Projet LOUCOM

Production du PV à concentration à faible coûts au Maroc

- **COORDINATION**

  Université Internationale de Rabat-
  Prof. Khalid BOUZIANE

- **CONSORTIUM**

  Université Internationale de Rabat (UIR)
  Université Sidi Mohammed Ben Abdeallah
  AIC Metallurgie / Delta holding
  MAGPOWER

- **DUREE DU PROJET**

  3 ans

- **BUDGET DU PROJET EN MAD**

  Financement IRESEN: 5 000 000
  Investissement global: 12 250 000

- **CONTACTS:**

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Partenaires Scientifiques

Université Internationale de Rabat (UIR). Les expertises des chercheurs de l'UIR qui sont impliqués dans ce projet sont dans les domaines des énergies renouvelables, efficacité énergétique et technologies de l'information et communication.

Université Sidi Mohammed Ben Abdeallah, The staff members involved in this project supervise many PhD theses, on electronics devices and microelectronics engineering.

Partenaires Industriels

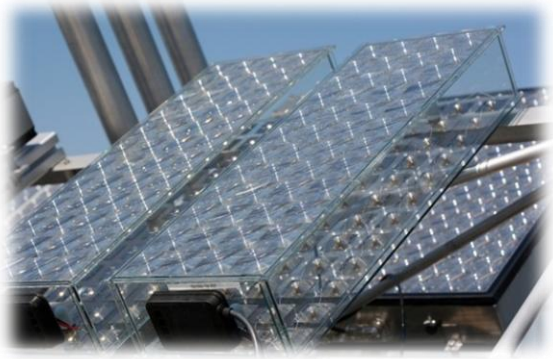
AIC Métallurgie, Morocco: AIC Metallurgy is a subsidiary of Delta Holding. Its production cycle includes design engineering and execution, cutting, drilling, bending, and stamping of different types of steel, welding, machining and surface treatment

Magpower, Portugal: Portuguese group founded in 1974. By enabling clean and renewable electricity at lower costs, Magpower provides a sustainable alternative to conventional energy sources.

Concerns about the changing environment and fossil fuel depletion have prompted much controversy and scrutiny. One way to address these issues is to use concentrating photovoltaics (CPV) as an alternative source for energy production. There are four main categories of photovoltaic cells candidates for CPV technology: c-Si solar cells, thin film solar cells (a-Si, CdTe, CIGS), III-V based multijunction solar cells and new technologies (including organic solar cells). Multijunction solar cells built from III–V semiconductors are being evaluated globally in CPV systems designed to supplement electricity generation for utility companies. In fact, the high efficiency of III–V multijunction concentrator cells, with demonstrated efficiency over 40%, strongly reduces the cost of CPV systems, and makes III–V multijunction cells as the technology of choice for most concentrator systems today.

A constant research preoccupation of the technical community involved in the solar energy harnessing technology refers to various solutions to increase the PV panels' conversion efficiency.
Among PV efficiency improving solutions we can mention: solar tracking, optimization of solar cells geometry, enhancement of light trapping capability, use of new materials, etc. CPV systems using multijunction solar cells exhibit another benefit. Expensive semiconductor material usage is minimized, which puts a constraint on the system cost components preventing them from getting too high, forcing the size of system parts to be reduced and less expensive for the given power output.

The Innovation In the project is to provide integrated smart solution for the optical, mechanical, electrical parts and in-situ reliability tests for an optimal low cost 5 kWp CPV system.



- **Objectifs du projet:**

Development of a low cost CPV technology prototype 5 kW (peak) integrated solar power device. This is a multidisciplinary project and shall include the main following parts:

1. Optical engineering for optimal high solar concentration solution,
2. Electrical and software engineering to develop and manufacture an optimal automate to control and monitor the tracking and other sensors,
3. Mechanical engineering to develop and manufacture a low cost fixed and mobile structures (column and central body) to support the PV panels,
4. Develop in-situ reliability test of solar cells integrated with the electrical monitoring solution.

- **Perspectives du projet:**

The hybrid monitoring and control system that will be developed are innovative and will not only be useful for the design and monitoring of current and future solar in Morocco but may also be exported to other countries. The joint venture with Metecontrol will certainly help in this direction. The prediction simulator should help accelerate the large-scale integration of solar energy in the Moroccan electrical grid.