

# **Final Publishable Executive Summary**

***orgaPVnet***

## ***Coordination Action towards stable and low-cost organic solar cell technologies and their application***

### **Coordination Action**



Contract number: *SES6-CT-2006-038889*

Project Co-ordinator: *Dr. Laurence Lutsen*

Project website: *www.orgaPVnet.eu*

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**“Sustainable Energy Systems, Research Activities having an impact in  
the medium and longer term / New and advanced concepts in  
renewable energy technologies**

## **Table of contents**

<b>1. PROJECT EXECUTION</b>	<b>3</b>
1.1. INTRODUCTION	3
1.2. PROJECT OBJECTIVES	4
1.3. PROJECT RESULTS	6
1.4. PROJECT IMPACT	7
1.5 COORDINATOR CONTACT DETAILS	7
1.6 PROJECT LOGO	7
1.7 PROJECT WEBPAGE	7
<b>2. DISSEMINATION AND USE</b>	<b>8</b>

## 1. PROJECT EXECUTION

### 1.1. INTRODUCTION

ORGAPVNET – “Coordination Action towards stable and low-cost organic solar cell technologies and their application” - was a project co-funded by the European Commission within the 6th Framework Programme (FP6).

One can observe a strongly increasing R&D-effort in the domain of solar cells based on organic layers. In order to have a real impact on the PV market, additional progress is needed on the level of efficiency, stability and application technologies to allow also the application of these solar cell technologies for power generation on a larger scale.

The ORGAPVNET coordination action consortium has fostered necessary progress on these issues by integrating a number of leading institutions in this field in association with the main industrial players entering this field: The Coordination Action being an appropriate vehicle by which the isolated competences that exist around Europe in this field can be integrated, structured and organized.

ORGAPVNET was started on 01 November 2006 for a period of 33 months. The project consortium was composed of 22 partners from 15 European and Associated countries from the European industry including SMEs, the research community and other major stakeholders of the organic PV sector. The 22 partners were:

UNIVERSITY OF PATRAS	GREECE
COMMISSARIAT A L'ENERGIE ATOMIQUE (CEA)	FRANCE
FUNDACIO PRIVADA INSTITUT CATALA D'INVESTIGACIO QUIMICA (ICIQ)	SPAIN
MERCK CHEMICALS LTD	UNITED KINGDOM
3E N.V.	BELGIUM
GREATCELL SOLAR S.A.	SWITZERLAND
SOLARONIX SA	SWITZERLAND
KONARKA AUSTRIA FORSCHUNGS UND ENTWICKLUNGS GMBH	AUSTRIA
BAR ILAN UNIVERSITY	ISRAEL
EGE UNIVERSITESI	TURKEY
VILNIAUS UNIVERSITETAS	LITHUANIA
CONSIGLIO NAZIONALE DELLE RICERCHE	ITALY

IVF INDUSTRIAL RESEARCH AND DEVELOPMENT CORPORATION	SWEDEN
HAHN-MEITNER-INSTITUT BERLIN GMBH.	GERMANY
FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	GERMANY
J. HEYROVSKY INSTITUTE OF PHYSICAL CHEMISTRY - ACADEMY OF SCIENCES OF THE CZECH REPUBLIC	CZECH REPUBLIC
ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE	SWITZERLAND
LINZER INSTITUT FUER ORGANISCHE SOLARZELLEN - JOHANNES KEPLER UNIVERSITAET	AUSTRIA
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (CNRS)	FRANCE
STICHTING ENERGIEONDERZOEK CENTRUM NEDERLAND.	NETHERLANDS
IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY AND MEDICINE	UNITED KINGDOM

This Action was necessarily positioned at the intersection between solid-state physics, chemistry, and materials science. A strong interdisciplinary approach was essential with a high degree of interaction. The formation of highly targeted Expert Groups provided visible and tangible vehicles to promote and stimulate focussed scientific discussions between materials scientists and organic PV device based researchers in Europe.

