

# SunOyster set to Double the Power

Posted by [Rochelle Gayle](#) [1] on Nov 4, 2013

Just in time for the CSP Today conference in Seville - where the SunOyster is exhibitor - the Hamburg-based company completed the installation of its first zero series machine in Germany.

## Technology

The SunOyster is a new concentrating solar technology. The bi-axially tracking SunOyster uses a superior mirror structure and co-generates PV power and heat with an unrivalled efficiency of up to 75%. There are totally six patents pending for the SunOyster.

The SunOyster is tracking the sun bi-axially all day from East to West. The vertical tracking is available in three versions and suitable for all latitudes, minimizing wintry shadowing. The control system is closing down the SunOyster in a secure position in case of stormy winds or hail ("Oystering"). The whole structure is suitable for - even tilted - rooftop installation.

The standard model of the SunOyster has presently three semi-parabolic mirrors with 6 m<sup>2</sup> each. The zero series machines are equipped with the light mirrors from Toughtrough in Bremen.

The heart of the SunOyster is a hybrid receiver which is combining the best of CSP and CPV technology: The receiver of 4 m length is protected by an evacuated borosilicate glass tube. In the tube, two versions of solar cells are possible: One is consisting of high-quality back contact silicon cells which are cut in a patented laser process and which are actively cooled by water running along the backside of the cells. The maximum temperature of this water is 95 °C. The superior option are linear Fresnel lenses concentrating the light a second time by factor 20, reaching a total concentration of 1,000 suns. Here, concentrator photovoltaic (CPV) cells with a cell efficiency of 40% convert the sunlight directly into electricity. The cells are actively cooled by a heat transfer fluid which can be either water or thermal oil. This fluid can reach temperatures of up to 200 °C, enough to open up interesting applications in process heat and multiple stage thermal coolers.

## Energy and Cost Efficiency

Based on its electrical system efficiency of up to 30 % and an electrical power of 5 kW p, the SunOyster can have at Munich (annual DNI of 1,000 kWh/m<sup>2</sup>) an energy generation of up to 5,000 kWh electricity p.a. At the same time, it generates with 7.5 kW thermal power up to 7,500 kWh heat p.a. In the best DNI locations of the world such as Chile or South Africa, this yield rises to 15,000 kWh of electricity and to 22,500 kWh of heat p.a.

The factory under preparation shall have an initial capacity of 500,000 m<sup>2</sup> mirror surface and start operation in end of 2014. The SunOyster shall be sold in bigger volumes at an ex-works price of 5,000 Euro (including support structure and inverter) With two thirds of the price allocated to the more valuable electricity, the price for one electrical kW peak of the SunOyster is 670 Euro.

This results of LCOE in Munich of 4.2 €/kWh and heat costs of 2.1 €/kWh. In the top locations the SunOyster reaches electricity costs of 1.4 €/kWh and heat costs of 0.7 €/kWh (assumptions in each case: transport and installation 1,000 € p.p., maintenance 500 € p.p. every five years, 25 years life time, no financing costs).

## Applications

The SunOyster is suitable for solar power plants where the CPV electricity is directly fed into the grid and where the heat can be used e.g. for co-powering fossil power plants or desalination.

Another focus shall be commercial roofs. The SunOyster can cover the electricity and heat demand of e.g. food, chemical or metal industry. Or the heat can power thermal chillers of hotels, office buildings or shopping centers.

Later on, the SunOyster shall also be sold to residential applications. The annual energy generation

of one SunOyster can cover in Germany the complete average heat and energy demand of a family in a modern house - in the top locations with lower average consumption it can power even a small village.

However, before that SunOyster has still some way to go with the installation and thorough testing and certification of its machine. Persons interested in the Sunoyster are invited to contact Dr. Carsten Corino, [cc@sunoyster.com](mailto:cc@sunoyster.com) [2], or to visit the start-up at the CSP Today exhibition.

**Links:**

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