



## Smart net metering for promotion and cost-efficient grid-integration of PV technology in Cyprus



**Newsletter**

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**Deloitte.**

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## Introduction

The project "Smart net metering for promotion and cost-efficient grid-integration of PV technology in Cyprus" with the Acronym SmartPV, is co-financed by the European Commission under the LIFE+ Programme.

This is a pilot demonstration project approved under the theme "Environment Policy and Governance" contributing to the implementation of European environmental policy and the development of innovative policy ideas, technologies, methods and instruments.

SmartPV started on 1<sup>st</sup> July 2013 and is expected to be finalized within 44 months. This is the second newsletter of the project, which apart from including its main scope and objectives it aims to present the current project developments, ongoing work, recent and forthcoming events and future activities.

## SmartPV project scope and objectives

The main objectives of SmartPV are to develop and validate a cost optimum scheme for higher Renewable Energy Source (RES) penetration in the energy mix of Cyprus.

SmartPV will thoroughly investigate pilot net metering schemes for cost-effective Photovoltaics (PVs) implementation and higher grid penetration of distributed generation in Cyprus with the target of achieving a WIN WIN scenario for both consumers and energy utilities. Essentially, the project will put to the test, evaluate and disseminate a simple and timely concept (net metering), which should be more widely applied in Europe under appropriate, customized circumstances. The project aims to highlight and understand the impact of smart net metering on consumer billing options, consumption sensitivities, consumer energy-related behaviour and cost and benefit implications for network owners and operators. For this purpose, the energy consumption and production profiles of about 300 consumers-producers (prosumers) equipped with smart meters (SMs) and bidirectional communication means will be examined.

The aim of the pilot demonstrations is to assist in the development of the most optimum PV net metering model via the analysis of real data generated by the pilot plants. Data on consumption and tariffs will be selected, studied and compared. The data series that will be collected will be used to optimize the model, which will be customized for the case of Cyprus. Thus, the pilots will be used to demonstrate and prove the benefits of PV net metering by validating different models. Furthermore, investigations will also take place in terms of the environmental impact, with a focus on CO<sub>2</sub> emissions reduction, as well as of the socio-economic impact.

## Development/Progress for this period

During the first part of the project the focus has been mainly on the implementation of the pilot sites in order to enable reliable data to be collected and subsequently used for the development of the net metering models, the optimisation of the different tariffs and the implementation of demand side management through active prosumer participation. Also, policy analysis for net metering scenarios has been conducted to assist in the development of the dynamic tariff model to be validated and refined using the actual data.



Figure 1. SmartPV weather stations that assist in forecasting PV generation.

The most important achievements for this period are listed below:

- Selection of the 300 participating prosumers according to the desired criteria, in order to enable investigation of different parameters
- Purchase, installation and set-up of the head-end system, in order to retrieve the required data from the pilot sites
- Purchase and set-up of the SMs and GPRS modems. Installation at the pilot sites is running smoothly and is expected to be

completed soon. Following the installation of the SMs the data monitoring phase will begin in order to provide adequate data for the validation of the Time-of-Use (TOU) dynamic tariff scheme



Figure 2. Smart Meters Installation process.

- Scheduling of personal contacts with the participants to record the base-case and then the after-effect case mainly in terms of energy awareness and behaviour. The core team to conduct personal contacts has also been trained. The first personal contact will take place immediately after installation of the smart meters. The second contact will be made prior to the TOU tariff application and In-House Display installation
- Data is collected from the ten installed meteorological stations throughout Cyprus, thus providing valuable information for the solar resource in Cyprus (Figure 1)

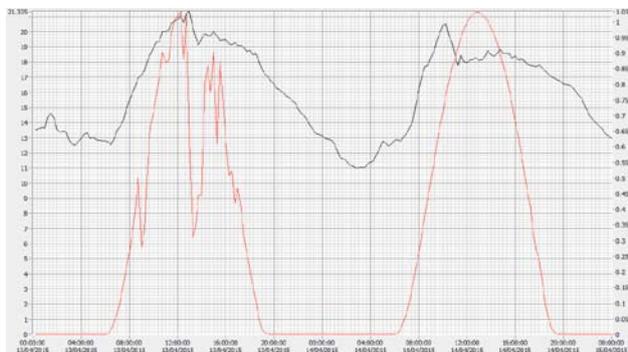


Figure 3. Weather stations monitoring

- Preparation of the tariff model development tool and methodology. The model will be

validated and refined using the actual data collected from the pilot sites. Figure 4 presents a screen shot of the software tool as obtained after simulation of data-sets acquired during the winter period

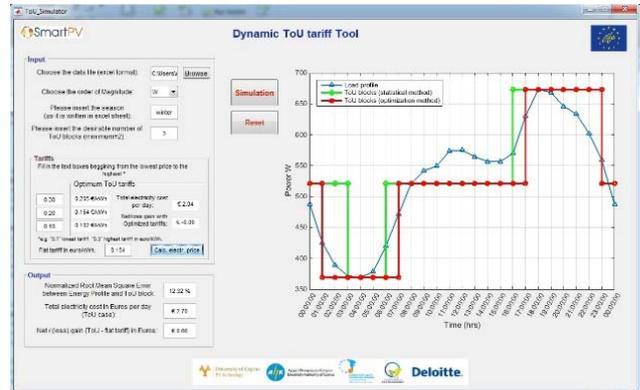


Figure 4. Developed dynamic TOU tariff software tool.

