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## **PV GRID**

*Abbau von Barrieren für die großflächige Integration  
von Photovoltaik-Strom in die Verteilnetze*

### **Abschlussbericht**

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**Projektkennblatt**  
der  
**Deutschen Bundesstiftung Umwelt**



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**Antragstitel**                      **Abbau von Barrieren für die großflächige Integration von Photovoltaik-Strom in die Verteilnetze – PV GRID**

**Stichworte**                      Photovoltaik, Bürokratieabbau, Barrieren, Markthemmnisse, Netzintegration, regulative Barrieren

Laufzeit	Projektbeginn	Projektende	Projektphase(n)
<b>30 Monate</b>	<b>Mai 2012</b>	<b>Oktober 2014</b>	

Zwischenberichte

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***Zielsetzung und Anlass des Vorhabens***

PV GRID ist ein Projekt, das von der Europäischen Kommission im Rahmen des Programms Intelligente Energie für Europa gefördert wird. Es dauert von Mai 2012 bis Oktober 2014. PV GRID folgt auf das Projekt PV LEGAL. Im Rahmen dieses Projektes wurde von Juli 2009 bis Februar 2012 eine umfassende Datenbank über die bürokratischen Hemmnisse erstellt, die die Installation von Solarstromanlagen in Europa erschweren, und Handlungsempfehlungen zu ihrer Überwindung erarbeitet.

Ziel dieses neuen Projekts

- Abbau von Hindernissen für die großflächige Einbindung von Solarstrom in die europäischen Netze. Zur Erreichung dieses Ziels sollen bestehende Barrieren und verfügbare technische Lösungen analysiert und priorisiert, sowie regulatorische und normative Empfehlungen formuliert werden.
- Die im Rahmen des Projektes PV LEGAL erstellte Datenbank wird aktualisiert und gepflegt. Die Datenbank stellt diejenigen administrativen Prozesse dar, die für die Installation, den Netzanschluss und Betrieb einer Solarstromanlage in den 16 teilnehmenden Ländern erforderlich sind.
- Reduzierung der bürokratischen Anforderungen für die Installation, den Netzanschluss und den Betrieb von Solarstromanlagen in Europa.
- Förderung des Wissenstransfers zwischen den EU-Mitgliedstaaten durch den gesamteuropäischen Kontext der Projektpartner und Verbreitung von gezielten Informationen über Maßnahmen während der Dauer des Projektes.

## ***Darstellung der Arbeitsschritte und der angewandten Methoden***

Das PV GRID-Projekt besteht aus fünf Arbeitspaketen (AP):

1. Management
2. PV-LEGAL-Datenbank
3. Diskussion und Empfehlungen für die Integration von PV-Strom in die Verteilnetze
4. Diskussionen und Verbreitungstätigkeiten auf nationaler und europäischer Ebene
5. EACI-Verbreitungstätigkeiten

Das vom BSW-Solar geleitete Arbeitspaket 1 konzentriert sich auf alle Koordinations- und Management-Aktivitäten der 21 Partner. Als Projektleiter und AP-Koordinator hat BSW-Solar die Verantwortung für die Überwachung der Fortschritte in allen Arbeitspaketen, die rechtzeitige Erfüllung der Aufgaben durch alle Mitglieder des Konsortiums sowie für die Durchführung regelmäßiger Fortschrittssitzungen. Insbesondere ist es wichtig, nicht nur die qualitativ hochwertige und termingerechte Ausführung in allen Arbeitspaketen zu gewährleisten, sondern auch um das Zusammenspiel zwischen ihnen zu überwachen. Verschiedene Arbeitspakete können somit parallel realisiert werden, was einen regelmäßigen Informationsaustausch erforderlich macht.

eclareon zeichnet sich als Leiter des AP 2 für die Recherche und das Management der PV GRID Online-Datenbank verantwortlich. eclareon wird die Recherchen der Projektpartner leiten und aufgrund der Erfahrungen aus dem Vorgängerprojekt die Neuprogrammierung der PV GRID Datenbank organisieren. Zudem wird eclareon die Revision der Rechercheergebnisse sicherstellen. Der BSW-Solar wird im AP 2 die Recherche für Deutschland abliefern.

In dem Arbeitspaket 3 wird der Themenbereich der Netzintegration analysiert. Das Konsortium wird die Herausforderungen identifizieren und analysieren, die sich aus der Integration von PV-Strom in das Verteilernetz ergeben. Das Hauptziel dieses Arbeitspakets ist es, die regulativen Grundlagen für die großflächige Integration von PV-Strom in die Verteilnetze in ganz Europa zu bereiten. Im Rahmen des Arbeitspakets werden 3 Arbeitsgruppen eingerichtet, in denen Projektpartner und externe Experten in der Erforschung und Analyse der Probleme zusammenarbeiten und Lösungen auf transnationaler Ebene diskutieren.

### ***Ergebnisse und Diskussion***

- Abbau von regulatorischen und normativen Hürden bei der Integration eines wachsenden Anteils von PV-Strom in das Verteilnetz
- Maßgeschneiderte regulatorische und normative Empfehlungen für die Umsetzung technischer Lösungen zur Netzintegration eines wachsenden Anteils von PV-Strom
- Zahlreiche Fachveranstaltungen und Termine mit Behörden, Entscheidungsträgern und Netzbetreibern mit dem Ziel, die PV-GRID-Handlungsempfehlungen umzusetzen
- Eine Übersicht der regulatorischen und normativen Barrieren für die Integration der Photovoltaik in die europäischen Verteilnetze
- Eine umfangreiche Analyse der Stärken und Schwächen der regulatorischen und normativen Rahmenbedingungen in den Ländern, die im Projekt eingebunden sind sowie generelle Empfehlungen für die Länder, die nicht am Projekt beteiligt sind
- Weiterführung der PV-LEGAL-Datenbank, als Beitrag zur Vereinfachung der rechtlich-administrativen Verfahren bei der Installation von kleinen, mittleren und großen PV-Anlagen in Europa
- Eine umfassende und frei zugängliche Datenbank im Internet, die über rechtlich-administrative Rahmenbedingungen für die Installation und den Betrieb von PV-Systemen in 17 EU-Ländern informiert

### ***Öffentlichkeitsarbeit und Präsentation***

Das AP 4 dient der Kommunikation und Verbreitung der Projektergebnisse, was in Form von Vorträgen, Pressemitteilungen, der Produktion der Webseite und Druckerzeugnissen geschehen wird. Im Rahmen des AP 4 werden zudem diverse nationale Foren organisiert, die die Ergebnisse von AP 1 und AP 2 mit den Stakeholdern der betroffenen Länder diskutieren. Auf europäischer Ebene werden verschiedene Foren die Zwischen- und Ergebnisse kommunizieren.

Das AP 5 beinhalten von der EU-Kommission verlangte Standard-Kommunikationsmaßnahmen. Diese haben nur einen kleinen Umfang (z.B. der Teilnahme am IEE-Info-Day, ggfs. Präsentationen im Rahmen von EU-Veranstaltungen).

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# 1 Summary

## 1.1 Objectives of the action

The main objectives of PV GRID were:

1. to **reduce the barriers hampering large-scale integration of PV systems on electricity distribution networks** across Europe;
2. to **ease the administrative requirements and procedures** necessary for installing, connecting to the grid and operating a PV system in each of the 16 EU countries participating to the project;
3. to favour **knowledge transfer between European countries** with regards to PV market development.

## 1.2 Main activities, results and lessons learned

The project consisted in 2 main activity lines:

- The research on the existing administrative framework for PV development in 16 EU countries
- The discussion of technical solutions favouring integration of PV in distribution network and the analysis of their ideal deployment as a basis for the regulatory recommendations.



Figure 1.1 - PV GRID database screenshot

The first activity, coordinated by the consultancy eclareon GmbH, resulted in the development of a renewed PV LEGAL/PV GRID database, featuring a new and intuitive user interface with easier access to quantitative data, and a series of tools allowing to export and analyse the extensive information researched by eclareon and 15 national solar associations participating in the project.

The research tasks feature an initial planning and training phase, directed at those partners that did not participate to the PV LEGAL project, and then consisted in 4 research and update phases, occurring approximately every 6-8 months.

The discussion on technical solutions allowing large scale integration of PV in distribution networks was by far the main activity of the project, evolving progressively along its entire duration. Starting from the research and analysis of available solutions, their clustering in different groups, and then moving through the analysis of the national regulatory and normative contexts where these solutions should operate, thus allowing to identify a set of barriers that needed to be overcome in order to allow the implementation of the solutions. Such activity, coordinated by the research institutes DERlab and IIT department of the Comillas University, allowed to identify a series of recommendations that were initially presented in initial Short and Consultation versions of the European Advisory Paper. Such intermediate versions, along with the initial set of the four national case studies on the four focus countries of the project (Italy, Germany, Spain and the Czech Republic) allowed

to carry out an extensive stakeholder consultation process that finalised the prioritisation of technical solutions, the regulatory and normative barriers analysis, and the recommendations of the Paper. All in all, this activity resulted in a Final European Advisory paper complemented by 3 annexes, exceeding what was agreed in the Grant Agreement:



Figure 1.2 - European Advisory Paper and Annexes

was agreed in the Grant Agreement:

- 3 different versions of the European Advisory Paper (Key recommendations, Consultation and Final)
- 8 national case studies (annex I and II, including additional case studies on France, Netherlands, Greece and the United Kingdom)
- A barrier assessment over 15 countries (Annex III)

In parallel to the two main activity streams mentioned above, the dissemination and communication tasks coordinated by EPIA allowed for effective distribution of the project results to the target stakeholders, setting the stage for the consultation process which was the prerequisite to finalise the European advisory papers. Also in this

case, the results exceeded what was promised in the project's contract:

- 16 national forums (an additional forum was organised in France)
- 16 national workshops (an additional workshop was organised in Belgium)
- 2 project reports (Initial and Final)

Several lessons can be learned by the project

- The **solutions advocated by PV GRID** can all help to integrate more PV in distribution grids, but **there is no “silver bullet”** amongst them. The choice of which solutions should be implemented heavily depends on national policy and economic contexts.
- **The participation of all key national stakeholders** (regulators, TSOs, DSOs, PV sector and the smart grid/distributed generation sector at large) in the discussion of PV GRID solutions and recommendations is of paramount importance in order to succeed in the implementation of the best solutions at national level.
- **At European level**, policy action should be taken in order to facilitate and harmonise such solutions. In particular, the Grid Codes development process shall take into account its repercussions on distributed generation and network infrastructures operation.
- Another important finding of the project is the **need to clearly define terms and concepts** involved in PV Integration, as both extremely complex technical matters and language barriers often led to stakeholders misunderstanding each other in discussions, even when using the same words.

### **1.3 Success stories**

PV GRID success stories could be drawn from most national consultation process, where the discussion between national stakeholders often promoted understanding of different positions and highlighted common ground. In Summary, three outstanding success stories can be highlighted:

- The discussion on PV curtailment in Germany initialized by PV GRID has for the first time put together DSOs and the national PV sector on a shared position towards regulators. Curtailment was thitherto a red tag for many solar stakeholders who feared non-compensated losses of solar kilowatthours on the long run. By PV GRID the understanding for the grid benefits could be raised. PV GRID was able to demonstrate a cost-benefit evaluation for curtailment and convinced the PV sector to follow a proposal on according curtailment rules, to be inserted in the “feed-in-management” chapters of the German renewable energy sources act (EEG).
- In Poland PV GRID contributed to the discussion leading to recent developments of the country’s energy policy on renewables. The most important effect was the inclusion of many project recommendations to the amendment of the Energy Law in July 2013 and the draft of the new Law on RES appeared in September 2014. The Polish PV GRID partner PTPV was involved in these processes and is often asked for advice in the field of PV by the Ministry of Economy or Members of the Polish Parliament.
- In France, the national dissemination process of PV GRID was particularly successful, and allowed the French partner ENERPLAN go reach a high visibility amongst national electricity grids stakeholders. After an initial successful national forum, the PV GRID recommendations were discussed with a consistent group of DSOs, the TSO, the national energy regulator and also representatives of the Government. Most stakeholders agreed that the content of the recommendations deserved more discussion, and thus a second national forum was organised towards the end of the project.

More details can be found in the correspondent national partner’s individual performance assessment sections.

### **1.4 Involvement of target groups and key actors in the action**

In general, involving DSOs and TSOs in most countries has been successful, leaving aside a few isolated cases in which the political and economical situation has recently harshened the conditions for the PV market. A key element that allowed to gather the stakeholder’s and key actors attention was the extensive review of the available technical solutions and how these were ranked according to the experience of DSOs in advanced PV and RES markets such as Germany and Italy.

Further, the consensus-based methodology with which the PV GRID recommendations were developed, both within the project consortium and within the national consultation process enacted in the national forums and workshops, has proven to gain attention and respectability from the national energy sector stakeholders, including regulators and policy-makers.



## 1.5 Performance indicators

### 1.5.1 Project performance indicators

Performance indicator	WP	Planned Target	Actual achievement	Comment on performance
<b>At least 1 process initiated leading to an improvement of national regulatory and normative frameworks for PV grid integration in the 4 focus countries</b>	3	1 process	<p>At least <b>3 processes</b> have been directly triggered by the PV GRID project consortium:</p> <p>In <b>Germany</b>, an incentive scheme to support PV storage came into force in May 2013. The PV GRID consortium is also involved in the debate over curtailment measures that will result in an increased capacity for PV generation on German distribution grids.</p> <p>In <b>Portugal</b>, a new legislation on self-consumption will boost integration of PV on distribution grids.</p> <p>In <b>Poland</b>, the PV GRID consortium partner PTPV participated to the drafting of the new RES law.</p> <p>(Source: PV GRID national workshops)</p>	Achieved
<b>Processes initiated leading to an improvement of national administrative frameworks in at least 14 of the participating countries (leaving UK and Slovenia aside)</b>	4	14 processes	<p>In general, a negative context has been witnessed in Europe due to the fast development of PV in the last years, which led to many political measures with a negative impact. Those measures are expected to further hamper PV development.</p> <p>EPIA monitors framework development in all participating countries, thanks to the collaboration of PV GRID national partners and regularly reports updates on the project website:  <a href="http://www.pvgrid.eu/news/national-updates.html">http://www.pvgrid.eu/news/national-updates.html</a></p> <p>However, partially positive measures have been recorded in 6 countries: <b>Austria, France, Germany, Poland, Portugal, and the UK.</b></p> <p>(Source: PV GRID website)</p>	The overall negative context towards PV has influenced this indicator throughout the project.
<b>At least 60-80 visitors in average for each of the national forums</b>	4	60- 80 visitors in attendance	<p>In average, <b>100 participants</b> attended the 16 PV GRID national forums, with a minimum of 35 in Belgium and a record of 272 in Austria.</p> <p>(Source: attendance lists)</p>	Achieved

<b>Performance indicator</b>	<b>WP</b>	<b>Planned Target</b>	<b>Actual achievement</b>	<b>Comment on performance</b>
<b>At least 10 key target actors participating in each national workshop</b>	4	10 key target actors	In average, 16 key target actors attended the 16 PV GRID national workshops, with a minimum of 8 in the Czech republic and a record of 29 in the Netherlands. (Source: attendance lists)	Achieved
<b>At least 1,500 visits per month to the PV GRID website in average over the duration of the project</b>	4	1,500 visits per month	From November 2012 to December 2014, the traffic on the PV GRID website was in average of 1.900 visits per month, of which 1.300 are unique visitors per month. After the launch of the database, 2.000 visits were recorded in one week. (Source: Google analytics)	Achieved
<b>At least 120 people attending in average each of the European events</b>	4	120 people attending	The first PV GRID European forum in London was attended by 100 people The Final PV GRID European forum in Brussels was attended by 75 people (Source: attendance lists)	The attendance to such events was influenced by the relative abundance of PV related events in the last years. However, both events from the content, discussion and feedback point of view have to be considered a success.

## 1.5.2 IEE Common performance indicators

The development of the European PV market in 2012-2014 has not been as it was expected at the time of the preparation of the PV GRID project proposal during Spring 2011. Market decline started in 2013 when both Italy and Germany saw a sharp halt in installations induced by less favourable market conditions. Nonetheless, also in emerging markets like Bulgaria, Belgium, Czech Republic and France the conditions for PV started to worsen resulting in less-than-expected market growth.

Consequently, the efforts and success of PV GRID were not able to make a stand against such political changes that sensibly affected PV market developments.

According to EPIA's Global Market Outlook for Photovoltaics<sup>1</sup> published in June 2014, the cumulative installed PV capacity in Europe was, in the medium scenario equal to 39 GWp. In Deliverable D5.1, we assumed PV GRID's contribution to be 1 GWP, equal to 10% of the difference between the old baseline scenario (35 GWp) and the Paradigm Shift Scenario, 45 GWp. Therefore, only 40% of such 1 GWp target has been reached.

<b>Within the duration of the action</b>			
<b>Common Performance indicator</b>	<b>Planned target</b>	<b>Actual achievement</b>	<b>Comment on performance</b>

<sup>1</sup> <http://www.epia.org/news/publications/global-market-outlook-for-photovoltaics-2014-2018/>

<b>Cumulative investment (Euro)</b>	2400 M€ cumulative investment made by European stakeholders in sustainable (PV) energy (corresponding to 1 GWp cumulatively installed)	2400 M€ cumulative investment (corresponding to 0,4 GWp cumulatively installed)	Influenced by worsening market conditions for PV in Europe
<b>Renewable Energy (toe/year)</b>	- A total of 189 ktoe solar electricity production triggered over the duration of the action	75 ktoe solar electricity production triggered	Influenced by worsening market conditions for PV in Europe
<b>Primary energy savings (toe/year)</b>	N/A	N/A	N/A
<b>Reduction GHG emissions (t CO2e/year)</b>	A total of 1 Mt CO2e reduction of greenhouse gas emissions over the duration of the action	0,4 Mt CO2e reduction	Influenced by worsening market conditions for PV in Europe

For 2020, EPIA has now reduced its most ambitious “advanced” scenario to 8% of PV penetration in electricity demand, and therefore, the total 23 GWp of PV GRID contribution to 2020, calculated as 10% of 231 GWp (the difference between the old baseline and paradigm shift scenarios, have to be reviewed to 12 GWp, i.e. 10% of the 120 GWp difference between the current EPIA baseline and accelerated scenarios for the year 2020).

<b>By 2020</b>			
<b>Common Performance indicator</b>	<b>Planned target</b>	<b>Actual achievement</b>	<b>Comment on performance</b>
<b>Cumulative investment (Euro)</b>	- 43700 M€ cumulative investment made by European stakeholders in sustainable (PV) energy (corresponding to 23 GWp cumulatively installed)	22800 M€ cumulative investment (corresponding to 12 GWp cumulatively installed)	Influenced by worsening market conditions for PV in Europe
<b>Renewable Energy (toe/year)</b>	A total of 7614 ktoe solar electricity production triggered over the 2015-2020 period	3972 ktoe solar electricity production	Influenced by worsening market conditions for PV in Europe
<b>Primary energy savings (toe/year)</b>	N/A	N/A	N/A
<b>Reduction GHG emissions (t CO2e/year)</b>	- A total of 40.3 Mt CO2e reduction of greenhouse gas emissions over the 2015-2020 period	21.0 Mt CO2e reduction	Influenced by worsening market conditions for PV in Europe

## ***1.6 Important problems and deviations from Annex I***

The main problems, from the management point of view have been:

- The retirement of project partner Lumen in the early stages of the project;
- The incorporation of ASIF into UNEF and that of Assosolare in Assorinnovabili.

These issues have been efficiently tackled by properly redistributing resources and tasks across the new or remaining partners in the consortium, as also reported in the interim report. The dealing with such matters also required three grant agreement amendments, and the corresponding efforts by the project coordinators and, naturally, EACI/EASME project officers.

At the beginning of 2013, the loss of BSW's project manager Thomas Chrometzka, due to his change of employer, was initially compensated by BSW's managing director Jörg Mayer and in-house consultant Paolo Michele Sonvilla, who had assisted Mr. Chrometzka during PV LEGAL and PV GRID. Mr. Chrometzka was later substituted by Bianca Barth, who unfortunately also left BSW after the last content report, but before the project's final technical and financial reporting phase. However, BSW was able to provide seamless project management, even though a certain cost was paid in terms of unforeseen additional staff costs.

No major deviations from the Grant Agreement Annex I have to be reported, and those that occurred hold perhaps a positive connotation. A delay in the release of the project's main deliverable (D3.2 - European Advisory Paper) was agreed in advance with EACI/EASME and incorporated in one of the Grant Agreement amendments. This delay was however compensated with two early versions of the Advisory Paper, four additional case studies and a barrier assessment study published as annexes to the final version of the European Advisory paper. As already mentioned above, 2 unbudgeted national events took place in France and Belgium upon initiative of national partners in order to boost the national discussion of the project's results.

## 2 Performance review by work package

### 2.1 Work package 1: Management

#### 2.1.1 Objectives

The objectives of WP1 were to guarantee overall project management, make sure, all other work packages delivered the expected results, organise project and advisory board meetings, ensure timely project reporting and guarantee efficient communication with EACI/EASME.

#### 2.1.2 Major activities and achievements

WP1 activities went mostly as planned, and in the end all project objectives and deliverables were timely met.

In total, **three plenary project meetings** took place:

- Kick-off project meeting in Berlin on 10-11 May 2012, discussing the project planning and setting up activities
- Intermediate project meeting in London on 23 October 2013, reviewing intermediate project results, discussing and agreeing modifications to the original planning.
- Final project meeting in Brussels on 1 October 2014, discussing the overall achievements of the project and possible follow-ups.

The **Advisory Committee (AC)** was set up by BSW during the project preparation phases:

- The first AC meeting coincided with the kick-off project meeting that took place in Berlin on 10-11 May 2012.
- The second AC meeting coincided with the WP3 meeting in Rome in October 2012 and allowed AC members to contribute directly to WP3 discussions.
- The third meeting of the PV GRID AC committee was held in conjunction with the first European Forum organised 22 October 2013 in London, allowing to discuss the initial project recommendations and the strategy on how to finalise them over the last year of the project.

Over **50 bi-weekly conference calls** were organised throughout the project at WP leaders level in order to guarantee proper communication and coordination. In some cases, additional ad-hoc conference calls were set up to discuss particular issues.

The agreed **three project reports** (progress, interim and final) were delivered to EACI over the duration of the project. The collection of financial data from partners proved to be a time taking activities.

In total, **three grant agreement amendments** were discussed with EACI/EASME and submitted over the duration of the project. Communication with EACI/EASME was also ensured with periodical meetings in Brussels or conference calls.

Due to staff changes in BSW over the duration of the project, a significant amount of WP1 efforts were also needed in order to handover information between departing and new BSW staff and in-house consultants.

### **2.1.3 Assessment of the performed work**

No significant deviations are found in WP1, with the exception of the 2 weeks delay in delivering the final report, agreed in advance with EACI/EASME. Only three Advisory committee meetings (instead of 4) were performed, as after the third one it was deemed sufficient to gather feedback from the AC either by email or by their participation in other project events.

The coordination of such a diverse and large group of partners revealed to be a challenging task for BSW, especially in the initial part of the project. In particular, the industrial and scientific partners posed a communication challenge, due to the vast and complex technical issues that were required to be tackled in the project, and a different understanding of how these should and could be approached. The challenges were overcome by delegating decision-making to key competent project partners, and by restricting the focus of the projects to the key topics that could be properly addressed in the PV GRID timeframe.

Looking back, the scope of the project as presented in the project proposal was very wide, and subject to interpretation. In the future, we would restrict the project focus to a more limited and circumscribed field of action.

## **2.2 Work package 2: PV GRID DATABASE**

### **2.2.1 Objectives**

The objective of WP2 was to update and maintain the PV LEGAL database in order to ease the administrative requirements and procedures necessary for installing, connecting to the grid and operating a PV system in each of the 16 EU countries participating to the project.

### **2.2.2 Major activities and achievements**

WP2 was composed of three tasks:

- T2.1 Review of research plan and upgrade of database architecture
- T2.2 Research on administrative frameworks and barriers for PV system development
- T2.3 Evaluation of research and database update

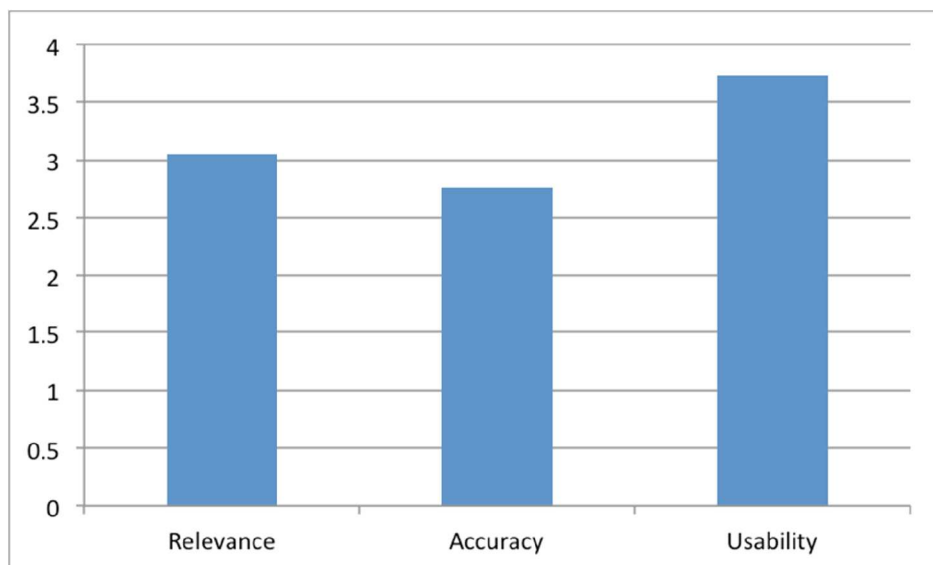
In T2.1, the work package leader, eclareon, together with BSW, EPIA, DERlab and COMILLAS prepared the grounds for the research phase for PV GRID. In particular, eclareon was responsible for preparing the database structure update (D2.1). Once approved, implementation work was passed on to an IT developer (subcontractor). At the same time, eclareon prepared a reviewed research plan to take into account the modifications of the database structure, the new partners joining the project and the experience of the previous PV LEGAL project. The reviewed research plan (D2.2) was presented to all national partners in a WP2 research kick-off meeting that took place on 28 August 2012 in Berlin. Within this same framework, eclareon organised one call with all partners to introduce the database structure,

the research template structure and the interview process. During each one of the four research phases, eclareon organised a bi-weekly conference call with all WP2 partners to keep track of the research. In total, about 32 conference calls have been organised for the WP2 research phase (4 phases lasting 4 months each and 2 calls per month).

In T2.2, a full-scale update of the database, involving all participating countries was started in September 2012. The update included the execution of a PV industry survey to quantify the durations, labour requirements and administrative costs connected with the development of PV systems. 3 market segments (residential systems, commercial systems, industrial ground-mounted systems) were analysed for the 16 participating countries. The first update included both qualitative and quantitative research.

Subsequent updates followed every 6-8 months for the qualitative part. Quantitative research was performed again only in the third and fourth update. The original project timeline only provided quantitative research for the third update, however a number of countries had upcoming laws whose effects would have altered the situation heavily. For this reason, those countries were allowed to move the quantitative research from the third to the fourth round, in order to take those effects into account. In total, 352 interviews have been performed. In the first update round, 77 interviews were made for the residential segment, 77 for the commercial one and 38 for the industrial one. In the third update round (second interview round) these numbers changed to 75, 70 and 15. Mainly this decline is due to the loss of vitality in the industrial segment, which remained active only in Germany, Greece and the UK.

In the project's lifetime, the data collected for the PV GRID database webpage show a total of 29,322 single users visiting the page. Furthermore, at the end of the project, visitors were prompted with a survey to assess the quality of the project's contents for the final users. Results show that the delivered content was highly relevant and accurate, and that the database was extremely user-friendly. The graph below plots the results (1=lowest score, 4=highest score).



*Figure 2.1 - Average PV GRID database user feedback review*

Users of the website were mainly National Public Bodies, Developers and EPC Companies. Out of 74 total respondents, 27 (9 each) belonged to the above-mentioned groups. The largest share of users, however, was from Universities (33 respondents). This number is however most likely skewed, as university professionals may be more willing to answer this kind of surveys and may therefore result in a higher share.

As regards the use of the site, 89 users responded to the survey. Of these, 53 use the website for research on administrative issues, 27 for PV projects development and 9 did not specify their goal.

In T2.3, at the end of each update phase defined in T2.2, eclareon collected the updates from each partner, revised them and included them in the database progressively as soon as they were ready.

### **2.2.3 Assessment of the performed work**

Our experience with WP2 has been of a fairly successful one. On the management's side, eclareon's team managed to keep up a consistent quality of work by regularly organising conference calls to discuss progress with the partners and despite internal team rearrangements, the process has always run smoothly. As regards the tools and instruments used, perhaps some simplification and streamlining in the processes could have been beneficial to the project. Then again, the research templates and websites had been very much improved in the transition between PV LEGAL and PV GRID.

All partners were generally responding well to eclareon's guidance as WP leader. Deadlines have been usually met and the quality of the delivered work has always been high. Clearly, in the beginning of the project some mistakes had to be fixed, however this was dealt smoothly in T2.3. This was expectable as some of the partners had never worked with the PV GRID research methodology and templates before.

Specific issues were mostly concentrated in the second part of the project (mid-2014 to project finalisation). Mainly, eclareon had experienced severe delays in some countries where the political or economic situation caused the PV Market to strongly shrink in size. Clearly, under those circumstances, PV associations had experienced an overload of work, and had sometimes to work to ensure their own existence, given how strongly the market had halted. In such cases, performing PV GRID research was firstly not a priority for them and secondly data for PV GRID was materially impossible to collect due to the lack of market development. In these cases, eclareon had agreed bilaterally with the partners on a separate timeline, that is moving the interview phase to the fourth round, instead of having it in the third one. This relieved the partners of some pressure and allowed them to handle the situation properly, and in turn to be able to perform interviews at a later stage.

Regardless of the market status, eclareon has received feedback from the partners with respect to the complexity of the interview process and to the responsiveness of the interviewees: involvement was sometimes difficult, as it was hard to convince stakeholders to disclose sensitive information (although they were promised anonymity) or to take part in hour-long interviews.



## ***2.3 Work package 3: Discussion and recommendations on PV GRID integration issues***

### **2.3.1 Objectives**

The main objectives of this work package were to identify and prioritize the technical solutions for enhancing the distribution grid PV hosting capacity, and producing an advisory paper, containing the barriers at European and National level, making recommendations to overcome them.

### **2.3.2 Major activities and achievements**

#### ***Initial data collection and set-up of working groups (T3.1)***

For the purpose of the initial WP data collection (T3.1), relevant documents were collected by all partners participating in the WP under DERlab's lead. The collection process was finalised by DERlab at the end of June 2012 and made available to project partners via a DERlab server at the end of July 2012.

Three Working Groups (WGs) have been set up (T3.1) for the purpose of data evaluation:

- WG1 (SMART GRIDS): Discussion of technical issues and solutions on the network and consumer side. (Task: Review of network/consumer side solutions. Participants: DERlab, ENEL, BSW, EPIA, RWE, ECLAREON, COMILLAS, LUMEN, ASIF)
- WG2 (SMART PV): Discussion of technical issues and solutions on the PV system side (Task: Review of PV system side solutions. Participants: DERlab, ENEL, BSW, LUMEN, ASIF, EPIA, RWE, ECLAREON, COMILLAS, CZEPHO)
- WG3: Discussion on regulatory and normative barriers related to grid expansion and operation frameworks (Task: Review of national grid expansion and operation frameworks and barriers. Participants: DERlab, COMILLAS, RWE, ENEL, BSW, EPIA, LUMEN, ASIF, CZEPHO, ECLAREON)

A number of external experts, drawn from the consortium's network of partners have also been invited to participate in WG activities, both by providing written comments by email and by participating in the following WP3 meetings.

#### ***Prioritization of Technical Solutions (T3.2)***

The objectives of T3.2 were set as:

1. Identification of key technical solutions;
2. Evaluation of the solutions against common criteria (e.g. cost, impact on voltage quality, impact on congestion, technology readiness, applicability within existing regulations) in order to assess their effectiveness;
3. Prioritisation of the technical solutions according to their effectiveness;
4. Delivery of a common position paper on: "Prioritisation of technical solutions available for the integration of PV into the distribution grid" (D3.1)

The first physical WP3 meeting took place in Rome, Italy, on 11 October 2012. The meeting was attended by project partners (DERlab, ENEL, BSW, EPIA, RWE, ECLAREON, COMILLAS, LUMEN, CZEPHO, ASIF), 8 invited external experts and 2 Advisory Committee members. During the one-day workshop, WG1 & WG2 technical area leaders presented the technical solutions in order to gather feedback from partners and external experts and to finalise the list of solutions that will be object of further discussion during

WG1&2 activities. The proposed technical solutions prioritisation methodology was also presented by DERlab, leading to a productive discussion that identified a number of necessary corrections.

After the Rome meeting, it was decided to merge WGs 1 and 2 in a single group. In fact, once the technical solutions had been identified, it made no further sense to treat them separately from PV or network side perspective. Further, DERlab substantially reformulated the prioritisation methodology. With the new methodology, all shortlisted technical solutions were separately analysed by DSO partners (ENEL, RWE and LUMEN, aided by COMILLAS and Iberdrola (external expert for Spain)), who provided, for each focus country and network type, an initial ranked list of technical solutions.

During the second WP3 physical meeting that took place in Berlin on 3 December 2012 (participated by DERlab, LUMEN, ENEL, BSW, EPIA, RWE, ECLAREON, COMILLAS, CZEPHO), an initial overall ranking of technical solutions based on the separate DSO inputs and put together by DERlab was presented and discussed. Most notably, the meeting resulted in a final agreement on the ranking methodology and on the results processing approach to be further utilised in T3.2 work.

The planning for the subsequent consultation round with external experts and PV associations was also discussed. Finally, D3.1 structure and planning were also initially discussed.

