



Shams 1, Abu Dhabi

In March 2013, Masdar inaugurated Shams 1 – one of the world’s largest Concentrated Solar Power (CSP) plants in operation and the first of its kind

in the MENA region. Masdar partnered with Total and Abengoa to deliver the 100-megawatt solar-thermal project. The US\$600 million project took three years to build. In January 2016, Masdar purchased Abengoa’s stake in the project.

Covering an area of 2.5 km², or 285 football fields, Shams 1 generates electricity to power 20,000 homes in the UAE. CSP offers dispatchable peak power, which strengthens energy security, and heat storage, through which thermal energy can be stored and released at a later point in time.

Incorporating the latest in parabolic trough technology, Shams 1 features more than 258,000 mirrors mounted on 768 tracking parabolic trough collectors. By concentrating heat from direct sunlight onto oil-filled pipes, Shams 1 produces steam, which drives a turbine and generates electricity.

Quick Facts

- + One of the largest CSP plants in the world.
- + A joint venture between Masdar (80%), Total (20%).
- + Powers more than 20,000 UAE homes and displaces 175,000 tons of CO₂ per year.
- + Plant covers a land area of 2.5 km², or 285 football fields.
- + Installed capacity: 100 megawatts.
- + Made up of 768 parabolic trough collectors.
- + Construction began June 2010 in Madinat Zayed, 120 kilometres from Abu Dhabi in the Western Region.
- + Plant inaugurated March 2013.

In addition, the solar project uses a booster to heat steam as it enters the turbine to dramatically increase the cycle’s efficiency. The project also includes a dry-cooling system that significantly reduces water consumption – a critical advantage in the arid desert of western Abu Dhabi.

Shams 1 contributes to the diversification of the UAE’s energy mix and reduces the country’s carbon footprint. The plant displaces approximately 175,000 tons of CO₂ per year, equivalent to planting 1.5 million trees or removing 15,000 cars from the roads.