- Monitoring of the project’s environmental and socio-economic impact has progressed. An environmental baseline report has been prepared. Regarding the socio-economic impact, a questionnaire targeting prosumers has been prepared and the field work will be conducted in due course.

### Communication activities and events

#### EUSEW Local Energy Day

On 11<sup>th</sup> June 2014, a Local Energy Day was organized by the SmartPV Consortium in Nicosia, within the framework of the European Sustainable Energy Week (EUSEW) entitled "Beyond grid parity: Smart net metering for promoting PV technology and the importance of developing dynamic tariffs to support demand side management in an attempt to optimize PV penetration". The event attracted all the major stakeholders as well as the public’s interest and it covered all the key themes and current developments in Cyprus in the field of metering policy schemes and grid integration. Fruitful discussions between panelists and the audience followed the presentations of the event. A press release was also prepared and disseminated.



Figure 5. EUSEW local energy day.

### SmartPV in the press

An article prepared by Deloitte was published in “Kathimerini” nationwide newspaper, Sunday edition, on 29<sup>th</sup> June 2014.

Another article was prepared by the Electricity Authority of Cyprus (EAC) and was published in “Kathimerini” newspaper on 19<sup>th</sup> December 2014 regarding the progress of the project and in particular the implementation of the pilot smart metering sites, the voluntary involvement of 300 interested consumers in SmartPV, their educational training to be undertaken and the anticipated benefits.

### Energy Sources & Energy Saving Conference

On 8<sup>th</sup> July 2014, SmartPV representatives participated in the Renewable Energy Sources & Energy Saving Conference held in Nicosia, Cyprus. The project’s coordinator, Dr. George E. Georghiou delivered a presentation on the opportunities, challenges and research results in the field of PV and presented the first results from SmartPV.

### Presentation at DEMSEE Conference

SmartPV was represented at the 9<sup>th</sup> International Conference on Deregulated Electricity Market Issues in South Eastern Europe (DEMSEE) 2014 in Nicosia, Cyprus (25<sup>th</sup> – 26<sup>th</sup> September 2014), by Mr. Nikolas Philippou.

The concept and objectives of the project and in particular aspects of Action B.1 (Metering studies, policy analyses and dynamic tariff model development) were presented. The preliminary results of the Dynamic ToU tariff model were presented and discussion with the audience was made on how to enable Demand-Side Management (DSM) in Cyprus.



Figure 6. DEMSEE conference presentation.

### Presentation at MedPower Conference

The presentation of the SmartPV project entitled “The development of a forecasting tool for predicting the energy yield from PV systems in Cyprus” was under the “Forecasting” session of the conference held in Athens, Greece on the 2<sup>nd</sup> – 5<sup>th</sup> of November 2014. The conference was mainly focused on enabling technologies for integrating RES in the energy mix and their reliable, efficient and safe integration to the electricity grid.



Figure 7. MedPower conference presentation.

## Networking activities

### SmartPV links with ELECTRA

The University of Cyprus (UCY) made a first contact with the project ELECTRA by attending the kick-off meeting of the project. At the meeting, SmartPV was presented and its most important aspects were highlighted. The ELECTRA project is highly relevant to the SmartPV objectives and for this reason the consortium decided to maintain a close link for further networking initiatives. The next networking activity with ELECTRA will take place in May 2015.

### EPRI International Innovation Technology Summit

The University of Cyprus (UCY) participated actively in the EPRI International Innovation Technology Summit in Dublin taking place on the 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> June 2014, organized by the Electric Power Research Institute in order to present and exchange experiences with the SmartPV project. The innovation summit was dedicated to the developments in the electric grid and more specifically on the technical implications of the rise of distributed generation. The summit gave the opportunity to the project consortium to relate the content of the planned work with the aspirations of the international world and adapt the deliverables of the project in such a way so as to be in line with the international expectations and needs of the electrical industry.

