

engerati.com

New Direct Molten Salt Storage Technology Creates a Significant Increase in Power Yield

3-4 minutes



Solar thermal power plant with molten salt technology and thermal storage can now be offered on a commercial basis.

Published: Mon 22 Sep 2014

Novatec Solar, a leading technology supplier for concentrating solar power, and chemical firm, BASF, have successfully commissioned a solar thermal energy demonstration plant in Spain which uses a new type of molten salt storage technology known as direct molten salt (DMS).

Using inorganic molten salt as heat transfer fluid

The plant, which is located on the site of the solar-thermal

power plant PE1 in southern Spain, has an innovative design feature in that the solar collector uses inorganic molten salt as heat transfer fluid. Most solar thermal power plants currently use heat transfer oils, which have a limited qualification temperature.

The molten salt technology, developed by BASF for the Fresnel collector technology, uses flat glass reflectors rather than parabolic trough collectors. The reflectors concentrate direct sunlight onto a receiver, through which the molten salt is pumped. Using inorganic salts as heat transfer fluid creates operating temperatures above 500°C, resulting in a significant increase in power yield. This means that costs are lowered significantly and the solar plants can act as baseload generators when needed.

The thermal energy can either be directly converted into electrical power or be stored in large molten salt tanks during periods of low demand. This stored energy can be kept in reserve for periods of low production, for instance when the sky is overcast or the wind is not blowing. Solar thermal power plants with storage systems can supply electricity as and when required. This will help to create a more stable power grid.

Developing the next generation of solar thermal power plants

According to Andreas Wittke, CEO of Novatec Solar, the solar

thermal power plants with molten salt technology and thermal storage can now be offered on a commercial basis.

Wittke says that the demonstration plant in southern Spain will be used to simulate a large number of different operating conditions to help develop the next generation of solar thermal power plants.

The use of DMS technology is being used at the 110MW Crescent Dunes power tower unit nearing completion in Nevada, which will be the largest solar thermal plant with storage in the world.

Novatec Solar will use DMS with its linear Fresnel technology, which has been deployed as a demonstration “solar booster” at the Liddell coal generator in NSW and is being mooted for a renewables-based replacement for the Collinsville coal fired power station in Queensland.

The DMS demonstration collector project is supported by the German Federal Ministry for Economic Affairs and Energy (BMWi) following a decision by the German parliament.

Transfer fluids based on inorganic salts are being developed and researched upon for several years at BASF, a company with over 30 years experience in the operation of salt bath reactors (chemical plants that also use molten salt as a heat transfer fluid for process control).