During the third WP3 physical meeting that took place in Madrid on 21-22 February 2013 (participated by DERlab, LUMEN, ENEL, BSW, EPIA, RWE, ECLAREON, COMILLAS, CZEPHO, UNEF, EACI project officer, 4 external experts), the complete results of the technical solutions' prioritisation process were presented. Furthermore, taking into account the feedback of the invited external experts and the PV industry's perspectives illustrated by PV Associations, a fine-tuning of the overall results was elaborated.

In the following weeks, work concentrated on the preparation and review of deliverable D3.1 "Prioritisation of Technical Solutions available for the Integration of PV into the Distribution Grid", which was completed during June 2013, with a few weeks delay compared to the original schedule.

This delay was originated by the necessity of a deeper wording review, brought forward by WP3 project partners.

### ***Discussion of regulatory and normative barriers (T3.3)***

The task of analysing and discussing regulatory and normative barriers (T3.3), led by COMILLAS, was started at the end of 2012 as planned. During a WG3 kick-off conference call that took place on 20 December 2012 (participated by ENEL, BSW, EPIA, RWE, ECLAREON, COMILLAS and DERlab), the focus of WG3 and its objectives, the planning of activities and its expected outcome were discussed.

It was also agreed that by late January 2013, project partners would have worked on the initial research on European-wide, general barriers arising from regulatory frameworks, administrative frameworks, grid codes and technical standards.

The results of this initial research were later used by COMILLAS for preparing a European perspective discussion paper on barriers to be used as a basis for the third WP3 physical meeting in late February 2013.

Furthermore, during the same meeting COMILLAS presented the methodology for addressing regulatory and normative barriers affecting the implementation of the most effective technical solutions highlighted in task T3.2. The methodology is to be used by project partners in order to build the 4 focus country case studies to be discussed at the following meeting. The leaders for the 4 focus countries were designated as:

- Czech republic: CZEPHO (reviewed by Lumen)
- Germany: BSW (reviewed by RWE)

- Italy: ENEL (reviewed by eclareon)
- Spain: UNEF (reviewed by Comillas and Iberdrola (external expert))

The fourth WP3 physical meeting took place in Prague on 7 June 2013 (participated by (DERlab, COMILLAS, RWE, eclareon, UNEF, CZPHO, BSW, EPIA, ENEL, 5 external experts) and was focused on the presentation of the draft 4 focus country case studies on regulatory and normative barriers. The presentation of the studies resulted in fruitful discussions on how to further improve the case studies, and how to draw from them the recommendations needed to address the barriers described in them. The proposed structure of deliverable D3.2 (European Advisory Paper containing recommendations for the introduction of regulatory and normative solutions) was also presented by COMILLAS, starting the discussion on how to structure this document.

Following the Prague meeting, time was spent by project partners in revising and expanding the national case studies. This work requires, in many cases, bilateral consultation with stakeholders such as national regulators, other DSOs, consultancies and other stakeholders. Such bilateral talks and meetings have been organised at different levels in all four focus countries.

Besides, a survey has been prepared by COMILLAS with the support of ECLAREON and DERLAB. This survey covers an analysis of barriers in five areas: PV system perspective, DSO (system side) perspective, demand response, grid connection requirements for grid integration of PV (voltage control) and storage. It has been distributed to several DSOs and regulatory agencies by ECLAREON and it is being filled in on a voluntary basis. The objective of the survey is to get a broader view of barriers in the entire European Union, not restricted to the four focus countries.

Another major WP3 activity taking place in the last weeks of the interim period has been the further revision of the D3.2 structure, led by BSW with the support of COMILLAS and all other partners participating in WG3. The structure of the document has been revisited taking into account the different levels at which issues or barriers may appear (European or national) and the consequent necessity of addressing the correspondent policymakers and regulators. Furthermore, the new structure will also address the task of allowing other European countries (beyond the four focus ones) to make use of the results of the PV GRID project.

#### ***Preparation of advisory paper (T3.4)***

The advisory paper is the main deliverable of PV-GRID project. During task 3.3 the discussion of the regulatory and normative barriers set the ground for the advisory paper. The cases developed and analysed in this task were used as a first draft for the advisory paper. The advisory paper was structured as having two main sections: the European challenges and recommendations, and the implementation of technical solutions at national level; covering therefore barriers both at European level and at national level. The initial proposal only considered 4 focus countries (namely Spain, Germany, Italy and Czech Republic). In the end of 2013 it was agreed to extend also the analysis to 4 additional case studies (namely France, United Kingdom, Greece and the Netherlands). All these case studies (focus countries and additional case studies) are included as annex of the advisory paper. Besides the survey initiated in task 3.3, turn out into a more elaborated barrier assessment that is also included as an annex in the advisory paper, covering the state of the barriers at 15 European countries. Each of these countries was represented by a PV association within the PV GRID project. Besides a consultation process of the advisory paper was initiated in the end of 2013, to gather the feedback of the National Workshops, and of the Advisory Committee. This consultation version was initiated with a short version of the Advisory Paper, which helped to improve the diffusion of the results. Finally the feedback received was taken into account to improve and produce the final version of the advisory paper.

### **2.3.3 Assessment of the performed work**

The prioritization of the technical solutions has successfully identified 18 technical solutions, classified in high, normal and low effectiveness, also clarifying how the effectiveness changes in the medium and low voltage networks. Besides, a techno-economic indicator identifies when the adoption of the solution requires a regulatory and technology development.

The objective of producing an advisory paper, with an identification of barriers and recommendations, has been exceeded in various aspects:

- 1) Not only 4 focus countries have been analysed but also 4 additional case studies have been provided.
- 2) The analysis has been complemented with a detailed barrier assessment in 15 European countries. The barrier assessment is a useful reference to anyone who needs to know the current situation of the technical solutions in these countries. In particular it covers 10 topics including DSO investment recovery, self-consumption, curtailment, storage and demand response.
- 3) A consultation process of the advisory paper has also been carried out, gathering the feedback of National Workshops and of the Advisory Board, and improving the final version of the advisory paper.
- 4) A short version of the advisory paper has also been produced, improving the visibility of the results.

None of the previous topics were initially foreseen in the project proposal.

The advisory paper has proved to be a useful tool as interface with the DSO/Regulators. Some PV associations have reported that as a result of this analysis, they are starting to be taken into account in discussions related to how to regulate the integration of PV in the distribution networks.

## ***2.4 Work package 4: EU level and national discussion and dissemination***

### **2.4.1 Objectives**

The main objectives of WP4 were:

- To create a logo, a set of communication tools and the PV GRID website including regular updates (Task 4.1)
- To prepare press releases, develop a project leaflet in all languages of the consortium and ensure 10 project presentations and articles in relevant publications(Task 4.2)
- To organise 15 National PV GRID Forums (Task 4.3)
- To organise 15 National workshops or bilateral meetings (Task 4.4 , EPIA)
- To organise two main European dissemination events (Task 4.5)
- To prepare two project reports (Task 4.6)

## 2.4.2 Major activities and achievements

### ***Project Image and Website (T4.1)***

During the first months of the project, all sub-tasks foreseen within the preliminary task T4.1 have been completed without major delays under the leadership of EPIA (WP4 leader):

- During July 2012, the PV GRID logo was agreed among project partners;
- During August 2012, EPIA coordinated the preparation of project visual identity guidelines (D4.1) providing templates and clear indications on how presentations and documents produced by the project consortium should look like;
- At the beginning of September 2012 a temporary website was put online, soon replaced in November by the permanent PV GRID website (D4.2) developed by a subcontractor, Thomas Wendt, selected further to a call for proposal launched for the development of both the PV GRID website and database;
- A Linked-in page was also created, replacing the previous PV LEGAL Linked-in group. This page is used to provide updates on the project towards a wider audience than the sole project partners.

As part of T4.1, all national partners were requested by EPIA to regularly report regulatory changes and evolution in their countries. These updates were progressively reported within the “News” section of the website at the beginning of the project and in order to offer more exposure to this part and make them easily accessible they were later on moved to a new dedicated section called “National updates”.

### ***Dissemination of results (T4.2)***

As part of T4.2, five press releases (D4.3) were published during the whole duration of the project:

- 15 November 2012: the first project press release (T4.2) was sent out, announcing the start of the PV GRID project and the release of the official PV GRID website. The press release was distributed in 13 countries in the national languages but also in English at the European level. The press release was not sent out in:
  - Belgium, due to the fact that national PV GRID partner (represented by EDORA) was at the time facing a very difficult context with the ongoing review of national support schemes
  - United Kingdom, as a subcontractor had not been yet identified in the country to take care of the PV GRID dissemination activities.
- 16 January 2013: release of the PV GRID database. The press release was distributed in 13 countries (national language) and at the European level (English). Countries in which it was not sent out were:
  - Belgium (represented by EDORA) due to a difficult political context (as explained above);
  - Italy (represented by Assosolare) due to their delay in providing content for the database.

- May to July 2013: announcement and reporting about the national forums. 13 national press releases were distributed. Countries missing were:
  - Sweden (represented by SSE), since previous press releases had a very low impact. SSE chose a different strategy and got a good article published in the national energy magazine, which did make publicity about their National Forum outcome.
  - Netherlands (represented by Holland Solar): the press release could not be sent at the time of the Dutch national Forum due to concomitant busy press activity. The Dutch partner opted to send out a press release at a more effective moment towards the end of summer 2013. It was done in parallel to another press release from a DSO concerning the rapid growth of solar PV.
- 30 January 2014: announcement of the consultation version of the Advisory paper and the upcoming national workshops, which would take place between April and May 2014. 15 national press releases were published, and the English version was disseminated at a European level.
- 30 September 2014: two press releases were published announcing the availability of the final project report and the European Advisory paper but also summarising the outcomes of the Final PV Grid event. The first press release has been published by BSW-Solar in German and the second one in English by EPIA.

Clippings of the outcome of these press releases, where available, are attached to the report

Apart from all the articles that derived from the various press releases in all project partners countries (D4.4), several articles about the PV GRID project were published in relevant publications and at least five articles were published in the EPIA newsletter with a vast distribution list of 15.000 contacts.

A project leaflet (D4.5) was also realised during Q4 2012. The leaflet was developed in English and then translated in 13 languages to cover all the project languages, including, Slovenian. The final version of all translated leaflets was completed in December 2012 and distributed to all partners in the first days of 2013.. In total, 36.900 copies were printed. Corrections and changes were made to the Italian leaflet in November 2013, as the partners name changed from Assosolare to assoRinnovabili.

A standard project presentation was prepared by EPIA and distributed to all partners. Further, eclareon and DERlab have prepared specific presentation on the content of WP2 and WP3. Based on these templates, project presentations (D4.6) were realised by national associations and other project partners:

1. 13 Sept. 2012, “Administrative workshop on solar energy”, Netherlands. Presenter: Arthur de Vries, (Holland Solar). Attendance: 70, mainly municipalities;
2. 19 October 2012, “10. PV Tagung Laxenburg”, Austria. Presenter: Vera Liebl, (PV Austria). Attendance: 170 (researchers, PV-installers, project developers);
3. 13 June 2013, CIRED 2013 (“Electricity Distribution Systems for a Sustainable Future”), Stockholm, Sweden. Interactive Poster presentation, Michel Vandenberg (see poster attached to this report). Paper full name: “Technical solutions supporting the large scale integration of photovoltaic systems in the future distribution grids”;

4. 18 June 2013, Regional Swedish Seminar focusing on grid issues, Lund, Sweden, Presentation by Jan-Olof Dalenback (SSE).
5. 1 October 2013, 28<sup>th</sup> European PV Solar Energy Conference and Exhibition, Paris, France. Presenter: Manoël Rekinger (EPIA), poster presentation and Paper full name: "Evaluation of technical solutions for a large scale integration of PV in European Distribution Grids"
6. 10 October 2013, DERri International Conference" Experimental research and DER integration in the EU Energy system. Presenter: Paolo Michele Sonvilla (BSW-Solar), poster and presentation.
7. 21 October 2013, 3<sup>rd</sup> Solar Integration Workshop, London, UK. Paper full name: "Evaluation of technical solutions for a large scale integration of PV in European Distribution Grids". Presenter: Manoël Rekinger (EPIA), Attendance: 50 (researchers, academians)
8. 27 November 2013, IEA PV PS Task 14 meeting, Sidney Australia, 2 presentations. Presenter: Manoël Rekinger (EPIA). Attendance: 25 (experts from research institutions)
9. 25 March 2014, Innogrid2020+, 3<sup>rd</sup> Annual Conference, Brussels Belgium. Presenter: Bianca Barth (BSW-Solar), Attendance: 130 (TSOs, DSOs, research centres and policymakers)
10. 26 March 2014, Innogrid2020+, 3<sup>rd</sup> Annual Conference, Brussels Belgium. Presenter: Manoël Rekinger (EPIA). Attendance: 150 (TSOs, DSOs, research centres and policymakers)
11. 10-11 June 2014, CIRED WORKSHOP 2014: "Connection and access options to accommodate distributed generation" presentation and poster. Presenters: Manoël Rekinger (EPIA), Paolo Sonvilla (BSW). Attendance: 150 (DSOs and research centres)
12. 25 September 2014, 29<sup>th</sup> European PV Solar Energy Conference and Exhibition, Amsterdam, the Netherlands. PV GRID project presentation: "Overcoming Normative and Regulatory Barriers Hampering PV Hosting Capacity Enhancement in European Distribution Grids" and presenter: Presenter: Manoël Rekinger (EPIA).
13. 6 October 2014, EUROPEAN UTILITY WEEK 2014: PV GRID – MAKE IT SMART!. Presenter: Manoël Rekinger (EPIA), Attendance: 30 (DSOs, TSOS and research centres)

2 roll-up banners have been created for the PV GRID project and were used for the dissemination and promotion of the project in various occasions.

A first issue of the PV GRID newsletter (originally not foreseen in Annex I) was distributed on 7 May 2013 to EPIA contacts/subscribers registered through the PV GRID website and other contacts provided by project partners. About 680 clicks-through were registered via the mailing sent by EPIA. The newsletter was also translated by project partners (on a voluntary basis) into 4 languages: French, German, Greek and Portuguese. In total 3 issues of the PV GRID newsletter were created and disseminated. Please see the content of the newsletters below:

- 7 May 2013: Launch of the PV GRID project, PV GRID's Initial Project Report Published, PV GRID project: National Forums on large scale grid integration of PV will be organised during April and May 2013, PV GRID database is now online!

- 10 April 2014: PV GRID Database updated, PV Grid Advisory Paper - Consultation versions published, Announcement of the European PV GRID Forum - London - 22 October 2013 and Outcomes of the PV GRID national Forums
- August 2014: Invitation to the European Final Forum, PV GRID Advisory paper consultation versions are still available, Update of the PV GRID database and Outcomes of the national Workshops

Further, the project website was improved and regularly updated each time a new deliverable was published, when a press release was published or when the organisational details of the national forums, national workshops and European Forums were announced or reported after they took place.

### ***Organisation of National Forums (T4.3)***

In order to prepare national dissemination activities (T4.3), EPIA initially presented the overall work plan at the WP2/WP4 meeting in Berlin on 28 August 2012. Detailed WP4 guidelines were successively distributed to all national partners in order to provide a reference for their activities.

For United Kingdom a subcontract was concluded with the Solar Trade Association (STA). The organisation is very much active in promoting PV and in particular grid related matters, it also has a frequent and positive relationship with national authorities DSOs and the energy regulator, which motivated the choice for this subcontractor. The subcontractor delivered all expected deliverables corresponding to the interim period in due time.

From December 2012 to July 2013 activities under WP4 mainly focused on the organisation of the 15 National Forums. Since the beginning of 2012, EPIA organised every two weeks a conference call with national partners to brief them and follow up on the organisation of forums. Guidelines were produced (see in annex) and distributed as well as an agenda template (see in annex) to provide some guidance to each national partner. EPIA's role was also to ensure the participation of other partners as speakers or visitors to the national forums. Many bilateral exchanges took place with forum organisers in order to make sure the event would correspond to the expected level of quality and content as specified in PV GRID Annex I. The outcomes of the national forums are available at the dedicated page on the PV GRID website.

All originally foreseen 15 National Forum were organised as planned. See the table below for details on venues and attendance.

An additional unbudgeted national forum on PV grid integration took place on the 10 September 2014 In France organized by ENERPLAN. This new event gathered as much attendees as the first one in July 2013. The PV GRID advisory paper, in his consultation version, was largely disseminated and discussed at this event.

<b>Country</b>	<b>Date</b>	<b>City</b>	<b>Number of Participants</b>
Sweden	April 26, 2013	Stockholm	50
Portugal	May 9, 2013	Lisbon	145
Netherlands	May 17, 2013	Amsterdam	80
Bulgaria	May 30, 2013	Sofia	100
Poland	June 6, 2013	Warsaw	75



Czech Republic	June 14, 2013	Prague	88
Germany	June 20, 2013	Munich	70
Austria	June 24, 2013	Vienna	272
Slovakia	June 27, 2013	Bratislava	53
Belgium	June 27, 2013	Namur	35
Spain	July 2, 2013	Madrid	52
UK	July 4, 2013	London	74
Greece	July 4, 2013	Athens	239
France	July 10, 2013	Paris	100
Italy	July 18, 2013	Rome	60
France	September 10, 2014	Paris	100

Table 2.1 - WP4 National Forums

#### **Organisation of National Workshops (T4.4)**

In November and December 2014 EPIA coordinated the process (T4.4) leading to the organisation of 15 national workshops or bilateral meetings (D4.9). These events took place between January and April 2014 and were aiming at promoting the adoption of recommendations contained in the European Advisory paper developed in WP3. Guidelines as well as a series of regular conference calls were organised every 2 weeks in order to provide instructions, to brief the national partners on how to approach local stakeholders that should be involved in the discussion of grid-integration issues and to track national associations' progress on this task.

For United Kingdom a subcontract was concluded with the Solar Trade Association (STA), likely as for the National Forum. The subcontractor delivered all expected deliverables corresponding to the interim period in due time.

In some countries, where it was difficult to bring together all the needed target groups, several bilateral meetings were organised instead of a single workshop. All originally foreseen 15 National Workshops/Bilateral meetings were organised as planned. See the table below for details on venues and attendance. The outcomes of the workshops are available on the PV GRID website.

An additional national workshop was organised by Belgian partner EDORA, in Namur Belgium on 7 October 2014, in order to boost the discussion of the PV GRID recommendations in the country.

<b>Country</b>	<b>Date</b>	<b>City</b>	<b>Number of Participants</b>
Germany	19 February 2014	Berlin	26
Sweden	11 March 2014	Stockholm	10
Czech Republic	18 March 2014	Prague	8
Greece	18 March 2014	Athens	18
Austria	25 March 2014	Vienna	13
Bulgaria	26 March 2014	Sofia	16
Spain	26 March 2014	Madrid	15
Italy	27 March 2014	Rome	15
France	March 2014	-	4 Bilateral meetings

Slovakia	April/May 2014	-	4 Bilateral meetings
Netherlands	23 April 2014	Rotterdam	29
Belgium	24 April 2014	Namur	16
UK	24 April 2014	London	16
Portugal	May 2014	-	3 Bilateral meetings
Poland	March 2013/May 2014	-	12 Bilateral meetings
Belgium	7 October 2014	Namur	9

*Table 2.2 - National Workshop Attendance*

## **2 European Forums (T4.5)**

The first European PV GRID Forum took place on 22 October 2013 in London. This event took place in conjunction with the 3rd Solar Integration Workshop organised by Energynautics. A mutual promotion agreement between EPIA and Energynautics had been signed in order to ensure a good participation from the PV sector at the event. The Forum presented the first results of the PV GRID project, focusing on technical and regulatory solutions for a smoother PV grid integration for both system owners and DSOs. Several mailings were done from August to October 2013 in order to promote the event and ensure a good participation from the PV and more generally the energy sectors. Furthermore EPIA established 8 media partnerships in order to promote the Forum and increase the visibility of the event as much as possible. The event gathered approximately 100 participants (DSOs, TSOs, policymakers, research community). The agenda and the presentations are available at the [PV GRID website](#).



*Figure 2.2 - Final PV GRID European Forum*

The Final European PV GRID Forum took place on 29 September in Brussels, Belgium and focused on discussing findings and future steps for PV large-scale integration at distribution level in Europe. The Forum presented the final results of the PV GRID project. During the different sessions project partners, consisting of DSOs and representatives of the PV industry, and external experts presented their views focusing on technical and regulatory solutions for a smoother integration of high penetration levels of Photovoltaic (PV) into European distribution grids. Several invitation mailings were sent from July to October 2014 in order to ensure high participation. Furthermore EPIA being a project partner in the IEE funded REserviceS project, decided to organise the 2 Final Events in consecutive days at the same venue in order to gather a higher number of participants that would be interested in attending both events. In addition 4 media partnerships were established in order to promote the event. As various channels of communication for the event were used, EPIA has decided not to make use of a specialised communication agency in order to bolster the resonance of the event. 95 participants registered online for the event and 75 were present at the Final European Forum. The agenda of the event and the presentations are available at the [dedicated page](#) of the PV GRID website.

#### **Project reports (T4.6)**

In the period between January and April 2013, eclareon and DERlab, under the coordination of EPIA, provided the content for the initial project report (D4.13). EPIA took care of the design, printing and distribution of the project report. The initial PV GRID project report was designed in order to constitute a general dissemination tool to be distributed by project partners at national forums and other events. Therefore, the report illustrated the main advancements of WP2 (eclareon) and WP3 (DERlab).

Unfortunately, at the time of finalisation of the report, the Italian WP2 database results (under the responsibility of Assosolare) were still not available. As a consequence the report was published without them. A revised version, including the WP3 wording changes and the Italian results has been made available in PDF format on the project website during July 2013. The same version was printed by Assosolare and distributed to the participants of the Italian national forum that took place in Rome on 18 July 2013.

During the summer of 2014, the [Final Project report](#) was produced (D4.14), under the leadership of BSW and in cooperation with EPIA, eclareon and DERlab. EPIA was responsible for the design, printing and distribution of the project report. The Final publication was distributed to the participants of the Final European Forum and was also shipped to the project partners later on in order to give them the opportunity to disseminate it in a national level. Using the occasion of various events that EPIA will be attending in the future (such as EU PVSEC and Intersolar), the report will be disseminated in order to promote the project results.

#### **Overall WP co-ordination and management (T4.7)**

EPIA as a WP leader in order to ensure the continuity of work and the delivery of high level results for this WP as well as timely developed deliverables organised numerous conference calls during the whole duration of the project with the WP leaders when needed and with the national partners.

### **2.4.3 Assessment of the performed work**

The work under WP 4 has been performed according to the Annex I. All objectives have been achieved. Even though no major problems have been identified in the work performed under this work package,

some PV GRID national partners have highlighted the difficulties in involving national relevant stakeholders and decision makers in the discussion of the PV GRID national workshops. Due to these difficulties, instead of organising several National workshops with low participation, some partners have preferred to additionally organise bilateral meetings.

## ***2.5 Work package 5: IEE Common Dissemination Activities***

### **2.5.1 Objectives**

The work package covered resources to contribute, upon request by the EACI/EASME, to common dissemination activities to increase the visibility of IEE-supported actions and promote synergies.

### **2.5.2 Major activities and achievements**

Deliverable D5.1, the updated set of IEE Common Performance Indicators, was delivered to EACI/EASME in early July 2012. No feedback was received so far.

Upon invitation of EACI/EASME, Paolo Sonvilla on behalf of BSW participated to the following events:

- on 23 May 2012 in the CA-RES meeting in Tallinn, Estonia, delivering a presentation on PV LEGAL/PV GRID within the project's WG3 activities;
- on 28 and 29 June 2012 BSW participated in the EACI RES-E Workshop in Brussels, Belgium.

No WP5 related activities took place in 2013 and 2014.

### **2.5.3 Assessment of the performed work**

Participation in the CA-RES events allowed presenting PV LEGAL/PV GRID to a key policymakers audience, greatly enhancing the visibility of PV GRID. Participation to the EACI RES-E Workshop allowed to discuss our experience of the IE programme and understanding its evolution towards Horizon 2020.

### **3 Individual performance review by partner (2-4 pages per partner)**

#### ***3.1 Coordinator: BSW-Solar***

Author(s): Paolo Michele Sonvilla, Jörg Mayer

##### **3.1.1 Role in the project**

BSW-Solar acted as coordinator of the PV GRID project, leading WP1 and WP5, and acting as a facilitator, assisting the leaders of all the other work packages in decision making and managing of the project partners. BSW-Solar also provided for the final quality check of all project deliverables.

Overall, BSW- Solar also contributed to the dissemination of project results at national and international levels, participating in other partner's national forums, and presenting the project at international events.

##### **3.1.2 Main activities and achievements**

###### ***WP1***

In WP1, BSW provided for overall project management: internal coordination, communication with WP leaders and project partners, organisation of plenary project meetings and advisory committee meetings and ensuring communication and reporting towards EACI as detailed in section 2.1.

Internal coordination required extra efforts in order to cope with the departure of key BSW staff during the project execution. At the beginning of 2013, the loss of BSW's project manager Thomas Chrometzka, due to his change of employer, was initially compensated by BSW's managing director Jörg Mayer and in-house consultant Paolo Michele Sonvilla, who had assisted Mr. Chrometzka during PV LEGAL and PV GRID. Mr. Chrometzka was later substituted by Ms. Bianca Barth, who unfortunately also left BSW before the project's conclusion.

However, BSW was able to provide seamless project management, even though a certain cost was paid in terms of unforeseen additional staff costs.

###### ***WP2***

In WP2, BSW-solar provided support and guidance to eclareon, especially in the initial restructuring of the PV GRID database.

As a national project partner, BSW-Solar took care of the research of the administrative PV development framework in Germany, making sure that the updated content for the PV GRID database was delivered in an accurate and timely fashion. In total, BSW-Solar took care of four research rounds for all three segments and of two interview rounds for all three segments, as planned. More specifically, BSW-Solar interviewed 6 developers for Segment A in each round, 5 for Segment B and 5 for Segment C, amounting to a total of 32 interviews performed in the framework of WP2.

**WP3**

In WP3, BSW-Solar took a key role in facilitating the work of WP leaders DERlab and Comillas, of the taking the lead of certain activities in the selection of technical solutions, the discussion of barriers and in the preparation of the different versions of the European Advisory Paper.

On national level, BSW, together with RWE were responsible for the discussion and preparation of the national case study for Germany.

Such collaboration with RWE, was one of the great achievements of the project, allowing the PV Sector's point of view to become closer to the DSO point of view, thus preparing common ground for agreeing regulatory solutions allowing better integration of PV in distribution grids. Within this process, an important collaboration was also put in place with the German national regulator, BNETZA, that agreed to meet on several occasions with the project participants, discussing issues and later participating to national dissemination events.

**WP4**

In WP4, BSW acted as a leader for the provision of the content of the final project report (D4.14), coordinating its work with EPIA and eclareon. BSW also contributed to the preparation of the initial project report (D4.13) and performed quality checks on all other dissemination and communication material prepared and published over the project.

On a national level, BSW organised the national forum (documented in 4.8) and the national workshop (documented in D4.10). Both events have to be considered great successes, in terms of stakeholder participation, level of discussion and outcome.

BSW solar also supported national partners by participating to 8 national forums in Austria, Poland, Sweden, Netherlands, Portugal, Italy, Czech Republic and Slovakia.

Finally, BSW participated in the following international events presenting the outcome of the project: CIREN 2014 and the InnoGrid2020 3<sup>rd</sup> Annual Conference.

**WP5**

In WP5, BSW participated to the 2 events suggested by EACI/EASME as detailed in section 2.5.

**3.1.3 Assessment of individual performance**

Overall, the performance of BSW in the project can be considered extremely positive. Dealing for the first time with such technical and regulatory issues greatly increased the expertise and skillset of the association and boosted its visibility and credibility at national and international levels.

From the staff allocation point of view, not all went as initially planned, but the changes in staff could not be foreseen. However they were dealt with timely, and from our point of view, in an efficient manner.

The relationship to other stakeholders of the German energy market was largely improved, namely to other DSOs and RWE. Shaping joint recommendations within the PV GRID project created a mutual understanding for each other's interests and built persuadability in the political German arena. Member companies of BSW-Solar started to identify with PV Grid recommendations and represented them in the political dialogues.

Also, external consultant Paolo Sonvilla delivered great value to the project: he supported the administrative coordination amongst the partners and contributed valuable inputs to the analyses and recommendations of the project, especially enabling weaker project partners to perform.

### 3.1.4 Sustainability of the action after the end of the project

BSW-Solar takes great pride in having been the coordinator of the PV LEGAL and PV GRID projects, from which several activities have originated:

- Solar Guidelines India

Based on the analytical and methodological approach of PV LEGAL, a web platform (database and interface) had been set up for the Indian solar sector. It presents the process towards PV project financing and implementation, differentiated by the Indian federal states. Key element of the platform is the step-by-step description through the administrative PV project development process. The project was set up during the years 2011 till 2012 and had been expanded since then continuously. The project was funded by the German organization GIZ. One purpose of the platform is to ease the access of foreign investors into the Indian market. More information can be found via <http://www.solarguidelines.in>

- Enabling PV in the MENA region (supported by GIZ)

“Enabling PV” is new born format (\* 2014) which helps European PV companies to explore emerging solar markets throughout the world. Within a GIZ project funding, the first countries for deploying the project were Jordan and Tunisia, others to follow. Enabling PV combines the analytical process of PV GRID and PV Legal with an evaluation of economic viabilities of various PV applications. As a result, political recommendations have been derived for Jordan and Tunisian policy makers and market reports have been published for all stakeholders for doing business in or with the countries. More information can be found via <http://www.solarwirtschaft.de/en/international-activities/enabling-pv.html>

- Enabling PV in Brazil (supported by GIZ)

Enabling PV in Brazil is looking more in detail into the legal administrative processes for auctions and power purchase agreements for solar. Moreover, grid connection procedures are described. Investors will have a complete overview over the investment and installation process for large PV power plants, translated into a web-based platform hosted by the German chamber for commerce in Brazil. The project is funded by GIZ and will be finished in May 2015. More information can be found via [http://www.solarwirtschaft.de/fileadmin/media/pdf/PVframework\\_Brazil\\_Jul2014.pdf](http://www.solarwirtschaft.de/fileadmin/media/pdf/PVframework_Brazil_Jul2014.pdf)

- PV Grid in Japan

Due to the huge interest of the German Ministry for Energy, the methodology of PV GRID shall be applied within the German – Japanese energy cooperation. The Japanese ministry for energy (METI) is interested to follow the same project process as in PV grid in order to reduce barriers in the grid integration of the ambitious PV growth plans. Potential start of the project can already be in 2015.

- PV FINANCING, supported within the H2020-programme

After having analysed barriers in the legal-administrative and in the grid connection processes, a third major difficulty shall be explored: the equity financing for PV projects. New financing models must be designed that empower the PV industry to implement projects in grid-parity markets without sufficient

public funding (e.g. feed-in-tariffs). Those models will be developed among the PV industry associations, banks, insurance companies and other private capital investor groups. If successfully applicable, the new financing models be broadly disseminated in the European PV markets. The project examines the status and potential in 6 European countries, plus Turkey. It was approved in December 2014 and started in January 2015 for a duration of 30 months.

The relationship to other stakeholders of the German energy market was largely improved, namely to other DSOs and RWE. Shaping joint recommendations within the PV GRID project created a mutual understanding for each other's interests and built convincibility in the political German arena. Member companies of BSW-Solar started to identify with PV Grid recommendations and represented them in the political dialogues.

### 3.1.5 Review of resources

#### 3.1.5.1 Staff resources

The spending of hours by BSW in the project evolved as detailed in the following table.

	<b>Planned</b>	<b>Final</b>
<b>WP1</b>	1.691	1805
<b>WP2</b>	465	351
<b>WP3</b>	491	804,50
<b>WP4</b>	847	810
<b>WP5</b>	205	29,5
<b>TOTAL</b>	<b>3699</b>	<b>3800</b>

Overspending of hours was seen in WP1, due to the extra internal and consortium management tasks arisen during project execution, and in WP3, due to the additional deliverables developed and the leading role taken by BSW in some WP3 activities. Consistent savings were achieved in WP2, thanks to the experience made in PV LEGAL and the collaboration of BSW members to the survey.

