

The ECOSOLE project

HCPV (High Concentration PhotoVoltaic) generator suitable for high efficiency PV power plants in desert areas

ECOSOLE (Elevated CONcentration SOLar Energy), is actually one of the largest FP7 European Demonstration projects in solar photovoltaic.

The project is focused on the study, design, and realization of an innovative HCPV generator made of new high efficiency PV modules equipped with:

- SoG (Silicone on Glass) fresnel lenses, with concentration factor >1100X
- III-V multi-junction solar cells, with efficiency >43%
- low cost self-adaptive solar tracker with distributed inverters approach

The project also demonstrates new high throughput methods for the industrial large scale productions, at very low manufacturing costs; started in August 2012 it will be completed within 2015.

The new HCPV solar generators will be a cost effective solution for electric energy production especially suited for high DNI desert areas where the standard silicon panels suffer from hot climate efficiency losses. The advantages of HCPV with respect to standard PV solutions are:

- greater efficiency (+100%)
- better land use (less surface needed and land multi-use thanks to no permanent shadowing)
- scalability and fast deployment of huge solar power plants
- no need of cooling water, (compared to CSP),
- constant power output all over the day from sunrise to sunset.

One of the project targets is also to demonstrate how the industry can achieve competitive LCOE with HCPV technologies.

The demonstration project will end with the installation of prototype systems in Italy and Israel.

The project is led by BECAR srl, a BEGHELLI group company, and includes relevant scientific partners as primary research institutions, like ENEA (Italian agency for renewable energies), UPM (Universidad Politécnica de Madrid) (UPM), Ben-Gurion University of the Negev (Israel), TECNALIA (Spain), and several European industrial companies partners.

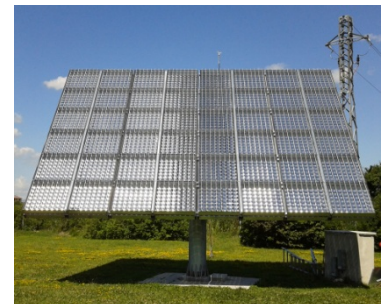


Concentration unit

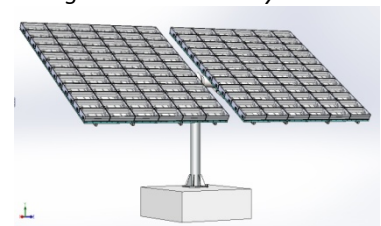
The new module is made of 72 multi-junction solar cells. Its power output is greater than 200W, with a net conversion efficiency in excess of 34%. More than 120 modules are assembled on each 100 square meters wide tracker giving a peak output power of almost 30kW @

1000W/sqm DNI irradiation, for each tracker. The trackers can be easily deployed on any kind of terrain to quickly set up big solar farms with several MW power output. Each tracker realizes an upside-down feature for the easy clean and maintenance operations

The project is funded under EU FP7, Seventh Framework Programme (ENER/FP7/295985) with the title "Elevated Concentration photovoltaic solar energy generator and fully automated machinery for high throughput manufacturing and testing"



HCPV Becar-Beghelli first generation HCPV system



ECOSOLE new tracker

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