Trinasolar

The power **behind** the panel

**Eco-photovoltaic greenhouse
San Pedro del Pinatar**

Campo de Cartagena, Murcia

Commercial rooftop system that uses
Trina Solar multicrystalline modules
TSM-PC05 230 W

2,2 MW
Commercial rooftop system

9.600
modules

3.126.528 KG CO2
emissions avoided

"We were very pleased to have Trina Solar as a photovoltaic partner. Our R+D department has been able to develop a solution which combines perfectly both energy and agricultural production in a greenhouse. And the well known resistance of Trina Solar modules in agricultural environments and seaside areas fitted perfectly with this project".

Raúl Morales, CEO of Soltec

This smart greenhouse hosts ecologic citric fruits cultivation and has an integral remote monitoring system to control both the PV system and the microclimatic parameters needed. The result is a very profitable investment that respects the environment.

The project was born to satisfy E. Renovables del Mar Menor needs. The company was looking to maximize a greenhouse in terms of an environmentally friendly profitability.

Soltec had the opportunity to bring the idea that its R+D department was developing from 2010. The project was successfully finalized in February 2012.

The main challenge was to combine the agricultural cultivation with the production of solar photovoltaic energy. It remained very important to control the climatic parameters inside the greenhouse and therefore the solar irradiation penetrating the cultivation, without forgetting the right layout and inclination of the photovoltaic panels to maximize the energy generation.

The greenhouse was adapted to integrate solar panels as a part of the construction itself using galvanized steel multi-tunnel structure with screwed unions. The result is a robust construction that lets the solar irradiation to get in, which optimizes both the photovoltaic and the agricultural production.

Thanks to Trina Solar panels and Danfoss inverters used, it was possible to integrate the modules in the greenhouse structure without needing any additional edification.

Trina Solar modules are key to ensure the agricultural production along the year, protecting it from the strong summer irradiation, torrential rains, great oscillations of the ground´s humidity, insects, fungus and low wind temperatures. Apart from protecting the citrus fruits. Trina Solar modules are able to produce 3.126.528 kWh of electricity per year, equivalent to the electricity needs of more than 1.000 families in Spain. 9.600 TSM-PC05 230 W modules were used for a greenhouse that takes up 30.720 square meters.

If compared to a coal-fired station, this smart eco-photovoltaic greenhouse would save 3.126.528 Kg of CO_2 per year. If compared to combined cycle natural gas, savings would be 1.250.611 Kg of CO_2 per year. Compared with CO_2 emissions produced by cars, this greenhouse would be saving the annual emissions produced by 2.379 cars or more than 26 million kilometers.

San Pedro del Pinatar photovoltaic system will produce energy at least during 25 years. As a manufacturer, Trina Solar offers a 25 years linear power output warranty.

The technology of this project can be implemented in any European region with the so called high yield agricultural production focus (suitable for cucumbers, peppers, tomatoes, eggplants or watermelons).

NAME OF THE PROJECT:
San Pedro del Pinatar

SIZE OF THE PROJECT:
2,2MW

TYPE OF INSTALLATION:
Commercial rooftop system

LOCATION:
Campo de Cartagena, Murcia (España)

PRODUCT USED:
TSM-PC05 230 W

NUMBER OF MODULES:
9.600

ANNUAL OUTPUT:
3.126.000 kWh

COMPLETION DATE:
February 2012

Trina Solar multicrystalline module TSM-PC05: the universal solution

This is currently Trina Solar most popular module. Versatile and adaptable, with power output ranging from 225 to 245Wp, the TSM-PC05 panel is perfect for large-scale installations, particularly ground-mounted and commercial rooftop systems. Using reliable and carefully selected components that are tested at the Trina Solar Center of Excellence, this panel comes with a 25 years power output warranty.

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