<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
<b>T1.1 Overall control of work plan and work package completion</b>	Paolo Sonvilla	480	Overall project management, quality check on project deliverables, coordination with WP leaders, handover to/from BSW-Solar staff, organisation and discussion of grant management amendments.
	Thomas Chrometzka	53	Overall project management, quality check on project deliverables, coordination with WP leaders
	Bianca Barth	181,5	Overall project management, quality check on project deliverables, coordination with WP leaders
	Jörg Mayer	78	Responsible project management, budget responsibility, final deliverable responsibility
	Holger Loew	55	Responsible project management, budget responsibility, final deliverable responsibility



	Rainer Brohm	33	Responsible project management, budget responsibility, final deliverable responsibility
	<b>TOTAL*</b>	<b>887</b>	<b><i>*The total also includes hours from staff that spent less than 15-20 on the task</i></b>
<b>T1.2 Financial and administrative project management, incl. ongoing tuning with EC</b>	Paolo Sonvilla	81	Discussion of financial and administrative issues with project partners and BSW. Identification and resolution of issues, Communication with EACI/EASME
	Thomas Chrometzka	31,5	Discussion of financial and administrative issues with project partners. Identification and resolution of issues.
	Bianca Barth	98	Discussion of financial and administrative issues with project partners and BSW. Identification and resolution of issues, Communication with EACI/EASME
	Jörg Mayer	36	Final revision and signature of administrative and financial documents
	Julia Ciesielski	37,5	Discussion of financial and administrative issues with project partners and BSW. Identification and resolution of issues, Communication with EACI/EASME
	<b>TOTAL*</b>	<b>290</b>	<b><i>*The total also includes hours from staff that spent less than 15-20 on the task</i></b>
<b>T1.3 Preparation of reports to EC</b>	Paolo Sonvilla	183	Coordination, preparation and drafting of progress, interim and final project reports.
	Bianca Barth	21	Revision and submission of interim report
	Julia Ciesielski	35	Revision and submission of final report
	<b>TOTAL*</b>	<b>226</b>	<b><i>*The total also includes hours from staff that spent less than 15-20 on the task</i></b>
<b>T1.4 Organisation and attendance of 3 project meetings</b>	Paolo Sonvilla	48	Discussion and preparation of meeting agendas, support to logistics, meeting moderation an preparation of minutes
	Thomas Chrometzka	49	Discussion and preparation of meeting agendas, support to logistics, meeting moderation an preparation of minutes
	Bianca Barth	22	Discussion and preparation of meeting agendas, support to logistics, meeting moderation an preparation of minutes (London meeting)
	Jörg Mayer	28	Discussion and preparation of meeting agendas, support to logistics, meeting moderation an preparation of minutes (final Brussels meeting)
	<b>TOTAL*</b>	<b>147</b>	<b><i>*The total also includes hours from staff that spent less than 15-20 on the task</i></b>

<b>T1.5 Organisation and attendance of 4 Advisory Committee meetings</b>	Paolo Sonvilla	34	Discussion and preparation of meeting agenda, support to logistics, meeting moderation and preparation of reports
<b>T1.6 Organisation and attendance of</b>	Paolo Sonvilla	115	Overall organisation and moderation of bi-weekly conference calls, redaction of action lists and follow-up of issues.
	Thomas Chrometzka	15,5	Participation and moderation in bi-weekly conference calls
	Bianca Barth	40	Participation and moderation in bi-weekly conference calls
	<b>TOTAL*</b>	<b>189</b>	<b>*The total also includes hours from staff that spent less than 15-20 on the task</b>
<b>T2.1 Review of research plan and upgrade of database architecture</b>			
	<b>TOTAL*</b>	<b>17</b>	<b>*The total also includes hours from staff that spent less than 15-20 on the task</b>
<b>T2.2 Research on administrative frameworks and barriers for PV system development</b>	Holger Loew	48	Research during the second database update
	Rene Gross	235,5	Research during the initial and second database update, performing of interviews with German PV stakeholders, analysis of results.
	<b>TOTAL*</b>	<b>300</b>	<b>*The total also includes hours from staff that spent less than 15-20 on the task</b>
<b>T2.3 Evaluation of research and database update</b>	Rene Gross	32,5	Follow-up of revision with eclareon preparation of finalized research templates
<b>T3.1. Initial data collection and setup of working groups</b>	Holger Loew	45	Collection of data on regulatory and normative barriers, Analysis of data, Preparing data for work in working groups
<b>T3.2 Analysis, discussion and evaluation of technical PV grid integration solutions</b>	Thomas Chrometzka	41	Attendance at Working Groups
	Holger Loew	190,5	Attendance at Working Groups, research of user side technical solutions
	Jörg Mayer	31,5	Attendance at Working Groups
	<b>TOTAL*</b>	<b>265</b>	<b>*The total also includes hours from staff that spent less than 15-20 on the task</b>

<b>T3.3 Analysis and discussion of regulatory and normative barriers Towards large-scale integration of PV electricity into the distribution grid</b>	Holger Loew	154,5	Research of administrative issues on network expansion processes, participation to working groups, coordination of regulatory issues analysis
	Jörg Mayer	24	Revision of results and documents
	<b>TOTAL*</b>	<b>179,5</b>	<b>*The total also includes hours from staff that spent less than 15-20 on the task</b>
<b>T3.4 Preparation of advisory paper on regulatory and normative recommendations for the implementation of technical solutions for improved PV grid integration</b>	Bianca Barth	205,5	Analysis of data from Working Groups Drafting of advisory paper Revision of advisory paper Coordination with the other authors Discussion of stakFinalisation of paper
	Holger Loew	66	Analysis of data from Working Groups
			Drafting of advisory paper
	Jörg Mayer	16	Revision of advisory paper
<b>TOTAL*</b>	<b>288,5</b>	<b>*The total also includes hours from staff that spent less than 15-20 on the task</b>	
<b>T4.1 Launch and maintenance of PV GRID website</b>	Bianca Barth	20,5	Content of Website preparation and quality check
	Paolo Sonvilla	20	Participation to DERri conference and CIRED 2014 conference
	<b>TOTAL*</b>	<b>57</b>	<b>*The total also includes hours from staff that spent less than 15-20 on the task</b>
<b>T4.2 Dissemination of project status and results (interrelation to WP 2,3)</b>	<b>TOTAL*</b>	<b>21</b>	<b>*The total also includes hours from staff that spent less than 15-20 on the task</b>

<b>T4.3 Contact to national stakeholders and organisation of national PV GRID forums</b>	Thomas Chrometzka	15	Contact to German stakeholders, organisation of national forum
	Rainer Brohm	79	Participation to German Forum Participation in other countries national forums: Italy, Vienna, Munich, Warsaw, Stockholm, Lisbon
	Jörg Mayer	78	Participation to German Forum Participation in other countries national forums: The Netherlands, Slovenia, Czech Republic
	Manuel Battaglia	30	Support to the organisation of the German national forum
	Holger Loew	154,5	Contact to German stakeholders, organisation of national forum
	<b>TOTAL*</b>	<b>359</b>	<b><i>*The total also includes hours from staff that spent less than 15-20 on the task</i></b>
<b>T4.4 Organisation of national workshops or bilateral meetings</b>	Bianca Barth	168,5	Preparation and attendance to national workshop
	Holger Loew	27	Preparation and attendance to national workshop
	<b>TOTAL*</b>	<b>207</b>	<b><i>*The total also includes hours from staff that spent less than 15-20 on the task</i></b>
<b>T4.5 Organisation of 2 European Forums to present the first project outcomes and its final conclusions</b>	Bianca Barth	51,5	Preparation and attendance to 2 European events
	Holger Loew	18	Participation to first European event
	Jörg Mayer	34,5	
	<b>TOTAL*</b>	<b>104</b>	<b><i>*The total also includes hours from staff that spent less than 15-20 on the task</i></b>
<b>T4.6 Project reports</b>	Bianca Barth	33,5	Structuring and revision of final project report
	Jörg Mayer	27,5	Structuring and revision of final project report
	<b>TOTAL*</b>	<b>62</b>	<b><i>*The total also includes hours from staff that spent less than 15-20 on the task</i></b>
<b>WP5 - IEE common dissemination activities</b>	Paolo Sonvilla	29	Participation in CA-RES meeting and IEE RES stakeholder's meeting.
	<b>TOTAL*</b>	<b>29,5</b>	<b><i>*The total also includes hours from staff that spent less than 15-20 on the task</i></b>

### 3.1.5.2 Subcontracting and other specific costs

The only subcontract deals with the final project audit. The same financial advisor that performed the financial audit on PV LEGAL was chosen, in order to provide consistency with the previous project and optimise costs.

<b>Cost category (subcontracting or other specific costs)</b>	<b>Foreseen item according to CPF</b>	<b>Estimated costs [EUR]</b>	<b>Actual incurred costs [EUR]</b>	<b>Reason for over-, under- or not spending</b>
Subcontracts	Legal-advisory budget for reviewing national regulatory and administrative recommendations (T3.4)	4.000	0	The subcontract was made superfluous thanks to the extensive consultation with stakeholders, policy-makers and the national regulator
Subcontracts	Costs for preparing a Project management contract with the support of a lawyer (T1.2)	2.000	0	The same project management contract used in PV Legal could be adapted
Subcontracts (as other costs in the CPF)	Financial guarantee/audit costs	6.000	3.570	Financial guarantee was not used.
Other specific costs	Travel costs for inviting Advisory committee external experts	30.000	3.179,49	Only 3 out of 4 meetings were executed, the number of AC members was less than originally planned, several experts did not ask for a reimbursement
Other specific costs	Travel costs for inviting Working group external experts	9.000	1.213,68	Several experts did not ask for a reimbursement, local experts were invited who did not need travel costs reimbursement
Other specific costs	Costs for Project, Advisory Committee and Working group meetings in Berlin, Madrid and Prague	9.000	3.392,24	Savings were achieved by using partner facilities

The authors hereby confirm that the selection of subcontractor(s) complied with rules laid down in the grant agreement.

### 3.1.5.3 Travel costs

No major deviations to report. The travel budget in order to participate to 8 national workshops in other participating countries was agreed with EACI/EASME during one of the grant Agreement amendments.

### 3.1.5.4 Report on budget shifts

An internal budget shift of slightly less than 7.000 EUR is proposed in order to compensate the overspending of staff costs with the savings in the other specific costs budget.

The overspending in staff costs has already been discussed in the sections above, and in summary derives from the extra efforts in WP1 and WP3. In WP1 they are due to three GA amendments and the changes in BSW staff that occurred over the duration of the project. In WP3, BSW took a key role in the publication of several versions of the European Advisory Paper and its annexes.

## **3.2 CB2: eclareon GmbH**

Authors: Christoph Urbschat, Robert Brückmann, Edoardo Binda Zane.

### **3.2.1 Role in the project**

eclareon's main role was to build on the existing PV LEGAL database and expand it in terms of covered countries and topics, as outlined in the project proposal. Namely, eclareon focused on:

- Reviewing the existing PV LEGAL research methodology in order to also address the procedures and issues involved with the operation of a PV system connected to the grid
- Expanding and reviewing the existing database structure to accommodate the additional information researched
- Setting up the PV GRID Database website, with the help of a subcontractor.
- Keeping the PV GRID Database up to date over the duration of the project
- Coordinating partners and subcontractors (national associations) as regards the four research rounds – one every seven months, approximately.

Furthermore, eclareon had a strong role in WP3, facilitating and coordinating the preparation of the European Advisory Paper. Finally, eclareon provided structure and content for other WP4 deliverables, such as the initial and final project reports, and participated to several national dissemination and consultation events.

### **3.2.2 Main activities and achievements**

eclareon's activities were mainly concentrated in WP2 – PV LEGAL Database, namely, eclareon was responsible for:

- T2.1 Review of research plan and upgrade of database architecture
- T2.2 Research on administrative frameworks and barriers for PV system development
- T2.3 Evaluation of research and database update

In practical terms, this meant that eclareon was responsible for designing the database website structure, pass it to the developer and monitor its functioning and implementation. In parallel, eclareon designed the research templates and coordinated the national partners for four rounds of research on national frameworks. At the end of every round, eclareon's experts undertook an in-depth review of the templates they received and, following corrections by the partners, if needed, proceeded to upload them online.

In addition, eclareon had a strong role as regards the preparation of the Initial Project Report, the Final Project Report and the Advisory Paper.

Thanks to the project framework and to internal management, eclareon was able to ensure high quality content for all research rounds and to deliver its results following the intended timeline for the most part. Some delays have been noticed, however just in isolated cases.

Eclareon also had an important role in WP3, supporting and facilitating the process leading to the normative and regulatory recommendations contained the European. In particular, eclareon took care of:

- Researching the prosumer side technical solutions, with special emphasis on self-consumption storage and demand response (as part of task T3.2).
- Researching the administrative framework for barriers towards network improvement works (as part of task T3.3).

During the structuring and preparation of the European Advisory paper (T3.4), eclareon took a strong role together with BSW and Comillas, facilitating and coordinating certain tasks during the deliverable's revision, stakeholder consultation and finalisation processes.

In WP4, eclareon participated to several events at national level, in Germany, Italy and Spain. Eclareon staff also presented the projects at international events and led and supported the preparation of project publications.

### **3.2.3 Assessment of individual performance**

eclareon's performance, despite some internal restructuring of the PV GRID team, remained constant and high-quality throughout the whole lifetime of the project. In particular, the team managed to stick to the intended deadlines and to channel efforts to deliver content on time.

Improvements could be used not so much in the team's performance, but rather in the instruments used, as some parts proved to be quite time-consuming (e.g. the upload time or the research template structure). This is however an internal issue with which the team dealt quite well.

For the future, in similar projects, a better streamlining of the processes and a simplification of the research structure could prove useful.

The team made use of internal management / project management tools such as BaseCamp, Gotomeeting, DropBox and Wunderlist. These, together with internal reporting about the project status, proved to be quite effective in monitoring the overall performance. Possibly, the team could have reached an even better result if such instruments had been enforced more. Each one of them was extremely effective individually, however we noticed some time loss and inefficiency because not all team members were sufficiently involved in their use. This was however a minor issue.

Another issue were the efforts of managing partners during the research phase in WP 2. The national PV associations were supposed to independently conduct the research. However, since database research is not in the core competencies of many associations the training and the support of the partners during the research phase took longer than expected. Another challenge was to harmonize the input from the different partners. Nevertheless, the contributions of the PV associations were essential for the success of the work package since the associations possess the best overview on the current developments in the respective markets. For this reason the additional resources were well invested and the experience will taken into account when designing the research in the PV FINANCING project.

### 3.2.4 Sustainability of the action after the end of the project

The PV GRID database will remain online in its current form until June 2015. After that, the database will be further updated within the concept of the PV FINANCING project (a recently-approved Horizon 2020 project).

Further ideas for the future of PV GRID have been discussed in the final consortium meeting in Brussels (October 2014), however to date no final decision has been taken on the matter.

### 3.2.5 Review of resources

#### 3.2.5.1 Staff resources

The table below gives an overview on the hours that eclareon spent on the execution of its tasks. Please note that 96 hours are not shown in the table. Upon invitation of the coordinator and to improve the comprehensibility of the table tasks that took less than 15 hours have been left out. Overall the time eclareon spent is well in line with the foreseen plans.

Deviations have mainly occurred in the execution of WP 2. The main reasons for the deviations were that due to changes among the personal of project partners some training sessions had to be repeated. Moreover, the support of the research of several partners took longer than expected; additional feedback rounds were included which helped to ensure the high quality of the PV GRID database. In addition eclareon conducted a user survey which was not foreseen in the original budget of the project but that helped better understand the preferences of the users of the database. This knowledge will be useful when continuing the database in the PV FINANCING project. In WP 3 less hours than originally planned were used. This was achieved through better accessibility of research results from other projects.

#### WP1

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
1.3 Preparation of reports to EC	Christoph Urbschat	16	Revision of reports
	Robert Brückmann	24	Preparation of final and interim project reports
	Edoardo Binda Zane	19	Preparation of the 1 <sup>st</sup> progress and interim project reports
1.4 Organisation and attendance of 3 project meetings and minutes	Edoardo Binda Zane	31	Participation to project meetings
	Paolo Sonvilla	18	Participation to project meetings



1.5 Organisation and attendance of 4 Advisory Committee meetings	Edoardo Binda Zane	37	Participation to Advisory Committee meetings
1.6 Organisation and attendance of conference calls	Robert Brückmann	16	Preparation and follow-up of conference calls
	Edoardo Binda Zane	58	Preparation, participation and follow-up of WP leaders conference calls every 2 weeks
	Paolo Sonvilla	63	Preparation in WP leaders conference calls every 2 weeks

**WP2**

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
2.1 Review of research plan and upgrade of database architecture	Christoph Urbschat	35	Review of research plan and database structure
	Robert Brückmann	49	Analysis of existing database structure, preparation, discussion and amendment of research plan, Design of new database structure
	Jan-Benjamin Spitzley	87	Analysis of existing database structure and provision of input from different database projects
	Edoardo Binda Zane	131	Preparation and drafting of database structure and research plan, development of concept for user survey, implementation and analysis of user survey, supervision of subcontractors for user survey
	Paolo Sonvilla	171	Discussion and ideation of the new database structure and user interface, tendering process, selection of subcontractor, supervision of SW development, supervision of the research planning process
2.2 Research on administrative frameworks and barriers for PV system development	Christoph Urbschat	17	Support and backup of research activities
	Robert Brückmann	212	Development of research templates, preparation of training material for national associations, backup of research activities Training of national associations and additional training of new association members
	Jan-Benjamin Spitzley	179	Research of legal conditions and execution of industry survey Slovenia, backup of research

			activities
	Edoardo Binda Zane	387	Preparation of training material for national associations, backup of research activities, training of national associations and additional training of new association members, research of legal conditions in UK
	Paolo Sonvilla	38	High level supervision of research activities
2.3 Evaluation of research and database update	Robert Brückmann	389	Revision of research templates from partners, Answering of content questions from partners Follow-up of revisions
	Jan-Benjamin Spitzley	112	Revision of research templates from partners, Answering of content questions from partners Follow-up of revisions
	Edoardo Binda Zane	312	Revision of research templates from partners, Answering of content questions from partners Follow-up of revisions Upload of finalized research templates
	Paolo Sonvilla	101	High level supervision and troubleshooting of database update activities
2.4 Overall WP co-ordination and management	Christoph Urbschat	61	Monitoring of research plan and internal communication
	Robert Brückmann	52	Communication with research partners, internal Conference calls and meetings
	Edoardo Binda Zane	43	Support in communication with research partners, internal conference calls and meetings
	Paolo Sonvilla	196	Overall supervision and coordination of WP2 activities, including internal coordination and coordination with other partners

### WP3

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
3.1 Initial data collection and set-up or working groups	Robert Brückmann	19	Analysis of data
	Edoardo Binda Zane	16	Collection of data on regulatory and normative barriers, Analysis of data, Preparing data for work in working

			groups
3.2 Analysis, discussion and evaluation of technical PV grid integration solutions	Robert Brückmann	17	Preparation of Working Groups Attendance at Working Groups Provision of further input and feedback
	Edoardo Binda Zane	34	Preparation of Working Groups Attendance at Working Groups Provision of further input and feedback
	Paolo Sonvilla	65	Attendance at Working Groups, research of user side technical solutions
3.3 Analysis and discussion of regulatory and normative barriers Towards large-scale integration of PV electricity into the distribution grid	Robert Brückmann	11	Participation in the national German Workshop, input on D3.1
	Edoardo Binda Zane	37	Preparation of Working Groups Attendance at Working Groups Provision of further input and feedback
	Paolo Sonvilla	50	Research of administrative issues on network expansion processes, participation to working groups, coordination of regulatory issues analysis
3.4 Preparation of Advisory paper on regulatory and normative recommendations for the implementation of technical solutions for improved PV GRID integration	Christoph Urbschat	16	Revision and support of advisory paper
	Robert Brückmann	18	Analysis of data, provision of input to advisory paper, revision of advisory paper, collaboration with the other authors
	Edoardo Binda Zane	34	Background research during revision process, revision of advisory paper
	Paolo Sonvilla	196	Analysis of data from Working Groups, Drafting of advisory paper, Revision of advisory paper, Coordination with the other authors, Discussion of stakeholder's feedback, Finalisation of paper

**WP4**

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
4.3 Contact to national stakeholders and organisation of national PV GRID forums	Robert Brückmann	15	Preparation of promotion of inter-country relations at PV GRID forums
	Celine Najdawi	41	Preparation of promotion of inter-country relations at PV GRID forums Attendance to French national forums European events

	Paolo Sonvilla	24	Preparation and attendance to Italian, Spanish and British national forums
4.4 Organisation of national workshops or bilateral meetings	Paolo Sonvilla	16	Preparation and attendance to Italian national workshop
4.5 Organisation of 2 European Forums to present the first project outcomes and its final conclusions	Paolo Sonvilla	18	Preparation and attendance to 2 European events
	Edoardo Binda Zane	15	Preparation and attendance to 2 European events
4.6 Project reports	Robert Brückmann	17	Analysis of data Collaboration with project Coordinator Drafting of Project Reports Review
	Paolo Sonvilla	34	Structuring and revision of initial and final project reports

### 3.2.5.2 Subcontracting and other specific costs

Cost category (subcontracting or other specific costs)	Foreseen item according to CPF	Estimated costs [EUR]	Actual incurred costs [EUR]	Reason for over-, under- or not spending
Database Upgrade and Programming	Database upgrade (T2.1)	20.000	12.872,50	Cheapest offer selected and working in close collaboration with the subcontractor

A tendering process was launched in order to select the subcontractor offering the best value for money for the restructuring of the PV GRID Database and the creation of the new User Interface. A tender was launched, and 5 companies were invited to present an offer: Fraunhofer IAIS, Graco, SunBeam, Thomas Wendt and Semantics. Thomas Wendt was selected on the basis of a cheap offer, a good elaboration on the tender contents and the previous experience of eclareon working closely with him. The results were pretty satisfying and a good part of the original budget was saved.

### 3.2.5.3 Travel Costs

In total, 8196,64€ were spent for travels. The reasons for lower costs are that the team paid attention to booking in time and choosing cheap accommodation, when possible, in order to save costs.

#### 3.2.5.4 Report on budget shifts

An internal budget transfer is requested in order to compensate additional staff costs incurred with savings in travel and other costs budget items.

In fact, the implementation, within WP2, of the PV GRID Database User Survey (that was requested by EASME in the interim report assessment) required additional investments of hours for development of concept & execution of survey & analysis. Furthermore, changes in the project consortium (especially the substitution of ASSOSOLARE with Assorinnovabili have led to additional hours to be spent for training of new partners' staff in WP2. In addition, the managing of the research partners took more efforts than expected.

### 3.3 CB3: European Photovoltaic Industry Association (EPIA)

Author(s): Myrto Papoutsi, Manoel Rekingier

#### 3.3.1 Role in the project

EPIA's role in the project has been very important as WP4 leader but also as major contributor to WP3. EPIA was responsible of promoting and disseminating the results of the project at a European and National level with an ultimate goal to initiate discussions for the adoption of the project recommendations. EPIA made sure that the project kept going in the right direction, provided guidance to the National Associations and ensured the coherence of each deliverable as regards the final aim pursued by the project, especially in WP4. Through each work package EPIA provided key input to work package leaders, partners and authors of deliverables.

#### 3.3.2 Main activities and achievements

**WP1:** EPIA was in each step of the project proactively advising the coordinator as regards the general management of the project. EPIA participated in all project meetings as well as recurring work package leaders conference calls organised by the coordinator or even suggested the organisation of additional calls when there was a need for more communication among the project partners. During advisory board meetings, EPIA made sure to support the coordinator and EPIA actively contributed along all the steps of the project in making sure deliverables could be delivered on time.

**WP2:** EPIA's role in WP2 was very limited in assisting with the review of research topics linked with WP3 and assisting with the transfer from the PV LEGAL database to the PV GRID database.

**WP3:** EPIA actively contributed to the WP3 by first supporting the work package leader, derLAB in the development of the methodology for assessing the different grid integration measures. Once the WP3 methodology, EPIA experts participated to the 3 working groups and collect relevant reports and papers aiming at identifying and describing PV grid integration solutions. EPIA also took part to the analysis of the regulatory barriers especially for the part on European legislation and standards. EPIA also drafted a questionnaire for national associations aiming at identifying the regulatory barriers at the member state level. EPIA then analysed the contributions together with the WP leader, Comillas. EPIA took part to all meetings and telcos organised in the frame of the WP3.

EPIA contributed and reviewed the content of deliverables D3.1 and all three versions of the D3.2. Furthermore, EPIA coordinated the design and printing of the short (January 2014) and long version (September 2014) of the Advisory Paper and its annexes.

**WP4:** EPIA's role as workpackage leader was essential. EPIA started with finding the adequate subcontractor to develop the project image, the logo and the definition of a corporate guidelines including a PowerPoint template and word template. EPIA's internal resources were used in order to update the website which was created with the support of an external website expert when some specific features would require it. This allowed saving substantial expenses foreseen on that aspect. There was no major other difficulties in this workpackage, most of the outside communication on the project (press releases and newsletter) were performed on time.

### **3.3.3 Assessment of individual performance**

EPIA had a key role in this project, as we were responsible of all the dissemination activities carried during the project. A key challenge in WP3 was to make sure to keep the time to finalise the full version of the European Advisory Paper on time, since a lot of the work was squeezed towards the end. Furthermore, the coordination of the National Workshops and Forums was sometimes challenging as the regulatory framework and the conditions in each country varied significantly. To make sure partners were keeping on track, EPIA organised very regular conference calls with national partners, in order to guide them through the processes and advise them on how to proceed with the organisation of the National Forums and National Workshops.

### **3.3.4 Sustainability of the action after the end of the project**

On 30 September 2014, EPIA also launched a common Press Release for PV GRID and another project financed by the Intelligent Energy Europe Program (REserviceS), which has triggered media coverage in the first days of October 2014.

The PV GRID project description and results have also been integrated as an input in the IEA-PVPS Task 14 reports on and distribution grids that have been released at the beginning of November 2014. These reports are available on the IEA PVPS website: <http://www.iea-pvps.org/> and are also largely disseminated during IEA PVPS events and fora.

Since the end of September 2014, EPIA also used results of PV GRID in different events: the Solar O&M Conference in Milan and Solar Integration Workshop in Berlin. Slides presenting the results of the projects have been integrated in EPIA's slide master and will be used for future presentations.

Finally, printed versions of the final report and the leaflets will be available on EPIA's booth during Intersolar in June 2015 and at the European Utility Week in November 2015.

### **3.3.5 Review of resources**

#### **3.3.5.1 Staff resources**

Below is an overview of the time spent by EPIA per work package, final and planned. Overall EPIA respected quite well the foreseen time for each WP. The deviation of the planned hours and the actual hours spent is due to the fact that extra work was carried out in WP3 for the publication of 2 versions of

the Advisory paper (Short version and Full version of the Advisory paper which went through a consultation face, leading to an improvement of the Report and its final publication in September 2014). In addition the deviation in WP4 results from intense and extensive dissemination activities carried out during the whole duration of the project (for instance the creation of the PV GRID newsletter which was not foreseen at the beginning).

	<b>Final</b>	<b>Planned</b>
<b>WP1</b>	310	271
<b>WP2</b>	22	25
<b>WP3</b>	708	591
<b>WP4</b>	1266,5	1165
<b>TOTAL</b>	<b>2306,5</b>	<b>2052</b>

Below for the WPs where EPIA had more than 200 hours planned (WP1, 3, 4) a detailed explanation of the time spent by each staff member for each task is provided.

### **WP1**

<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
1.3 Preparation of reports to EC	Marie Latour	43	Preparation of the 1 <sup>st</sup> progress Report and interim report
	Myrto Papoutsis	12	Preparation of the final report
	Manoël Rekinger	12	Preparation of the 1 <sup>st</sup> progress Report, interim report and final project report
1.4 Organisation and attendance of 3 project meetings and minutes	Marie Latour	16	Participation to the 2 <sup>nd</sup> project meeting in London and in Madrid
	Manoël Rekinger	14	Participation to the 2 <sup>nd</sup> project meeting in London and the Final project meeting in Brussels
	Myrto Papoutsis	6	Participation to the Final project meeting in Brussels
1.5 Organisation and attendance of 4 Advisory Committee meetings	Manoël Rekinger	24	Participation to AB meetings in Berlin, Rome, Madrid
1.6 Organisation and attendance of conference calls	Marie Latour	98	Participation in WP leaders conference calls every 2 weeks
	Manoël Rekinger	34	Participation in WP leaders conference calls every 2 weeks

	Giorgia Concas	13	Participation in WP leaders conference calls every 2 weeks
	Myrto Papoutsis	38	Participation in WP leaders conference calls every 2 weeks

**WP3**

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
3.1 Initial data collection and set-up or working groups	Manoël Rekinger	17	Initial data collection and setting up the WGs
3.2 Analysis, discussion and evaluation of technical PV grid integration solutions	Ioannis Thomas Theologitis	98,5	Participation in the WG meetings in Rome and Berlin , input on D 3.1
	Manoël Rekinger	142	Participation in the WG meetings in Rome, Berlin, Madrid, participation in WP3 conference calls, ,support in the smooth development of the deliverable D3.1
	Giorgia Concas	12	Participation to the WG meetings in Madrid
	Marie Latour	12	Participation to the WG meetings in Madrid
	Giorgia Concas	95,5	Participation to the kick-off conference call and contribution to T 3.3 in identifying the existing barriers towards the adoptions of priority solutions for better PV integration
	Manoël Rekinger	105	Participation to the WG meeting in Prague, to the kick-off conference call and contribution to T 3.3 in identifying the existing barriers towards the adoptions of priority solutions for better PV integration
3.4 Preparation of Advisory paper on regulatory and normative recommendations for the implementation of technical solutions for improved PV GRID integration	Frauke Thies	61,5	Drafting of the Short and Full version of the Advisory paper, support in identifying regulatory and normative solutions for large scale integration of PV into the grid and in proposing guidelines
	Giorgia Concas	60	Publication and Dissemination of the Short version of the Advisory paper, support in drafting the Short version of the Advisory paper,



			participation in conference calls
	Manoël Rekinger	53,5	Publication and Dissemination of the Full version of the Advisory paper support in drafting the Long version of the Advisory paper, participation in conference calls
	Gaetan Masson	51	Drafting of the Short version of the Advisory paper, support in identifying regulatory and normative solutions for large scale integration of PV into the grid and in proposing guidelines

**WP4**

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
4.1 Project image development, launch and maintenance of PV GRID website	Scarlett Varga	140	Regular update and improvement of the website
	Michel Bataille	62	Launch and Maintenance of the PV GRID website
	Benjamin Fontaine	76	Coordination and support in creating the PV GRID logo and communication tools and support in updating the PV GRID website
	Marie Latour	12	Support in creating the PV GRID identity and updating the PV GRID website
	Myrto Papoutsi	32	Support in updating the PV GRID website
4.2 Dissemination of project development and results	Sophie Lenoir	8,5	Drafting and dissemination of the press releases
	Craig Winneker	5	Drafting and dissemination of the press releases
	Benjamin Fontaine	59	Drafting and dissemination of the press releases, coordination in the creation of the PV GRID leaflet and drafting of the PV GRID newsletter
	Manoël Rekinger	90	Presentation of the PV GRID project in IEA PV PS Task 14 in Sidney and in EU PVSEC 2014 in Amsterdam, support in preparation of articles (D4.4) in relevant publications through the project duration and drafting of the PV GRID newsletter

	Myrto Papoutsi	20	Drafting and dissemination of the PV GRID newsletter
4.3 Contact to national stakeholders and Organisation of national PV GRID forums	Ioannis Thomas Theologitis	12	Participation and presentation during the National Forum in Greece
	Giorgia Concas	54	Guidelines to national partners, proceedings of the National Forums for PV GRID website, Participation and presentation during the National Forum in UK and Italy
	Gaetan Masson	12	Participation and presentation during the National Forum in France
	Manoël Rekinger	12	Participation and presentation during the National Forum in Namur(Belgium)
	Marie Latour	85	Guidelines to national partners, proceedings of the National Forums for PV GRID website, Participation and presentation during the National Forum in Portugal, Bulgaria and Poland
4.4 Organisation of national workshops or bilateral meetings	Manoël Rekinger	27	Participation to the Belgium Workshop in Namur, Belgium
	Myrto Papoutsi	65	Coordination, guidelines and support to national partners for the organisation of the national workshops, proceedings of the workshops for the PV GRID website
	Marie Latour	12	Guidelines and support to project partners for the organisation of the National workshops
4.5 Organisation of 2 European Forums to present the first project outcomes and its final conclusions	Marie Latour	45	Logistics, Organisation and participation to the First European Forum in London
	Manoël Rekinger	68	Organisation, invitation of speakers and participation to 2 European Forums
	Myrto Papoutsi	103	Organisation, logistics, promotion and participation to 2 European Forums
	James Watson	8	Participation to the Final European Forum in Brussels

	Frauke Thies	45	Moderation at the PV GRID Final European Forum, assistance in inviting the speakers for 2 European Forums
	Benjamin Fontaine	28	Communication actions for the Organisation of the 2 European Forums, press relations for the events
4.6 Project reports	Scarlett Varga	30	Publication and dissemination of the initial project report
	Manoël Rekinger	25	Publication and dissemination of the final project report
4.7 Overall WP coordination and management	Marie Latour	26	Participation in WP4 conference calls to make sure that the work of the WP is carried out smoothly and that deliverables are timely developed and delivered
	Myrto Papoutsi	61	Participation in WP4 conference calls to make sure that the work of the WP is carried out smoothly and that deliverables are timely developed and delivered
	Scarlett Varga	44	Participation in WP4 conference calls to make sure that the work of the WP is carried out smoothly and that deliverables are timely developed and delivered

### 3.3.5.2 Subcontracting and other specific costs

<b>Cost category (subcontracting or other specific costs)</b>	<b>Foreseen item according to CPF</b>	<b>Estimated costs [EUR]</b>	<b>Actual incurred costs [EUR]</b>	<b>Reason for over-, under- or not spending</b>
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<b>Cost category (subcontracting or other specific costs)</b>	<b>Foreseen item according to CPF</b>	<b>Estimated costs [EUR]</b>	<b>Actual incurred costs [EUR]</b>	<b>Reason for over-, under- or not spending</b>
Subcontracting	Organisation of the Final European Forum(T 4.5)	15.000	9.489,08	Final cost was lower than foreseen, EPIA decided to use its own means for promoting the event instead of collaborating with an event organizing firm
Subcontracting	Subcontract for organisation of dissemination and national Forum in the UK( T4.2-4-3)	15.000	15.000	Budget was correct and spent
Other specific costs	Publication and shipment of 2 project reports	26.000	17.155,02	The costs for the production and design of the report were less than initially foreseen
Other specific costs	Publication of European Advisory paper	10.000	10.716	Expenses for the publication of the Short version of the Advisory paper were shared between EPIA and BSW-solar. Furthermore expenses for the design of the Annexes of the Full version were covered completely by BSW-Solar
Other specific costs	Budget for project flyers	10.000	11.265	Costs were higher than initially foreseen

### **Major subcontracts:**

#### **Organisation of the Final European Forum**

EPIA requested and received at least 3 offers for this subcontract from different venues, the one offering the best value for money was chosen. One of the reasons for having a lower final cost than the one foreseen was that EPIA decided to use its own means of disseminating and promoting the event. Furthermore, as EPIA is a project partner to the REserviceS project, it was decided to organize both project final events in a back-to-back basis, in order to gather a higher number of participants, instead of using a specialized event firm to promote the Final Forum.

