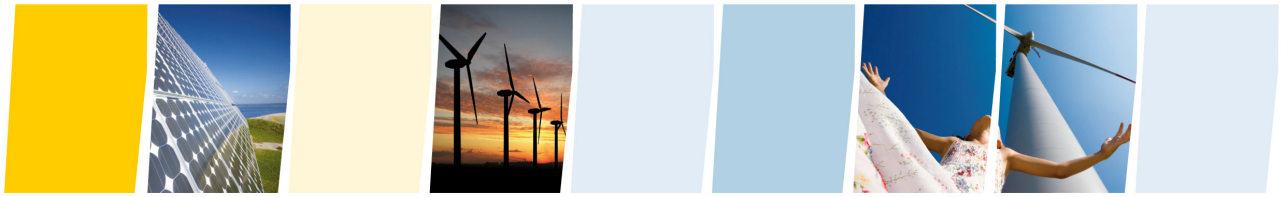
European Investment Bank

Spotlight



European Investment Bank finances renewable energies in Spain

Fostering a **sustainable, competitive and secure energy supply** is one of the Bank's operational priorities. It therefore gives priority to projects involving investment in renewable energies, energy efficiency, energy RDI, the diversification and security of the internal energy supply (including trans-European energy networks), and external energy security.

EIB loans for renewable energy projects have experienced major growth over the past few years. Up to 2006, the Bank lent around EUR 500 million a year under this heading. In 2007 and 2008, lending rose to EUR 2 billion a year. In 2009, the Bank lent EUR 4.2 billion for such projects. These figures include all types of renewable energy in the EIB's countries of operation, both within and outside the European Union.

These projects meet the EU renewable power generation, environmental improvement and energy security objectives endorsed by the plenary European Parliament in 2008 – dubbed the three 20s for 2020 (20% share of renewables, 20% emissions reduction and 20% energy saving).

Spain has been at the forefront of the development of renewable energy projects and has received decisive financial support from the EIB. As a country with a long tradition of hydropower, favourable geophysical conditions and a strong and innovative electricity sector, it quickly joined the move towards wind power and is pioneering the launch of large-scale thermosolar power plants. Since 1995, when the EIB financed the first wind power project in Spain, the Bank has provided EUR 2 billion for renewable energy projects in the country – although, in line with trends, the main growth took place from 2006 onwards, with the development of solar power being particularly significant. We have selected four very different projects for this brochure as examples of renewable energy generation in Spain.

Hydropower: harnessing water resources

Supported by an EIB loan in 2009, the expansion works currently being carried out by Iberdrola SA will turn the **La Muela II** hydropower facility into the biggest pumping plant in Europe. Four reversible units will be installed to exploit the 500 metre difference in levels between the La Muela reservoir and the Cortes de Pallás dam in Valencia. The schemes do not involve any enlargement of the dam, but are designed to double the plant's generation and pumping capacity to 1 260 MW and 1 110 MW respectively. Commissioning is scheduled for the end of 2012.

The purpose of pumping plants is to improve the management of power generation and especially to feed more renewable energy into the grid. These plants use energy produced at off-peak times, creating a substantial reserve of immediately available power.

Wind power: promoting renewables

The Bank granted Iberdrola SA a EUR 450 million loan to finance its 2005-2007 wind power investment programme. This includes the construction of wind farms throughout Spain, but mainly in Castilla-La Mancha, Andalusia and Galicia.

The project substantially increased the share of wind power in the company's energy mix, consolidating Iberdrola's position in the Spanish market and helping to turn it into a world leader in wind power generation.

Clean energies using locally available resources (in this case wind) are replacing other more polluting energy sources – fossil fuels that are always associated with CO2, SO2 and NOx emissions.

Solar power: competing technologies

There are currently five promising thermosolar technologies: (1) parabolic cylinder; (2) central tower receiver with water heat storage; (3) central tower receiver with molten salt heat storage; (4) Fresnel technology; and (5) Stirling dish technology. All of these are in use or under development in Spain. The EIB's aim in financing these projects is to help bring down the cost of these technologies as quickly as possible.

In 2006 and 2007, the EIB contributed EUR 230 million to financing the construction and commissioning of the **Andasol 1 and 2** thermosolar power plants, each with a capacity of 50 MW. These are based on *parabolic cylinder technology* that was originally developed and applied in the United States and improved in

Europe (Eurotrough patent) with the assistance of the European Commission and CIEMAT[1] through the Almería solar platform – the world's first thermosolar complex with large-scale molten salt heat storage. The projects are located in Marquesado del Zenete (province of Granada).

The projects were promoted, built and operated by the ACS Group via its subsidiary Cobra Energía, along with the German company Solar Millennium AG.

The innovative feature of these plants compared to those in the US are the molten salt heat storage tanks that enable them to keep operating when it is cloudy and continue producing energy for up to seven and a half hours after sunset. An oversized solar field produces a surplus of thermal energy that is stored in the molten salt tanks.

In 2007, the EIB granted a EUR 130 million loan to the company Solúcar, part of the Abengoa Group, to finance the construction and commissioning in Sanlúcar la Mayor (province of Seville) of the **Solúcar PS10 and PS20** thermosolar plants, with a capacity of 10 and 20 MW respectively, using *central tower receiver technology*. These plants are integrated into the so-called "Solúcar platform", which is designed to concentrate up to 300 MW of solar power generation capacity.

These were the first commercial projects in the world to be developed using this technology on this scale. Two experimental central towers built in the US in 1980s and '90s (Solar 1 and 2) have since been dismantled.

It should also be stressed that the technology employed in the project was developed by the promoter, the Abengoa Group. Abengoa has a committed R&D investment policy that enables it to remain a world leader. The EIB also supported Abengoa with a EUR 109 million loan for RDI in 2007, with the aim of helping the company to improve its different experimental renewables technologies, especially thermosolar.

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For further information on the EIB, visit its website, www.eib.org.

[1] CIEMAT: *Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas* (the Energy, Enivronmental and Technological Research Centre, which reports to the Spanish Science and Innovation Ministry)