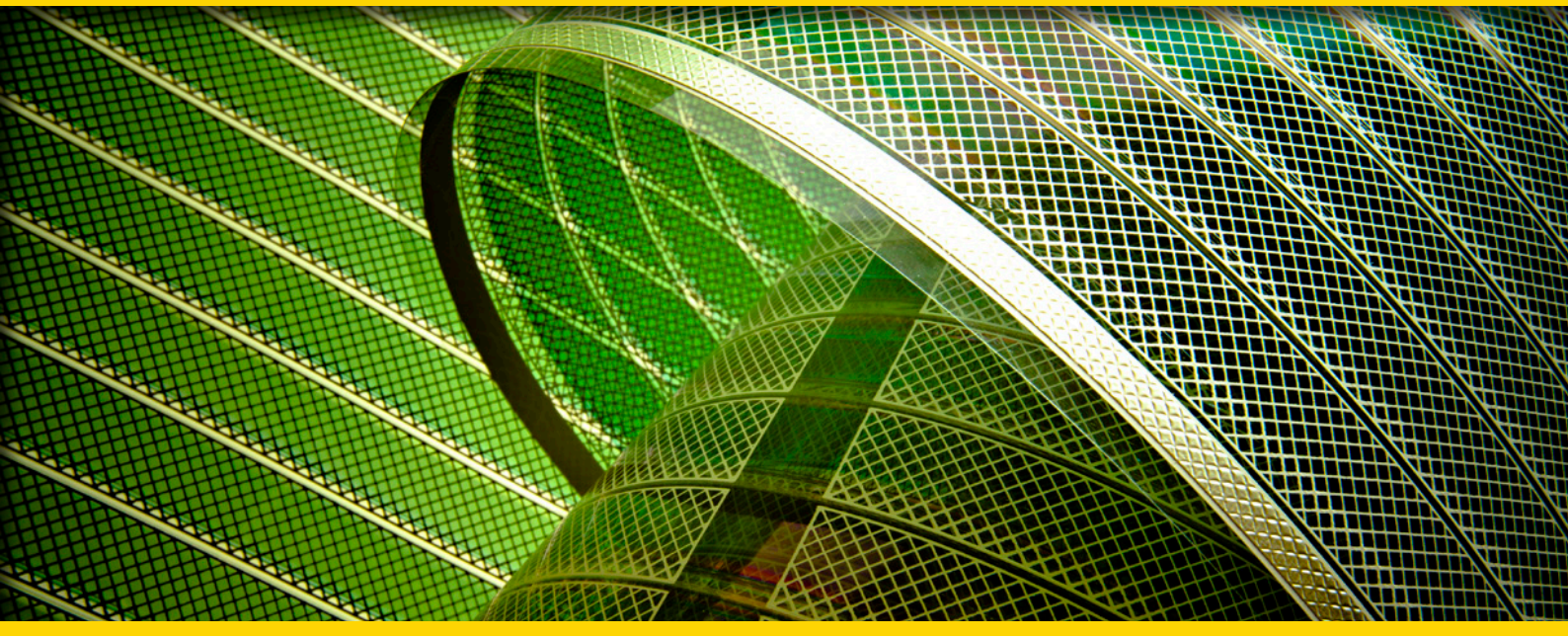
Sunflower

SEVENTH FRAMEWORK PROGRAMME

SOLAR ENERGY IN EVERY DAY LIFE



The Sunflower project vision

Organic photovoltaics (OPV) represent the newest generation of solar-to-power conversion technologies. OPV provide a key opportunity for the EU to further establish its innovation base in alternative energies offering the benefits of flexibility, low weight, and freedom of design. OPV can operate under low light conditions and is shadow tolerant. These advantages and the ease of handling in subsequent product-integration processes will enable the development of consumer and portable electronics and building-integrated photovoltaic (BIPV) products. The Sunflower consortium has chosen three demonstration targets to visualize these new possibilities.

