

Case Study on:



Ruban D'Honneur Recipient

European Business Awards 2011

The UKTI Award For Innovation
The Gemasolar Project
Fuentes De Andalucia, Spain



Gemasolar

Making Concentrated Solar Power a Commercial Reality

Words from the Judges

“Innovation is part of SENER’s founding spirit and has resulted in this breakthrough project with huge global significance.”



A leader in the field of Engineering and in particular Solar Power Generation, SENER is a well-deserved recipient of the Ruban D’Honneur for the UKTI Award for Innovation at the European Business Awards 2011. The accolade has been given in recognition of SENER’s ground-breaking work in the development and start-up of its Gemasolar Concentrated Solar Power (CSP) plant.

As the first CSP plant in the world to include a molten salt thermal storage system in a central tower configuration using heliostats, Gemasolar is understandably getting the Sustainable Energy industry rather hot under the collar. It has the potential to make renewable energy a viable commercial alternative to traditional fossil fuels and is expected to reduce annual CO₂ emissions by a staggering 30,000 tons per year. Gemasolar is the first commercial solar thermal plant in the world to successfully deliver dispatchable power for an uninterrupted 24-hour period at full capacity.

“Innovation is one of the key drivers behind the substantial growth and the diversification of SENER. For the past two decades, SENER has been focused on developing new solar thermal technologies as a means of providing a significant difference to society. SENER has concentrated on creating new solutions aimed at making power generation as profitable as possible. The company is working tirelessly to reduce the cost and environmental impact of electricity generation.” Andrés Sendagorta, Vice President, SENER

Thanks to SENER’s pioneering technology, Gemasolar has a capacity factor of 75% which is almost on a par with nuclear plants. Alongside this greater capacity, the plant has lower specific investment per unit generated and produces higher quality energy.

Gemasolar is a high-temperature solar power plant which can reach operational temperatures of over 500°C – much higher than those in traditional plants that require oil as a heat transmitter. It is these extreme temperatures that produce superheated

pressurised steam and increase the efficiency of the plant.

The capability of the molten salt thermal storage at Gemasolar allows the power supply to be delivered on demand and regardless of solar radiation. The plant can continue producing electricity for up to 15 hours without sunlight, meaning it can operate throughout the night and during cloudy weather. With nominal power of 19.9 MW, Gemasolar can provide safe, clean electricity to a population of **27,500 homes** in southern Spain. It is expected that the plant will produce about 110 GWh a year, operating a total of 6,450 hours per year at full capacity.

The annual production of Gemasolar is equivalent to the energy produced using 217,000 barrels of oil in a conventional thermal plant. It has the potential to reduce the deficit in the balance of payments by \$25 million at today’s crude oil prices.

The plant marks the first collaboration between Spain and the UAE and was officially inaugurated on 4 October 2011 by His Majesty the King of Spain, Don Juan Carlos I alongside His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the Armed Forces of the UAE.

“Thanks to our commitment to R&D and Innovation, SENER has produced the vast majority of the cutting-edge technology used at Gemasolar and our team has project managed the entire build. We formed a strategic partnership with Masdar, based in Abu Dhabi to secure funding for our ambitious plans and set up a joint venture called Torresol Energy with the goal of becoming a global leader in CSP as a sustainable source of power.” Andrés Sendagorta

Torresol Energy received €171 million project finance for Gemasolar through a transaction involving several leading European financial institutions including Banco Popular, Banesto, Instituto de Crédito Oficial (ICO). Later, €80 million were syndicated to the European Investment Bank.



“This organisation can clearly demonstrate that for over 50 years, Innovation has been a fundamental part of its culture. SENER invests more than 10% of its work hours every year in R & D. The company works in a highly collaborative cross organisational manner which brings together skills from Aerospace, Construction, Engineering and Academia to work on projects which have truly national and global significance.”

Phil Forrest, Chairman of the Judges, European Business Awards 2011



Looking to the Future...

SENER is working in many different industries and is always seeking new industry sectors where there is an opportunity for competitive advantage. The company is dedicated to taking technological advancements off the drawing board and making them a reality with the goal always being to develop products and services that will actively benefit the wider society.

The company is already established within the Aerospace industry, and this is expected to expand further in future years. This will run alongside heavy investment in further CSP development as well as a commitment to finding a means to reduce the cost of energy derived from solar power in order to make it a commercial reality across the globe.

“The benefits of this plant will extend well beyond new technologies and will result in large scale changes across the world as other countries become aware of this significant advancement. SENER is working to make solar energy a reality. We are committed to providing a viable and ecologically sustainable energy supply that protects the environment for future generations.” Andrés Sendagorta

SENER has a horizontal flow of technologies with each sector benefitting the others. Advancements in Aerospace technology, especially in areas such as heat transmission have a direct relevance to the work being done in solar energy. SENER is working to create a pipeline of new and innovative technology that flows between each division of the business and benefits each one simultaneously.



"This award gives recognition to the huge importance that SENER places on innovation. Moreover, it recognises that, since its origins back in the '50s, SENER has taken its breakthrough findings and made a physical contribution to society through the provision of efficient solutions with high technological content."



Andrés Sendagorta,
Vice President, SENER

About SENER

Founded in Bilbao in 1956, SENER is a private engineering and technology group which offers its clients cutting-edge technological solutions across many different industry sectors including Aeronautics, Energy and Environment. The company is internationally recognised for its commitment to innovation, quality and independence.

SENER is dedicated to Research & Development and Innovation, investing more than 10% of the total hours worked each year in these valuable activities. SENER's passion for innovation has permeated all levels and areas of the company and the overall structure of the company has been specifically designed to facilitate collaboration between different departments, with each area bringing its own expertise to the mix in order to continually push technological boundaries.

SENER employs more than 5,000 highly qualified professionals and currently has a turnover of more than €1 billion. Despite the harsh economic environment, the company is experiencing significant year-on-year growth with sales increasing by over 20% from 2008-2009 and has a growth forecast of over 30% for 2011.

The company has offices across Europe and worldwide including Abu Dhabi, Algiers, Barcelona, Bilbao, Buenos Aires, Lisbon, Madrid, Mexico City, Okayama, San Francisco, Sao Paulo, Seville, Valencia and Warsaw.

In the last decade, SENER has devoted enormous effort to the intellectual, economic and commercial advancement of Concentrated Solar Energy.

"We are proud to be bringing over 10 years of intensive innovation and development to fruition in the Gemasolar plant. With this breakthrough technology, we are perfectly positioned to solidify the role of renewable energy on a global scale and in turn we will move a step closer to confronting some of the world's biggest challenges including energy security, climate change mitigation and sustainability."

Andrés Sendagorta

About the European Business Awards

Since 2007, the European Business Awards programme has been shining a light on the most pioneering businesses on the continent by promoting excellence, best practice and innovation in the European business community. The awards programme recognises excellence in all disciplines of business including individual business functions. Last year entrants ranged from fish farming organisations to renewable energy firms. Together they had a combined turnover greater than €766 billion Euros (6% of EU GDP) and employed over three and a half million people between them.

Businesses from each of the 28 European territories are invited to enter the Awards. The competition for finalist places is fierce with many of the Europe's most established brands being represented.

The judging panel is comprised of experts in their fields who each bring experience, business acumen and understanding to the board. The overall winners in each of the categories will be announced at the Awards ceremony in Barcelona on 22nd November 2011.

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The way to see the future

