



POWER
Low Carbon Economies



INTERREG IVC
INNOVATION & ENVIRONMENT
REGIONS OF EUROPE SHARING SOLUTIONS



European Union
European Regional Development Fund

Best practice Identified and transferred

Section	Indication of content
1 Title of the best practice	SOLUCAR SOLAR PLATFORM
2 Precise theme/issue tackled by the practice	<p>Solar Energy.</p> <p>The Solúcar platform held by the Abengoa Solar company will generate 300 MW of electrical power from a variety of solar sources: 50 MW from concentrated solar power (CSP) from tower technology, 250 MW from CSP parabolic troughs, 1.2 MW produced by photovoltaic technology, and 80 MW from CSP dish Stirling technology.</p> <p>It will produce enough energy to supply 153,000 households, and will prevent the emission of 185,000 tons of CO₂ per year. During the lifespan of the platform it will reduce an estimated 4 million tons of CO₂ emissions.</p>
3 Objectives of the best practice	<p>The Plataforma Solar de Sanlúcar is currently configured not only as a set of power generation by solar energy, but allows R & D in the solar business. Abengoa Solar New Technologies is the company's R & D of Abengoa Solar in Spain. Collaborate with institutions such as NREL-USA, CIEMAT (Research Centre for Energy, Environment and Technology, an agency under the Ministry of Science and Innovation, Spain) the Fraunhofer Institute in Germany, and several universities in the development of both solar thermal technology (FMC Technologies) as photovoltaics. Abengoa Solar has its own R & D technological projects in order to reduce costs and improve installation performance, research projects carried out at the Solar Platform.</p>
4 Location	<p>Country: Spain Region: Andalusia Province: Sevilla Metropolitan Area: Sevilla Municipality: Sanlúcar La Mayor</p>
5 Detailed description of the best practice	<p>- Origin: Andalusia has been a pioneer in the research and development of thermosolar technology throughout the research of the Andalusian Universities, University of Seville, and the Solar Station of Almería Plataforma Solar de Almería PSA, currently depending on CIEMAT Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (Center of Energy, Environment and Technological Research) belonging to the Spanish Ministry of Science and Innovation. Counting out with this existing experience in Andalusia, the first milestone</p>

of the Solucar Solar Platform activity occurs in 2007 when the first commercial technology commercial tower in the world (11 MW PS10 power) and the largest low concentration PV plant in the world, Sevilla PV , 1.2 MW were inaugurated.

- Timescale

Construction: 2007-2013

O&M: from 2007.

- Bodies involved / implementation

The Platform is owned by the Abengoa solar Company, an enterprise of the Abengoa Group. Some of the power plants and R&D projects have been granted by the national and regional government.

- Process and detailed content of the practice:

ALREADY RUNNING POWER PLANTS

Photovoltaics:

Sevilla PV (1,2 MW) is the largest low-concentration (1.5x and 2.2x) PV plant in the world. It is composed of 154, two-axis tracking units. Each unit is 1076 ft² (100 m²) in area. The plant delivers 2.1 GWh of electricity to the grid annually enough to supply about 650 households and CO₂ emissions are reduced by about 1,800 t per year. This plant delivers to the grid annually under the Special Regime production tariff-in.

Casaquemada (1,9 MW)

It is a 1.9-MW photovoltaic plant with two-axis tracking technology that went into operation in September of 2008. The plant has the particular feature of serving as a test field for high-concentration technology that enables concentrating sunlight by about 500 times onto a special module. This is Abengoa Solar's first commercial plant to integrate this new technology into part of its installation.

These PV plant use Abengoa Solar's proprietary [Sevilla PV](#) technology.

CSP power plants:

PS10 (11 MW)

PS10, first commercial tower worldwide. The field is composed of 624 Sanlucar 120 heliostats. Each heliostat is 1291 ft² (120 m²) in area. The heliostats concentrate solar radiation onto a receiver located on a 377 ft (115 m) high tower. The electricity produced by PS10 is enough to supply electricity for 6,000 households.

PS20 (20MW)

PS20 is the world's second power tower plant in commercial use. PS20 features a number of significant technological improvements with respect

to PS10, the first commercial power tower. These enhancements, developed by Abengoa Solar, include a higher-efficiency receiver, various improvements in the control and operational systems, and a better thermal energy storage system.

With a power capacity of 20 megawatts, double that of PS10, the new PS20 solar power plant will produce enough clean energy to supply 10,000 homes, and will avoid the emission of approximately 12,000 tons of CO₂ into the atmosphere that a conventional power plant would have produced.

PS20 consists of a solar field made up of 1,255 mirrored heliostats designed by Abengoa Solar. Each heliostat, with a surface area of 1,291 square feet, reflects the solar radiation it receives onto the receiver, located on the top of a 531 feet-high tower, producing steam which is converted into electricity generation by a turbine.

Solnova 1 and Solnova 3 (50 MW each)

Solnova 1 and Solnova 3 are the first 50-megawatt parabolic trough plant in operation of a total of five (Solnova 1,2,3,4 and 5) at the Solúcar Platform.