#### **Subcontract for organisation of dissemination and national Forum in the UK (T4.2-4-3)**

EPIA having a good relationship with the Solar Trade Association (the UK National PV Association) as foreseen in the CPF, subcontracted the Association in order to Organize and disseminate the UK Forum which took place on 4th of July 2013 in London. The duties of STA were exactly the same as for the other project National partners when it refers to the tasks 4,2 and 4.3. STA participated in conference calls, adapted and disseminated the Press Releases, promoted and organized the UK Forum, provided the minutes, conclusions and list of participants to EPIA and answered all EPIA's requests on time.

The author(s) hereby confirm(s) that the selection of subcontractor(s) complied with rules laid down in the grant agreement.

### 3.3.5.3 Travel costs

No deviation was made on this budget line. In the case of travel to Australia, EPIA being part of the IEA PVPS has been invited to present results of their activities in Europe during the PVPS task 14 meeting organized in Sidney in November 2013. PV GRID has been presented twice during the meeting. First during the general presentation given by EPIA at the open workshop for local utilities (50 participants <http://iea-pvps.org/index.php?id=262>, <http://apvi.org.au/workshop-pv-and-the-electricity-grid-overcoming-the-growing-pains/>) and secondly during the closed task 14 meeting, where a detailed presentation of the project has been given in front of 25 experts coming from 14 different countries.

### 3.3.5.4 Report on budget shifts

EPIA has slightly overspent the budgeted staff costs, which can be compensated by the savings in the “Other specific costs” category. The reasons for overspending are detailed in section 3.3.5.1.

## 3.4 CB4: ASIF

ASIF ceased its participation in the project after 2 weeks, to be replaced by CB22 UNEF.

## 3.5 CB5: APESF

Author(s): Karl Moosdorf and Leonor Barradas

### 3.5.1 Role in the project

APESF is co-beneficiary of the PV GRID project.

APESF is the national association for photovoltaic in Portugal, which undertook the task to assess the necessary procedures to the installation of a photovoltaic facility. APESF has provided updated data on the national authorities and legislators. APESF also collected a list of other important players in the area, such as universities and laboratories, which produce technical solutions to some difficulties regarding the integration of photovoltaic energy in the grid.

Last, but not least, the PV GRID project grounded the argument, that the legislation in Portugal was outdated and needed to be revised urgently. It is our belief that the project was a great contribution to the new legislation that has just been published, making PV self-consumption a reality.

### 3.5.2 Main activities and achievements

APESF has engaged in the assessment of the difficulties existing in Portugal, in what concerns the installation of PV photovoltaic. There are two major segments of intervention in Portugal: the residential one, and the commercial one. There is no market or legislation for ground-mounted systems.

APESF has interviewed the main installers in Portugal, choosing companies of three regions: north, centre and south. The interviews have stated the difference in price in these three regions. The labour costs in the north of the country are inferior to the ones in the centre and south.

Also, it has been proven that the legislation needs to be clarified. It allows different interpretations on the technical rules, resulting on the approval or disapproval of an installation. The different

interpretations on the rules are noted mainly from region to region, but can also occur within the same region, depending on the inspector.

The national forum has provided the country with an overview of the needs of the sector. It was clear that the legislation was obsolete, since it did not meet the necessities of the Portuguese market. It was also made very clear that photovoltaic had to be seen in a broader perspective, such as the introduction of self-consumption, as well as the related developments like the *prosumer* and storage of energy.

The forum and its results have enabled APESF to act by the legislators and regulators, sustained with specific data from other European countries, proving that self-consumption is a means to develop the market of PV in Portugal and to promote the national economy.

The main difficulty that APESF faced was the uneven cooperation of the national authorities. At the beginning they were quite cooperative. For example, our national forum was a huge success. It was pointed out as the greatest event on the area ever to have taken place in Portugal. But, as the project became more technical, and therefore demanded more commitment from the national authorities (such as the producing of the Advisory Paper), we faced rejection. All national authorities either declined or delayed the interviews to a point, that the deadline was due.

On the other hand, universities, laboratories have been most cooperative.

The main DSO in Portugal (EDP Distribuição) has provided the study with important data. The PV GRID project opened an important door between this big company and the small companies that operate in the sector.

### **3.5.3 Assessment of individual performance**

Taking part in the PV GRID project has granted APESF the necessary acknowledgment by the national authorities. The collecting of data by means of interviews has provided APESF with updated information on the market, and enabled APESF to use that information when meeting with the national authorities.

Nevertheless, the communication with the national authorities did not always succeed, in particular when the subject was more on the technical side.

APESF had not anticipated how much this study, as well as the necessary meetings, would provide the association with data that substantiated the claim for the change in the legislation. One of the changes concerned the introduction of the self-consumption possibility. A new decree of law has been approved on 20 October 2014. APESF takes pride on having contributed to its elaboration, providing the national authorities with specific suggestions on what should be part of the legislation.

The main barrier we had concerns scheduling. We were unable to establish a date to organise a workshop for the Advisory Paper, and were then forced to arrange bilateral meetings.

We believe that if the project were to begin now, it would be easier to accommodate all different contributions, since now the players have become accustomed to hearing from the project and have acknowledged its role in the development of photovoltaic in Portugal.

### **3.5.4 Sustainability of the action after the end of the project**

The data of the project posted on the official site has proven to be an important source of information. Some APESF members have used the data on their on seminars.

Since Portugal has now legislation on self-consumption, it is possible to use the examples of other countries where this economical measure is a reality already, and ground suggestions on how Portugal can act. APESF is organizing national events on the subject, where the collected data will play a main role to prove that photovoltaic can be a measure for energy efficiency.

Portugal expects great changes in 2015 (when the new legislation will be effective), namely on the system cost of an installation.

### 3.5.5 Review of resources

#### 3.5.5.1 Staff resources

In general, staff resources used during the project were less than planned, especially thanks to an average cost rate inferior to the budgeted one.

WP 1 tasks were undertaken mainly by Karl Moosdorf and Leonor Barradas.

Both the conference calls and the project meetings were fundamental to assess the work produced, as well as to have a better picture of PV in the other participating countries.

WP 2 tasks required less time than expected. Since there were no major changes in the Portuguese market and legislation, the data collected initially demanded very little updating over the duration of the project.

WP 3 task of preparing the advisory paper enabled APESF to unite several entities related to PV in Portugal, opening the theme to discussion. The work that PV GRID has developed with the advisory paper has been much appreciated. The people APESF interviewed consider that the project has addressed all the most relevant issues on the theme.

There were no major differences between the number of hours budgeted in the project and the number of hours used.

WP 4 tasks were definitely the most challenging and the most rewarding ones. The Portuguese national Forum proved to be the most successful event on PV in Portugal. In the same room were gathered all the partners and stakeholders on PV in Portugal: legislators, regulators, installers, universities, producers. The success of the Forum gave APESF the leverage it needed to better represent the PV sector in meetings with the legislators.

There were no major differences between the number of hours established in the project and the number of hours used.

	<b>Final</b>	<b>Planned</b>
WP 1	168	174
WP 2	353	440
WP 3	37	34
WP 4	535	519

Below a chart with the detailed explanation for the tasks where APESF had more than 200 hours planned.

<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
Task 2.2: Legal-administrative research	Leonor Barradas	208	Research of information and interviews with Portuguese PV Sector stakeholders
Task 2.2 Legal-administrative research	Karl Moosdorf	103	Conduction of two interviews for training purposes of Leonor Barradas; revision of researched data
Task 2.3: Evaluation of research and database update	Leonor Barradas	42	Discussion and review of revision status, finalisation of database content
Task 4.2 Dissemination of project status an results	Leonor Barradas	30	The results have been sent by e-mail to our members, other stakeholders and to the media, drawing attention to the PV GRID website.
Task 4.3 Organisation of national forum	Leonor Barradas	223	Contact to stakeholders; organisation of forum; preparing of printing material
Task 4.3 Organisation of national forum	Alexandre Cruz	58	organisation of national forum; defining the venue and negotiating of the terms for rental; speaker at the national forum
Task 4.3 Organisation of national forum	Karl Moosdorf	12	speaker at the national forum and driving time
Task 4.4 Organisation of national workshops or bilateral meetings	Leonor Barradas	162	Preparation of the questionnaire; interviewing of the selected participants; preparation of the data
Task 4.4 Organisation of national workshops or bilateral meetings	Karl Moosdorf	50	Preparation of the questionnaire; final revision of the data



### 3.5.5.2 Subcontracting and other specific costs

Cost category (subcontracting or other specific costs)	Foreseen item according to CPF	Estimated costs [EUR]	Actual incurred costs [EUR]	Reason for over-, under- or not spending
Other specific costs	National Forum organisation	4.000€	6.849,09	The costs of the forum were exceeded by over 2500 EUR due to the printing costs that were borne by APESF directly, instead of EPIA due to the early timeline of the Portuguese Forum.
Other specific costs	Budget for translation of research	2.000	0	Translation was done in-house. Instead, translation services were used for the national forum.

### 3.5.5.3 Travel costs

The travel budget was not fully utilised, thanks to savings especially on national travels.

### 3.5.5.4 Report on budget shifts

An internal budget shift between the travel costs and the other direct costs categories is requested in order to compensate the extra national forum organisation costs discussed in the sections above with the savings in the travel budget costs.

## 3.6 CB6: ASSOSOLARE

Author(s): Luisa Calleri; Costanza Boggiano Pico

### 3.6.1 Role in the project

Assosolare merged into CB23 Assorinnovabili as of 16 September 2013, thus Assorinnovabili replaced Assosolare in the project execution.

Assosolare's main role was researching the Italian's administrative framework (WP2) and organizing the Italian national forum (WP4) as outlined in the project proposal. Namely, Assosolare focused on:

- Researching national data, updating and revising them every 7 months (four research rounds) and carrying on a revision of research results;
- Collecting initial data;
- Contacting stakeholders;
- Organize the national forum;
- Contribute to disseminations activities

### 3.6.2 Main activities and achievements

Assosolare's activities were mainly concentrated in WP2 – (PV LEGAL Database), and WP4 (EU level and national discussion and dissemination).

For WP2 the association was involved in collecting national data and gathering, verifying and updating the normative framework for each market sector (residential-commercial medium and large size) in order to compare it with national data collected.

The collecting of national data has been made through interviews to a representative group of operators. A list of significant identified stakeholders grouped for category ( policy makers/Administrative Authorities/Grid Operators/PV installers/PV system integrators/independent power producers/Legal firms/architects/others) has been prepared. A template with standardized questions has been prepared and a first phone call to inform about the contents and the purpose of this activity has been forwarded before sending the template and calling back in an established time in order to collect infos and comments related to the template. This activity as aimed to identify the state of art of the PV sector highlighting the main barriers for integration into the distribution Grid formulating first proposals and notes to be discussed later on in order to overcome the identified barriers for each market-sector.

In WP4 Assosolare has been especially involved in the organization of the national forum (hosted in Rome on July, the 18<sup>th</sup> 2013) and in some related dissemination activities (press releases, distribution of documents informing about the project; making members interested and informed through the association website and dedicated communication tools).

The National forum was attended by 21 participants: among them institutions, (GSE) solar energy producers associations (APER- Assosolare), Italian TSO (Terna), companies and experts of the electricity sector.

Participation in all WP1 activities was duly carried out as well (participation in call conferences, attendance to the WP2/WP4 project meeting in Berlin (28/08/2012) preparation of reports for EC, filling all required documents).

### 3.6.3 Assessment of individual performance

Assosolare performance, despite the short time in which the association was involved in the project, allowed all the following steps starting the methodology of collecting and verifying data and the normative framework and gathering all the most significant stakeholders in the national forum to discuss the barriers to the integration of PV electricity in the distribute grid.

All the work has been carried out by the PCOW, Mr. Andrea Zanolla, who shared his competence and technical preparation with high commitment supported by Mr. Simoni and well coordinated with subcontractors in order to ensure the best results especially in the organization of the national forum.

The national forum showed high interest and active participation of all stakeholders involved, confirming the relevance of the topic within the PV sector.

### 3.6.4 Sustainability of the action after the end of the project

In September 2013, the 16th, Assosolare merged assoRinnovabili: assoRinnovabili replaced then the role and the task of Assosolare in PV Grid project until its end.

### 3.6.5 Review of resources

#### 3.6.5.1 Staff resources

The total amount of the scheduled hours was limited to the period in which Assosolare was in charge of the project. WPs interested by the activity of the association were WP1, WP2 and WP4.

Task n° + name	Involved staff members	Hours spent	Keywords on undertaken activities
WP 2 Database	Andrea Zanolla	261	Attending the WP2 meeting in Berlin; Collecting data and performing interviews; preparing templates to start the methodology to collect data, revision of database content
WP4 Dissemination	Andrea Zanolla	128	Organizing and attending National Forum

#### 3.6.5.2 Subcontracting and other specific costs

- 20<sup>th</sup> June 2013, PV GRID National Forum in Germany, Munich– participation of Assosolare board member Gianni Chianetta, total travel and subsistence expenses € 308,50.

#### 3.6.5.3 Travel costs

Assosolare attended two meetings, namely:

- 28<sup>th</sup> August 2012, WP2/WP4 meeting in Berlin – participation of Andrea Zanolla, total travel and subsistence expenses € 469,06.

#### 3.6.5.4 Report on budget shifts

Nothing to report here.

## 3.7 CB7: Bulgarian Photovoltaic Association

Author(s): Mariya Trifonova

### 3.7.1 Role in the project

Bulgarian Photovoltaic Association (BPVA) is a non-profit organization unifying more than 320 Bulgarian and foreign companies from the solar industry. Its members are companies with different profile-producers of solar panels, designers, installers, investors in the construction of photovoltaic power plants, project developers, financial institutions, investment companies and consultancies.

BPVA was part of the existing PV LEGAL project consortium that has broadened its composition to welcome other actors of the wider **electricity distribution sector** in order to fulfil the objectives of the PV Grid Project. As national industry association BPVA's role in the project was:

- to participate in all project meeting and online discussions;
- to conduct a research on administrative framework and identify legal-administrative and regulatory barriers which hamper the PV integration into the national electricity grid;
- to carry out two national workshop and to communicate the problems and recommendation for their solving with all stakeholders in the sector at the national level;
- to contribute with its industry knowledge on national level to the creation and periodical update of the PV Grid online database;
- to disseminate the project results in Bulgaria.

### 3.7.2 Main activities and achievements

One of the main activities performed by BPVA was gathering information about and conduction analysis of the current administrative requirements and procedures necessary for installing, connecting to the grid and operating PV system power plants. Although the BPVA team has the knowledge and expertise about these procedures, conducting surveys with PV power plants owners, legal and technical experts, DSO representatives, policy makers and academics were necessary for the database construction as well as for the barrier assessment and recommendation drafting on the next stages of the project.

The contact with so many companies from different segments had additional effect of knowledge base increase of BPVA's employees, creation of new contacts and networking as well as distribution of information about the PV Grid project's goals and results in informal conversations.

For first time the administrative procedures in Bulgaria were described and illustrated in a very systematic way, the concrete statistics about the procedures and how they vary across segments is used by our organisation in public presentations, by journalists, by consultants as well as by representatives of universities in Bulgaria. We hope that policy makers also take advantage of the PV GRID database in their discussions and prepositions for normative and legislative changes.

The two national workshops were scheduled in Bulgaria exactly at times, when there were public conflicts between PV producers and DSOs or the Regulator and the sector participants. For this reason it was very challenging to bring together stakeholders which are conflicted and to make them discuss hot topics and work together for solutions.

As additional achievements I would point out the dissemination activities which have led to publications about this project in Bulgarian media as well as the opportunity for BPVA to come in personal contact with other national associations. The contact to the other national association was very advantageous for us, because we had the chance to discuss with them how they deal with other problems to transfer knowledge and learn about good practices.

### **3.7.3 Assessment of individual performance**

The PV Grid Project was a very motivating and interesting project for the BPVA's employees and I think all of them gave their best performing the project activities although our association is small and has limited HR resources. Except some very small delays the required outcomes for each work package were delivered on time and in the maximum possible quality.

We believe that we would have delivered better quality results if there would not have been so many conflicts and negative public campaign against the PV sector in Bulgaria. For instance in the second national workshop which main aim was the discussion of the normative and regulatory barriers and the identification of possible solutions, there was no representative of the Ministry of the Economy and Energy or the Regulatory Commission. It would have been very important to receive their feedback on the presented project outcomes and to see their engagement for a regulatory and normative change in the future. Although our team was trying actively to ensure the representation of these institutions we met absence of interest from these institutions in the workshop participation.

### **3.7.4 Sustainability of the action after the end of the project**

BPVA strongly believes that most of the identified recommendations and project outcomes could be implemented in Bulgaria and could lead to improved PV integration. The Bulgarian electricity network is very outdated and its modernization takes time. On the other hand the PV sector development was not an outcome of an expected, planned and structured process. For this reason most of the technical solutions identified in the other countries which were subject of review within the project are still not implemented in Bulgaria. Their implementation will require change in the national administrative procedures and legal framework. Therefore even after the project is finalized we continue to inform our partners, media representatives and other stakeholders from the sector about the project reports and results described in them. We include these best practices in our statements submitted to Bulgarian authorities. In the view of a future common EU energy market we believe that these topics will become more and more important for the Bulgarian decision-makers and authorities. We hope that there will be more binding rules on the EU level for the harmonization of the administrative procedures and regulations in terms of RES deployment in each EU country. Our proposal for future projects goals would be the investigation of the legal potential for unification of certain procedures for RES integration among the EU member states.

Our organization's staff continues observing and updating the information about the administrative procedures for the building and connecting PV power plants from all segments to the electricity grid. This information will be available and sent for keeping the database on the PV Grid website up to date. The PV Grid website is still promoted on our website.

### 3.7.5 Review of resources

#### 3.7.5.1 Staff resources

Three members of BPVA board and three employees of BPVA have been involved in the project realization during the years. Mr. Nikola Gazdov was chairman of BPVA until Sept. 2013. He participated in the kick-off meeting in Berlin together with Mr. Ivo Tsachev, former member of the board. Rumen Petrov was Head of Policies and Regulatory Affairs with BPVA and worked on the project from 01.08.2013 to 30.11.2013. He was appointed a main contact person regarding the PV GRID Project for Bulgaria. From 1.12.2013 his role in the project was taken over by Mariya Trifonova, administrative and program director with the association. Desislava Lesova was involved during the whole project period as a junior expert.

No important deviations took place in the amount of hours employed during the project compared to the ones planned. In total, 1036 hours were used instead of the 1167 foreseen, with main savings arising out of WP1.

<b>Task n° + name</b>	<b>Involved staff members</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
WP2/2.2 Legal-administrative research	Rumen Petrov	55	Research of all relevant acts regulating the PV sector. Update of the changing regulations mostly related with imposing levies and practices of the different institutions.
WP2/2.2 Legal-administrative research	Desislava Lesova	30	Communication with experts and lawyers BPVA usually works with on drafting statements regarding legal and regulatory changes and prepositions
WP2/2.3 Evaluation of research and database update	Rumen Petrov	165	Difficulty in finding PV producers due to the moratorium on PV imposed for the last 3 years for ground-mount installations. The unstable legal framework and the imposed retroactive measures additionally led to flux of interest in the other PV segments.
WP2/2.3 Evaluation of research and database update	Desislava Lesova	207	Desislava Lesova continued the same activities fulfilled by Rumen Petrov in WP 2.3 after he had left the project team.
WP4/ 4.2 Dissemination of project status and results	Rumen Petrov	22	Regular press releases and information spread to the media, PV producers, authorities, DSOs, other relevant stakeholders, newsletters
WP4/ 4.2 Dissemination of project status and results	Desislava Lesova	16	Regular press releases and information spread to the media, PV producers, authorities, DSOs, other relevant stakeholders, newsletters

<b>Task n° + name</b>	<b>Involved staff members</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
WP4/ 4.2 Dissemination of project status and results	Mariya Trifonova	16	Preparing texts and figures regarding the project for presentations on national and international forums, round tables and BPVA's general assemblies.
WP4/ 4.3. Contact to national stakeholders & organisation of national forums	Rumen Petrov	80	Conducting a national forum for presenting the project and the current results of it to the relevant stakeholders in Bulgaria.
WP4/ 4.3. Contact to national stakeholders & organisation of national forums	Desislava Lesova	154	All necessary activities for the national forum realization- preparation of list of participants, invitations, agenda, presentations, reporting
WP4/ 4.3. Contact to national stakeholders & organisation of national forums	Mariya Trifonova	8	Preparation of list of national stakeholders incl. their contact details
WP4/ 4.4. Organisation of national workshops or bilateral meetings	Desislava Lesova	48	A national workshop took place in Bulgaria on 26 <sup>th</sup> of March 2014. Desislava Lesova was involved in the preparatory work.
WP4/ 4.4. Organisation of national workshops or bilateral meetings	Mariya Trifonova	114	A national workshop took place in Bulgaria on 26 <sup>th</sup> of March 2014. The preparatory work included identifying all stakeholders, which have been invited, drafting a formal invitation letters and reminders via phone, organizing a conference room and coffee breaks, preparation of materials for the presentation. Mariya Trifonova coordinated the event during its preparation and realization. After the event additional information was obtained by the DSOs. A report was prepared and submitted.

### 3.7.5.2 Subcontracting and other specific costs

Nothing to report.

### 3.7.5.3 Travel costs

In total 3353 Euro have been spent on travelling from Bulgaria to 4 Project events (Kickoff Project Meeting in Berlin, National Associations Meeting in Berlin, PV Grid Forum visit in Athens, PV Grid European Forum and Project Meeting in London as well as PV GRID Final Project meeting in Brussels. The total amount spent is within the budget of BPVA for travelling although the last journey to Brussels costs 50 Euro more than the foreseen 800 Euro. The reason is late hotel reservation due to BPVA team changes.

### 3.7.5.4 Report on budget shifts

No budget shifts are requested. All the costs for staff, travelling and other eligible costs were within the planned budget framework.

One small change was made in the time sheet submitted in the interim financial report in July 2013- 4 working hours were added in July 2013 for the time Desislava Lesova has spent for the interim report preparation.

## 3.8 *CB8: Czech Photovoltaic Industry Association - Česká fotovoltaiická průmyslová asociace (CZEPHO)*

Author(s): Roman Kuruc

### 3.8.1 Role in the project

CZEPHO's main role in the project was to communicate among PV shareholders (National regulator, Distribution companies, Ministries responsible for energy agenda and particular companies operating on PV market), to gather appropriate data regarding national policy skills and to disseminate all results of the project to professional public. To fulfill the role and the project objectives and in order to submit all required outputs CZEPHO was obliged to make examination of the current PV market – i.e. to analyze local conditions for PV plant construction/installation (for all three segments: rooftop, commercial systems and industrial ground-mounted systems), analyze PV environment in order to identify and recognize main barriers existing within Czech distribution system environment. Since the local partner Lumen withdrew the project, CZEPHO was obliged to hire a subcontractor whose main role was to make an analysis of the Energy act 458/2000 coll. and the analysis of the act on promoted energy sources 165/2012 coll. with regard to PV Grid Czech case study - Advisory paper. Other crucial points discussed by the subcontractor covered issues regarding conditions for curtailment and application of self-consumption.

### 3.8.2 Main activities and achievements

CZEPHO was involved in 4 work packages:

WP 1: Main activities included preparation of reports to EC (mainly official project documents), organization and attendance at project meetings. CZEPHO had organized one project meeting, which was held in Prague in June 2013. Representatives of CZEPHO participated in one Project meeting, which was held in Berlin and in one advisory committee meeting held in Madrid. Important data and information were distributed and circulated at regular basis via conference calls and emails. In this WP we haven't encountered any problems.

WP2: In order to get new data and information for the database, specific PV companies and shareholders had been contacted and interviewed. Last but not least the database itself (in both languages – Czech and English) had been extended and updated according to newly identified barriers. During the first stages of the project we have not encountered any difficulties, the companies whom we have interviewed were cooperative and we have gathered quite sufficient and functional data. However, after January 2013 the situation has rapidly changed. Their attitude to any kind of cooperation was changed



mostly due to the situation, which emerged on the Czech PV market after 1. January 2013. As a result, we didn't succeed to interview more than 3 companies during last stage of the research. It is important to say that due to the fact of low demand from the side of PV customers, those companies were forced to change their business activities, so they actually didn't have the new or actual data about the market.

WP3: First activity included set up of the working team. Team members were primarily focused on communication with Distribution companies or more precisely with the partners who spoke on behalf of distribution companies (Lumen and later Mr. Karel Procházka from EGC České Budějovice). Team members made an effort to identify how the distribution system is organized then they were prepared to identify and recognize main problems and barriers existing within this system. Because of the withdrawal of Lumen CZEPHO has mostly cooperated with Mr. Karel Procházka from EGC České Budějovice and subcontractors. Information and data received from this studying process have been used for developing recommendations of normative and regulation solutions in the field of PV market.

WP4: Activities included preparation of documents, which were used to disseminate information about the project itself and about its advancement, which happened during particular project periods. This information was circulated through bilateral meetings, seminars, National forum, European forum and National workshop. CZEPHO has successfully organized one National forum and one National workshop.

### **3.8.3 Assessment of individual performance**

Despite the problems that two team members and the main partner quit the project in the early stage, CZEPHO has met all required objectives and submitted all required outputs.

### **3.8.4 Sustainability of the action after the end of the project**

Publication of project outputs like European Advisory paper, National database etc. will raise public awareness among citizens of more positive viewing of the Czech PV market. Up to now, there is still a perception that people must pay great amounts of money for PV owners (or more precisely for their government subsidies). Results of the PV Grid project will help to change this negative perception and we hope that promotion of those results will generate some kind of pressure on policymakers so they will be more in favour to reduce the barriers. Also very important is the example of other European countries (mentioned in Advisory paper); it shows that PV market could successfully operate under much less amount of government subsidies.

### **3.8.5 Review of resources**

#### **3.8.5.1 Staff resources**

On the WP1 we have used 208,5 hours from planned 234 hours.

On the WP2 we have used 423,1 hours from planned 440 hours.

On the WP3 we have used 565,3 hours from planned 641 hours.

On the WP4 we have used 451 hours from planned 572 hours.

Because on each WP was claimed more than 200 hours, in the chart below we provide break down of hours by task and staff member. Details are provided for the tasks per used hours (over 20 hours).

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<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
1.4 Organisation and attendance of 3 project meetings	Zuzana Musilová Martin Půlpitel Ján Říha	21 21 22,5	Attendance at project meetings in Berlin, Prague, Madrid.
1.5 Organisation and attendance of 4 advisory committee meetings	David Bušek	45	Attendance at committee meeting in Madrid.
1.6 Organisation and attendance of conference calls	Roman Kuruc	40,5	Attendance at conference calls.
2.2 Legal-administrative research	Ján Říha Zuzana Musilová Roman Kuruc	74,1 186,5 92	Conducting a legal-administrative research for PV Grid database. Work on the PV Grid database.
3.1 Initial data collection and set-up of working groups	Ján Říha	25,9	Tasks have been assigned to particular team members. Collection, review and evaluation of data.
3.2 Analysis & discussion on technical PV grid integration solutions	Ján Říha Zuzana Musilová Roman Kuruc David Bušek	29,3 85,5 55 56	Contact and communication with distribution companies (later communication with company "EGC České Budějovice", which represented DSOs operating in Czech territory. Work on proposals regarding technical PV grid integration solutions.
3.3 Analysis and discussion of regulatory and normative barriers	Zuzana Musilová Roman Kuruc David Bušek	66 83 61	Communication with policy makers (Ministry of industry and trade) and subcontractors.
3.4 Preparation of advisory paper on regulatory and normative recomms	Zuzana Musilová Roman Kuruc	22 48,5	Work on Czech case study. Using the information and data from previous sub points of WP3.
4.2 Dissemination of project status and results (interrelation to WP 2,3)	Zuzana Musilová	20	Preparation of documents needed for interviews regarding national database.
4.3 Contact to national stakeholders & organisation of national forums	Zuzana Musilová Roman Kuruc David Bušek	35 123 70	All work connected with preparation of documents etc. and with organization of national forum. Making contacts of potential participants, arranging venue for NF.
4.4 Organisation of national workshops or bilateral meetings	Zuzana Musilová Roman Kuruc David Bušek	50 73 45	All work connected with preparation of documents (agenda, invitations etc.) and with organization of national forum. Making contacts of potential participants, arranging venue for NW.

### 3.8.5.2 Subcontracting and other specific costs

For the subcontracting we have spent € 6469 from planned € 4000. Total overspending reached the amount of € 2469.

For other specific costs we have spent €11068 from planned € 7000. Total overspending reached the amount of € 4068.

<b>Cost category (subcontracting or other specific costs)</b>	<b>Foreseen item according to CPF</b>	<b>Estimated costs [EUR]</b>	<b>Actual incurred costs [EUR]</b>	<b>Reason for over-, under- or not spending</b>
Subcontracting	Legal-advisory budget for reviewing national regulatory and administrative recommendations	4000	6649	Reason for overspending: In general we needed to analyse situation in the Czech PV market regarding the local conditions for operation of Distribution companies. Also we have analyzed local conditions for curtailment and application of self-consumption. Those information were mainly used for the purposes of Czech case study and Advisory paper.
Other specific cost	National forum organization	4000	9021	Major costs included expenses for organization of National forum and National workshop, Promotion of the PV Grid project and production and print of PV Grid materials. Reason for overspending: We have realized that one of the most important things for successful conclusion of the project was to carry out a good project promotion. Therefore we have spent extra money for media exposure (PV web sites and newspapers) regarding project results and outputs.
Other specific cost	Budget for translation of research	2000	618	Reason for underspending: most of the translations were made by us (in-house employees).
Other specific	Cost for WG	1000	644	

cost	meetings			
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According to the information from CZEPHO management the selection of subcontractors complied with rules laid down in the grant agreement.

### 3.8.5.3 Travel costs

Within this budget category, the amount of € 7 744,93 was saved/underspent. All travel costs were in line with the project purposes. In case of travel expenses (London) of David Busek during 18.10.-23.10.2013, there was total number of five days. Only two days out of five were covered from the PV Grid budget (€ 738).

### 3.8.5.4 Report on budget shifts

We would like to transfer the amount of € 2 469,00 from budget chapter “Travel and subsistence expenses” to budget chapter “Subcontracting” and the amount of € 4 067,94 from budget chapter “Travel and subsistence expenses” to budget chapter “Other specific costs”. By this budget shift we would like to cover extra costs, which we were obliged to spend on extra expertise work. Since our Czech partner Lumen left the project we were forced to find a substitute for some of the expertise work. Therefore we have approached several companies and finally have chosen Sikola and partners. Our field of cooperation included: Analysis of Energy act 458/2000 coll. and act 165/2012 coll. with regard to PV Grid Czech case study and Advisory paper. Also we have broadly discussed local conditions for curtailment and application of self-consumption. Without the contribution of subcontractors it wouldn't be possible to finalize significant parts of Czech case study and Advisory paper. We have also realized that one of the most important things for successful conclusion of the project was to carry out a good project promotion. Therefore we have spent extra money for media exposure (PV web sites and newspapers) regarding project results and outputs. We have also made an effort to print out material and hand outs, which were used during CZEPHO – PV Grid round table (National workshop) and which were then handed over to PV Grid experts, stakeholders and public. Without this extra budget it would have been difficult to disseminate and make public major results and outputs of the project.

## 3.9 CB9: ENERPLAN (*French Professional Syndicate for Solar Energy*)

Author(s): Sylvain Roland

### 3.9.1 Role in the project

Enerplan was involved in the PV GRID project as a follow up of the previous PV LEGAL project. With our national expertise, our main role in the consortium was to deal with the French situation regarding grid integration of PV electricity, by promoting the project, its findings and recommendations' to decision makers, grid operators, the national energy regulator and also PV actors, as much as updating the database about French PV development process. Inside Enerplan, work foreseen was shared between a senior expert, Richard Loyen, and a junior expert, Sylvain Roland. While Richard Loyen was mainly in charge of direct promotion to decision makers through many formal or informal bilateral meetings or networking sessions, Sylvain Roland was in charge of tasks linked to the legal-administrative research, PV grid integration issues and preparation of national forum and bilateral meetings.

### 3.9.2 Main activities and achievements

As previously addressed, Enerplan was involved in 4 work packages out of 5.

#### **WP1: Project Management**

Enerplan has attended to all project meetings and contributed to the preparation of all reports of the project.

Regarding the conference calls foreseen in the original budget, we have attended to them as much as we were available. However, in the final staff hours account, time originally dedicated to conference calls is not fully reported as WP1, but also in the WP linked to the topic of each call.

#### **WP2: Legal-administrative research**

Enerplan was in charge to provide all the legal and administrative information about the PV development process at the French level in order to fill the database. This work was easy to execute as the PV GRID database was an evolution of the one settled for the PV LEGAL project. Further this, we have to mention that national legal and administrative framework has not much evolve since March 2011. This way, we have regularly contributed to the 4 database updating phases, but did not spend as much hours as foreseen.

We have succeeded in maintaining update and accurate data's regarding residential and commercial PV systems segments, including PV industry survey in order to gather information on cost and duration of each administrative step.

If this was led without difficulty, it was not the case for the market segment focused on Industrial ground-mounted systems. Indeed, the French framework is slowing this segment's activity. PV industrial ground-mounted is only driven by the feed-in-tariff sets in France. As the regular and regulated FIT for large installation is at a very low level, no PV project is developed under this scheme. Thus, the Government manages the development of this segment through call for tenders. During the PV GRID project, no call for tenders could be studied in his wholeness: a first call launched in the summer of 2011 was closed in the summer of 2012. Tender winners have to finish their installation (including grid connection) until summer 2015. A second call for tenders was launched in spring 2013 and closed in spring 2014. Tender winners have to finish their installations until spring 2016. Facing this situation, the industry survey could not be made for this segment. Only the description of the legal and administrative proceedings and burdens has been led to the end.

This overall situation has consequently influenced the total hours amount spent on this WP (142.5 out of 440 budgeted in Annex 1). It was also decided to use remaining hours to concentrate us on the national discussion and dissemination foreseen in the WP4, which was identified, in the first 6 months of the PV GRID project, as a crucial task we have to put our efforts on over years 2013 and 2014 in order to reach a general success of the PV GRID project at the national level to ease grid integration of PV.