The synergy of the know-how present in the various research groups, all with strong international reputation in their subfields, concerning i.e. design and synthesis of novel polymer materials with as well donor as acceptor properties, nano-particles, solid electrolytes, the expertise in analytical, electrical and optical characterisation techniques, modelling and device up-scaling technology has ensured a more rapid progress.

## 1.2. PROJECT OBJECTIVES

The goal was the establishment of a common understanding for future investments and strategies concerning Organic Photovoltaics.

The measurable objectives and mission of OrgaPVnet were:

- to stimulate the restructuring of the Organic Solar Cell research community from a model of independent or collaborative research towards a model of integrated research to enhance uptake of Organic Photovoltaics.

- to allow closer relations between the various already existing organizations of scientific and technological cooperation in the two largest Organic Solar Cell communities in Western and Eastern Europe.
- to facilitate the transfer of results from the European Research to the European PV industry
- to work on measurement standards and prediction of the performance of Organic PV cells and modules.
- to implement more coherent National and European research activities in the field of Organic based Solar Cells.
- to stimulate new opportunities for Organic Solar Cells research community in a wide range of application domains: identify opportunities and barriers in the European Market, identify opportunities and barriers in Export Markets.
- to determine Organic Photovoltaic market potentials and opportunities
- to address socio-economic and financial issues relevant to the Organic Photovoltaic sector
- to cross-fertilize and disseminate results to the whole sector by means of various tools as a OrgaPVnet website for example.
- To develop future scenarios for advanced Organic Photovoltaics and application; identification of technology gaps and determination of requirements for a sustainable future growth

The ORGAPVNET method of work was:

- the organization of multi-disciplinary workshops/symposia to stimulate direct interaction on the Organic PV issues
- the promotion of industrial participation in the coordination action activities
- promote links with other researchers in relevant national, European, projects and networks
- the setting up and maintenance of the OrgaPVnet website, as an open and transparent means of information exchange and dissemination
- the elaboration a “who is who” guide for the Organic Photovoltaic activities
- the organization of expert group meetings to discuss specific issues of the consortium
- the management of funding for short scientific personnel visits to promote the scientific exchange between partners through a unified management structure that encourages staff mobility, staff exchange and joint execution of research projects
- the elaboration of a state of the art report
- the elaboration of the European Organic Photovoltaic Roadmap
- the definition of a strategy and action plan to ensure the continuation of an European coordination of the Organic Photovoltaic activities after the two years EC funding (sponsoring, new proposals to be submitted, Expression of Interest, etc...)

### 1.3. PROJECT RESULTS

In the course of the first year, the project has organized a kick-off meeting where all the partners were present. The 6 Expert Working Group Leaders with the project coordinator have organized a first Workshop in Prague on 21<sup>st</sup> and 22<sup>nd</sup> of May 2007 where contributions towards the state-of-the-art of the field were presented and discussed in small "round table" discussions after each session. Two meetings of the Steering Committee were organized where the preparation of the roadmap has been started to be discussed. A first ORGAPVNET International Symposium has been announced to the OPV research community and registration forms could be found on our project webpage [www.orgaPVnet.eu](http://www.orgaPVnet.eu)

In the second year, the consortium and the steering committee have started to work on the preparation of two questionnaires (one concerning DSC and one concerning OPV). One meeting of the Steering Committee was organized where the preparation of the roadmap and the questionnaires has been discussed. A first ORGAPVNET International Symposium has been organized by Prof. Sariciftci from LIOS in Linz in Austria on 6-8 February 2008. More than 350 persons have registered and attended the conference: the presentations given by the invited speakers can be found on our project webpage [www.orgaPVnet.eu](http://www.orgaPVnet.eu). The two questionnaires were sent beginning of 2009 to a large panel of persons working in the field in order to get information for the roadmap. The preparation for the second ORGAPVNET International Symposium has been started also and was planned as a joint session of the E-MRS conference in June 2009.