Each 50 megawatt plant, Solnova 1 and 3, will generate enough clean energy to meet the electricity needs of 25,700 homes, while preventing the emission of approximately 31,400 tons of CO₂ into the atmosphere each year.

PLANTS UNDER CONSTRUCTION

Solnova 4 (50 MW)

This is one of the parabolic trough collector plants of a total of five under construction. As Solnova 1 and 3, it is made up of 3.2 million of acres (300 000 m²) of collectors and will enable the production of enough power to supply 25,700 homes while eliminating the emission of 31,400 t of CO₂ each year.

In 2007 construction began on Solnova 1 and 3. In 2008 it started up construction on Solnova 4, a plant with the same features and location as the previous two.



PLANTS UNDER DEVELOPMENT


Within the Sanlúcar Platform, three plants are still under development:

Solnova 2, and 5 (100 MW total):

Two plants creating 50 MW each, based on trough technology similar to

	<p>that used in Solnova 1.</p> <p>AZ20 (20 MW) :</p> <p>Tower technology plant with similar characteristics to PS20.</p> <p>Aznalcóllar TH (80 kW) :</p> <p>A CSP plant based on dish Stirling technology</p> <p>- Legal and financial framework</p> <p>Spanish Framework: The economical instruments to support the development of electricity production RES facilities are based on the “National Decree on Special Regime” that sets the economical framework for the “special regime” which includes all the producers of electricity from RES and gives the right to receive a feed-in tariff or premium while delivering electricity to the grid. This decree enables the erection of renewable power plants.</p> <p>Andalusian framework: Besides, pioneer renewable power plants additionally receive regional subsidies , for instance, PS10 and PS20 renewable power plants developments.</p> <p>PS10, PS20 as well as other three different R&D demonstration projects in the Sanlúcar Platform have received funds both from the regional and national government.</p> <p>Regional funds sum up 5.455.288 € over a total budget of 115,648,331 €</p> <p>The regional and national subsidies are related to the Research & Demonstration development cost, the main investment cost have been financed by the private sector, through financial institutions (e.g. banks ad banks associations).</p> <p>The regional administration is fully competent to deliver following licenses to these kind of facilities:</p> <ul style="list-style-type: none"> - The license to obtain the condition of “producer of electricity belonging to the special regime”, an economical regime that includes all the producers of electricity and gives the right to receive a feed-in tariff while delivering electricity to the grid. - The authorisation of establishing a RES power plant when needed. This certificate includes the environmental license when needed. <p>Besides, a final license given by the local authorities (municipalities), the “building up license” is required for the effective construction of the plant.</p>
<p>6 Evaluation</p>	<p>- Possible demonstrated results (e.g. through indicators)</p> <p>This technology is a current reality counting with more than 131 MW of CSP power currently in operation in the Solucar Solar Platform, from a</p>

	<p>current total 231 MW installed in Andalusia.</p> <p>- Possible success factors:</p> <ul style="list-style-type: none"> - Experience in research and development carried out since 1980 in Andalusia in the Plataforma Solar de Almería, CIEMAT, Spanish Ministry of Science and Innovation. - Spanish legislation Electricity Act and its implementing regulation through feed-in tariff has been an essential element for the development of this technology in Spain. - Newly mature technology, with availability of resources (solar energy and water resources) at the location. - The existence of a company specializing in the exclusive development of such developments. - Favorable support scheme and legal framework at national, regional. - Favorable opinion and well received by citizens and civil society. <p>- Difficulties Encountered</p> <p>So far the main difficulties have been related to the development of new technologies and their commercial implementation for the first time in Europe. In relation to develop these facilities now and in the future difficulties may be related to the general contraction of the financial market.</p>
<p>7 Lessons learnt from the best practice</p>	<p>The experience gain concerning the development, financing, construction, starting-up, maintenance an operation of different high temperature and photovoltaic solar installations for the production of electricity from renewable sources in the same location, counting out with an abundant solar resource, has allowed current and future expansion of these type of projects in other locations in Europe and around the world.</p>
<p>8 Contact information</p>	<p>Abengoa Solar Centro Tecnológico Palmas Altas - Sevilla Ana Cabañas Burgos Communication Department. e-mail: comunicacion@abengoa.es Teléfono +34 629964476 Fax + 34 95 445 26 59 http://www.abengoasolar.com/corp/web/en/our_projects/solucar/index.html</p>
<p>9 Other possible interesting information</p>	<div style="text-align: center;">  C:\Documents and Settings\Cserra\Escri </div> <p>- Abengoa Solar Brochure embedded.</p> <div style="text-align: center;">  C:\Documents and Settings\Cserra\Escri </div> <p>- PS10 Brochure embedded.</p>

	 C:\Documents and Settings\Cserra\Escri - Solnoa 1 Brochure embeded.
10. Best practice transfered	The experience gain under the Sanlúcar Solar Plant is applicable to other solar energy projects anywhere in the world. Innovations and testing of the Platform for Sanlúcar are being implemented by the company Abengoa Solar in commercial projects being developed in the United States, Algeria and Morocco.