

Thermosolar power station in Spain works at night

March 18 2012, by Katell Abiven



The Torresol Energy Gemasolar plant in Fuentes de Andalucía near Seville. The unique thermosolar power station in southern Spain can shrug off cloudy days: energy stored when the sun shines lets it produce electricity even during the night.

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The Gemasolar station, up and running since last May, stands out in the plains of Andalusia.

From the road between Seville and Cordoba, one can see its central tower lit up like a beacon by 2,600 solar mirrors, each 120 square metres (28,500 square feet), that surround it in an immense 195-hectare (480-acre) circle.

"It is the first station in the world that works 24 hours a day, a solar power station that works day and night!" said Santago Arias, technical director of Torresol Energy, which runs the station.

The mechanism is "very easy to explain," he said: the panels reflect the sun's rays on to the tower, transmitting energy at an intensity 1,000 times higher than that of the sun's rays reaching the earth.

Energy is stored in a vat filled with molten salts at a temperature of more than 500 degrees C (930 F). Those salts are used to produce steam to turn the turbines and produce electricity.

It is the station's capacity to store energy that makes Gemasolar so different because it allows the plant to transmit power during the night, relying on energy it has accumulated during the day.



The Crown Prince of Abu Dhabi (left) with Spain's King Juan Carlos at last year's opening of the solar power plant. Torresol Energy is a joint venture between the Spanish engineering group Sener, which holds 60 percent, and Abu Dhabi-financed renewable energy firm Masdar.

"I use that energy as I see fit, and not as the sun dictates," Arias explained.

As a result, the plant produces 60 percent more energy than a station without [storage capacity](#) because it can work 6,400 hours a year compared to 1,200-2,000 hours for other solar power stations, he said.

"The amount of energy we produce a year is equal to the consumption of 30,000 Spanish households," Arias said, an annual saving of 30,000 tonnes of CO₂.

Helped by generous state aid, renewable energies have enjoyed a boom

in Spain, the world number two in solar energy and the biggest [wind power](#) producer in Europe, ahead of Germany.

For the Gemasolar solar product, [foreign investors](#) helped too: Torresol Energy is a joint venture between the Spanish engineering group Sener, which holds 60 percent, and Abu Dhabi-financed renewable energy firm Masdar.



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"This type of station is expensive, not because of the raw material we use, which is free solar [energy](#), but because of the enormous investment these plants require," Arias said.

The investment cost exceeds 200 million euros (\$260 million).

But "the day when the business has repaid that money to the banks (in 18 years, he estimates), this station will become a 1,000-euro note printing machine!," he said, recalling that oil prices have soared from \$28 a barrel in 2003 to nearly \$130.

For now, the economic crisis has nevertheless cast a shadow over this kind of project: Spain is battling to slash its deficit as it slides into recession and has suspended aid to new [renewable energy](#) projects.

Andalusia, hard hit by the economic crisis with the country's highest unemployment rate at 31.23 percent, holds regional elections on March 25.

"We have three projects ready but stalled" because of the aid suspension, Arias said, admitting that in a difficult global economy the group has not managed to sell the Gemasolar technology abroad despite huge interest outside Spain.

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