Objectives

ECO**SOLE** concerns the study, design and realization of an innovative HCPV generator made of new high efficiency PV modules equipped with refractive optics and III-V solar cells and a low cost high precision solar tracker with distributed inverters.

The project focuses also on the study and demonstration of new high throughput manufacturing method that will drop the production cost, to be competitive in the PV market.

Industrial Goals

ECO**SOLE** aims at a higher reliability, increased system efficiency and lower costs of CPV products.

HCPV generator production cost reduction (1.2÷1.5 €/W)

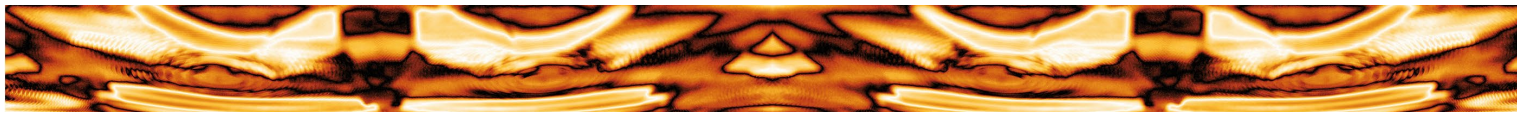
- High System Integration
- Simple high throughput assembly procedures and machineries
- Efficient fast complete 100% testing equipment
- High System Efficiency (>33%)

PV electricity generation cost in high DNI regions<6 € cents/kWh

- Easily deployable self- controlled System
- High Reliability and availability

ECO**SOLE**

ECO**SOLE**



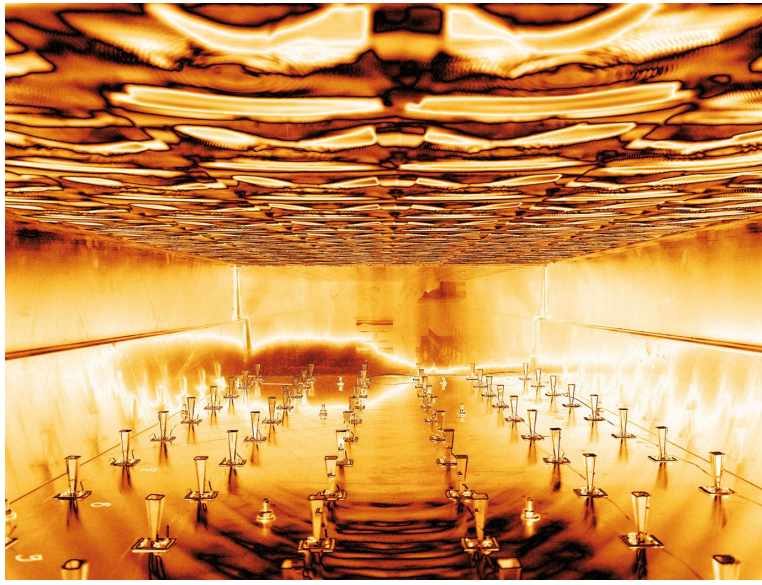
PROJECT DETAILS

Coordinator: BECAR
Project reference: 295985
Status: Execution
Total cost: EUR 11 955 283
EU contribution: EUR 6 998 000
Programme acronym: FP7-ENERGY
Subprogramme area: ENERGY.2011.2.1-3
Contract type: Collaborative project

BECAR
BEGHELLI GROUP
www.ecosole-project.eu

EVONIK INDUSTRIES · ENEA · AUR'EL AUTOMATION · OEC · PLAMTEX INT · tecnalia Inspiring Business

Elevated concentration photovoltaic solar energy generator and fully automated machinery for high throughput manufacturing and testing



ECO**SOLE** is a European project developing a new HCPV system for utility scale solar energy generation.

Supported by the European Commission

Competences

ECO**SOLE** combines multi-sectorial international competences to provide an efficient and competitive solar energy generator, addressing the issues preventing the uptake of HCPV (High Concentration PV) systems on the market.

The **High Concentrator Photovoltaic Technology** (HCPV) is a promising alternative to PV-flat solutions. The advantages of High Concentration Photovoltaic Technology with respect to standard PV are: greater efficiency, better land use (less surface and land multi-use thanks to no permanent shadowing), scalability and fast deployment of huge solar power plants, no need of cooling water, constant power output all over the day from sunrise to sunset.

The research leading to these results has received funding from the European Union Seventh Framework Programme FP7/2007-2013 under grant agreement n° 295958 (Project acronym: ECOSOLE)

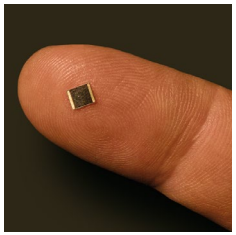
Supported by the European Commission

Technology

Low cost, high efficiency, easily manufacturable and deployable HCPV system

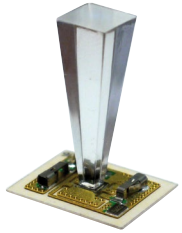
1 CELL

small size, increased efficiency, low cost - thanks to reduced use of materials and improved production process and customization.



2 RECEIVER

best thermal stack, increased conversion efficiency and reliability; improved SOE attach methods and a new automatic sorting equipment for higher module's efficiency.



3 MODULE

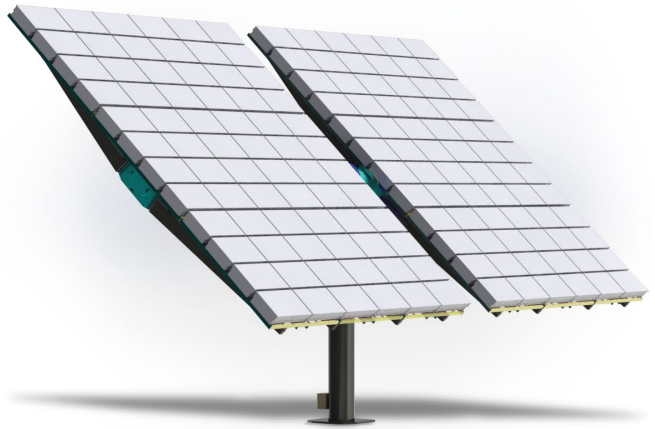
effective simple low-cost architecture; high precision assembly process for high throughput manufacturing. Radio controlled module inverter for module independence and mismatch avoidance.

4 OPTICAL SYSTEM

primary and secondary element as a whole; optimization of the complete optical path; high reliability and low cost anti-reflective multifunctional coating process for SOE and front glass.

5 TRACKER

specific design, pre-assembly in factory and installation procedure for optimised mounting; automatic self-aligning procedure to adjust automatically to the sun; lean metal structure and brushless motors.



6 MODULE TESTING EQUIPMENT

module power flash tester and module optical analyzer to test and measure each single module coming out of the assembly line, showing evidence of any loss of tolerance during the assembly process.