



## High Efficiency Solar Energy

Abengoa counts on its **own solar thermal technology** and is a world leader in this sector, where it has developed, designed, built and/or operated solar thermal plants in four continents, with a total capacity of 1.9 GW, representing approximately 30% of capacity worldwide. In addition, the company is currently participating in 52% of solar thermal capacity under construction.

Solar thermal electricity with parabolic trough technology (STEP) is based on the capture of solar energy through a parabolic trough collector that allows a heat transfer fluid to heat up, enabling said heat to be used in a conventional thermal cycle. With more than **1,600 MW under operation**, Abengoa is a pioneer in the construction of plants using this technology which, on average, are producing at a performance rate over 100% their capacity.

To guarantee production during long periods without solar radiation or after sunset, Abengoa incorporates a **molten salt energy storage system** into its plants.

As a highly innovative company, and searching for a competitive advantage, Abengoa is committed to the creation of its own R&D, as well as to the continuous improvement in all its projects. Proof of this is the project that is being carried out in the Mohammed bin Rashid Al Maktoum solar park, which includes the installation of our most innovative trough design with **the largest aperture of the CSP market (8.2m)**. This collector leads the solar field design to an optimal configuration in terms of cost and efficiency.

Thanks to its innovative capacity and its extensive experience in the entire CSP value chain, Abengoa is a world leader in the development of this type of solutions.

Through **the hybridization** of technologies, Abengoa is a specialist in 'Smart Solutions' for dispatchability and stability in the generation of energy from renewable sources.

**Abengoa** is an international company that applies innovative technology solutions for sustainability in the **infrastructures, energy and water** sectors. It has over 75 years of experience in **engineering and construction**, being specialists in the execution of complex "turnkey" projects or engineering, supply and construction projects (**Engineering, Procurement and Construction**) for third parties in four fundamental areas: **energy, water, services and transmission and infrastructure**.

Abengoa has extensive experience in the **power generation** sector thanks to the development of **open and combined cycle and cogeneration technologies, wind farms, and solar thermal, photovoltaic, waste to energy and biomass power plants**.

This experience provides the company with a **high capacity of design and hybridization** among power generation technologies, that allows it to offer the optimal solution to its clients.

30% of the worldwide installed solar thermal energy capacity already under operation

More than 1,600 MW under operation



Solar Thermal Energy Parabolic Trough Collectors

### Noor Energy I

- 3 x 200 MW
- United Arab Emirates

### Mojave

- 280 MW
- United States (\*)

### Solana

- 280 MW + 6 hours of thermal storage
- United States (\*)

### Shams 1

- 100 MW
- United Arab Emirates

### Kaxu Solar One

- 100 MW + 3 hours of thermal storage
- South Africa (\*)

### Xina Solar One

- 100 MW + 5 hours of thermal storage
- South Africa

### Waad Al Shamal

- 50 MW
- Integrated in a hybrid solar-gas plant of 1,440 MW (solar field of 50 MW)
- Saudi Arabia
- Under construction

### Yumen

- 50 MW
- China

### Solucar

- 50 MW x 3
- Spain (\*)

### Ecija

- 50 MW x 2
- Spain (\*)

### El Carpio

- 50 MW x 2
- Spain (\*)

### Castilla La Mancha

- 50 MW x 2
- Spain (\*)

### Extremadura

- 50 MW x 4
- Spain (\*)

### Ain Beni Mathar

- 20 MW
- Integrated in a hybrid solar-gas plant of 470 MW
- Morocco

### Hassi R'Mel

- 20 MW
- Integrated in a hybrid solar-gas plant of 150 MW
- Algeria

### Agua Prieta

- 14 MW
- Integrated in a hybrid solar-gas plant of 470 MW
- Mexico

### ITB Solar field

- 1 MW
- India

(\*) Property of Atlantica Yield

# ABENGOA Energy



Campus Palmas Altas  
C/ Energía Solar, 1  
41014 Seville (Spain)



## ABENGOA

Solar Thermal Energy  
Parabolic Trough Collectors

Innovative technology solutions for  
**sustainability**