PROJECT TARGETS - INNOVATION IMPACT

Portable charger demonstrator for tablet and e-reader devices.
This demonstrator makes use of the following OPV properties:

- Ruggedized technology for daily use
- Integration into standard passive materials such as plastic, leather, etc.
- Low weight
- High performance under diffuse and indoor illumination
- Design aspects to combine good looks with photovoltaics

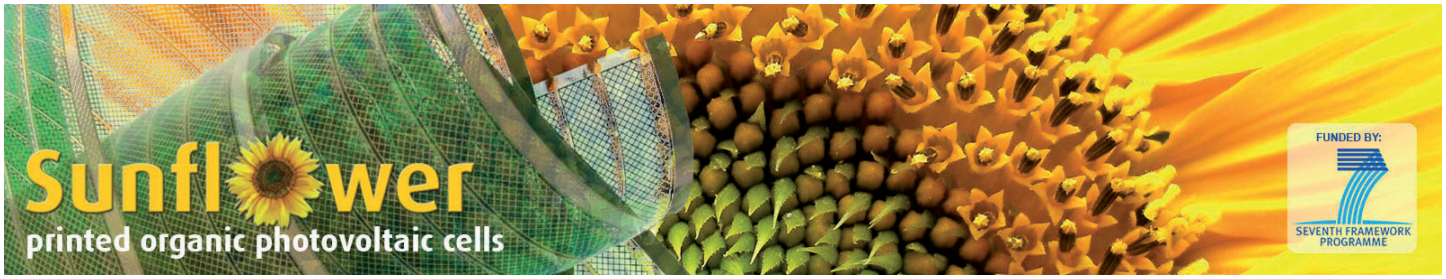
Vertical window blind demonstrator — a "retrofittable", adaptive product for existing buildings.

- Designed to cope with the traditional geometric dimensions of vertical blinds
- Flexible and easy to use
- Low weight for integration into existing fittings

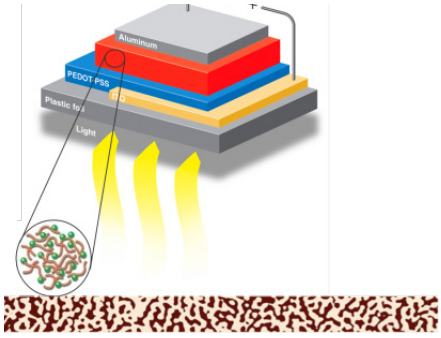
OPV-window demonstrator application in building facades.

- An OPV adhesive film to retrofit indoor windows or OPV laminated between two glasses
- Free-shape and color gives rise to tremendous integration and design opportunities
- Flexibility enable compatibility with window production methods

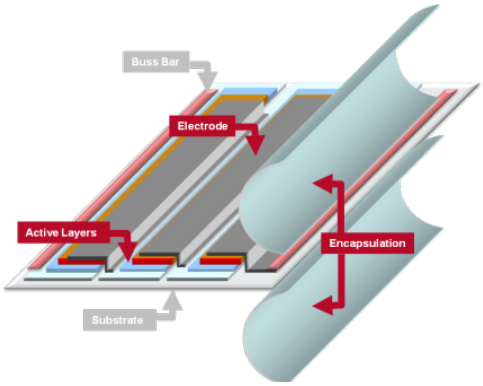
The Sunflower project team is open innovation driven, working in collaboration with interested end-user companies. It is our aim to be guided by the market in developing the best possible solutions and widely acceptable outcomes within our partnerships. The Sunflower consortium is actively disseminating information and addressing end-users by holding customer information events, organizing conferences and summer schools, and engaging with the general public to increase awareness of these new technologies.