### Links with POLICITY AND BECA projects

SmartPV representatives from Deloitte established links and exchanged useful information with projects POLYCITY<sup>1</sup> and BECA<sup>2</sup> on the 8<sup>th</sup> and 9<sup>th</sup> July 2014 in Turin, Italy. The main aims of the networking meeting were twofold: a) to share best practice examples and

experiences with the POLYCITY project team, particularly in relation to the socio-economic research activities, which will be applied within the scope of the SmartPV project; b) to present the SmartPV and disseminate useful information about the project framework, pilot activities and expected impact both to the POLYCITY project team and to a wider audience interested in the topics of promotion of renewable energy, optimisation of metering policies and smart grid integration. Not only were the above objectives achieved, but it was also possible to establish links with representatives in other relevant projects such as BECA<sup>3</sup> and SiNGULAR<sup>4</sup>. On the 9<sup>th</sup> July 2014 the SmartPV project was presented during a workshop entitled “Energy Performances in Social Houses technical and social results in 10 years of research”, presenting its main activities, expected results and impact, progress so far and how we intend to approach the socio-economic impact dimension of the project, i.e. foreseen methodology, indicators to be used etc.



Figure 8. SmartPV was presented during the “Energy Performances in Social Houses technical and social results in 10 years of research” workshop.

### Smart Grid World Summit 2014

In November 2014, SmartPV representatives from the Cyprus Energy Regulatory Authority (CERA) participated in the Smartgrid World Summit 2014 held in London, UK. The Smart

<sup>1</sup> <http://www.polycity.net/en/index.html>

<sup>2</sup> <http://www.beca-project.eu/home/>

<sup>3</sup> <http://www.beca-project.eu/home/>

<sup>4</sup> <http://www.singular-fp7.eu/>



Grid World Summit is the definitive annual conference providing practical guidance and strategic advice on Smart Grid Industry, Technology and Applications. At the beginning of the seminar the representatives from CERA distributed the project's first newsletter in order to inform the participants regarding the project.



Figure 9. Smart Grid World Summit 2014.

More information about the meetings can be found on the project website.

### Contact information

**WEBSITE:**

<http://www.smartpvproject.eu/>

**TWITTER:**

[https://twitter.com/SmartPV\\_Project](https://twitter.com/SmartPV_Project)

**FACEBOOK:**

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**LINKEDIN:**

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### Project partners



University of Cyprus  
PV Technology

The University of Cyprus (UCY) is the leading research University in Cyprus that aspires to promote scholarship and education standards of excellence through teaching and research.

One of the main priorities of the University is to develop further its academic and research portfolio in the field of sustainable energy and in particular photovoltaics (PV). An integral part of the Department of Electrical and Computer Engineering is the Photovoltaic Technology Laboratory which focuses on solar energy research aspects such as long-term outdoor performance monitoring of modules, standardized indoor performance monitoring, accelerated aging studies, novel solar cells, etc. The Laboratory also provides professional awareness initiatives on renewable energy as well as training courses on practical issues relating to photovoltaic system installation, operation and maintenance.

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Αρχή Ηλεκτρισμού Κύπρου  
Electricity Authority of Cyprus

The Electricity Authority of Cyprus (EAC) is a semi-government organization, established in 1952. EAC is responsible for the organisation of generation, transmission and distribution of electricity in Cyprus. EAC has extensive experience with feed-in tariff (FiT) schemes for renewable sources of energy. The FiT scheme obliges the EAC to buy the electricity produced by independent producers at a fixed price based on its marginal production cost. As a result, EAC has experience in granting and



facilitating grid access, accessing and assessing energy production data of distributed producers.

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The Cyprus Energy Regulatory Authority (CERA) was established by virtue of the Law on Regulating the Electricity Market of 2003 N.122(I)/2003, which was enacted by the House of Representatives on 25<sup>th</sup> July 2003, for harmonisation purposes with the Aquis Communautaire. This Law establishes CERA also as the Authority responsible for Regulating the Natural Gas Market. The relevant Directive was transposed into national Law by Law 183(I)/2004.

The Cyprus Energy Regulatory Authority is an independent authority of the Republic of Cyprus and has executive powers and competences in the Energy Field.

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The Department of Environment, of the Ministry of Agriculture, Natural Resources and Environment (MANRE), is the consulting body for environmental policy issues and

coordinator of environment related projects/programmes. It has the overall responsibility of environmental policy implementation and coordination of procedures.

As far as climate change is concerned, the Department of Environment is assigned with the implementation of mitigation and adaptation strategies and the monitoring of greenhouse gases emissions.

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## Deloitte.

Deloitte is a leading provider of professional services to electric power companies and electric and gas utilities worldwide, offering a wide range of industry-tailored services. In Cyprus, Deloitte houses several professionals focused on the renewable energy sector, with significant experience in assisting clients with activities involving different renewable technologies, including photovoltaic, solar thermal, wind and biogas. Deloitte participates in a number of EU funded projects in the energy and other sectors via the Grants & Incentives Unit, which is part of its Financial Advisory Services.

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