#### **WP3: Discussion on PV GRID integration issues**

Enerplan was not much involved in this work-package at the beginning. It was only foreseen that we will contribute to initial data collection of the French situation and work on the advisory paper on regulatory and normative recommendations'. The contacts progressively developed with grid operators allowed us to succeed in the national barrier assessment that comes as an annex of the final advisory paper.

In the last months of the project, as agreed inside the consortium, we have spent a consistent number of additional hours on this WP for the realization of a French national case study. This work was done consecutively to the national barrier assessment (include into WP3) and bilateral meetings with decision makers organized in the frame of WP4.

This extra work, however very useful for the PV GRID project comprehensiveness and our dissemination work at national level, has led to a consistent hours deviation from the initial WP3 budget.

#### **WP4: EU level and national discussion and dissemination**

This work-package is the one we have put a strong focus on, as we have to develop, more than they were in 2012, our relations and contacts with decision makers, grid operators and the national energy regulator on PV electricity grid integration issues.

In order to ensure a large dissemination, followed by discussions, on project recommendations, we have been getting closer to DSO and TSO activities linked to the renewable energy sources producers in order to be able to promote recommendations through internal meetings or networking sessions. This first work allowed us to accurately identify contacts and partners in order to organize a national forum on 10 July 2013, which gathered around 80 people to discuss technical solutions, potential recommendations on grid integration and also promote the PV GRID database use. This forum helped us to strengthen our relations with decision makers, our recognition by them and also the interest they have on the PV GRID project.

This strength led us to go with bilateral meetings in the spring of 2014 in order to promote recommendations of the European advisory paper to DSO, TSO, the national energy regulator and also the Government. In these meetings, we have disseminated the PV GRID advisory paper in consultation version in order to discuss recommendations' with our partners. We have chosen to proceed with bilateral meeting as each of our contacts was not concerned by the same recommendations' and as their positions on the topic are not always compatible, which would have been led to a no way discussion.

These meetings allowed us to deal with them in depth on the national PV grid integration situation and prove the relevance of the project recommendations. At the end of each meeting, it was discussed the usefulness of setting up a new national forum in order to put every organization around one table and present how the grid integration will evolve in the near future, based on the application of PV GRID recommendations'.

As every of our contacts were in favour of this proposition, we have decided to organize a second unbudgeted national forum on PV grid integration, which one took place on the 10 September 2014. This new event gathered as much attendees as the first one in July 2013. The PV GRID advisory paper, in his consultation version, was largely disseminated at this event. Topics discussed during the forum were the opportunities brought to the grid by the PV development (technical solutions, ancillary services, storage...), smart-grids experimentation and framework evolutions needed, role of the local administration in the grid development, the 2020-2030 vision of the grid and the deployment of renewable energy sources and also which decisions have to be taken in order to realize this vision.

This event has met a large success and was appreciated by all speakers and attendees. It however has led to an extra amount of hours spent in the organization and some extra costs that were partially balanced by revenues for entrance fees, and unused budget of WP2 translation of research.

### **3.9.3 Assessment of individual performance**

Overall, everything in the project went well. As above explained, we have had to deal with national particularities unforeseen when the PV GRID project proposal was signed: a legal-administrative framework which remains globally unchanged, and a need to work more on relations with decision makers about grid integration issues.

This has led us to deviate somehow from the initial budget, but at the end, we are satisfied of the work done, and especially the fact that PV actors are much more listened by decision makers when it comes to grid integration or grid development.

If something was to be made differently, it would probably be in the dissemination phase. In fact, at the beginning of the project we probably did not sufficiently estimate the work needed in order to be considered by grid operators. Otherwise, we would have had to work earlier on the promotion of the project and its foreseen results.

### **3.9.4 Sustainability of the action after the end of the project**

The main proof of sustainability of the action engaged which will last after the project ends, will be the good relationship established between Enerplan and all stakeholders, especially DSOs, the national energy regulator and the Government. The involvement of these stakeholder representatives in the national forum we have organized in September 2014 is a good sign of their willingness to carry on working with the PV sector about the specific grid integration topic. Both are interested in the deployment of smart grids, taking into account PV electricity contribution.

Main lines of discussion are “smart connection” asked by the national energy regulator to the DSO, support by open-minded PV sector actors about grid balancing. On this last topic, they are ready to discuss and contribute to it in a “win-win” paradigm.

The involvement of the PV industry into topics and debates as self-consumption, use of ancillary services (curtailment, active/reactive power...) or smart-grids experimentations is very large. Actors of this industry also support the role of local authorities, grid owners, in terms of grid evolution. A common discussion with all these stakeholders could lead to more intelligence on grid management, and result in a grid connection fees decrease associated to a large PV penetration.

Results of the PV GRID project will still be disseminated after the end of the project and will be used as a discussion base for further negotiations with the above mentioned organizations.

Moreover, links developed or reinforced with other national PV associations in the frame of the project will contribute in larger feed-back knowledge.

### **3.9.5 Review of resources**

#### **3.9.5.1 Staff resources**

Overall, even if large deviations have to be mentioned between work packages compared to what was initially foreseen, planned hours were a bit exceeded (5% more than foreseen, 1,228.5 hours instead of 1,167).

For WP 1, many of hours planned for the task *1.6 Organization and attendance to conference calls* were in fact reported into the accurate WP concerned by the call.

For WP 2, the work gone easier on task *2.2 Legal-administrative research* and *2.3 Evaluation of research and database update* as the French legal framework doesn't evolve significantly during the project, and as the most of the frame was already described in the PV LEGAL database. This results on a much lower amount of hours spent, 142.5 instead of 440.

For WP3, more hours were spent, especially for the unbudgeted French case study linked to task 3.4 Preparation of advisory paper on regulatory and normative recommendations.

WP 4 is the one that asked us much more work than initially planned, as relations we have with stakeholders needed to be deepened in terms of grid connection. This results on an excess of 71% of the planned amount, 888 hours instead of 519.

This excess splits as follow:

<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
2.2 Legal-administrative research	Sylvain Roland	117.5	Performing all the legal-administrative research for market segments studied, including PV industry surveys.
2.2 Legal-administrative research	Richard Loyen	12	Helping occasionally in identifying specific legal-administrative frameworks.
2.3 Evaluation of research and database update	Sylvain Roland	9	Evaluation and control the operating of the updated database.
2.3 Evaluation of research and database update	Richard Loyen	4	Checking of the updated data's.
3.1 Initial data collection and set-up of working groups	Sylvain Roland & Richard Loyen	10	Together, identification of norms, regulations and technical procedures of integrating PV plants to the grid.
3.4 Preparation of advisory paper on regulatory and normative recommendations'	Sylvain Roland	25.5	Performing the national barriers assessment and contribution to the advisory paper.
3.4 Preparation of advisory paper on regulatory and normative recommendations'	Richard Loyen	1.5	Supporting in final validation of the national barriers assessment.
3 Realization of the French national case study	Sylvain Roland & Richard Loyen	69.5	Collecting and checking information needed for the national case study, and writing it.
4.2 Dissemination of project status and results	Richard Loyen & Sylvain Roland	17	Supervising press relations, participating to project conference call.
4.3 Contact to national stakeholders & organization of national forum	Richard Loyen	41	Over the 1 <sup>st</sup> year of the project, identification of accurate contacts for different stakeholders (in coordination with Sylvain Roland), plus first contact (call or email).
4.3 Contact to national	Richard Loyen	103	Over 3 months, from May to July 2013, regular call or meeting with contacts in the



stakeholders & organization of national forum			frame of bilateral meetings or in networking sessions in order to organize the national forum (July 2013)
4.3 Contact to national stakeholders & organization of national forum	Richard Loyen	44	Follow up of the national forum during the last quarter of 2013; networking sessions with stakeholders in the frame of other events linked to PV sector or grid issues.
4.3 Contact to national stakeholders & organization of national forum	Sylvain Roland	52	Over the 1 <sup>st</sup> year of the project, identification of accurate contacts for different stakeholders (in coordination with Richard Loyen), plus first contact (call or email).
4.3 Contact to national stakeholders & organization of national forum	Sylvain Roland	195.5	Over 3 months (from May to July 2013) organization of national forum: logistics issues, agenda definition, speakers' identification and invitation, promotion of the event.
4.3 Contact to national stakeholders & organization of national forum	Muriel Caunois	34	Over 2 months (June and July 2013), support in national forum organization: logistics issues, invoicing and accounting attendees fees.
4.3 Contact to national stakeholders & organization of national forum	Sylvain Roland	43	Over the last semester of 2013, national meeting follow up: debriefing with speakers, dissemination of forum conclusions.
4.4 Organization of national workshop or bilateral meetings	Richard Loyen	39.5	From January to May 2014, direct relations with stakeholders (DSO, the national energy regulator, others stakeholders) in order to organize bilateral meetings and dissemination of PV GRID recommendations.
4.4 Organization of national workshop or bilateral meetings	Richard Loyen	61	From June to September 2014, supervision of the second national forum organization, following bilateral meeting, in order to have an accurate agenda for this event, dedicated speakers and a large promotion of PV GRID recommendations and interest gave to them by stakeholders.
4.4 Organization of national workshop or bilateral meetings	Sylvain Roland	120.5	From January to May 2014, in coordination with Richard Loyen, getting back to different stakeholders (DSO, the national energy regulator, others stakeholders) in order to organize bilateral meetings and dissemination of PV GRID recommendations. Many calls were organized between Enerplan and its representatives who participate to bilateral meeting.
4.4 Organization of national workshop or bilateral meetings	Sylvain Roland	169	As for the 1 <sup>st</sup> forum, organization of the second national forum: logistics issues, agenda definition, speakers' identification and invitation, promotion of the event. The aim was to have a more detailed agenda compared to topics dealt during the 1 <sup>st</sup> forum. This led to new contacts identifications, with lot of explanation about the PV GRID project and his main results, as much as the purpose of the forum.
4.5 Organization of 2 European forum	Sylvain Roland	10,5	Attendance to 1 European forum

### 3.9.5.2 Subcontracting and other specific costs

<b>Cost category (subcontracting or other specific costs)</b>	<b>Foreseen item according to CPF</b>	<b>Estimated costs [EUR]</b>	<b>Actual incurred costs [EUR]</b>	<b>Reason for over-, under- or not spending</b>
Specific costs	National Forum organization	4,000 €	5,808.36 €	Overspending is linked to catering services for the forum and security services of the room (lent for free). This overspending is balanced by a revenue of 2.100 € coming from admittance fees.
Specific costs	Budget for translation of research	2,000 €	0 €	Not spend due to the situation in the WP 2 which not needed a large translation work. This was done internally.
Specific costs	2 <sup>nd</sup> national forum organization (10 September 2014)	0 €	4,268.86 €	New specific costs due to the organization of a 2 <sup>nd</sup> national forum, following bilateral meetings. This new spending is partly balanced by the revenue from admittance fees (2.500 €)

### 3.9.5.3 Travel costs

Travel costs claimed reach 5,107.03 €, compared to 8,900 planned initially. This under-spending is linked to less European travel (i.e. only one participation to other national forum than 3), and also less national travel linked to WP2 and research phase. Sometime, instead of two people travelling, only one does.

Most of travels last one or two days. Only the last one last 3 days, but it was a combination of final European event and final project meeting.

### 3.9.5.4 Report on budget shifts

Internally, 3,787 EUR of savings from the travel costs budget can be used to partially cover the 4,113 EUR overspending in the other specific costs categories.

In order to fully cover the incurred costs in the staff costs and other specific costs categories, and given the fact a significant part of the work delivered (i.e. the French national case study and the 2<sup>nd</sup> national forum) was not originally budgeted, an external budget shift is requested for a total of 3,084 EUR, to be sourced from other partners that have overall savings in their budget.

### **3.10 CB10: HELAPCO**

Author(s): Stelios Psomas

#### **3.10.1 Role in the project**

HELAPCO, as a national partner in the project, had the role of identifying and proposing ways to overcome possible barriers hampering the large-scale integration of PV power into the Greek electricity Distribution System (DS). This goal was pursued through an analysis of barriers and solutions in cooperation with the national DSO, identifying those solutions that are most appropriate for the country, and disseminating the outcomes and proposals to various stakeholders and the broader public.

HELAPCO has also taken care of the maintenance of the PV LEGAL database with updated information on Greek legislation and regulations, and contributed to removing administrative barriers for PV system installations.

#### **3.10.2 Main activities and achievements**

During the course of the project, HELAPCO was continuously updating the **PV LEGAL database** in which detailed qualitative and quantitative information on administrative processes and barriers faced by PV system developers in Greece can be found. During the last two years of the project, there were numerous regulations related to PV, and this database updating was important for any PV system developer to keep track with all these developments, as there is no other source of information which offers integrated, concrete, detailed and updated information on all legal and administrative developments in the country related to the PV market. As a result of this work, the PV GRID advisory paper and the related lobby accompanying this information, in April 2014 the Greek government lifted a freeze in the authorization of new PV systems that was in place for almost 20 months.

Although it was not originally foreseen by the project outline, HELAPCO has put extra effort to produce a **national case study for the barriers and solutions that are most appropriate for Greece**. Building on the technical suggestions made by the PV GRID project, HELAPCO has worked together with the national DSO to identify which of these suggestions are already used or could be used in the case of Greece. A Greek case study report was produced for this purpose, which is the first of its kind in Greece. The Greek DSO had never put all possible technical solutions together, and this exercise was very helpful for them as well. The most important thing however, is that the DSO and the PV market have now a common understanding of the real problems, barriers and solutions related to the large-scale integration of PV power into the Greek electricity Distribution System, and have also reached an agreement on priority measures.

HELAPCO has organized a very successful **national forum** presenting to the national PV stakeholder community the status quo of administrative procedures and barriers for PV in Greece and other European countries, in parallel with the outcomes of the discussion on specific PV grid integration issues. This event, was attended by some 280 people (including all major stakeholders). It was by far the most successful PV event in Greece during the last few years, and received a lot of media attention.

HELAPCO has also organized a very productive **national workshop**, aimed at promoting and enforcing towards national level key decision makers and stakeholders the normative and regulatory

recommendations of the advisory paper in order to create a better framework for enhancing the hosting capacity and the operation efficiency of the distribution grid thus allowing for larger scale penetration of PV. During this event, the Greek case study report was presented for the first time, before its dissemination through the media.

Finally, HELAPCO participated in the **final European event** organised in Brussels to present to the European institutions, energy sector associations and other organizations the results and recommendations of the PV GRID initiative.

### 3.10.3 Assessment of individual performance

HELAPCO has fulfilled all aims of the project as described in the original proposal. Furthermore, it has put extra effort in producing a national case report, which was not originally foreseen by the project contract. This extra involvement proved extremely useful both for the Association as well as for the national DSO, as there is now an on-going dialogue on these issues.

### 3.10.4 Sustainability of the action after the end of the project

Building on the outcomes and suggestions of the project, HELAPCO has now a clear roadmap for all actions needed to guarantee the overcome of possible barriers hampering the large-scale integration of PV power into the Greek electricity Distribution System. Based on this information, HELAPCO has already started working with technical institutions and Universities to make sure that these suggestions will be followed and applied accordingly in the coming years. PV GRID has offered an invaluable added value to the Association, speeding up developments related to the ability of distribution grids to host an ever increasing PV capacity.

### 3.10.5 Review of resources

#### 3.10.5.1 Staff resources

During the course of the project there was a major shift in priorities. As the Greek PV market conditions changed (authorisation of new PV systems was frozen for some time during the project), further research was meaningless during this period. This explains the fewer hours dedicated to WP2. On the contrary, more resources than originally scheduled were spent on WP3 (preparation of a national case report, which was not originally foreseen by the project contract), as research and reporting on the particular situation in Greece was considered (and finally proved to be) the best option for the success of the project. As a result, more involvement by the senior expert (and consequently less involvement by the project assistant) was needed.

<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
WP2: PV LEGAL Database	Stelios Psomas	200	Research, drafting and revision of database content
WP2: PV LEGAL Database	Maria Georgiadou	86	Arranging contacts and facilitating meetings and interviews with stakeholders who contributed to the database content.
		<b>Total: 286</b>	

<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
WP3: Discussion and recommendations on PV GRID integration issues	Stelios Psomas	180	Research and drafting of national case report (not originally foreseen by the project contract)
WP3: Discussion and recommendations on PV GRID integration issues	Maria Georgiadou	17	Arranging contacts and facilitating meetings with relevant stakeholders for the preparation of the national case report.
		Total: 197	
WP4: EU level and national discussion and dissemination	Stelios Psomas	284	Managing the organisation of national forum and workshop. Contacts and discussion with stakeholders. Media work related to the project.  Extra participation at the final dissemination meeting in Brussels explains slight deviation from originally planned hours for the senior expert
WP4: EU level and national discussion and dissemination	Maria Georgiadou	160	Organisation of national forum and workshop
		Total: 444	

### 3.10.5.2 Subcontracting and other specific costs

<b>Cost category (subcontracting or other specific costs)</b>	<b>Foreseen item according to CPF</b>	<b>Estimated costs [EUR]</b>	<b>Actual incurred costs [EUR]</b>	<b>Reason for over-, under- or not spending</b>
Other specific costs	Organisation of national forum	4.000	6.715,92	Higher expenses for preparation of national forum, due to its large attendance (over 280 people)
Other specific costs	Translation of research	2.000	0	Translation done internally

### 3.10.5.3 Travel costs

Actual travel costs are 6135 EUR while the budget was 8900 EUR.

### 3.10.5.4 Report on budget shifts

As extra work was done for the production of a national case study, there were more hours dedicated by the senior expert (in-house consultant) for this task than originally anticipated. These extra 167 hours however were partially compensated by fewer hours assigned to the Project Assistant (see also “Staff resources”) and can be partially further compensated by the proposed internal budget transfer, making use of the savings in the travel costs budget.

### **3.11 CB11: Holland Solar**

Author(s): Arthur de Vries, Amelie Veenstra

#### **3.11.1 Role in the project**

Holland Solar has performed the role as national project partner. Our staff has executed the research of technical, regulatory and administrative aspects for establishing grid connections in the Netherlands, as part of work package 2 and provided local input for the development of European recommendations, as part of the European Advisory Paper in work package 3. In addition, we have organised the interaction with stakeholders, in the form of bilateral meetings, the National Forum and the National Workshop, in work package 4. Last, but not least, our organisation handled communication and disseminating of the outcome of the research, in presentations and publications (work package 1).

#### **3.11.2 Main activities and achievements**

The main activities within the project consisted of research, analysis, reporting and communication. Below, these activities and its achievements are described in more detail.

1) Research of the legal / administrative processes and an assessment of the barriers for developing a PV project in the Netherlands, resulting in useful reliable data for the PVLEGAL database. The availability of this easy accessible data offered stakeholders a better insight in the steps to be taken to realise a PV project in our country, and offered a better understanding of the reasons why certain hindrances are experienced by the industry.

2) Quantifying the database with reliable data on the cost and the time/efforts required to realise PV projects. Performing surveys with parties from within the industry and analysing its outcome, gave the stakeholders a quantified understanding of the severity of these hindrances. Stakeholders experienced this as a useful and constructive basis to discuss in a prioritised way the possible measures to ease the realisation of PV projects for residential PV systems and large commercial systems. Thanks to this approach, Holland Solar is now regularly invited to participate at consultation work group sessions with these stakeholders, to elaborate this topic in the future. This has resulted in revisions of existing rulings, requirements and procedures. Amongst other, the requirement for connecting a large size commercial PV system to the grid via a separately ordered grid connection has been removed. This removal of a technically unnecessary requirement means a significant saving in the cost and the administrative processing time for PV system developers.

3) We have researched the technical and regulatory aspects for connecting and running a PV system on the national grid in our country. We have thereafter matched the outcome of the European PVGRID study, performed in the 4 main countries as part of work package 3, with our finding on the particular situation in the Netherlands. This gave us a factual check on the present status of our national grid (and DSO's grids) and an understanding of the issues which we will encounter when the share of PV solar on our grid will grow over time.

4) Organisation of the National Forum in Amsterdam, during which the initial outcomes of the barrier assessment and technical research were presented to the stakeholders and representatives from the industry, followed by a debate leading to conclusions and action points. The Forum was well attended (over 100 persons), and has resulted in a better understanding between the involved parties and on the

goals and benefits of the PVGRID project. The action points were followed up by our team, and have in several cases already led to improvements. Thanks to this we've established a regular dialogue with stakeholders, in particular DSO ,TSO and representatives of the Ministry of Economic Affairs.

5) Organisation of the National workshop where the outcome of WP3, in particular the technical and regulatory recommendations from the European study in the 4 main countries, was presented and discussed in a select setting. The outcome of the workshop was further researched and its conclusions fed back to be incorporated in the drafting of the European Advisory paper and the Final PVGRID project report.

6) In order to more effectively use the European conclusions and recommendations from the European final reports, it was decided to develop a National PVGRID Advisory paper in our national language stressing the elements of the European paper which are most relevant for the Netherlands, and which will be continued to be disseminated for the purpose of enhancing our national situation on grid connection and the reduction of legal/administrative barriers, after the PVGRID project is ended.

As our main overall achievement of the project, we consider the following 3 elements:

- Contribution to the PVLEGAL database with quantitative and qualitative data on the development of PV projects in the Netherlands. As the database provides reliable and neutral facts and figures, it gave us the basis to enter into a constructive discussion with stakeholders.
- Development of the National PVGRID Advisory paper. The Dutch localised advisory paper offers us the basis to focus on the for our country most relevant elements of the research, after the project has ended.
- And, overall an ongoing dialogue and mutual understanding between industry and DSO/TSO and regulator.

### **3.11.3 Assessment of individual performance**

Holland Solar has experienced the work on the PVGRID project as very beneficial for the development of our market. Our staff has not only worked on the 'technical ' outcome of the project, but also used the momentum of the project to develop an ongoing contact with both national stakeholders and industry, and with the European partners which were involved in the project. On the latter, we participated actively during the project meetings in London, Berlin and Brussels, and on the conference calls.

Our National Forum and National Workshop were well attended. During both events, we aimed at offering an overall attractive program targeted on the needs of the stakeholders, whereby we merged the outcome of the research and recommendations of the project into the broader picture and vision of the growing PV market in the Netherlands. This approach was much appreciated by the attendees.

We have been able to build up and maintain a high quality database on the realisation of PV projects in our country, addressing the legal / administrative processes and barriers both in a quantitative and a qualitative manner. In order to reach this level, our staff has performed a large number of interviews with a variety of players within the industry (industry surveys). By maintaining regular contact with these companies, and reviewing their data with them on a regular basis, we were able to further increase the level of quality of the database over the course of the project. The companies involved in

the industry surveys experienced this approach as structured and meaningful, were proactive in providing updates to original interviews, and felt ‘being part of the project’.

Holland Solar has been on time with the deliverables of the various work packages. Only task 3.4 of work package 3 has been a challenge. We had underestimated the amount of technical and regulatory research work required for our contribution to the European Advisory Paper. Although the work was carried out satisfactory, it led to spending more hours on this task than budgeted at the start of the project.

The overall contribution of Holland Solar within the PVGRID project was successful and was within budget.

### **3.11.4 Sustainability of the action after the end of the project**

The sustainability and strength of the PVGRID project most probably lies, next to the ongoing dialogue with stakeholders, within the drafting of the European Advisory paper and the PVGRID project report at the end of the project. Within these two documents, based on a foundation of all research work over the period of more than 2 years, useful recommendations have been developed which require further dissemination and discussions. Holland Solar is committed to continue this work after the end of the project.

For this reason, we have developed a national version of the Advisory paper. The Dutch PVGRID Advisory Paper provides an overview of the, for our country, relevant research findings and recommendation in our language. The paper will be used in combination with the European reports in follow up meetings with stakeholders. As it is drafted in our own language, it is based on European research but geared towards our national situation, issued by the national solar association but realised in cooperation with European partners and with the support of the European Commission, the ‘weight’ of this paper in formal settings will be higher than the European PVGRID reports on its own.

The report will also be distributed at the Sunday congress 2014, i.e. the largest congress for solar in the Netherlands, organised by Holland Solar in cooperation with ECN and RVO (Ministry of Economic Affairs). This annual congress is attended by approximately 450 persons, amongst them representatives from the government, regulators, industry, research & knowledge institutes and energy providers. In addition, several elements from the advisory report will be included in the program.

Further, Holland Solar will continue the meetings with stakeholders on the topics of the Dutch Advisory paper. We will do this within the context of the Dutch Energy Agreement. The agreement, established between the government and the representatives of the energy sector, specifies the objectives and trajectory to reach the 2020 energy targets in the Netherlands. The practical aspects for the implementation of the agreement are presently being negotiated. Therefore, the government has instituted several expert working groups, each covering an important element of the Energy Agreement. Holland Solar will feed expert knowledge to these working groups, and in some cases even participate as member in some of the working groups.



### 3.11.5 Review of resources

#### 3.11.5.1 Staff resources

The project was executed by 2 members of the project staff of Holland Solar, under the supervision of a member of the board of our organisation. Each Work Package has been performed in line or below the budgeted hours, with the exception of an extra spending of 63 hours in WP3 to prepare the national case study for the Netherlands. The overall number of hours spent by the project staff during the term of the project has been within the set budget.

<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
2.2 Research of national data	Amelie Veenstra	158	Revision of original PV Legal database Enhancement with actual legal framework and administrative processes Barrier assessment Industry surveys
2.3 Revision of research results	Amelie Veenstra	113	Barrier assessment Industry surveys
2.3 Revision of research results	Saskia 't Hart	119	Update of database Industry surveys
3.1 Initial data collection	Amelie Veenstra	4	Collection of available data, in-house and via experts
3.4 Participation in Advisory Paper	Amelie Veenstra	54	Matching of findings of WP3 project team with national situation Drafting input on national situation for European advisory paper Drafting of the national case study for the Netherlands.
3.4 Participation in Advisory Paper	Saskia 't Hart	39	Collection of additional data relative to national technical and regulatory situation, used in the preparation of the Dutch national case study.
4.2 Participation to communication activities	Saskia 't Hart	52	Providing material for website and EU communication Dissemination of results of the project
4.3 Contact stakeholders and organisation of national forum	Amelie Veenstra	38	Invitation of selected attendees Organisation and execution of the national forum
4.3 Contact stakeholders and organisation of national forum	Saskia 't Hart	166	Building contact list Announcement of Forum Invitation of speakers Registration of attendees Operational coordination Reporting on outcome

<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
4.4 Organisation of national workshop	Amelie Veenstra	22	Organisation and execution of the national workshop
4.4 Organisation of national workshop	Saskia 't Hart	60	Building contact list Invitation of selected attendees Invitation of speakers Reporting on outcome
4.5 Participation in EU events	Amelie Veenstra	14	National forum in London European Final project presentation in Brussels
4.6 Preparation of Final project report	Amelie Veenstra	11	Developing National Advisory Project Paper
4.6 Preparation of Final project report	Saskia 't Hart	30	Drafting final technical and financial project report

### 3.11.5.2 Subcontracting and other specific costs

<b>Cost category (subcontracting or other specific costs)</b>	<b>Foreseen item according to CPF</b>	<b>Estimated costs [EUR]</b>	<b>Actual incurred costs [EUR]</b>	<b>Reason for over-, under- or not spending</b>
Other specific costs	National forum organisation	4000	3.555	Underspending. Thanks to the possibility to use the conference facilities of one of the partners of our association, we were able to save on cost for the realisation of the forum.
Other specific costs	Translation of research	2000	2.702,50	Overspending. Due to the volume of material resulting from research in WP2 and WP3 the cost of translation turned out to be slightly higher than originally envisioned at the start of the project.
Other specific costs	Development of National Advisory Paper	0	3.457,30	Overspending, due to the development of the National Advisory Paper, whose need wasn't envisioned earlier on in the project.
Other specific costs	Expenses for participating at project meetings in Berlin	0	1.236,55	Administrative. Travel cost for participation of non-staff (board member) included under other specific costs.

### 3.11.5.3 Travel costs

Of the approved budget for travel cost (i.e. 8.200 Euro) only 2.051,90 Euro was spent. The reason for this underspending is threefold. First, being close to Brussels, the cost of participating at the Brussels meetings by us was nihil. Secondly, due to efficient scheduling of meetings in our agenda's for research work, we were often able to combine several bilateral meeting at the same venue at the same day.

Lastly, the expenses of our board member (not part of our staff) were specified under ‘other eligible cost’. The travel cost under ‘travel & subsistence’ relate mainly to performing industry surveys and participating at the project meetings in London.

#### **3.11.5.4 Report on budget shifts**

The overall spending of Holland Solar was within budget.

However, an internal budget shift is to be requested in order to compensate for the slight 360 EUR overspending in staff costs and the 4953 EUR overspending in other specific costs. The funds can be sourced by the above-mentioned savings in the travel costs budget.

The overspending resulted from:

- a) the inclusion of the travel costs for non-staff in ‘Other eligible costs’ instead of in ‘Travel & Subsistence’ (see explanations above)
- b) the decision to draft a national Dutch Advisory Paper (national case study), i.e. a restructured and translated version based on the original European version, the design and production of these documents, and its printing.

The report is being distributed (see 3.11.4 above) and will serve as the basis for further discussions on the legal/administrative and on technical/regulatory aspects of grid connection with these stakeholders in the Netherlands.

### ***3.12 CB12: PTPV - Polskie Towarzystwo Fotowoltaiki***

Author: dr Stanislaw M. Pietruszko

#### **3.12.1 Role in the project:**

Partner. National policy expert. National PV association – acting as an interface towards the PV sector and policy makers and electricity regulators, observing, giving opinion on legal and administrative issues, updating database, working on providing transparency with regard to administrative barriers for PV system installations, disseminating information on photovoltaics, providing consultation of new Polish Law on RES, involved in organization of events.

#### **3.12.2 Main activities and achievements**

PV GRID followed the PV LEGAL project, which was a great success for Poland. In that project we identified, analyzed and described the legal-administrative barriers for development of photovoltaics. The results of the project were extremely important and valuable for the deployment of PV in Poland. The Advisory Papers were frequently used by potential investors and authorities on different levels of administration.

PV GRID allowed to continue many actions started in PV LEGAL as well as to start actions towards DSO, TSO and URE (regulator).

In general renewable energy sources in Poland are only defined through biomass and wind energy. Fortunately photovoltaics, continues to gain higher attention. A true challenge comes from unawareness of profits the photovoltaic technology brings for the contemporary world among decision-makers, opinion leaders, business and opinion-forming media.

PTPV is leader in creating a Polish photovoltaic lobby. Years after 2012 were the most important time and the only opportunity to open the biggest photovoltaics market in Central-Eastern Europe as now the future of the business is shaping.

The National Forum was organized on 6 June 2013. The aim of the Polish Forum was to initiate dialogue and cooperation between PV and the power industry to develop the best solutions for Poland. Photovoltaics and energy industry have similar goals and discussion is crucial in confirming the synergy of priorities and discussing the potential fears and myths, which may arise in connection with the development of photovoltaics in Poland.

This goal was pursued through an analysis of barriers and solutions, as well as the formulation of regulatory and normative recommendations. This National Forum highlighted the status of administrative procedures for PV and the findings of the PV GRID project. The conference provided a presentation of the outcomes of the PV GRID project concerning the prioritization of technical solutions available for enhancing photovoltaic generation (PV) hosting capacity in distribution grids.

The grid integration of PV systems is one of the main barriers to the further development of PV in Europe. In recent years, a completely new situation has emerged in several European countries where distribution grids have to deal with very high shares of PV generation, leading to new technical, economical and administrative challenges. This situation is not a case in Poland at the moment, but with growing number of connected PV systems DSOs start to see the problem. Therefore results of PV GRID projects are very important.

The most important effect was the inclusion of the most recommendations to amendment of the Energy Law in July 2013 and the draft of the new Law on RES in September 2014. PTPV was and is often asked for advice in the field of PV by Ministry of Economy or Members of the Polish Parliament.

### **3.12.3 Assessment of individual performance**

Polish Society for Photovoltaics arranged many bilateral meetings to discuss challenges and solutions for grid integration of photovoltaic systems. This allowed to concentrate on specific problems relevant to each stakeholder group. The results of the PV GRID project, status of photovoltaics in Poland, perspectives of development, support measures, technical, economic and administrative barriers were discussed. The very important point in each meeting was the possibility to discuss the actual issues and prepare space for the better future cooperation.

The results of the project, status of photovoltaics in Poland, Perspectives of development, support measures, technical and administrative barriers deeply discussed with the representatives of the:

- Distribution and Transmission System Operators: (RWE STOEN Operator, ENEA Operator, PSE Operator, Polish Association of Transfer and Distribution of Electrical Energy)
- Government (Ministry of Economy and Ministry of Environment),
- Regulators (Office of Technical Inspection, Energy Regulation Office)

- Policy makers: Members of Parliament (Sejm and Senate)
- Funding: (National Fund for Protection of Environment and Water Management and Bank of Environment Protection).

The survey on the National Barrier Assessment was filled in by PTPV, based on our knowledge of national frameworks and on the consultation with experts from Polish DSOs (RWE STOEN Operator, ENEA Operator), TSO (PSE), regulator (URE, UDT) and policymakers (MG, MŚ) and other organization.

Two DSOs (RWE STOEN Operator and ENEA Operator) actively contributed to the study on Poland and agreed that the issues elaborated in the Advisory Paper address the main issues concerning the injection of PV in the grid, and agree that the solutions match the barriers in question. Moreover, the participants found that the PV GRID document has revealed themselves as a relevant study to further explore the barriers. Discussions went on the DSOs' access to advanced PV inverter capabilities, the self-consumption framework, a potential framework for DSOs and storage solutions in order to increase grid capacity availability. Development of smart-meters and smart-grids were also discussed as a necessity to succeed in large PV integration to the grid.

The installed photovoltaic capacity in Poland on 31 March 2014 was 3,78 MW in 29 systems, according to Energy Regulation Office. Although amendments made in the Energy Law in September 2013 removed most of the administrative barriers for the PV systems up to 40 kW, so far there is no support mechanism which could trigger development of the PV market. Therefore the barriers found in the Advisory Paper are still ahead of Polish market.