TECHNOLOGY



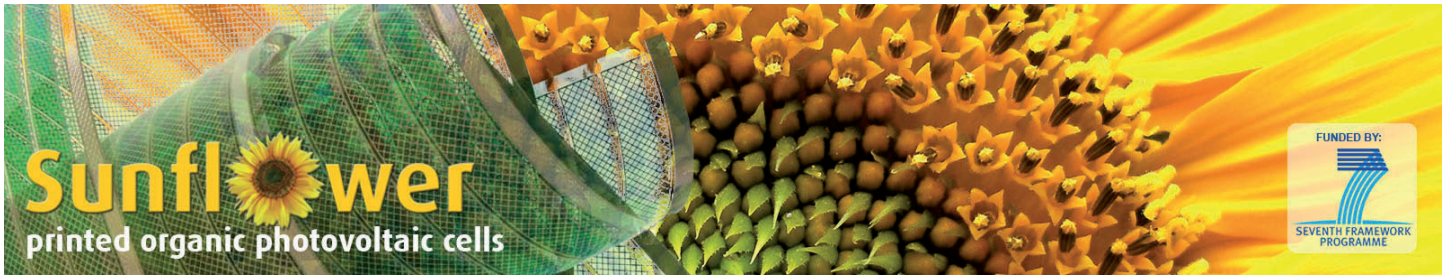
OPV technology is based on organic semiconductors, man-made using organic chemistry and tailored to those functionalities desired. Sunflower uses polymeric semiconductors that are soluble and printable. Several layers of materials are printed on top of one another to create a functional device. Through morphological engineering, a so-called p-n heterojunction is established during the fabrication process. The power-conversion efficiency of the technology is increased by researching new semiconductors and by adding layers that absorb complementary parts of the solar spectrum (tandem cells).



Through processes which are newly developed yet based on proven manufacturing technology, OPV cells can be arranged to form modules. A combination of additive processes, such as coating and printing, and subtractive ones, such as dry-structuring, leads to fully functional modules. Compared to other technologies, the outer and inner form-factors can be tuned quite easily in order to allow for customized properties in terms of voltage, shape, and transparency. The lifetime of OPV modules is increased by using barrier and "weatherable" materials. Light guiding technologies are also used to increase efficiency.

OPV applications can differ significantly from those of traditional photovoltaic. Thanks to the advantages in terms of design and integration potential, completely new products are possible: OPV thus complements the portfolio of current photovoltaic technologies. New designs incorporating the given properties of OPV can be used as aesthetic photovoltaic solutions for building facades and integration into products we use in our daily lives. The Sunflower consortium has chosen three distinct demonstrators to highlight this.

The Sunflower project encompasses the development of OPV technology from end to end. While working on increasing performance in terms of lifetime, efficiency, cost, and sustainability by means of R&D activities on the cell and module levels, Sunflower also addressed usage scenarios that are suited to OPV, as well as the technology's end-of-life environmental impact. With its 17 partners distributed along the value chain, Sunflower aims at major improvements in three fields: materials, processes, and tools and applications.



PROJECT FACTS

	PROJECT DETAILS
Project Acronym	SUNFLOWER Sustainable Novel FLexible Organic Watts Efficiently Reliable
Duration	4 YEARS (2011/10/01 TO 2015/09/31)
Project Cost	€ 14.2 M of which € 10.1 M are funded as Collaborative Project within the Seventh Framework Programm
7th Framework Programm	The SUNFLOWER project (Grant number 287594) is supported by the European Commission through the 7th Framework Programm on Research and Technological Development under the Information and Communication Technologies (ICT) thematic call: FP7-ICT-2011-7

PROJECT MEMBERS

The project consortium combines industrial, institutional and academic support to make a significant impact at a European and International level, especially on materials and processes while demonstrating their market relevant implementations. The industrial project partners are all well positioned along the supply chain of future OPV-based products: an important prerequisite for the creation of a significant socio-economic impact.

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"We have the chance to develop a technology that is ideally suited to manufacturing in the EU due to its high level of automation, need for highly trained personnel, low energy consumption, and close proximity to suppliers and markets."

Dr. Giovanni Nisato

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