



CPV

ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development.

**CPV Outdoor Solar cells, Modules and system characterization**

<b>Location of the infrastructure :</b>	Portici, Naples- Italy	<a href="http://www.ene1.portici.enea.it/">http://www.ene1.portici.enea.it/</a> ;
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**Objectives :** Characterization of CPV solar cells, module and systems

**Main features :**



The outdoor facilities are based on the following sun trackers all them with tracking based on Sun-sensor and Calculation mode

- Phocus tracker area 32 m2 accuracy +/- 0.2 °
- Atec Robotic Solar tracker 2x2 m2 accuracy +/- 0.02 °
- EKO Sun Tracker STR-22 accuracy +/-0.01° Payload 1.5 Kg balanced

The first two sun trackers are used for PV-C module I-V characterization, the last one for outdoor I-V characterization of PV-C solar cells and optical efficiency, the experimental focal length measurement of concentration lens, and energy rating and performance characterization of PV-C solar cells.

For the Eko Sun trackers the solar cell temperature can be varied by 20°C up to 80 °C and a specific procedure developed by Ene a can also assure the change in direct incident light intensity

Accuracy characterization of solar tracker position respect sun and PV-C module position respect sun can be assured by a sun pointer probe developed and patented by Enea and based on a PSD detector having an accuracy of 0.01 °

The temperature of PV\_C modules is measured by PT-100, and IR Vision can also be assured for thermal mapping. The direct solar irradiance and global irradiance is acquired through First class Pyrheliometr/ pyrhanometr Eko while the solar Spectrum is acquired in the range 200-1700 nm through a Dual-DSR StellarNet Spectroradiometer.;

**Limitations or constraints :** The access will be allowed with technical and scientific assistance from Enea.

**Typical services or results :** The facilities can assure a complete operative performance analysis in outdoor condition of PV-C lens, solar cells, PV- C modules , and array –string of PV-C systems. The facility currently participate to round robin procedures.

**Examples of research projects :** The facility was used on many national and FP EU funded research projects including 7FP project Apollon