The amendment to the Energy Law on 11 Sept. 2013 introduced many significant changes for the installations up to 40 kW (called micro-installations). It is no longer necessary for the physical persons to obtain a concession for production and sale of energy, therefore there is no need to establish a company and pay social security charges. Systems up to 40 kW do not require a building permit and installations with a height of less than 3 meters do not require the building notification. Connection of micro-installations to the grid is done on a base of notification and there is no charge for connecting. Individuals can sell the produced energy at a price of 80% of the average selling price of electricity on the competitive market (181,55 PLN/MWh).

After those changes, Polish prosumer-market starts to develop, but very slowly, because of a weak support scheme. The producer is entitled to the certificate of origin for the period of maximum of 15 years (no longer, then until December 31<sup>st</sup> 2035), counting from the first day of production of the energy for which the certificate of origin was issued.

Project of the new Law from 04 April 2014 called "RES Law" introduces significant changes in installations producing electricity from RES. This Law went to the Parliament in September 2014. A pivotal point incorporated in the support schemes are auctions.

### **3.12.4 Sustainability of the action after the end of the project**

We found that there is high interest regarding photovoltaics. The different groups were interested in various topics (technical, economic, social, finance) and discussions were constructive. A good

cooperation appeared with grid operators and regulators, with a willingness to cooperate and seek synergies.

Although for Poland, the issues elaborated in the PV GRID Advisory Paper are still ahead, DSOs are looking into potential technical barriers to connect a very large number of PV systems to the distribution grids. From this point of view the project PV GRID and obtained results are very important and interesting to them. The recommendations are useful and address the main existing barriers and limitations to full integration of distributed production with the grid. Thanks to the delay in the implementation of PV, Poland has a chance to omit mistakes done by others.

The interest on PV GRID we have encountered from the decision-makers was, above all, in the economic aspects. Through these meetings, grid operators, energy regulator, Ministry could have seen the PV industry actors' readiness to work with them in exploring, testing and deploying solutions that will facilitate the PV installations integration in the mutual interest of all parties.

The current debate, in Polish Parliament, on the shape of a new law on renewable energy sources shall decide on the future of the photovoltaics market in Poland. During the forthcoming months, the key action, which shall ensure a mass application of photovoltaic solutions, is introducing respective statutory provisions in the governmental document on renewable energy sources.

### 3.12.5 Review of resources

#### 3.12.5.1 Staff resources

The main goal of the activities of the Polish Society for Photovoltaics was to prepare favourable conditions for stable and sustainable development of the PV market in Poland. Dr. Pietruszko spent a lot of time for participation in many conferences in Poland and arranged many bilateral meetings with key players like governmental and parliamentary decision makers, DSOs representatives to discuss challenges and solutions for developing PV market. After the lack of the proper support mechanism, the grid integration of PV systems is one of the main barriers to the further development of PV in Poland. The results of the PV GRID project, status of photovoltaics in Poland, perspectives of development, support measures, technical, economic and administrative barriers were discussed. The very important point in each meeting was the possibility to discuss the actual issues and prepare space for the better future cooperation.

The number of hours is slightly higher - 49 hrs (4%) more than planned (1227). The most of work was done by Dr. Pietruszko due to the fact that he is person recognized by decision makers and DSOs.

The total staff resources claimed are: 1276 hrs vs 1227 hrs planned, i.e. are higher by 49 hrs. (4%)

- WP1 – 235 vs 233;
- WP2 – 447 vs 440,
- WP3 – 34 vs. 34;
- WP4 – 560 vs 520.

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
1.3 Preparation of reports	Stanislaw M. Pietruszko	32	Reports

to EC			
1.4 Organisation and attendance of 3 project meetings	Stanislaw M. Pietruszko	40	Project meetings
1.6 Organisation and attendance of conference calls	Stanislaw M. Pietruszko	121	Management
2.2 Legal-administrative research	Stanislaw M. Pietruszko	222	Research on legal aspects
2.2 Legal-administrative research	Jakub Wawrowicz	72	Data for database
2.2 Legal-administrative research	Karolina Mlynek	30	Data for database
2.2 Legal-administrative research	Izabela Lukasz-Domaradzka	36	Data for database
2.2 Legal-administrative research	Stanislaw Palka	40	Data for database
2.3 Evaluation of research and database update	Stanislaw Palka	33	Evaluation of data
4.3 Contact to national stakeholders & organisation of national forums	Stanislaw M. Pietruszko	210	Dissemination
4.3 Contact to national stakeholders & organisation of national forums	Stanislaw Palka	35	Organization of meetings
4.4 Organisation of national workshops or bilateral meetings	Stanislaw Palka	52	National forum and bilateral meetings
4.4 Organisation of national workshops or bilateral meetings	Kamil Kulma	101	National forum and bilateral meetings
4.4 Organisation of national workshops or bilateral meetings	Stanislaw M. Pietruszko	80	Dissemination
4.5 Organisation of 2 European Forums	Stanislaw M. Pietruszko	30	Management
4.6 Publishable Project Reports	Stanislaw M. Pietruszko	25	Reports

### 3.12.5.2 Subcontracting and other specific costs

No subcontracting costs.

Cost category - other specific costs)	Foreseen item according to CPF	Estimated costs [EUR]	Actual incurred costs [EUR]	Reason for over-, under- or not spending
Other specific costs	National Forum organization	4.000,00	5591,78	Higher costs of organization than assumed
Other specific costs	Budget for translation of research	2.000,00	616,58	This is the cost of simultaneous translation during the National Forum. Other translation of research was usually done by researchers and included in labour hours

Other specific costs	Not planned	0	511,67	This is the cost of the stand for 4 days on Conference and Fairs POLEKO in Poznan, Oct. 2014. The cost was very discounted the events were used to promote of PV GRID results.
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### 3.12.5.3 Travel costs

The travel costs are lower than budgeted. At the same time more conferences were attended. Most of them were the events in Poland. In August 2013 the series Polish Congress on Renewable Energy started. 11 regional events were organized in different cities, capitals of Voivodships. <http://energiajutra.eu/>. PTPV participated in six. Dr Pietruszko usually participated in the plenary panels. We also participated in Conferences and Fairs POLEKO and GREEN POWER. The costs are usually travel costs without accommodation and subsistence.

The events gave a lot of experience in the implementation of micro and small PV systems. Since the year 2014 was the year in which the Law on Renewable Energy was taking the final shape there was usually discussions from the regional and local authorities. The special attention was taken to the barriers of the development and connection to grid of small installations up to 40 kW which are called prosumer systems. In March 2014 National Fund for Protection of Environment and Water Management started the Program PROSUMENT in which PV installations may get 40% subsidy and 1% credit. PTPV actively took part in the discussion pointing on the challenges from DSOs due to the low knowledge of photovoltaics.

The cost of travel to the meetings of the Steering Committee (or Annual General Meeting) of the European Photovoltaic Technology Platform and EPIA's meetings were included since attendance gives PTPV chance to listen to the voice of European science and industry as well as express needs of less PV developed countries. Such meetings are extremely valued for PTPV. Additionally I may add that when the Platform was formed in 2006 the representatives of DG Research informed us that it is possible to use projects money for travel to the Platform meetings. The PTPV is NGO, not industry association, with limited funds.

### 3.12.5.4 Report on budget shifts

We ask for the shift of 1939 EUR from the line "travel" to "staff" and other costs in order to partially recover the overspending in these 2 categories – this change is due to the more work in the work on draft RES Law. The number of labour hours are higher due to the intensive work done in promotion of photovoltaics, the project ideas and results. The new Polish Law on RES was in the final stage of drafting so additional work was necessary.

## **3.13 CB13: PV AUSTRIA - Photovoltaic Austria Federal Association**

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### **3.13.1 Role in the project**

As a National association the role of PV Austria is to represent the Austrian installers and to enable contact to them. During the project the national association was supported by the Energisch PR Agency and the FH Technikum.

The role of Energisch PR Agency was to coordinate the Austrian part of the project. Because of its daily business and experience, the PR Agency was responsible for the organisation of the national forum and of the workshop. A large part of the surveys with the installers were carried out by the Agency, too.

The FH Technikum, as research partner, was working especially in the legal administrative research (WP 2) by collecting relevant information and state the legal administrative framework more precisely. In WP 4 the main input was the experience and the technical know-how, which was necessary and fruitful for the workshop where grid integration issues had been discussed with stakeholders, DSOs, market regulators and policy makers.

### **3.13.2 Main activities and achievements**

The main achievement is the practical and useful online database as well as the successful reduction of the required time to install a PV system in Austria.

The database, constructed in WP 2, is very well suited to show installers and also foreign investors, planners or installers how to build a PV system in Austria. It specifies which steps are necessary to take in advance in order to build a plant in Austria and illustrates very well how much time is needed and which challenges may arise. Therefore the database enables us time savings in our daily work. The database is also a good instrument for discussions with stakeholder because it helps to compare the situation in Austria and other flagship countries like Germany, where installations are realized easier and faster.

The second main achievement was the time reduction for installing PV systems in Austria. At the beginning of the project about 20 weeks were needed for the installation whereas at the end of the project a residential PV system could be installed within 5 weeks. Commercial systems can be installed within 36 weeks and therefore about 10 weeks quicker.

Honestly, one problem was the collection of information of industrial PV systems because most of the installed systems in Austria are small scale systems and the biggest PV plants in our country have only a size of 1 MW (mostly because of the missing financial subsidy for bigger systems). Since no new and bigger systems were built during the database's 3rd updating round and no interviews of their experience exist consequently, only legal administrative information has been collected for the segment of industrial PV systems.

Many people attended the workshop and national forum, which have both been a success with sustainable effects. As a result, the Federal association as well as the outcomes became more well-known.

### **3.13.3 Assessment of individual performance**

Since Austria has not been part of the project PV LEGAL, the project's beginning was a challenge as it was our first bigger European project. But we received helpful support and assistance from the project leader eclareon and BSW. Our main achievements were the sustainable time-reduction for constructing a PV

system of all sizes as well as founding a useful basis for discussions with stakeholder from the grid operator or regulator side.

### 3.13.4 Sustainability of the action after the end of the project

The workshop was a good opportunity to meet all involved parties and bring them on one table by discussing the problems due to integrating large scale PV systems into the Austrian grid. The participants got to know each other through the conversation which may turn out to be a starting point for an increasing work in the future.

After the workshop, the regulator's representatives took the project's results into their internal working group for further discussion.

One of the fruitful discussion's conclusions was that a coordinated approach to manage the current challenges will be necessary. Therefore, future solutions should be developed in cooperation with political parties at all levels and network operators. A common dialog should be possible on the basis of this new relationship in the future. For the future we reconsider to organise yearly workshop with stakeholder like grid operators, regulator and energy supplier to use and expand the present good relationship.

The results of the workshop and the advisory paper are basis for further public events and also for negotiations with grid operator and stakeholders. We will try to keep the database up to date.

### 3.13.5 Review of resources

#### 3.13.5.1 Staff resources

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
WP 2.2 Legal-administrative research	Vera Liebl	222,10	Contact to installers and administrative bodies to identify barriers, interviews and collecting information regarding legal administrative procedure by installing PV-systems.
WP 2.2 Legal-administrative research	Karl Knöbl	130,22	collecting relevant information and state the legal administrative framework more precisely
WP 2.2 Legal-administrative research	Vincenzo Lembo	141,73	September 2012- December 2012
WP 2.3 Evaluation of research and database update	Vera Liebl	25,7	Update of the online database, contact to WP leader, corrections where necessary
WP 2.3 Evaluation of research and database update	Karl Knöbl	14,15	Update of the online database where necessary
WP 4.2 Dissemination of project status and results	Vera Liebl	34,5	Translating press releases, adapt them if necessary and forward the press release to journalists, answer further questions
WP 4.2 Dissemination of project status and results	Karl Knöbl	0,5	Assisting by writing press releases.

WP 4.3 Contact to national stakeholders and organisation of national PV GRID forum	Vera Liebl	133,50	Organisation of event, create the agenda and invite speakers, speak to important people and invite them to attend the forum, attending the forum
WP 4.3 Contact to national stakeholders and organisation of national PV GRID forum	Karl Knöbl	7	create the agenda, invite speakers, attending the forum
WP 4.3 Contact to national stakeholders and organisation of national PV GRID forum - CP	Carmen Pihan	120	Organisation of event, room renting, booking of catering, distributing the invitations, registration, attending the forum, distribute the presentation afterwards
WP 4.4 Organisation of national workshops or bilateral meetings	Vera Liebl	91,75	Organisation of workshop, create the agenda, contact participants and ask for their participation, preparation of content, attending the workshop, report about the event
WP 4.4 Organisation of national workshops or bilateral meetings	Karl Knöbl	49,18	Create the agenda, contact participants and ask for their participation, preparation of content, attending the workshop, report about the event
WP 4.4 Organisation of national workshops or bilateral meetings	Gabriele Költringer	24,27	Invite participants, create the agenda, distribute the presentation afterwards
WP 4.5 Organisation of European Forum	Vera Liebl	29,0	Attending the European Forum in London (October 2013) and Brussels (September 2014)
WP 4.5 Organisation of European Forum	Karl Knöbl	16	Attending the European Forum Brussels (September 2014)
WP 4.6 Publishable Project Reports	Vera Liebl	5,5	Deliver information on hours spent, financial expenditure
WP 4.6 Publishable Project Reports	Vera Liebl	2	Deliver information on hours spent, financial expenditure

The amount of hours we needed for organizing the national forum and attending the national European Forum as well as project meetings exceeded the scheduled workload. Nevertheless, the entire project work was carried out in the predicted total amount of hours.

### 3.13.5.2 Subcontracting and other specific costs

<b>Cost category (subcontracting or other specific costs)</b>	<b>Foreseen item according to CPF</b>	<b>Estimated costs [EUR]</b>	<b>Actual incurred costs [EUR]</b>	<b>Reason for over-, under- or not spending</b>
Staff costs	Staff costs - <u>Energisch PR Agency</u>	22.184	27.108	<u>Reason for overspending:</u> The reason for the increased expenditure on staff costs is the increased

				hourly rate of the Junior Consultants. In addition because of organisation reasons and higher efficiency, parts of the work, foreseen done by FH Technikum, has been done finally by Energisch PR Agency.
Staff costs	Staff costs - <u>FH Technikum</u>	22.128	18.130	<u>Reason for underspending:</u> Most of the work has been done by Junior Consultant instead of the budgeted senior Consultant. In addition parts of the estimated work has been transferred to Energisch PR.
Travel costs	Travel costs	8.900	4.500	<u>Reason for underspending:</u> Because of good planning and cheap offers the cost have been lower.
Other specific costs	National forum organisation	4.000	12.100	<u>Reason for overspending:</u> Relatively high cost for catering because of 272 participants Even we got location for free.

### 3.13.5.3 Travel costs

Because of good planning and cheap offers the cost have been lower. Only the half of the budgeted travel costs has been used, even the budgeted travel cost for the final European Forum has been exceeded. Vera Liebl and Karl Knöbl attended the PV Grid final European Forum and the PV GRID final project meeting in Brussels (28th of September until 1st of October 2014). The budget was 700 Euro, however in fact PV-Austria needed more than 2.000 Euro because two people attended the final European Forum instead of one budgeted person. Nevertheless, the predicted travel costs (Euro 8.900) has not been exceeded. In fact, only half of the budgeted costs (Euro 4.500) incurred.

### 3.13.5.4 Report on budget shifts

Internal Budget transfers are requested in the categories:

- **Staff costs (from Euro 44.312 to 45.239)**

The reason for the increased expenditure on staff costs is the increased hourly rate of the Junior Consultants. Therefore the work has been transferred from staff with a higher hourly rate to staff with a cheaper hourly rate in order to become more efficient. Nevertheless, the quality of the work remained high.

- **Other specific costs (from Euro 7.000 to 9.917)**

The rise in the section “other specific costs” incurred especially due to the national forum, which took place on June, 24 2013. 272 people attended our national forum which was a great success. Even though we got the location for free, we had to hire the local catering whose costs were really high for such a large number of participants (Euro 9.966). Therefore instead of the budgeted Euro 4.000, Euro 12.100 had to be spent. In order not to exceed the budget to much, the translation of research has been done by our own and the foreseen budget for translation of research has not been used.

- **Travel costs (from Euro 8.900 to 4.500)**

Savings were possible in the category travel costs. Because of good planning and cheap offers, the travel budget was not used totally.

### ***3.14 CB14: Edora***

Author(s): F.Gerard; B. Wilkin

#### **3.14.1 Role in the project**

Beside the tasks related to the proper management and internal coordination of the project (Conference calls and meetings), the main role in the project was “Communication & national policy expertise”.

#### **3.14.2 Main activities and achievements**

The main activities were:

- Participation to the PVGRID conference calls.

These participations gave us mainly the information to properly lead the project on our side. Nevertheless, and despite the fact that it was not always easy to be present (1/2 weeks) these conference calls constituted a quick and efficient way to get new information and to learn and share the experiences from different countries.

We believe that in some other EU project, this management tool could save a lot of money, energy and CO<sub>2</sub> by replacing one or two meetings by regular conference calls.

- Participation to PVGRID European meetings and seminar.

We were not able to attend the second project meeting (London, 22 of October) because of some other project meetings taking place at the same time.

However, we participated to the other two as well as the final event (seminar) in Brussels. These participations helped us to continue working properly on the project. It also opened our eyes on our specificity compared to other countries: Edora was already close to the regulator, decision makers and stakeholders before the project. Edora is continuously working with these stakeholders on different issues: curtailment rules, capacity, grid reinforcement and connection, DSO tariffs.

- Organisation of bilateral discussions with installers and regulators for PV survey and collection of information linked to the creation and update of the national database.

This task was easier at the early steps of the project than in the middle or in the end. Indeed, like into some other countries, Belgium suffered from huge political changes and uncertainties into the support scheme after the beginning of the PVGRID project.

So during the beginning of the project many actors were playing in a dynamic PV market and we got a lot of good and proven information from them to make a good survey and define the national database. As we are in direct contact with the administration, the regulator and the government, as Edora staff we are already up to date with the changes and their impact on the activity of the companies.

Some months after this beginning (and until the end of the project), during the first update period, it appeared that many actors disappeared or were not available anymore for interviews because of their economic priorities. Furthermore we had a long period of political uncertainties that left us unable to describe with certainty as well as accuracy the new rules of the market; even we knew that the current rules would be changed. The impacts of these changes will take a little bit time, it is therefore not easy to assess them now.

- Creation and updates of the national database itself.

Despite our difficulties we have implemented and updated the national database as it is into the PVGRID website.

- Organisation of bilateral discussions mainly with DSO to create and improve the National Barrier assessment survey and to explore the identification of common concerns and recommendations.

As said, it appeared that EDORA was already well connected to the stakeholders. This means that PVGRID did not provide a first opportunity for the PV sector to meet the DSO's or regulators.

In Belgium PVGRID brings the opportunity to have periodic meetings with DSOs. PVGRID is providing useful technical background to explore interesting solutions – through the PV GRID Advisory paper as well as through the national barrier survey. This background allows us to deeply exchange on DSO's technical and regulatory world, reinforcing also our image as relevant and constructive partner.

These steps were also profitable for the DSOs. Some of their specific works studies on the subject (Active/reactive power management of inverters at the low voltage grid analysis, for instance) could be challenged by the PV GRID point of view.

Today's contacts between DSO and EDORA are strong and still active.

- Organisation of one national forum around PVGRID in June 2013.

PV GRID was an excellent opportunity to continue a first good dynamic between stakeholders started by the Walloon regulator in 2011 (REDI) and that had no extension.

PV GRID helped to keep this dynamic alive and go further than the technical analysis suggested by the project to reach the 'regulatory market' issues.

- Organisation of 2 national workshops around PVGRID in April and October 2014.

These two workshops were the opportunity to go deeper into the regulatory market issue. They were supported by all the results of the PV GRID project (Database, Advisory paper and National barrier assessment).

### **3.14.3 Assessment of individual performance**

Things that worked very well were:

- Collaboration and meetings with DSOs
- Forum and workshops with stakeholders
- Assessment of barriers and identification of recommendations
- Understanding of market issues to address the implementation of the technical solutions

During all events and bilateral contacts, all concerned stakeholders were open-minded about the issues the whole electrical system is facing with the deployment of decentralised PV into the grid.

We had some difficulties for:

- The database update. Indeed the big non-political-decision time induced big uncertainties, our internal PV market collapsed and they was a kind of “moratoria” due to these waiting time. The government timing was not the PV GRID one!
- Integrate the electrical regulators into the discussion as an active stakeholder. Our regulator was facing other concerns and in parallel driving the curtailment issue. It is not their most urgent concern to increase the hosting capacity of PV into the low and medium voltage grid.

### **3.14.4 Sustainability of the action after the end of the project**

Since a few months now, we are hardly working with the administration to deliver concrete recommendations and orient the implementation of the third electricity package directive. The main issues on which we are now working are: curtailment (already concrete in the transposition of the directive discussions); metering and the evolution of the activity; self consumption framework and evolution of support schemes; evolution of the business model of the DSO (the way they recover their cost and the performance indicator).

The major barrier is the way the electricity market does function. Price signal is prerequisite for the implementation of many of the identified solutions. Edora is already busy to address the market aspects in other field and discussion: curtailment and cost benefit analysis; capacity remuneration mechanisms; monitoring and forecast. <So the next step for us is to ensure that the signal price is well accessible at various voltage levels in order to ensure the development of new services and products. Our major concern is therefore to follow ALL policy development that could have an impact on the electricity market: grid codes, communication systems, market rules. Then, in a second step, in order to speed up the deployment of some solutions which can be considered mature, incentive framework could be assessed. Such framework will be designed on the basis of strict CBA.

### 3.14.5 Review of resources

#### 3.14.5.1 Staff resources

Overall: we had foreseen 1.267 hours, and spent 1.151 hours.

WP1: we had foreseen 175 hours, and spent 213 hours mainly due to more coordination between the members of the team working on the project (5 people in place of 3 as foreseen in the CPF). Bruno Vanzeebroek did leave EDORA early 2013, meaning there was also a need to hand over.

WP2: we had foreseen 540 hours, and spent 364 hours. This is mainly explained by the direct follow up of the legal framework with the administration and decision makers. The need to conduct surveys and to consult developers and installers was lower than expected.

WP3: we had foreseen 33 hours, and spent 68 hours. EDORA was not directly involved in this WP, but we spent time in bilateral consultation of some key stakeholders to carry out a detailed assessment of the technical solutions, like it was done by the four partners involved in this WP3 (DE, SP, CZ and IT). It was a interesting way to liaise with these stakeholders.

WP4: we had foreseen 519 hours, and spent 507 hours.

<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
WP1	Noémie Laumont	24	General project management, coordination among different stakeholders
WP1	Monika Michalik	27	General project management, coordination among different stakeholders
WP1	Benjamin Wilkin	80	General project management, coordination among different stakeholders, participation at the different conf call and meetings of the project
WP1	Frank Gérard	50	General project management, coordination among different stakeholders, participation at meetings of the project
WP1	Bruno Vanzeebroek	32	Coordination among different stakeholders, participation at the different conf call and meetings of the project
WP2	Benjamin Wilkin	53	Regular contact with administration, regulator and government regarding the support scheme; Conduction of a survey with project developers; Review in details the legislation and normative framework evolution (in 2013 and 2014)
WP2	Frank Gérard	51	Liaise with new changes of the framework (between 2012 and 2014) for large scale and residential systems (follow up



			with the administration, the regulator and representative of the government). Overview of the results of the survey and cross check with developers.
WP2	Bruno Vanzeebroecke	174	Regular contact with administration, regulator and government regarding the support scheme; Conduction of surveys with project developers; Review in details of the legislation and normative framework (2012)
WP3	Benjamin Wilkin	53	Assessment of the technical solutions; Meeting and deep discussions with DSO about the solutions;
WP3	Frank Gérard	15	Assessment of the technical solutions; Meeting and deep discussions with DSO about the solutions;
WP4	Noémie Laumont	90	Exchange about solutions, barriers and recommendations with various stakeholders;
WP4	Monika Michalik	59	Event preparation and conduction ; Translation of some documents (incl. sub-contractor management)
WP4	Benjamin Wilkin	89	Event preparation and conduction ; Exchange about solutions, barriers and recommendations with various stakeholders;
WP4	Frank Gérard	269	Event preparation and conduction ; Translation of some documents; Exchange about solutions, barriers and recommendations with various stakeholders;

### 3.14.5.2 Subcontracting and other specific costs

Thanks to the 'inhouse' expertise, there was no need to get external expertise and to subcontract.

### 3.14.5.3 Travel costs

Wallonia is a very small country and traveling from Brussels (EDORA's offices) to stakeholder's place can only be a few hours issues. There was no need for long expensive travels. We also do manage to work by phone calls and mainly by email. There are two major DSOs in Wallonia, reducing therefore the amount of stakeholders to meet also.

#### **3.14.5.4 Report on budget shifts**

The budget shift is mainly explained by the difference of hourly rate. We had foreseen to work with a junior expert (759 hours) for the main tasks, but finally we spent only 86 hours at the rate of the junior expert (assistant) and 951 hours at the rate of expert (in place of 380 hours foreseen in the CPF) . It was not possible for different reasons:

- There was a need for a strong knowledge in carrying out the work of WP3 and WP4 (technical background);
- There was a need for a long experience with decision makers and system operators in carrying out the work of WP3 and WP4 (legal and political background);
- There was also a need to liaise with other tricky files in the pipe of the decision making table;
- We had no workforce available (short timing to hire internal staff). It is more efficient to use available expertise and workforce, to finally spend less hours and lower total expenses.

### ***3.15 CB15: Svensk solenergi***

Author(s): Jan-Olof Dalenbäck

#### **3.15.1 Role in the project**

Svensk solenergi (Solar Energy Association of Sweden) is a national Swedish branch organization with about 120 member companies and organizations.

The role of Svensk solenergi was to catch up with the development in other countries. There were only about 34 MW of grid-integrated PV in Sweden in end 2013. There is no Swedish National Action Plan for solar energy. There is an investment subsidy with less funding than applications (long cue) and there may come a tax reduction for small systems from January 1, 2015.

#### **3.15.2 Main activities and achievements**

Svensk solenergi has organized a PV Grid Forum, contributed with Swedish input to the database and PV Grid reports and disseminated PV Grid results and reports via a workshop (DSO), meetings, telephone and mail to the appropriate stakeholders.

Considering the low interest for solar PV in Swedish authorities and among Swedish politicians our participation in PV Grid has resulted in a strengthened position to promote solar PV in Sweden.

#### **3.15.3 Assessment of individual performance**

The participation in PV Grid has especially helped us to improve relations with Swedish DSO's.

#### **3.15.4 Sustainability of the action after the end of the project**

Considering the small Swedish PV market and the early stage of grid integration, the participation in PV Grid is the starting point for continued and increased interaction with appropriate Swedish stakeholders to reduce barriers and promote supporting measures.

### 3.15.5 Review of resources

#### 3.15.5.1 Staff resources

Task n° + name	Involved staff member *In-house consultant	Hours budget	Hours spent	Keywords on undertaken activities
WP1	Jan-Olof Dalenbäck Bengt Stridh* Li Lindström	174	127 8 44	Project management Project meeting Project management
WP2	Jan-Olof Dalenbäck Bengt Stridh*	540	61 388	Contacts, etc. Data base
WP3	Jan-Olof Dalenbäck	34	40	Assessment
WP4	Jan-Olof Dalenbäck Bengt Stridh* Li Lindström	519	92 10 96	Forum Workshop, etc Forum Forum dissemination, web, press releases, PV Grid reports, etc
	<b>TOTAL</b>	<b>1 267</b>	<b>866</b>	

We have only claimed about 70% of the budgeted hours, mainly related to that we have carried out less hours of work in WP4. Reasons are e.g. first that the Forum was co-organized with our AGM and later that consultation and dissemination was carried out at a number of other occasions than specific PV Grid workshops, e.g. already established contacts with the DSO organisation and the Swedish Energy Agency. Reasons are also the so far very small market and thereby the lack of interest from Energy Regulator (Energimarknadsinspektionen) and TSO (Svensk Kraftnät). There was however more work to fill-in the National Barrier Assessment Report (WP3) than budgeted, so here the budget was under estimated.

#### 3.15.5.2 Subcontracting and other specific costs

Cost category (subcontracting or other specific costs)	Foreseen item according to CPF	Estimated costs [EUR]	Actual incurred costs [EUR]	Reason for over-, under- or not spending
Other Specific cost	National Forum organisation	4.000	2.986	Savings in room location, several speakers with own budgets
Specific costs	Translation of research	3.000	0	Translation done internally
<b>Total</b>		<b>7.000</b>	<b>2.986</b>	

#### 3.15.5.3 Travel costs

Participated in Kick-off-project meeting (Berlin), European Forum and project meeting (London) and Forum and project meeting (Brussels). Total travel costs amount to € 4708.

#### 3.15.5.4 Report on budget shifts

Nothing to report.

### **3.16 CB16: SAPI**

Author: Marek Harviš

#### **3.16.1 Role in the project**

SAPI as a national association founded in 2010 has very deep knowledge and contact with the PV market and administrative environment in Slovakia. Our overall role in the project was to be the right organization that can fulfil the tasks of the project the most effectively thanks to our relations with the PV sector and institutions. We can provide the data from the industry, we can communicate with the whole sector via our members, have good communication with policy makers based on good relationship.

#### **3.16.23 Main activities and achievements**

In work package 1 SAPI provided the overall organization of its work on the project, controlled the work plan and completion of work packages. Our staff attended on periodical conference calls with the consortium, and at all of the project consortium's meetings, and events.

The work package 2 is one of two most important work packages in which SAPI was involved. As the new member of consortium we have provided the legal administrative framework research at the beginning of the project, prepared the PV industry survey as an assessment from inside the market, and then updated the data 2 times during the project. We have experienced that we were able to provide the very detailed step-by-step instructions for the potential investors or installers with a lot of extra important information from the real life on the market that have not been available in our country ever before. What we also find was that often it was not easy to find a clear guidance through the whole process of PV installation. There were often different requirements from the same offices and bodies in different locations within the area of one DSO. Also the installers had problems to identify the man-hours spent on each process or steps, even the costs were provided mostly only as the estimations. The only one group of data collected during the phase of interviews with the installers were quite good evaluated and it is the duration of the processes. Due to quite unstable legislative environment (the act on renewable energy sources is changing few times a year) we experienced that during the updating the database after the desk research we had to deactivate two of three segments in the database because suddenly the legal framework got changed and larger installations (over 30kWp) became not allowed. In the autumn of 2013 SAPI was involved in dramatic legal change for residential systems – we achieved a very big lowering in bureaucratic and administration load in the processes of new small installations, but it came to practice since beginning 2014. Suddenly during the last phase of research in January 2014 the government announced that there will be available the 100M Eur support scheme from EU funds for residence sector in Slovakia and whole market got frozen that time waiting for further information and there was no installations and therefore no experience with new legislative. We decided to postpone our industry survey for a few months, but finally some support scheme framework information came later in the autumn 2014 and the funds will be available sometime in year 2015 so we was not able to interview any installers at the end of the last updating phase one more time as was planned.

Concerning the work package 3 SAPI was not involved deeply in this work package. We had observed and assessed our national barriers at technical and regulatory level and discussed it with consortium.

In work package 4 we were focused on spread the information about PV GRID project widely to all stakeholders in PV sector but also to public. We translated officially released press releases and distributed within our members and also within more than 60out media contacts. We organized a successful National forum in the spring 2013, had several meetings with the regulatory body, policymakers and system operators, and organized 5 bilateral meetings where we introduced the project results.

### **3.16.3 Assessment of individual performance**

This project was great experience for our association. We had a chance to test how deep and good are the also relationships within the members and with the other stakeholders as well. The legal-administrative research went very good except some more variants of information about one thing we get from more sources. But it was caused by different requirements on some issues from the local authorities, which have quite wide competences in the administration in PV installation so sometimes the certain information varied. What we were a bit surprised was, that the installers were not so open to share the information about the administration process itself because it seems to be a bit complicated and they consider this kind of information as a part of their know-how. We had several times to promise them to treat the information they provided as a confidential. We also expected the interviews with installers will be the easiest part, but several times we end up with a long discussion with them in order to describe very deep the questions. It appeared that often they simply do not have so deep knowledge about the costs and time needed to spend on the particular small parts/steps in the installation lifetime cycle. They often just estimated the values (mainly the man-hour requirements and the labour costs).

We highly appreciate the attendance of Mr. Mayer on our National forum. He illustrated very well the situation in other countries and the trends in the worldwide scope. This also helped us later with the cooperation with ministry of economy to improve the act on renewable energy sources through lowering lots of administrative barriers for residential sector. We were very welcomed also at bilateral meetings with the stakeholders in their offices and improved our relationship a little bit. We had a chance to get also their point of view and there were enough time to explain also technical issues. What appeared during the project was that there is no problems with the capacity in the distribution grid and the DSOs could operate and manage even multiples of loads of PV energy. The only problem (with the frozen market and practically no other deployment) is at the TSO level. They declared that they work on it and in ten years horizon the Transmission backbone and corridors on the state borders will be ready to manage the bigger loads of renewable energy sources. At the same time they note that it is also a political decision because in fact we produce enough energy in traditional plants (nuclear and coal plants). Concerning the press releases we experienced quite strong ignorance from the side of media. The dissemination tasks (press releases) did not have any budget spend on and it was practically impossible to announce the releases as we provided to the media. Some of them announced them but it was strictly by a close personal relationships with the redactors. For the next time we suggest to assign some budget for press releases as it is normal that other subjects pay some fee for this service.

