

# **Circuit integrated solar concentration photovoltaic modules**

## **General Outlook**

The Photovoltaic (PV) sector has experienced a very rapid expansion in the whole world and also in Portugal.

Solar concentrators are believed to be one of the most promising technologies to turn photovoltaic energy competitive with fossil fuels.

High concentration photovoltaic systems have shown some performance under laboratory conditions, and defective operation in on field applications. Medium and low concentration devices have shown reasonable efficiency associated to reliable performance while keeping energy cost still at higher value. The thesis will focus on the development of a solar photovoltaic module for medium concentration assembled on an electronic board by usual pick and place machines.

## **Objectives**

The project will lead to the development of a photovoltaic module for medium and high concentration level. The module will result from the integration of especially designed solar cells into newly developed circuit board. The thesis will focus on the selection of the electronic materials, analysis of mounting procedures, integration of diodes and MPP within cells and production of prototypes and industrial beta tests.

The project is integrated within larger R&D projects and people with experience on solar cells, optics and electronics.

As a result, the candidate will produce and new photovoltaic module manufactured with existing machines and with the potential of be widely adopted in the PV industry.

The program is highly challenging and requires highly committed students.