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Concentrated solar power could generate 'quarter of world's energy'

Industry groups call for solar thermal technology to expand in 'sun belt' around world as Spain leads the field

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Solar thermal is best suited to desert regions. Photograph: Ho/Reuters

Solar power stations that concentrate sunlight could generate up to one-quarter of the world's electricity needs by 2050, according to a study by environmental and solar industry groups. The technology, best suited to the desert regions of the world, could also create hundreds of thousands of new jobs and save millions of tonnes of CO₂ from entering the atmosphere.

Concentrating solar power (CSP) uses mirrors to focus sunlight onto water. This produces steam that can then turn turbines and generate electricity. It differs from photovoltaics, which use solar panels to turn sunlight directly into electricity and can operate even on overcast days. CSP only works in places where there are many days with clear skies and is a proven, reliable technology.

At the end of 2008 CSP capacity was around 430MW, and worldwide investment in the technology will reach

€2bn (£1.8bn) this year, according to Sven Teske of Greenpeace International and co-author of the report. He said investment could increase, under a relatively moderate scenario, to €11.1bn by 2010 and provide 7% of the world's generating capacity by 2030. By 2050 investment could reach €92.5bn, creating almost 2m jobs by 2050 and saving 2.1bn tonnes of CO₂ every year.

"Due to the feed-in tariff in Spain and a few schemes in the US, this technology is actually taking off and we wanted to highlight that we have a third big technology to fight climate change — wind, photovoltaics and now CSP," said Teske.

Spain is leading the field on CSP: more than 50 solar projects in the country have been approved for construction by the government and, by 2015, it will generate more than 2GW of power from CSP, comfortably exceeding current national targets. Spanish companies are also exporting their technology around the world.

Environmentalists argue that many countries in the "sun-belt" around the equator would benefit from CSP technology – including desert regions in the southern United States, north Africa, Mexico, China and India.

The new study, carried out by [Greenpeace International](#), the [European Solar Thermal Electricity Association](#) and the International Energy Agency's (IEA) [SolarPACES group](#), looked at three scenarios of future growth in CSP. The first was business-as-usual reference scenario that assumed no increases at all in CSP; the second continued the CSP investments seen in recent years in places such as Spain and the US; while the advanced scenario was most optimistic, removing all political and investment barriers to give figures for the true potential of CSP.

Under the third, most optimistic, scenario there could be a giant surge in investments to €21bn a year by 2015 and €174bn a year by 2050, creating hundreds of thousands of jobs. In this case, solar plants would have installed capacity of 1,500GW by 2050 and provide 25% of the world's electricity capacity. Even in the second scenario, which sees only modest increases, the world's combined CSP capacity could reach 830GW by 2050, representing up to 12% of the world's energy generation needs.

Teske acknowledged that these estimates were far higher than official figures from the IEA. It says that by 2050, CSP would provide only 0.2% of global power generation. But Teske added that the IEA analysis does not assume any increases in production capacity in the next few decades, hence CSP forms a very small part of the overall energy mix.

The new report also said that CSP technology was improving rapidly, with many new power plants fitted with storage systems for steam so that they could continue to operate at night. In addition it said the cost of the electricity produced, currently at €0.15 to €0.23 a kilowatt, would fall to €0.10-€0.14 by 2020 if governments continued to support the technology with incentives such as feed-in tariffs.