### **3.16.4 Sustainability of the action after the end of the project**

The main result of the project – the paper with the technical and other solutions to solve the lack of grid capacity – is during these days not actual in our environment. Slovak energetic market and PV sector deals with lots of another problems and issues. It is quite new industry (only since year 2009) and meets lots of political and bureaucratic issues. But the most positive in our perspective is that we have shown the positive cases from outside the country, we have shown that across the Europe there are teams working hard on the tasks connected to implement more renewable energy sources into their systems and we have pointed that one day very similar issues will stand in front of us as well. We have got the authorities into the discussion and we move in it a little bit forward. The best is, that we have the paper containing the experience of other who are long way ahead, we have highlighted positive actions and solutions of problems and at the end a useful tool or guideline for the cases which we probably will experience in the future. In case of our actual issues we discussed with the DSOs, ministry of economy, and regulatory body the procedure of preparing new legislative actions together at the round table. The other action we took, is preparing of international conference about the future of renewable energy sources (with the prior for PV) and the adaptation of the stakeholders to this big shifts from the central production to distributed production. It will take place in the spring 2015.

### 3.16.5 Review of resources

#### 3.16.5.1 Staff resources

SAPI has estimated 1267 hours in total in PV GRID project. We used 1115 hours so it is a bit less than planned. We experienced also some deviations of subtotal hours within each work package. On WP1 we spend 21 hours more than estimated (195 instead of 174 hours), in WP2 we spend 42% more than expected (775 instead of 540). As a new member of consortium we had to provide a complete legal-administrative research in 3 regions of the country because the process differs in each region due to different distribution system operators. Even at the municipal level there often exists different requests and approaches to installation process. Also the completion of the industry survey was more time consuming because the installers were asked such questions for the first time and never before did not think about things in that way, so that took time for them to collect the right information and provide the statement or answer. From WP3 we declare no hours spend (0 instead 34- the work provided on barriers assessment we declared in WP2) and in WP4 we spend 374 hours less than planned (145 instead of 519 estimated).

<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
T2.2 research of national data	Marek Harviš	110	Legal -administrative research of basic data
T2.2 research of national data	Marek Harviš	120	Industry survey – interviews
T2.3 Revision of research results	Marek Harviš	235	Desk research after 1 year, correction of data in database
T2.3 Revision of research results	Marek Harviš	60	Data validation
T4.3 Contact stakeholders and organise national forums	Marek Harviš	20	Preparing and attendance on National forum

T4.4 Organise national workshops	Marek Harviš	20	Preparation and attending 4 bilateral meetings
T4.5 Participate to European Events	Marek Harviš	20	European forum Brussels 9/2014
T2.2 research of national data	Veronika Galeková	90	Legal -administrative research of basic data,
T2.2 research of national data	Veronika Galeková	60	Data validation before updating a database
T2.3 Revision of research results	Veronika Galeková	100	Research after the legislative changes during 2nd and 3rd update
T4.2 Participate to communication activities	Veronika Galeková	20	Correction of print materials or media outcomes (leaflet, press releases) leaving the association
T4.3 Contact stakeholders and organise national forums	Veronika Galeková	30	Organisation of National forum, meetings with stakeholders on SAPI conferences and tradefairs
T4.4 Organise national workshops	Veronika Galeková	10	Organisation bilateral meetings
T4.5 Participate to European Events	Pavel Šimon	25	European Forum Brussels, 9/2014

### 3.16.5.2 Subcontracting and other specific costs

<b>Cost category (subcontracting or other specific costs)</b>	<b>Foreseen item according to CPF</b>	<b>Estimated costs [EUR]</b>	<b>Actual incurred costs [EUR]</b>	<b>Reason for over-, under- or not spending</b>
Other specific costs	National forum organisation	4000	2928.32	We were cost effective (discussed better rental price, did not serve regular lunch etc.)
Other specific costs	Budget for translation of research	3000	0	We translated it within our own human resources.

### 3.16.5.3 Travel costs

The travel costs were estimated for 8900 EUR and we have spent 4160.39 EUR. We did not use the estimated cost to our national forum as it was held in Bratislava, we did not attend any other national forum, Bilateral meetings were mostly in Bratislava, and we used one car for whole team to move to the places and costs were less than half of estimated. We book the hotels and flights in advance and get better fares.

### 3.16.5.4 Report on budget shifts

We do not request any budget shift.

### **3.17 CB17: ENEL Distribuzione**

Author(s): Riccardo LAMA, Lorenzo BAZZANI, Fabio CAZZATO, Mariangela DI NAPOLI

#### **3.17.1 Role in the project**

Enel Distribuzione (hereinafter: ENEL) is one of the two DSOs involved in PV Grid project.

The role of DSOs within PV Grid project was to provide technical expertise and operational advice about distribution grids, contributing to the identification of relevant technical solutions to enhance grid's hosting capacity in terms of PV, to the analysis and the evaluation of technical as well as regulatory barriers to their delivery and validating the shared achievements from the network operator's perspective.

#### **3.17.2 Main activities and achievements**

The main contributions by ENEL have been related to the activities of WP3 and WP4.

Within WP3, ENEL was pivotal in the definition of the main technical barriers to PV integration into the distribution grid, to the scouting and evaluation of non-conventional as well as standard technical solutions for the integration of RES, to the identification of the most promising technical solution and to the analysis of the most significant regulatory barriers to their implementation. The abovementioned analyses have been performed both at EU and at National level.

ENEL contributed to the production of all deliverables of WP3 through both principal authors (directly writing down the documents) and overall contributors (by reviewing the drafts provided by others).

ENEL was involved in all EU-level workshops - or other related events - falling into the framework of WP4, to which it contributed through speakers, panellists and providing dissemination material (booklets, presentations, etc.).

ENEL also contributed to the organization of workshops at Italian level, together with Assosolare (later: Assorinnovabili), and supported the Spanish and the Greek PV associations in their national workshops.

In terms of dissemination initiatives, ENEL also provided advice, support and technical expertise in PV Grid participation, as a Consortium, to international Conferences and events (CIRED, etc.).

Last but not least, ENEL always attended the internal Coordination Meetings (WP1) and the Technical Meetings (WP3), and hosted one of them in its premises of Villa Lazzaroni in Rome.

#### **3.17.3 Assessment of individual performance**

The PV Grid experience worked particularly well for the whole Consortium and for ENEL.

Being one of the two main technical partners (together with RWE) on the grid topics, ENEL was required to heavily contribute to the delivery of the Project's products; however, as the partnership was well-functioning and the coordination by BSW very effective, the work flowed quite effortlessly from the brainstorming phase to the refinement of the written documents.

Attention was paid, from every partner's point of view but – we dare say – particularly from ENEL's, to the commitment to the scope of the project more than to each individual or Company interest, and this



helped a lot while confronting on “hot” or controversial topics, on which a collective agreement was always reached.

In terms of relationships with the Stakeholders’ Committee (including Eurelectric, ENTSO-E, etc.), ENEL contributed to the Consortium fairness and respect of different points of view that the Committee brought into the framework of the Project, and which have all been considered and addressed, sometimes also through amendments to the deliverables to take into account the remarks and the suggestions received.

### 3.17.4 Sustainability of the action after the end of the project

Due to the content of the Project, the expected actions will be mainly implemented by national PV Associations at Member State level and by EPIA at European level.

In particular as to the speed-up of permitting processes, which has been specifically addressed by WP2, their activity will benefit from the benchmarking coming from PV Legal extended database.

From a purely technical point of view, PV Grid main findings and proposals, coming from WP3, are tightly linked to ENEL expertise of grid innovation. In particular, most of the so-called “interactive” solutions can be achieved through a Smart Grid architecture, that ENEL has already shown to be able to deliver (within selected areas through funded projects). So, provided the regulatory framework can in the near future support innovation in distribution network by encouraging Smart Grid massive delivery, it can be expected that also the most innovative technical solutions are somehow delivered if needed.

More “traditional” solutions, only requiring slight modifications in the regulatory framework, are expected to be deployed in the near future, and some of them have become applicable in regulatory terms within the duration of the Project itself.

### 3.17.5 Review of resources

#### 3.17.5.1 Staff resources

Task n° + name	Involved member	staff	Hours spent	Keywords on undertaken activities
WP1	Lama Riccardo		62	Coordination meetings, web-conferences
WP1	Bazzani Lorenzo		42	Coordination meetings, web-conferences
WP3	Lama Riccardo		171	Technical solutions, regulatory barriers
WP3	Bazzani Lorenzo		98	Regulatory barriers
WP3	Cazzato Fabio		272	Technical solutions
WP3	Di Napoli Mariangela		98	Regulatory barriers
WP4	Lama Riccardo		49	Dissemination EU-Workshops, National Workshops, Conferences
WP4	Bazzani Lorenzo		37	Dissemination EU-Workshops, National Workshops
WP4	Cazzato Fabio		25	Dissemination EU-Workshops, National Workshops, Conferences
WP4	Di Napoli Mariangela		8	Dissemination EU-Workshops,

			National Workshops
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The total amount of man-hours is smaller than budgeted (about 862 actual hours vs. 914 budgeted hours), resulting in a reduction of 5,7%. More in detail:

- in WP1, the factual amount of man-hours has been significantly lower than budgeted (104 instead of 173) as the attendance to coordination meetings (including conference calls) was limited to two people and, as the contribution required to Enel was essentially about technical issues, the hours spent in preparation of the meetings was declared as belonging to WP3 activities;
- in WP4, the factual amount of man-hours has been significantly higher than budgeted (119 instead of 89) as Enel attended more national meetings than budgeted (see 1.1.2 above).

### 3.17.5.2 Subcontracting and other specific costs

Cost category (subcontracting or other specific costs)	Foreseen item according to CPF	Estimated costs [EUR]	Actual incurred costs [EUR]	Reason for over-, under- or not spending
Other eligible direct costs	Meeting expenses	3.000	1.357,80	The meeting was hosted at Villa Lazzaroni, which is owned by Enel, instead than in a private location, resulting in a smaller expense

### 3.17.5.3 Travel costs

Travel costs resulted in a greater expense than budgeted, both as a consequence of the participation to national workshops in other Countries (Spain, Greece) and to a systematic attendance to Coordination and Technical meetings.

As a result of the abovementioned attendance, the internal coordination of ENEL team was extremely effective and led to a fast convergence on the documents to be produced that were in fact delivered in a slightly shorter time than expected.

More than that, the impact of this cost increase in the overall budget has been negligible compared to the reduction of personnel costs due to the difference between actual hourly costs for Executives (see below) and the average Company cost for the same category, which was used in budget planning.

### 3.17.5.4 Report on budget shifts

An internal budget transfer of 4.944 EUR is required in order to cover the additional travel expenses incurred. Such budget transfer can be finance by the savings in the staff costs categories.

As the activities were completed in more or less the scheduled amount of hours (see the “Staff resources” paragraph above), the only relevant budget deviations were due to the difference between actual hourly costs and the ones adopted in the budget planning phase. More in detail, significant differences were observed in the Executives’ costs, whose actual value for the involved person (Riccardo LAMA) was between one half and one third of the foreseen hourly amount (about 65 €/hour instead of 160 €/hour).

### **3.18 CB18: LUMEN**

Lumen retired from the project during the first year.

### **3.19 CB19: RWE Deutschland AG**

Author(s): Carmen Calpe, Roland Hermes.

#### **3.19.1 Role in the project**

RWE has played a key role in the development of activities of WP3 and associated documents. The main contributions were to provide with the technical and regulatory background from the network perspective. The desk research was linked with the reality by providing real experiences from the DSO (Distribution System Operator). This helped the project to focus on those barriers which are key for the introduction of RES in the networks and providing recommendations for overcoming them.

Also the experience of RWE in different on-going European activities and discussions (e.g. Eurelectric) has given a broader view to PV GRID.

#### **3.19.2 Main activities and achievements**

##### **3.19.2.1 WP3 Discussion and recommendation on PV GRID integration issues**

**The main activities** of RWE Deutschland AG were focused on WP3, providing the DSO point of view to the integration of PV in the grids (from both technical and regulatory point of views), bringing the real experiences to the project.

RWE took actively part in the discussions about the different technical solutions to improve the integration of PV in distribution grids based on the technical background of the experts involved. RWE helped to find a common understanding of the different technologies within the consortium. Additionally the expert view of the DSO was a basic input to identify the prioritization of the different solutions which is one of the key output of the project

The international working field of RWE's experts was key for identifying the differences between different European countries (metering, grid investments, etc.) and the sensitive topics for regulatory barriers.

Furthermore, RWE and BSW smoothed the way for applying these technical solutions by developing a roadmap combining PV investor view with the DSO experience to create a broad set of scenarios which led to the key questions in the PV GRID roadmap.

The **main achievements** of these activities are:

- Prioritization of the different technical solutions for integrating PV into distribution grids
- Development of the German case study (in collaboration with BSW)
- Common position between DSO and PV associations for sufficient framework to use PV curtailment as a technical and economic solution for increasing hosting capacity
- European Advisory paper containing clear recommendations

- PV GRID Roadmap for applying technical solutions

### 3.19.2.2 WP4 EU level and national discussion and dissemination

RWE has supported the dissemination activities of the project by attending 2 PV GRID national forums (D4.7, 1 in Germany, 1 in Italy), the German national workshop (D4.9) and 2 European forums (D4.11, D4.12), including the final event where RWE participated actively in the different panel sessions. RWE has also supported the dissemination of the PV GRID results at national level in Germany.

Furthermore, RWE has taken part in an additional workshop with the German national regulatory authority, the *Bundesnetzagentur*, in order to have a regulatory view on the technical results of the project. The result of this workshop was a valuable input for linking the technical results achieved so far in the project with the upcoming work focusing on regulation, promoting the internal discussions for the German case.

Furthermore RWE has collaborated and provided the input for elaborating the final project report (D4.14).

The **main achievements** of these activities are:

- Dissemination of project results by participating in forums, workshops etc.
- Promoting the discussions at national and European level based on project results
- Final project report

### 3.19.3 Assessment of individual performance

The starting phase was a bit complicated due to the different types of stakeholders and interests (DSO vs. associations) involved and also due to the different background of partners (technicians vs. non technicians, researchers vs. practical experiences). However, eventually partners found the right way of communicating, being open-minded and encouraging the discussions.

During the project duration interesting debates took place, allowing us to better understand the other points of view and sharing practical experiences. As a result, the consortium produced a final document that expresses the different interests in a satisfactory way for both DSOs and other stakeholders.

The final phases of the project went smoothly.

### 3.19.4 Sustainability of the action after the end of the project

RWE got a better understanding about the position of the PV industry and their associations, this better understanding has also influenced internal discussions within RWE.

RWE understands its position as an enabler of the *“Energiewende”* (energy turnaround). Therefore the close collaboration within the project was an important experience for further activities.

The common position between DSOs and PV associations on a sufficient framework to use PV curtailment as a technical and economic solution for increasing hosting capacity arrives at the right point in time. Currently in Germany this topic is one of the most controversial ones in the area of integration of RES. The high impact of the solution proposed within the project was shown in a study published by the German Federal Ministry of Economic Affairs and Energy in September 2014. The result of the PVGRID

project in this topic helped to focus the on-going and future discussions enabling the solutions. As next step, the framework has to be defined which needs compromises between RES and distribution grids.

Therefore the clear recommendation in the European Advisory Paper is paving the way for integrating RES.

### 3.19.5 Review of resources

#### 3.19.5.1 Staff resources

The hours spent in the project are in line both with the hours planned and the activities performed during the project duration. Less resources than planned for management (WP1) have been necessary (143 hours instead of 234). No major deviations have been incurred.

More than 200 hours have only been incurred in WP3. The total number of hours in this WP has been 591 and the efforts have been spent in the activities described above. Only main contributions are detailed in the next table.

<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
WP1 Management	Carmen Calpe	120.7	preparation of reports to EC, attendance conference calls, attendance advisory committee
WP3 Discussion and recommendation on PV GRID integration issues	Roland Hermes	231	inputs about technical PV integration barriers and solutions, participation in discussions and preparation of reports
WP3 Discussion and recommendation on PV GRID integration issues	Oliver Franz	252.5	preparation and discussion of advisory paper, inputs about regulation and normative barriers
WP3 Discussion and recommendation on PV GRID integration issues	Carmen Calpe	106	preparation, discussion and revision of reports from WP3, internal coordination
WP4 Dissemination	Roland Hermes	40.1	participation in national and European forums, inputs and revision of final reports
WP4 Dissemination	Oliver Franz	32	participation in national and European forums, inputs and revision of final reports

#### 3.19.5.2 Subcontracting and other specific costs

Not applicable.

#### 3.19.5.3 Travel costs

No deviations to report.

#### **3.19.5.4 Report on budget shifts**

Not applicable.

### **3.20 CB20: DERlab e.V.**

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#### **3.20.1 Role in the project**

DERlab led WP 3 “Discussions and recommendations on PV grid integration issues”, coordinating the activities with the other partners, caring for the initial data collection, caring for the initiation and leading of different working groups on identified technical topics, leading the analysis and discussion concerning technical solutions, supporting the preparation of the advisory paper on regulatory and normative recommendations for the implementation of technical solutions for improved PV grid integration.

DERlab contributed to the activities of WP 1 “Management”, WP2 “PV LEGAL database” and WP 4 “EU level and national discussion and dissemination”.

#### **3.20.2 Main activities and achievements**

WP2 “PV LEGAL database” – DERlab supported the review of the research topics.

WP3 “Discussions and recommendations on PV grid integration issues” – DERlab coordinated the WP activities, coordinated the initial data collection, initiated and set up three working groups, led and coordinated the activities of two working groups: “Smart Grids” and “Smart PV”, participated in the activities of the third working group, supported the preparation of the advisory paper, led and coordinated the realisation of the report “Prioritisation of technical solutions available for the integration of PV in to the distribution grid”.

WP 4 “EU level and national discussion and dissemination” – DERlab contributed to the “Initial project report”, as well as to the “Final project report”, participated and contributed to the project dissemination activities, participation and contribution to several PV GRID forums and national workshops.

#### **3.20.3 Assessment of individual performance**

DERlab had the leading role for the central technical work package of the PV GRID project activities. The institute also brought its expertise and contributed to most of the other defined tasks in the project.

DERlab coordinated the identification and the evaluation of the key technical solutions enabling higher shares of PV in the distribution grid. Furthermore, DERlab coordinated the prioritization of the identified key technical solutions and the delivery of the PV GRID common position paper “Prioritization of

technical solutions available for the integration of PV into the distribution grid” in close contact with the DSOs present in the PV GRID Consortium, as well as with external DSOs via dedicated meetings and workshops.

DERlab supported the realisation of the “European Advisory Paper”.

DERlab has achieved all the objectives of the activities it was in charge of within the PV GRID project.

### 3.20.4 Sustainability of the action after the end of the project

DERlab foresees to promote and use the acquired knowledge as well as the developed methodologies and recommendations in further national and EU projects approaching the topic of grid integration of PV. DERlab will and has already started to disseminate the project results within its network of member institutes, as well as within the ISGAN/SIRFN network, in its role of Operating Agent.

Furthermore, DERlab in CENELEC TC 8X “System aspect of electrical energy supply” and is planning to present the project outcomes, especially the regulatory recommendations, within the working groups of afore-mentioned frameworks.

### 3.20.5 Review of resources

#### 3.20.5.1 Staff resources

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
WP1	D. Craciun	69,5	Project reporting, participation in and contribution to project meetings.
WP1	V. Helmbrecht	70	Participation in and contribution to project meetings.
WP1	S. Numminen	29,5	Participation in and contribution to project meetings.
WP1	M. Vandenberg	81	Contribution to project reporting, participation in project meetings.
WP3	D. Craciun	200,5	WP 3 management. Organization of and participation in WP3 workshops. Communication. Definition of tasks management and execution strategy. Prioritization of technical solutions.
WP3	V. Helmbrecht	394,5	Collection and analysis of initial data. Prioritization of technical solutions.
WP3	M. Vandenberg	553,5	WP3 management. Analysis, evaluation and prioritization of the initial data collection. Lead of expert technical discussions. Participation in national forums and international events.

WP3	R. Saha	40	Establishment and management of online platform for data collection.
WP3	A. Abdelhaq	40,5	Establishment and management of online platform for data collection.
WP4	D. Craciun	25	Preparation of articles and visual presentations of project results.
WP4	V. Helmbrecht	40	Preparation of articles and visual presentations of project results.
WP4	M. Vandenberg	144	Participation in national forums and international events. Preparation and presentation of visual presentations, articles and posters of project activities and results.

DERlab has spent 88 extra hours than foreseen in WP4. This effort was necessary in order to ensure the presentation of project results in different international publications and national and international events. DERlab participated and contributed to the national Polish and British forums, and organized the preparation and presentation of a conference paper at the CIRED 2013 conference in Stockholm and EU PVSEC 2013, Paris.

### 3.20.5.2 Subcontracting and other specific costs

Not applicable.

### 3.20.5.3 Travel costs

The travel costs of DERlab account for a total amount of 5.982,97 Euro for the complete project duration of which 85% relate to WP3 activities and the rest to activities in WP1 and WP4.

Line N°	Name	Destination (city, country)	Date (dd/mm/yy)	Duration (days)	Purpose	Amount
1	Craciun, Diana	Berlin, Germany	9.05.12	2	WP1 PV GRID kick-off meeting	184,13
2	Helmbrecht, Vincent	Berlin, Germany	9.05.12	3	WP1 PV GRID kick-off meeting	286,72
3	Vandenberg, Michel	Rome, Italy	10.10.12	2	WP 3 PV GRID working group meeting	767,90
4	Helmbrecht, Vincent	Rome, Italy	10.10.12	2	WP 3 PV GRID working group meeting	770,40
5	Craciun, Diana	Berlin, Germany	3.12.12	2	WP 3 PV GRID working group meeting	300,94
6	Vandenberg, Michel	Berlin, Germany	3.12.12	1	WP 3 PV GRID working group meeting	69,86
7	Helmbrecht, Vincent	Berlin, Germany	3.12.12	1	WP 3 PV GRID working group meeting	97,92
8	Vandenberg, Michel	Madrid, Spain	20.02.13	3	WP 3 PV GRID working group meeting	548,04



9	Craciun, Diana	Madrid, Spain	20.02.13	3	WP 3 PV GRID working group meeting	458,54
10	Vandenbergh, Michel	Warsaw, Poland	5.06.13	2	WP 4 PV GRID Forum Poland	429,59
11	Vandenbergh, Michel	Prague, Czech Republic	6.06.13	2	WP 3 PV GRID working group meeting	523,08
12	Vandenbergh, Michel	Madrid, Spain	16.09.13	2	WP 3 PV GRID working group meeting	564,98
13	Vandenbergh, Michel	London, UK	22.10.13	2	WP 4 PV GRID Forum	418,68

### 3.20.5.4 Report on budget shifts

Not applicable.

## 3.21 CB21: COMILLAS

Author(s): Carlos Mateo Domingo and Pablo Frías Marín

### 3.21.1 Role in the project

The main role of Comillas in the project has been participating in WP3, discussion and recommendations on PV GRID integration issues, collaborating in the identification of the technical solutions, and leading the analysis of regulatory and normative barriers and recommendations, which has culminated in the European advisory paper.

### 3.21.2 Main activities and achievements

The main tasks and achievements have been:

- 1) Participating in the telcos and meetings of coordination of the project (WP1)
- 2) Collaborating in the collection, review and evaluation of the most promising technical solutions to integrate PV in the distribution networks (WP3). In this task first the technical solutions have been identified. Then, a classification has been made according to their effectiveness. Also it has been identified for each focus country which is the state of each technical solution (technical readiness and regulatory barriers). In particular Comillas was responsible of assessing the effectiveness, the regulatory barriers and the technical readiness in Spain. For this task he had the collaboration of Iberdrola, from the advisory board.

These results are included in:

- D3.1 Prioritisation of Technical Solutions Available for the Integration of PV into the Distribution grid.
- 3) Leading the analysis of the regulatory and normative barriers, and recommending normative and regulatory solutions to overcome these barriers (WP3). The result of this task has been the

advisory paper, which contains the lists of barriers and recommendations. The results of this task exceed the initial planning. In particular:

- A short version of the advisory paper has also been produced, making available the results before the final version was completed, and facilitating the diffusion of the results.
- The long version of the advisory paper has been complemented with a consultation version, extending the length of this task and compiling the feedback received by the advisory board and by the national workshops.
- The analysis of barriers and recommendations in the initial proposal only considered four focus countries (Germany, Italy, Czech Republic and Spain). However, the analysis has also been extended to four additional case studies (France, United Kingdom, Greece and the Netherlands).
- A barrier assessment (not planned in the proposal) has also been made, identifying the situation (existing barriers) in all 15 countries participating in PV-GRID.

The results are the following documents:

- PV GRID Advisory Paper. Consultation version: Key Recommendations. December 2013.
  - D3.2. European Advisory Paper. July 2014 (including the 3 annexes with the focus countries, the additional case studies and the barrier assessment).
- 4) Collaborating in the dissemination of the results (WP4), presenting the results of the technical solutions and barrier assessment in several countries (Bulgaria, Slovakia, Spain and Czech Republic), and presenting results in the final Spanish national Workshop.

### **3.21.3 Assessment of individual performance**

The advisory paper (including three annexes) has been made publicly available on PV-GRID website. The results have exceeded the initial planning, analysing barriers and recommendations in four additional case studies and carrying out an additional barrier assessment in 15 European countries. The barrier assessment is a useful reference to anyone who needs to know the current situation of the technical solutions in these 15 European countries. In particular, it covers 10 topics including DSO investment recovery, self-consumption, curtailment, storage and demand response.

The advisory paper has proved to be a useful tool, enabling the national partners to discuss the barriers and recommendations with the DSOs and regulators. In some countries the national associations have reported that a dialogue with the DSOs/regulators has been initiated because of the project, enabling this work that the PV associations are included in the discussion of the technical solutions, for integrating PV in the distribution networks. The lack of communication between the stakeholders is one of the main barriers towards finding new solutions. This work has fostered the dialogue between stakeholders, achieving agreements in areas, which were taboo only two years ago (e.g. curtailment).

### **3.21.4 Sustainability of the action after the end of the project**

In some way, the project re-starts now with the diffusion of the results. The Advisory Paper can be a very useful tool for regulators and DSOs, when dealing with technical solutions for increasing the PV hosting

capacity of the distribution networks. In our contacts with the industry and the regulators we will use this document as interface with them, presenting them the results and discussing with them the recommendations. This way we will push so that these recommendations are finally applied, and the barriers that hamper the large-scale integration of PV in the distribution networks are removed.

### 3.21.5 Review of resources

#### 3.21.5.1 Staff resources

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
1.3 Preparation of reports to EC	Carlos Mateo	15	Technical and financial reports. Comillas and WP3-WG3 sections.
1.3 Preparation of reports to EC	Pablo Frías	10	Preparation of reports
1.4 Organisation and attendance of 3 project meetings	Carlos Mateo	22	Organization of meetings, facilities, presentations. Preparation of presentations. Attendance to the meetings.
1.4 Organisation and attendance of 3 project meetings	Pablo Frías	10	Organization of meetings, facilities, presentations. Preparation of presentations. Attendance to the meetings.
1.5 Organisation and attendance of 4 advisory committee meetings	Carlos Mateo	60	Preparation of presentations. Attendance to the meetings.
1.6 Organisation and attendance of conference calls	Carlos Mateo	80	Execution of action lists. Attendance to the conference calls.
1.6 Organisation and attendance of conference calls	Pablo Frías	42	Management related to the execution of action lists. Attendance to the conference calls.

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
2.1 Review of research plan and upgrade of conference calls	Carlos Mateo	29	Comments on research plan and database.

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
3.1 Initial data collection and set-up of working groups	Carlos Mateo	10	Collecting documentation.

3.1 Initial data collection and set-up of working groups	Pablo Frías	6	Collecting documentation.
3.2 Discussion on technical PV grid integration solutions	Carlos Mateo	60	Review of technical solutions. Impact assessment for Spain.
3.2 Discussion on technical PV grid integration solutions	Pablo Frías	40	Review of technical solutions. Impact assessment for Spain.
3.3 Discussion on regulatory and legal-administrative grid expansion and operation frameworks	Carlos Mateo,	452	Identifying the key areas. Leading the discussion on regulatory and administrative barriers.
3.3 Discussion on regulatory and legal-administrative grid expansion and operation frameworks	Pablo Frías,	125	Management related to the discussion on regulatory and legal-administrative grid expansion and operation frameworks.
3.3 Discussion on regulatory and legal-administrative grid expansion and operation frameworks	Javier Reneses	59	Revision of documents.
3.3 Discussion on regulatory and legal-administrative grid expansion and operation frameworks	Rafael Cossent	10	Revision of documents.
3.4 Preparation of Advisory Paper on legal-administrative and regulatory solutions	Carlos Mateo	282	Collaboration in defining the structure of the document. Consultation process. Revision of European and national barriers. Revision of focus countries. Revision of additional case studies. Preparation of barrier assessment.
3.4 Preparation of Advisory Paper on legal-administrative and regulatory solutions	Pablo Frías	46	Management related to the preparation of the advisory paper.

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
4.3 Contact to national	Carlos Mateo	55	Preparation and attendance of

stakeholders and organisation of national PV GRID forums			conference calls to organize the national forums. Preparation of webinar. Preparation and participation in forums.
4.5 Organisation of 2 European Forums to present the first project outcomes and its final conclusions	Carlos Mateo	28	Preparation of material.
4.6 Project Reports	Carlos Mateo	48	Preparation of documents, in particular for WP3-WG3.

There has been substantially more work than initially planned which has increased the staff budget as it is justified later for a requested budget shift. The high level of the discussion has required involving more senior personnel than initially planned. However, these senior staffs have been able to deal with the additional topics without major deviations in the number of hours: in total, 1489 hours instead of the 1465 planned, a bit more. More junior staff would have required anyway significantly more hours to deal with the additional topics. Therefore, as a result of the additional objectives and tasks, the staff costs have increased.

### 3.21.5.2 Subcontracting and other specific costs

<b>Cost category (subcontracting or other specific costs)</b>	<b>Foreseen item according to CPF</b>	<b>Estimated costs [EUR]</b>	<b>Actual incurred costs [EUR]</b>	<b>Reason for over-, under- or not spending</b>
Other specific costs	6.750,00€		497.36€	It has been required less travel budget for experts than initially programmed. First, some experts covered their expenses with their own resources. In other cases, national experts did not incur in travel costs.

In “Other specific Costs” we have 6.750,00€ that we will not be able to justify because in the first half of the project covered by the interim report we only had the compensation of the travel costs of external expert Eduardo Lorenzo Pigueiras (470,69€) and in the second half of the project we have report few cost items.

### 3.21.5.3 Travel costs

Breakdown of travel costs is provided below.

Name	Destination	Date	Actual incurred costs [EUR]	Explanation
Mateo, Carlos	Berlin, Germany	9/05/12	622,25	Initial meeting of the project. Meetings with the advisory committee and with the project partners.
Frías, Pablo	Berlin, Germany	10/05/12	543,27	Initial meeting of the project. Meetings with the advisory committee and with the project partners.
Frías, Pablo	Rome, Italy	11/10/12	392,57	First meeting of Working Group 1 and 2 (WP3)
Mateo, Carlos	Berlin, Germany	30/11/12	559,29	Second meeting of Working Group 1 and 2 (WP3)
Frías, Pablo	Toledo, Spain	15/03/13	39,38	Meeting with Spanish experts (Iberdrola, Unión Fenosa, UNEF) to discuss the situation and the barriers to the technical solutions in Spain
Mateo, Carlos	Toledo, Spain	15/03/13	24,43	Meeting with Spanish experts (Iberdrola, Unión Fenosa, UNEF) to discuss the situation and the barriers to the technical solutions in Spain
Mateo, Carlos	Sofía, Bulgaria	29/05/13	545,45	National Forum from Work Package 4 to disseminate the results of the project with a special focus on regulatory barriers
Mateo, Carlos	Prague (Czech Republic)	06/06/13	609,39	Second meeting of the Working group 3
Mateo, Carlos	Munich, Germany	20/06/13	827,59	National Forum from Work Package 4 to disseminate the results of the project with a special focus on regulatory barriers
Mateo, Carlos	Bratislava (Slovakia)	26/06/13	561,78	National Forum from Work Package 4 to disseminate the results of the project with a special focus on the technical solutions
Frías, Pablo	Madrid, Spain	16/09/13	26,67	Working Group 3 Third Meeting: Discussions and agreement on the advisory paper structure and content
Mateo, Carlos	Madrid, Spain	16/09/13	26,67	Working Group 3 Third Meeting: Discussions and agreement on the advisory paper structure and content
Mateo, Carlos	London, U.K.	22/10/13	580,9	Advisory Committee; Project meeting (Barriers and Recommendations at national level; Organization of National workshops)
Mateo, Carlos	Brussels, Belgium	29/09/14	757,08	Final European Event and Final Project Meeting

### 3.21.5.4 Report on budget shifts

An external budget transfer of 4860.35 EUR is proposed in order to compensate the additional staff costs incurred by Comillas in the project that cannot be compensated by an internal budget transfer.

Comillas will in fact not claim all travel costs assigned in the CPF, as the real costs raised up to 6.116,72€ lower than the assigned 10.500€. Additionally, in the “other costs” section, Comillas will claim for 497.36 € compared with the 6.750€ initially budgeted.

The difference among the programmed and real costs has been shifted to personnel costs, as additional work over that programmed was needed to complete additional objectives not initially included in the proposal but approved by the European Commission, that improved the quality of the results:

- Making the consultation process of the advisory paper, during the last year. This has enabled to include the feedback received. This additional task required to extend the work of WP3 during one additional natural year.
- Collaborating in the production of a short version of the advisory paper, for the consultation process.
- Reviewing additional case studies.
- Carrying out a barrier assessment in 15 European countries, led by Comillas.

### **3.22 CB22: UNEF**

Author: Lucia Dolera

The Spanish Photovoltaic Union (UNEF) is the sectorial association of photovoltaic solar energy in Spain, UNEF makes up more than 250 companies and entities of all the technological value chain, and represents more than the 85% of the sector’s activity in Spain and bring together almost the whole of: producers, installers, engineering, raw materials producers, modules and components manufacturers and distributors.

The main goal of UNEF is to assume the institutional tasks and promotion of the PV Sector at a national and international level.

UNEF has an open institutional structure which is specifically designed to integrate all the participants and interests of the Spanish PV Sector, independently of its activity or size and not only at a national level, but also at regional.