In the last period of the project, one meeting of Steering Committee was organized to analyze the answers received on the two orgaPVnet questionnaires and then finalized the outline of the roadmap. Then a large part of the activities were related to the writing-up of the roadmap text. A second orgaPVnet international conference was organized by Prof. Michael Graätzel as a special session at the E-MRS conference in Strasbourg in France in June 2009. Also a second orgaPVnet discussion workshop was prepared and organized in June 2009 to present to the consortium partners and the DSC/OPV community the first draft of the orgaPVnet roadmap. From the comments and discussion, the orgaPVnet roadmap was then finalized.

<p>The conclusion of the project is an integrated vision shared by the experts from the Organic Photovoltaics community in the form of a <b>"European Organic Photovoltaics Technology Roadmap"</b></p>
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#### 1.4. PROJECT IMPACT

ORGAPVNET has offer the opportunity for all actors in the sector to work together and discuss issues of crucial relevance, as well as to give a valuable input for the whole sector.

To date, the "**European Organic Photovoltaics Technology Roadmap**" forms the basis for a dialogue with the European Commission towards a FP7 transition and national funding bodies. It will be a basis for better directing and focusing the content of their future research and development programmes, and for improving the participation in and the access to these programmes by companies, particularly small and medium sized enterprises.



*Pdf file of the document can be obtained on request to the coordinator by e-mail*

#### 1.5 COORDINATOR CONTACT DETAILS

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#### 1.6 PROJECT LOGO



#### 1.7 PROJECT WEBPAGE

http: [www.orgapvnet.eu](http://www.orgapvnet.eu)

## 2. DISSEMINATION AND USE

The "knowledge" generated is intended to be a greater degree of consensus concerning which characterization methods are useful, which models are valid, and which are the priority areas for further research and development. The audience for this knowledge is thus the community of researchers and the relevant decision. Both the "state of the art" deliverable and the "roadmap" deliverable is disseminated via the web-site and via email under request.

The main dissemination actions are summarized below:

### Press release

- September 2007

CEA prepared a press release on solar Cells in "Science & Vie" for general public

- September 2007

CEA prepared a press release on solar Cells in "Usine Nouvelle" for industrials

- December 2007

CEA prepared a press release on solar Cells in "Journal du Dimanche" for general public

- February 2008

The Austrian National TV ORF has broadcast the First International orgaPVnet Symposium in the main News Programme at 19:00 with interviews of Nobel Prize laureate Prof. Alan Heeger and with the symposium organizer Prof. Sariciftci

- Jan 2009

IMEC reports method to extend lifetime of organic solar cells ( Europe, Asia, US)

- July 2009

Arie Zaban participated in Israeli Brain Storming Cast with president Shimon Peres (Israel)

### Media Briefing

- February 2008

In the evening of 6th of February the Mayor of the City of Linz made a press dinner together with approx. 30 journalists. This lead to large scale newspaper coverage in the next days.

- October 2008

Media briefing on organic solar cells in IMEC Leuven, Belgium

### Exhibition

- March 2007

Organic Electronic Association, Linz, Austria

- November 2007

Organic Electronics Association, CEA, Grenoble, France

- 22 Oct 2009

Solar Cells demo event : 30 hard copies of the orgaPVnet roadmap were distributed from the IMEC/IMOMECE stand

Conference/workshops

- April 2007

CNR-ISMAL gave an oral presentation of the OrgaPVNet C.A. project at the Technological Forum dedicated to "Actual and Future trends of PV technologies in Italy". XVIII National AIV Congress, Florence, Italy

- May 2007

E-MRS conference, Strasbourg, France

- May 2007

orgaPVnet workshop in Prague, Czech republic

- May 2008

E-MRS conference, Strasbourg, France

- 10-13 May 2009

HOPV conference, Benidorm, Spain

- February 2008

orgaPVnet first international symposium, Linz, Austria

- 08-12 June 2009

E-MRS / Symposium : A "Mesoscopic Dye Sensitized and Organic Heterojunction Solar Cells", Strasbourg, France

- June 2009

Second orgaPVnet workshop, Strasbourg, France