MW "molten-salt-type central receiver" power plant near Upington. A feasibility study is reportedly due to be completed by the end of this year. The utility will then make a decision on whether to go further with the project, according to Eskom's [Sabre-Gen site](#).

One of the arguments used against the use of renewable energy in South Africa is that it is expensive. However, increasing moves to combat climate change and the availability of clean energy funding through Kyoto Protocol mechanisms may make solar power like CSP more attractive.

Commercial solar thermal

Solar thermal power plants have been in use commercially in California since 1985. The [Solar Energy Generating Systems \(SEGS\)](#), comprises nine solar power plants in California's Mojave Desert. The plants have a 354 MW installed capacity, making SEGS the largest solar plant in the world. The facilities have more than 1-million mirrors and cover more than 6.4 square kilometres. The plants have generated over 12-billion kWh of solar electricity since 1985.

The installation uses parabolic trough solar thermal [technology](#), which is different technology to the central receiver concentrated solar plant Eskom is looking into.

How does CSP work?

A central receiver CSP station of the type that Eskom is looking into would comprise a field of giant mirrors, called heliostats, that track the sun and focus its rays onto a central focal point, known as a receiver. The receiver is on a tower about 150m to 200m above the mirrors. The receiver absorbs the radiation and transfers the heat to molten salt which is then used to generate steam which is used to drive turbines that generate electricity. According to [Eskom](#), about 6,000 heliostats, each 120-square-metres in size, would be needed to obtain a power output of 100MW.

In Desertec it is envisaged that CSP could be used to desalinate sea water by piping the steam after it has powered the turbines through tanks of seawater which would boil and evaporate. Steam from the sea water would be piped away and condensed and stored as fresh water.

CSP power stations are said to be the cheapest way to generate solar electricity.