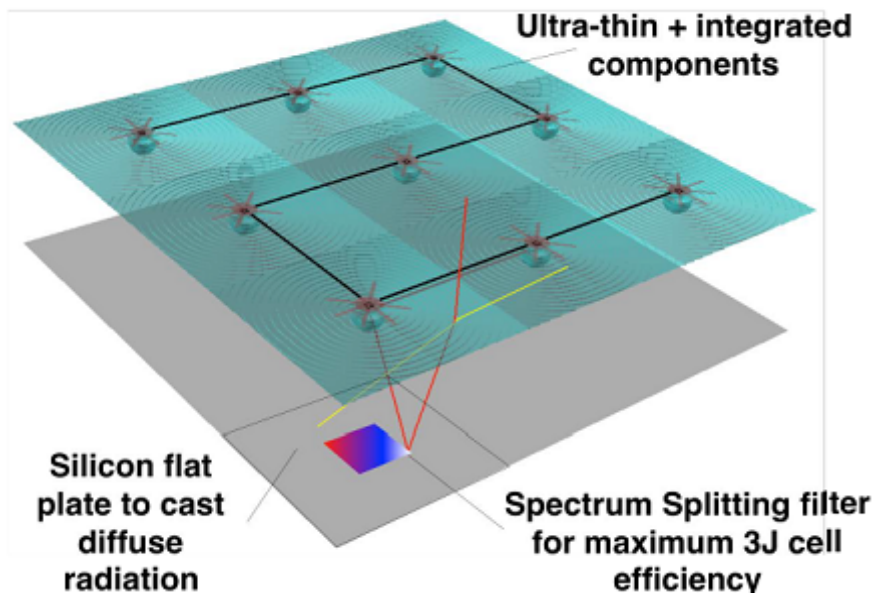


LPI Europe seeks to generate photovoltaic energy with 45% module efficiency



LPI EUROPE SL has been selected among 9 other projects in the 3rd call of *Fondo de Emprendedores* organized by Fundación Repsol. They have presented a novel concept to produce photovoltaic solar energy with super-high efficiency: “The high concentration ultra-flat **MF 45** CPV module”

The project evolved from the need to develop an economically viable and more sustainable energy-model through cleaner energy production. The sun, as a source of inexhaustible and non-polluting energy, is one of the most promising alternatives in the green energy fields.

In order to make it competitive and independent of subsidies policies, it is essential to lower the price of the kWh produced with solar energy. The current goal in the European zone is to reach a price between 0,10 and 0,25 €/kWh by 2020 (US\$0.135 and US\$0.338/kWh).

The **MF 45** module can potentially increase efficiency by 60%, relative to the best photovoltaic (PV) flat panel on the market (two-axis tracking), lowering the electricity generation costs and reducing the footprint needed to build solar plants.

Project description:

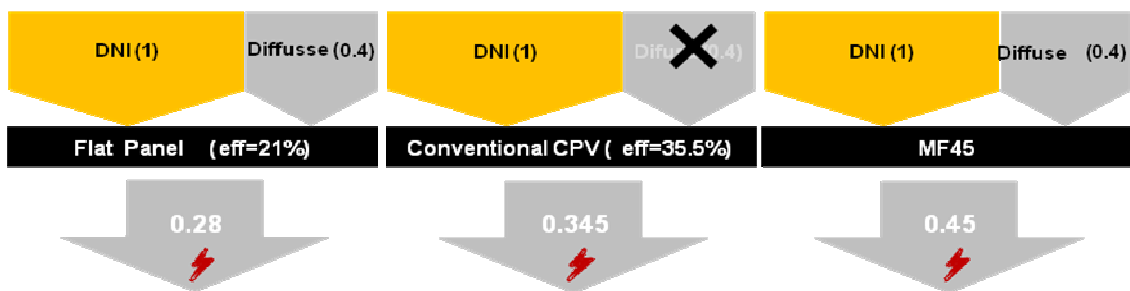
The **MF 45** is an ultra-flat high-concentration photovoltaic system (CPV) of very high efficiency, which may convert the equivalent of 45% of solar direct radiation into electricity. This very high efficiency is obtained not only due to the simplicity and high

performance of the optical system, but also thanks to the use of solar spectrum “splitting” techniques that segregate certain wave lengths of the solar spectrum between high-concentration multi-junction cells (MJ) and low-cost silicon (Si) solar cells. This patented system profits from the lowest material investment (fewer parts and achievable through mass production methods), but above all because of its high efficiency that improves by 30% that of the best existing CPV module.

The **MF 45** consists of an input primary panel containing not only the primary Fresnel lens but also the secondary concentrator lenses and the MJ cells. The deposition of the optics plus the MJ cells is achieved via “Silicon on Glass” (SOG) technology. The second part of the system is achieved by placing a flat plate of silicone cells beneath, at ½ the distance of the focal plane of the Fresnels. The solar spot of the Fresnels hit a spectral splitter that reflects back to the MJ cells the solar wave lengths that best suits these cells, letting through to the Si cell the radiation it can use to generate electricity. All of the other area not in the Fresnel solar spot at ½ focal distance absorbs direct full spectrum rays. These two capture methods conspire to increase the total efficiency of the system.

To improve alignment and reduce costs, the primary and secondary lenses are molded and auto-aligned in a single SOG step, while also protecting the MJ cells against water and oxydation, the wiring and the heat-sink mechanisms, which are also embedded in the input panel. Using this reflective spectral splitter, the total module thickness is reduced by half, bringing it closer to the dimensions of a PV flat panel.

A **MF 45** module with a 6 x 9 array of individual four-channel lenses will be designed and developed as a proof of concept under this project partially financed by Fundación Repsol.



For more information, you may visit:

- [LPI Europe](http://www.lpi-llc.com/) (http://www.lpi-llc.com/)
- [Fondo de Emprendedores de la Fundación Repsol](#) web