#### **3.22.1 Role in the project**

The overall goal of the PV GRID project is to address the regulatory, normative and administrative barriers hampering the integration of Photovoltaics (PV) into the electricity distribution grids in Europe.

The role of UNEF in the project was at first time, having a data collection activity in order to analyse and identify the existing technical integration for the PV in the grid in Spain, regulations, etc. Once having all the data collected, the regulatory and normative barriers were evaluated, and priority solutions, and good practices for better PV grid integration were discussed and analysed.

Furthermore, the organization of a Spanish Forum and final workshop opened to all Spanish key stakeholders, of project outcomes towards Spanish key stakeholders

Another role for UNEF at PV GRID project has been the review and update of the database that was created in the PV LEGAL previous project.

UNEF has developed also an important job concerning the dissemination of the results of the project. UNEF has disseminated in meetings, forums, etc., that we have attended the PV GRID project and conclusions.

### **3.22.2 Main activities and achievements**

The initial set of recommendations after a big analysis of the collected data was discussed at national and European level during a series of high level workshops involving DSOs, transmission system operators (TSOs), electricity market regulators, national authorities and the PV sector, allowing the barrier analysis and recommendations to be fine-tuned and presented in the PV GRID European Advisory Paper, published in July 2014 and coordinated by the Institute for Research in Technology of the Madrid-based Comillas Pontifical University.

UNEF coordinated with Comillas University elaborated a Spanish advisory paper on regulatory and normative recommendations related to the barriers and improvements detected.

After a deep study it was concluded that PV penetration in Spain is still low. Covering a little over 3% of total electricity demand, it is clear that there is still a high potential for growth. The European Photovoltaic Industry Association EPIA believes that PV penetration could reach an average of 12% in 2020 across European Countries. That percentage is very difficult to achieve in the case of Spain due to new laws that have appeared preventing the development of virtually all types of PV installation. Nevertheless, it remains to be seen what other changes will come in the seven remaining years to 2020.

On the other hand UNEF has also participated on Working Group 1 (WG1), which is related to the preparation of reports, the attendance of 3 project meetings, also the attendance of the advisory committee meetings, and the conference calls that have been taking place during the development of the project.

Other activity was regarding the survey updated on quantitative information on legal-administrative frameworks and barriers database created in the PV LEGAL Project for Spain, where the results are accessible online. The database was updated three times within the PV GRID project, as planned.

UNEF also organized the Spanish Forum/Conference, opened to all Spanish key stakeholders, national dissemination of project outcomes towards Spanish key stakeholders. The title of the Forum was: "Towards a large scale integration of PV in Spain ", held on the 2nd of July 2013 in Madrid, which also was framed within the PV Grid project.

UNEF also organized a Spanish Workshop last March 2014, where it was showed the compilation data of the project's relevant data, structure, objectives and instruments of the PV LEGAL (previous project), to follow with a description of the PV GRID, which challenge is the large-scale integration of PV electricity into the distribution grid. The objectives were reviewed, the evaluation of the national PV development frameworks in each of the 16 participant countries, offering for every of the 3 market segments (assembly in residential, commercial and industrial land of PV systems) a description of:

- Procedures and administrative requirements to connect into the grid
- Term and costs involved
- Market barriers and solutions



It was also mentioned that the research is conducted by the National Associations of the solar industry, it was complimented with interviews to national developers of PV systems and operators and it is aimed at developers and designers of project policies.

Furthermore, UNEF has also participated in the elaboration of the Final Project Report and the dissemination activities of the results of the project.

### **3.22.3 Assessment of individual performance**

UNEF considers PV GRID project a great success.

Regarding the organisation's performance, I must say that on the one hand it was easy to follow the dynamics of the PV GRID project steps, because UNEF had already participated in the previous project PV LEGAL (as ASIF) and another success that UNEF has also reached is the collaboration of the utilities companies although at the beginning was difficult to cooperate and reach conclusions together. But despite the difficulties it was possible to work together and share a discussion together.

Other difficulty, in the case of Spain, was the update of the database that comes from the previous project of PV LEGAL. As there is moratoria and a draft of legislation for self-consumption that threat with a backup toll, the PV sector in Spain is totally stopped

I emphasize the importance of the phone conversations (conference call) although they are time consumer, they have been very helpful in order to coordinate, clarify and get a progression of the activities.

I would also highlight the importance of the dissemination of the results in meetings, forums, in order to receive also the point of view of another stakeholder, decision maker, etc., that could be another part of the project for the future.

### **3.22.4 Sustainability of the action after the end of the project**

UNEF activities undertaken during the project are related to the cooperation with the Utilities companies and after this project Utilities have opened the door for further cooperation.

In addition to this, in every single meeting with the national government and regional, we always talk about the PV GRID project and the conclusions reached. But not only this, but also when UNEF is a speaker in a workshop we do the same.

Another activity regarding the dissemination is, for instance, the importance of handing over the Final Project Report and the European Advisory Paper of PV GRID, in every single Forum/Workshop that UNEF organizes. For example, in the "Spanish FORO SOLAR" that took place last 18-19<sup>th</sup> November 2014, in which there were more than 200 people attending the FORO, not only from the whole chain of the Spanish PV Sector but for the international PV Sector too, we handed them the Final Project Report .

UNEF will keep this activity of disseminating in Forums, stakeholders, decision makers, etc., as one of the best practices for spreading the PV GRID project.

### 3.22.5 Review of resources

#### 3.22.5.1 Staff resources

It's attached below a table with an overview of the time spent by UNEF per work package, final and planned. Overall EPIA respected quite well the foreseen time for each WP.

	FINAL	PLANNED
WP1	230	234
WP2	380,5	440
WP3	521,5	491
WP4	339,5	527
<b>TOTAL</b>	<b>1.471,5</b>	<b>1.692,0</b>

Task n° + name	Involved staff member	Hours spent	Keywords on undertaken activities
<b>WP1</b>	<b>TOTAL</b>	<b>230</b>	
Task 1.3 Preparation of reports	Lucia Dólera	29,5	Preparation of the first interim report
Task 1.4 Organisation and attendance of 3 project meetings	Eduardo Collado	33,5	Participation to the second project meeting in London, and in Madrid
	Lucia Dólera	67	Participation in the project meeting in Berlin (august 2012) and Final Project meeting in Brussels
Task 1.6 Organization and attendance of conference calls	Eduardo Collado	50	Participation in WP leaders conference calls every fortnight
	Lucía Dólera	50	Participation in WP leaders conference calls every fortnight...
<b>WP2</b>	<b>TOTAL</b>	<b>380,5</b>	
Task 2.2 Legal Administrative Research	Lucia Dólera	275,5	Surveys to the companies, elaboration database
	Eduardo Collado	31	Surveys to the companies, elaboration database
Task 2.3. Evaluation of Research Database update	Lucía Dólera	70	Database update, review...
	Eduardo Collado	4	Review database.
<b>WP3</b>	<b>TOTAL</b>	<b>521,5</b>	
Task 3.1 Initial data collection and set-up or working groups	Eduardo Collado	48	Initial data collection and set-up or working groups
Task 3.2 Analysis, discussion and evaluation of technical PV grid integration solutions	Eduardo Collado	140,5	Participation in the WG meetings in Rome, Berlin, Madrid, participation in WP3 conference calls. Participation to the WG meeting in Prague, to the kick-off conference call and contribution to T 3.3 in identifying the existing barriers towards the adoptions of priority solutions for better PV integration

Task 3.3 Analysis and discussion of regulatory and normative barriers	Eduardo Collado	260	Identifying and working in the existing barriers towards the adoptions of priority solutions for better PV integration
Task 3.4 Preparation of Advisory paper on regulatory and normative recommendations	Eduardo Collado	73	Drafting of the Short and Full version of the Advisory paper for the Spanish case, support in identifying regulatory and normative solutions for large scale integration of PV into the grid and in proposing guidelines
<b>WP4</b>	<b>TOTAL</b>	<b>339,5</b>	
Task 4.2. Dissemination of project development and results	Eduardo Collado	16	
	Lucía Dólera	27	Coordination in the creation of the PV GRID leaflet
	Tomás Díaz	40	Drafting and dissemination of the press releases, and drafting of the PV GRID newsletter
4.3 Contact to national stakeholders and Organisation of national PV GRID forums	Eduardo Collado	46	Organisation of the Spanish Forum, Participation and presentation (2 <sup>nd</sup> July 2013)
	Lucía Dólera	71	Organisation of the Spanish Forum, Participation and presentation(2 <sup>nd</sup> July 2013)
	Tomás Díaz	27	Organisation of the Spanish Forum, Participation and presentation (2 <sup>nd</sup> July 2013)
4.4 Organisation of national workshops or bilateral meetings	Eduardo Collado	59	Organisation of the Spanish Workshop (26 <sup>th</sup> March 2014)
	Lucía Dólera	53,5	Organisation of the Spanish Workshop (26 <sup>th</sup> March 2014)

### 3.22.5.2 Subcontracting and other specific costs

<b>Cost category (subcontracting or other specific costs)</b>	<b>Foreseen item according to CPF</b>	<b>Estimated costs [EUR]</b>	<b>Actual incurred costs [EUR]</b>	<b>Reason for over-, under- or not spending</b>
Other specific costs	National Forum organisation	4.000	1.353,45	Forum was hosted for free by Comillas university

### 3.22.5.3 Travel costs

For UNEF, there are no major deviations in travel costs, just the ones for attending the 3 project meetings, etc., as it was planned initially in the project.

### 3.22.5.4 Report on budget shifts

UNEF has nothing to add in this section.

## 3.23 CB23: ASSORINNOVABILI

Author(s): Luisa Calleri; Costanza Boggiano Pico

### 3.23.1 Role in the project

AssoRinnovabili's main role was researching the Italian's administrative framework (WP2) and translate the recommendations of WP3 as outlined in the project proposal.

Namely, assoRinnovabili focused on:

- Researching national data, updating and revising them every 7 months (four research rounds) and carrying on a revision of research results;
- Collecting initial data and preparing an advisory paper after discussing recommendations with PV Grid consortium;
- Contacting stakeholders;
- Organize national workshop and forums;
- Participating to EU events;
- Contribute to disseminations activities.

### Main activities and achievements

AssoRinnovabili's activities were mainly concentrated in WP2 – (PV LEGAL Database), WP3 (Discussion + Recommendations) and WP4 (EU level and national discussion and dissemination).

For WP2 the association was involved in gathering, verifying and updating the normative framework for each market sector in order to compare it with national data collected.

The collecting of national data has been made through interviews to a representative group of operators. A template with standardized questions has been prepared and a first phone call to inform about the contents and the purpose of this activity has been forwarded before sending the template and calling back in an established time in order to collect infos and comments related to the template. This activity has represented a good opportunity to be in direct contact with difficulties that operators were facing, especially regarding the whole procedure. The management of a long authorization process has been deeply analysed, thus allowing to find critical phases and suggest proper modifications for each market-sector.

For WP3 assoRinnovabili conducted an accurate revision of the Italian case-study primarily drafted by Enel Green Power, considering the whole and diversified national PV framework for which the association is a strong point of reference. This activity brought the opportunity to integrate the document adding more and specific consideration for the sector, then discussed and shared with Enel Green Power.

In WP4 assoRinnovabili has been especially involved in the organization of the national workshop (hosted in assoRinnovabili venue in Rome on March, the 27<sup>th</sup> 2014) and in many dissemination activities (press releases, intervention in already scheduled events and distribution of documents informing about the project; writing articles on specialised magazines and making members interested and informed through the association website, social media, newsletter and dedicated communication tools). Especially in the event Solar O&M Europe (October 2014, the 7<sup>th</sup>) in which an intervention has been

made regarding the project, the association registered a strong interest from members willing to participate.

Participation in all WP1 activities was duly carried out as well (participation in call conferences, attendance to two of three project meetings, preparation of reports for EC, filling all required documents).

### **3.23.2 Assessment of individual performance**

assoRinnovabili's performance, was affected by some internal changes and by having inherited the PV GRID project from Assosolare, when the project was already set up.

The PCOW has changed two times, the first for paternity leave, the second for handover from Assosolare to assoRinnovabili. assoRinnovabili staff working on PV GRID changed for maternity leave. All this passages caused a re-handling all work previously carried on, with some initial delays and more time-consuming activities than formerly budgeted.

Despite this, the team revealed high interest and commitment throughout the whole lifetime of the project and has been accurately supported by the coordinator and other members of the Consortium.

In particular, the team managed meet the deadlines striving to deliver proper and accurate content on time.

Good feedbacks came from the dissemination activity, reflecting the interest of the sector in analysing and discussing how to overcome the most important barriers at national level for the access of PV electricity in the distribution grid.

### **3.23.3 Sustainability of the action after the end of the project**

In assoRinnovabili website will be visible the link to the PV GRID project until this will remain on-line. The association will make available the database to allow free consultation and use of the tool by investors and interested stakeholders and people.

Moreover, the association will consider all the suggestions emerged from the discussions that took place over the course of the project and in the final event to push towards the overcoming of administrative barriers, for which the association is a good actor already committed and involved.

Further ideas for the future of PV GRID have been discussed in the final consortium meeting in Brussels (October 2014), but no final decision has been taken so far.

### **3.23.4 Review of resources**

#### **3.23.4.1 Staff resources**

The total amount of the scheduled hours remained almost unchanged. There were, however, shifts between the numbers of hours attributed to some WPs.

In particular for the WP3, it was necessary to deal repeatedly with the operator ENEL to mature shared positions before formulating recommendations; while the WP1 has required more efforts due to the repeated handovers: the project was in fact primarily managed by the association assoSolare, that in 2013 joined assoRinnovabili.

In assoSolare, the project has been carried on by Mr. Zanolla, who resigned for paternity leave: Mr. Simoni succeeded then in all the operative tasks. From 16 September 2013 onwards Assosolare joined the association AassoRinnovabili and the staff (Mr. Andrea Zaghi, Mrs. Luisa Calleri, Mrs. Sara Gollessi, Mr. Alessandro Totaro) of the new comer association had to succeed, studying all the project from the beginning and taking over in an already started methodology, understanding the logic and driving it forward.

In assoRinnovabili, the person in charge of the European Projects, Mrs. Sara Gollessi, especially dedicated to the administrative management and to the overall supervision of the work, left for maternity leave in April 2014 and Mrs. Costanza Boggiano Pico came after, having to learn all the previous work and to handover it.

<b>Task n° + name</b>	<b>Involved staff member</b>	<b>Hours spent</b>	<b>Keywords on undertaken activities</b>
WP1 - Reports and call conferences	Andrea Zaghi	7	Studying all documents of the project for handover Check and revision for documents approval
WP 2 Database	Andrea Zaghi	8	Checking and approving
WP3 Recommendations	Andrea Zaghi	11	Analysing and revising the Advisory Paper -Discussing with Enel; approving the final version
WP4 Dissemination	Andrea Zaghi	24	Dissemination – communication- organizing events
WP1 – Reports and call conferences	Sara Gollessi	57	Studying all documents of the project for handover; Filling administrative documents; drafting reports and statements; attending call conferences and updating consortium on the evolution of the project in Italy from assoRinnovabili
WP2 - Database	Sara Gollessi	43	Collecting data; checking with Luisa and Andrea; translation activity
WP3 Recommendations	Sara Gollessi	25	Analysing and revising the Advisory Paper -Discussing with Enel;
WP4 Dissemination	Sara Gollessi	47	Managing communication tools, sending updating and requests to members through all institutional channels and social media
WP 1 Report and call conferences	Luisa Calleri	36	Studying all documents of the project for handover; participation to call conf;
WP2 - Database	Luisa Calleri	74	Handover of the formerly methodology and data collected; collecting data and checking; translation activity
WP3 Recommendations	Luisa Calleri	82	Analysing and revising the Advisory Paper -Discussing with Enel; sending e-mails to define the final version

WP4 Dissemination	Luisa Calleri	53	Dissemination – communication- organizing events
WP1 Report and call conferences	Alessandro Totaro	25	Attending the project meeting in London; reporting about the contents; filling administrative documents
WP 1 Report and call conferences	Costanza Boggiano Pico	184	Studying all documents of the project for handover; Attending the project meeting and Final Event in Brussels; participating in c.calls; reporting about the contents; filling administrative documents and drafting reports and statements
WP2 Database	Costanza Boggiano Pico	30	Translation activity; double check with Luisa Calleri about contents
WP3 Recommendations	Costanza Boggiano Pico	30	Discussing with Enel; sending e-mails to define the final version
WP4 Dissemination	Costanza Boggiano Pico	90	Dissemination – writing articles; managing social media communication and institutional communication; organizing participation to SolarO&MEurope

### 3.23.4.2 Subcontracting and other specific costs

Nothing to report here.

Cost category (subcontracting or other specific costs)	Foreseen item according to CPF	Estimated costs [EUR]	Actual incurred costs [EUR]	Reason for over-, under- or not spending

### 3.23.4.3 Travel costs

AssoRinnovabili attended two meetings and the final event, namely:

- 22<sup>nd</sup> and 23<sup>rd</sup> October 2013, meeting in London – participation of Alessandro Totaro, total travel and subsistence expenses € 591,14.
- 29<sup>th</sup> and 31<sup>st</sup> October 2014, final event and last project meeting – participation of Costanza Boggiano Pico, total travel and subsistence expenses € 770,76.

Event	Date	costs [EUR]	Staff participating
Project meeting	22 <sup>nd</sup> and 23 <sup>rd</sup> October 2013	591,14	Alessandro Totaro
Final Event and project meeting	29 <sup>th</sup> and 31 <sup>st</sup> October 2014	770,76	Costanza Boggiano Pico

#### **3.23.4.4 Report on budget shifts**

An internal budget transfer is proposed in order to compensate the slight overspending in staff costs with the savings in the other specific costs budget.



## **4 Consortium management**

### ***4.1 The partnership***

The bulk of the project consortium was inherited from the previous PV LEGAL project. Most national associations, eclareon and EPIA had in fact already worked successfully together in the previous project. As four new countries were added, 4 new national associations from Belgium, Sweden, Slovakia and the UK (as subcontractors), however also these contacts derived from existing EPIA activities, so their addition to the consortium was very smooth.

PV GRID featured new partners that complemented the original consortium's skillset: 3 DSOs (RWE, ENEL Distribuzione and Lumen) and 2 research institutes (DERLab and IIT Comillas). The diverse background and field of action of these new partners presented an initial challenge, mainly due to technical language barriers and different work procedures. The unfamiliarity of most of the original PV LEGAL consortium with technical solutions for grid integration also played a role. However, these challenges were overcome in a few months, and provided a great learning opportunity for all partners involved.

Unfortunately, one of the DSOs, Lumen from the Czech Republic, realised that their initial understanding of the project's activities was flawed, and decided to quit the consortium due to lack of interest in the topics developed.

### ***4.2 The management structure***

The responsibility for overall project management was initially held by BSW's Thomas Chrometzka, with in-house consultant Paolo Sonvilla acting as a deputy and advisor, i.e. the same team that managed PV LEGAL. Due to Mr. Chrometzka's departure in March 2013, BSW's managing director Jörg Mayer took charge with the support of Mr. Sonvilla, until July 2013 when Bianca Barth joined BSW to take over the PV GRID project management role.

During the first year of the project, several project and WP meetings took place, and in between these regular bi-weekly conference calls involving WP leader, DSO and key partners for the project's 4 focus countries took place in order to ease discussion of work progress and decision-making.

The role of the Advisory committee was fundamental at project's start in order to drive the consortium in its work, and was also later instrumental in shaping and disseminating recommendations towards the end of the action.

### ***4.3 Project meetings***

During the preparation of the project proposal, given the large size of the consortium, it was decided to have only a limited number (three) of plenary project meetings, in order to contain costs, and guarantee efficiency of communication. Instead more dedicated meetings with less participants were organised in WP2, WP3, WP4 in order to provide for coordination of these activities, complemented by conference calls in between.

In summary the following meetings took place:

- 10-11 May 2012: Kick-off and Advisory Committee meeting (Berlin)

- 28 August 2012: WP2/WP4 Meeting for national partners (Berlin)
- 11 October 2012: WP3 and AC meeting (Rome)
- 3 December 2012: WP3 meeting (Berlin)
- 21-22 February 2013: WP3 meeting (Madrid)
- 6 June 2013: WP3 meeting (Prague)
- 18 September 2013: WP3 meeting (Madrid)
- 22-23 October 2013: Plenary Project and Advisory Committee meeting (London)
- 1 October 2014: Final Plenary project meeting (Brussels)

In general, all required partners participated to the meetings, with the exception of edora, which missed the plenary project meeting in London due to conflicting schedules, and DERlab that missed the final plenary project meetings due to a transport issue that prevented their delegate from reaching Brussels in time.

#### ***4.4 European exchange activities***

The project consortium, upon initiative by EPIA, set-up a collaboration with the IEE project REServices that consisted in setting up a intertwined agenda and sharing the location for the final event in Brussels for the final event. Such solution proved to be very effective, as the 2 projects have a complementary approach to similar problems.

PVGRID representatives were also invited to deliver presentations within the Framework of the DERri and Innogrid2020 European projects.

#### ***4.5 Quality control***

BSW and eclareon GmbH were the main responsible for quality control of project deliverables and other published documents, validating the final drafts from WP leaders DERlab, COMILLAS and EPIA. The process was very effective and allowed to deliver the desired quality in deliverables and publications.

#### ***4.6 Project website***

The web based tool Basecamp provided by EPIA, was used to share documents and calendars during the project duration. The tool is separate from the project website and accessible thanks to a link

EPIA will maintain the PV GRID project website after the duration of the project, while the PV GRID database will be adopted by the new PV FINACING Horizon 2020 Project, once again coordinated by BSW.

#### ***4.7 Contact with the EACI/EASME***

Communication with EACI/EASME was very transparent and effective throughout the negotiation and execution phases. The main project officer was Ms Francesca Harris, whose initial maternity leave absence was covered by Mr Gianluca Tondi, who previously was the Project Officer for PV LEGAL and therefore was already acquainted with BSW. Ms Zenaide Paoli mainly covered the financial officer role.

As already stated, we found the cooperation with EACI/EASME very positive. The PO participated in a key WP3 meeting in Madrid and in 2 project events, and periodically conference calls between BSW and EACI/EASME were organised to discuss the project's progress and to agree the necessary adjustments to the execution plan.

The Grant Agreement amendments were discussed and agreed in advance, with EACI/EASME providing the necessary guidance. Whenever an administrative or financial question was raised by the consortium, this was promptly clarified by EACI/EASME.

#### ***4.8 Amendments to the grant agreement***

3 amendments took place during the project execution lifetime:

- CB 4 ASIF / CB 22 UNEF partner change and retirement of CB18 LUMEN
- EACI/EASME name change
- CB 6 Assosolare / CB23 Assorinnovabili partner change

All the amendments were successfully completed.

#### ***4.9 Suggestions for improvements***

None to add.

## 5 Overview tables

### 5.1 Table 1: Updated list of submitted deliverables of the action

Del. N° <sup>1</sup>	WP N° <sub>1</sub>	Deliverable name <sup>1</sup>	Available format(s)	Available language(s)	Initial submission with: <sup>2</sup> (PR1, IR, PR2)	Actual month of completion	Available on project website? <sup>3</sup> (yes, no)	Hard copy with FR (yes/no)	Information on deviation to Annex I <sup>4</sup>
D2.1	2	<b>Database Structure</b>	PDF	EN	PR1	6	NO	NO	
D2.2	2	<b>Reviewed Research Plan</b>	PDF	EN	PR1	6	NO	NO	
D2.3	2	<b>PV GRID database</b>	Web-based	15 languages	PR1	9	YES	NO	
D3.1	3	<b>Prioritisation of technical solutions for grid integration of PV</b>	Printed, PDF	EN	IR	14	YES	YES	
D3.2a	3	<b>NEW -European Advisory Paper – key recommendations</b>	Printed, PDF	EN	FR	20	YES	YES	New deliverable
D3.2b	3	<b>NEW - European Advisory Paper – Consultation version</b>	PDF	EN	FR	22	NO	NO	New deliverable
D3.2c	3	<b>NEW – Final European Advisory Paper – with 3 annexes</b>	PDF	EN	FR	28	YES	YES	4 additional case studies delivered in annex II and a barrier assessment report in Annex III
D4.1	4	<b>Project Website</b>	Web-based	EN	PR1	5	N/A	NO	
D4.2	4	<b>Project Visual Identity Guidelines</b>	PDF, other	EN	PR1	5	NO	NO	
D4.3	4	<b>4 press releases</b>	PDF	15 languages	IR, FR	6; 9; 13-15, 20	YES	NO	
D4.4	4	<b>10 project articles</b>	PDF	Several	IR, FR	30	NO	NO	
D4.5	4	<b>Project leaflet</b>	PDF, printed	15 languages	PR1	5	YES	YES	

<b>Del. N°<sup>1</sup></b>	<b>W P N°<sub>1</sub></b>	<b>Deliverable name<sup>1</sup></b>	<b>Available format(s)</b>	<b>Available language(s)</b>	<b>Initial submission with:<sup>2</sup> (PR1, IR, PR2)</b>	<b>Actual month of completion</b>	<b>Available on project website?<sup>3</sup> (yes, no)</b>	<b>Hard copy with FR (yes/no)</b>	<b>Information on deviation to Annex I<sup>4</sup></b>
D4.6	4	<b>10 project presentations</b>	PDF	EN	IR, FR	30	NO	NO	
D4.7	4	<b>15 National Forums</b>	Other	N/A	IR	15	NO	NO	
D4.8	4	<b>15 National Forum proceedings</b>	PDF	EN	IR, FR	28	YES (separately for each Forum)	NO	An additional forum was organised in France
D4.9	4	<b>15 National Workshops</b>	Other	N/A	FR	27	NO	NO	
D4.10	4	<b>15 National Workshops proceedings</b>	PDF	EN	FR	30	NO	NO	An additional workshop was organised in Belgium on month 30
D4.11	4	<b>First European Forum</b>	other	EN	FR	18	YES	NO	
D4.12	4	<b>Final European Forum</b>	PDF	EN	FR	29	YES	NO	
D4.13	4	<b>Initial project report</b>	Printed, PDF	EN	IR	12	YES	YES	
D4.14	4	<b>Final Project report</b>	Printed, PDF	EN	FR	28	YES	YES	
D5.1	5	<b>UPDATED IEE COMMON PERFORMANCE INDICATORS</b>	PDF	EN	FR	3	NO	NO	

<sup>1</sup> This information must be identical with your List of Deliverables in Annex I of your grant agreement. If additional deliverables were produced indicate "new" next to the deliverable name. If a deliverable was renamed, please indicate the old and the final title in this overview to facilitate its identification.

<sup>2</sup> Indicate the relevant report (PR1, IR or PR2). Note that deliverables indicated as CO (= confidential) must also be submitted to the EACI in order to be able to assess the effort related to the activities/deliverable(s).

<sup>3</sup> All key deliverables with public dissemination level (PU) should be available for public download in all available language versions. Deliverables uploaded at an internal website area are not considered as being uploaded for public download. As general rule deliverables should be available for download without requiring registration or similar actions.

<sup>4</sup> Explain any kind of deviation, e.g. format, length, language(s) etc.

**5.2 Table 2: Updated excel table of hours per partner and work package**

		CO1	CB2	CB3	CB4	CB5	CB6	CB7	CB8	CB9	CB10	CB11	CB12	
Actual & planned achievement		BSW	eclareon	EPIA	ASIF	APESF	Assosolare	BPVA	CZEPHO	ENERPLAN	HELAPCO	Holland Solar	PTPV	
		Total partners												
WP1	actual	5786	1805	314	310	31	168	14	96	209	92	173	176	235
	planned	5770	1691	269	271	31	174	14	173	234	172	173	174	233
WP2	actual	8438	351	2579	22		353	261	457	433	143	286	390	447
	planned	8951	465	2292	25		440	261	440	440	440	440	440	440
WP3	actual	7624	805	513	708		37		35	537	107	197	97	34
	planned	7088	491	592	591		34		34	641	35	34	34	34
WP4	actual	8597	810	237	1266		535	128	448	470	888	444	393	560
	planned	9456	847	212	1165		519	128	520	572	520	520	519	520
WP5	actual	30	30											
	planned	205	205											
WP6	actual													
	planned													
TOTAL	actual	28177	3800	3643	2306	31	1093	403	1036	1648	1229	1100	1056	1276
	planned	28988	3699	3365	2052	31	1167	403	1167	1887	1167	1167	1167	1227

		CB13	CB14	CB15	CB16	CB17	CB18	CB19	CB20	CB21	CB22	CB23	
Actual & planned achievement		Total partners	PV Austria	edora	SSE	SAPI	ENEL	Lumen	RWE	DERlab	COMILLAS	UNEF	ASSORINN OVABILI
<b>WP1</b>	actual	<b>5786</b>	176	213	179	195	104	125	145	250	239	230	308
	planned	<b>5770</b>	173	175	173	174	234	126	235	273	234	204	160
<b>WP2</b>	actual	<b>8438</b>	534	364	449	775		1			29	381	185
	planned	<b>8951</b>	540	540	540	540		1		24	24	440	179
<b>WP3</b>	actual	<b>7624</b>	37	68	40		639	194	590	1229	1090	522	148
	planned	<b>7088</b>	34	33	34	34	591	193	591	1390	1086	491	91
<b>WP4</b>	actual	<b>8597</b>	511	507	198	145	119		74	209	131	340	185
	planned	<b>9456</b>	520	519	520	519	89		88	121	121	526	391
<b>WP5</b>	actual	<b>30</b>											
	planned	<b>205</b>											
<b>WP6</b>	actual												
	planned												
<b>TOTAL</b>	actual	<b>28177</b>	<b>1257</b>	<b>1151</b>	<b>866</b>	<b>1115</b>	<b>862</b>	<b>320</b>	<b>809</b>	<b>1688</b>	<b>1489</b>	<b>1472</b>	<b>826</b>
	planned	<b>28988</b>	<b>1267</b>	<b>1267</b>	<b>1267</b>	<b>1267</b>	<b>914</b>	<b>320</b>	<b>914</b>	<b>1808</b>	<b>1465</b>	<b>1661</b>	<b>821</b>

### 5.3 Table 3: List of contact persons after end of the action

Participant N°	Participant Short name	first name of contact person	Family name of contact person	E-mail	Telephone N°
1	<b>BSW-Solar</b>	Jorg	<b>Mayer</b>	<a href="mailto:mayer@bsw-solar.de">mayer@bsw-solar.de</a>	+49 30 29 777 88 51
2	<b>eclareon</b>	Robert	<b>Brückmann</b>	<a href="mailto:rb@eclareon.com">rb@eclareon.com</a>	+49 30 246 286 93
3	<b>EPIA</b>	Manoel	<b>Rekinger</b>	<a href="mailto:m.rekinger@epia.org">m.rekinger@epia.org</a>	+32 2 7095543
7	<b>BPVA</b>	Mariya	<b>Trifonova</b>	<a href="mailto:mtrifonova@bpva.org">mtrifonova@bpva.org</a>	+359 2 44 222 28
8	<b>CZEPHO</b>	Veronika	<b>Knoblochová</b>	<a href="mailto:veronika.knoblochova@czepho.cz">veronika.knoblochova@czepho.cz</a>	+420 722 562 453
9	<b>ENERPLAN</b>	Richard	<b>Loyen</b>	<a href="mailto:richard.loyen@enerplan.asso.fr">richard.loyen@enerplan.asso.fr</a>	+33 4 42 32 43 23
10	<b>HELAPCO</b>	Stelios	<b>Psomas</b>	<a href="mailto:spsomas@otenet.gr">spsomas@otenet.gr</a>	+30 210 8221862
11	<b>Holland Solar</b>	Arthur	<b>de Vries</b>	<a href="mailto:adevries@celstar.nl">adevries@celstar.nl</a>	+3226334740
12	<b>PTPV</b>	Stanislaw M.	<b>Pietruszko</b>	<a href="mailto:pietruszko@pv-poland.pl">pietruszko@pv-poland.pl</a>	+48 22 234 7782
13	<b>PV AUSTRIA</b>	Vera	<b>Liebl</b>	<a href="mailto:office@pvaustria.at">office@pvaustria.at</a>	+43 (0)1 522 35 81 50
14	<b>edora</b>	Frank	<b>Gerard</b>	<a href="mailto:fgerard@edora.be">fgerard@edora.be</a>	+32 2 217 96 82
15	<b>SSE</b>	Jan Olof	<b>Dalenbäck</b>	<a href="mailto:Jan-Olof.Dalenback@chalmers.se">Jan-Olof.Dalenback@chalmers.se</a>	+46 31 772 1153
16	<b>SAPI</b>	Marek	<b>Harvis</b>	<a href="mailto:marek.harvis@sapi.sk">marek.harvis@sapi.sk</a>	+421 - 908 215 990
17	<b>ENEL</b>	Riccardo	<b>Lama</b>	<a href="mailto:riccardo.lama@enel.com">riccardo.lama@enel.com</a>	+39 06 8305 4850
19	<b>RWE</b>	Carmen	<b>Calpe</b>	<a href="mailto:Carmen.Calpe@rwe.com">Carmen.Calpe@rwe.com</a>	+49 201 12-29403
20	<b>DERlab</b>	Diana	<b>Craciun</b>	<a href="mailto:diana.craciun@iwes.fraunhofer.de">diana.craciun@iwes.fraunhofer.de</a>	+49 5617294126
21	<b>COMILLAS</b>	Carlos	<b>Mateo</b>	<a href="mailto:Carlos.Mateo@iit.upcomillas.es">Carlos.Mateo@iit.upcomillas.es</a>	+34 91 542-2800 ext. 2708
22	<b>UNEF</b>	Lucia	<b>DÓLERA</b>	<a href="mailto:asociados@unef.es">asociados@unef.es</a>	+34915900300
23	<b>Assorinnovabili</b>	Luisa	<b>Calleri</b>	<a href="mailto:l.calleri@assorinnovabili.it">l.calleri@assorinnovabili.it</a>	+39 06/8552293