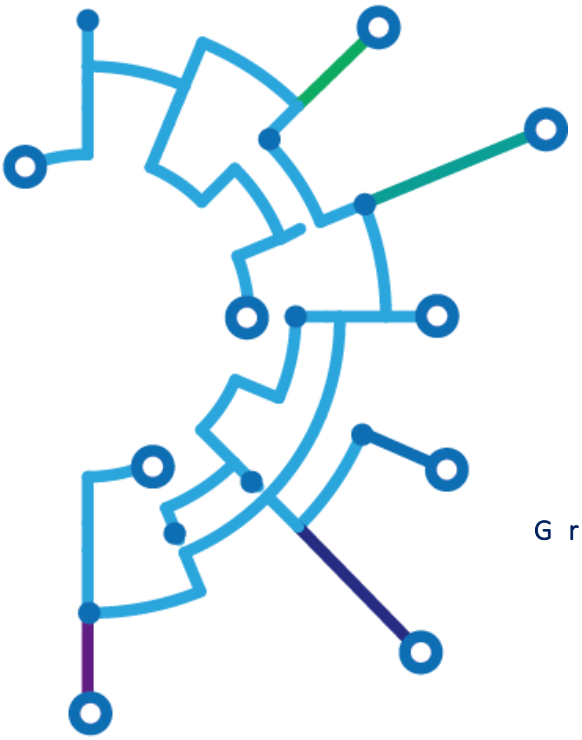

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PV IMPACT

Actual execution of the Implementation Plan for Photovoltaics and monitoring the Implementation Plan's delivery

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D1.6 – Intermediate report on WP 1 focusing on mentoring support

Month 19 – Month 36

Disclaimer of warranties

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About PV IMPACT

PV IMPACT will try out a variety of approaches to stimulate PV research, development and innovation initiatives in Europe. The first part of the project will focus on inviting companies to match-making events so they can find partners with whom to work on future projects under EU and/or national funding schemes. The project will also target two specific industrial companies: ENEL Green Power and Photowatt. Another important part of the project will be to monitor progress in PV. Data will be collected on public spending in the EU, on private spending, on the kinds of projects being funded and on the overall performance of PV technology. Forecasts for future spending will be made according to various scenarios. The project will track whether improvements in the performance of technology are keeping pace with expectations and will make recommendations to European funding authorities.

PV IMPACT Partners

EUREC The Association of European Renewable Energy Research Centres

enel Green Power

Photowatt

eit InnoEnergy Knowledge Innovation Community

Fraunhofer ISE

3E

Consiglio Nazionale delle Ricerche

BECQUEREL INSTITUTE

imec

eurac research

WIP RENEWABLE ENERGIES

Document information

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PU	Public	X
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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1. Introduction

As it was introduced in previous deliverables, one of the core objectives of the PV IMPACT project was to foster innovation in the area of PV technology by supporting the realisation of the R&I activities and the achievement of the targets established in the SET-Plan Implementation Plan on PV. PV IMPACT was structured to provide a place and an opportunity for scientists and industry leaders of the PV sector to interact, connect and find the right complementarities to collaborate among each other and create new value for the industry.

To achieve this target, a series of Match-making events have been organised along the past 3 years within the Work Package 1 of the PV IMPACT project. The objective was to put different stakeholders in contact with other industry players in a creative and energetic environment to foster the creation of new connections and enable potential partnerships. Ultimately, the project intended for the best project ideas presented in the match-making sessions to evolve into future projects under international and/or national funding schemes, which would transform into a real-world impact in the PV market, by bringing innovative solutions to increase the added value of the existing PV technologies and business models.

In this report, more details are provided on the principles of mentoring support offered by the consortium partners to the awarded participants. The selected project ideas, which were most voted for in each of the sessions are presented alongside some success stories of mentoring support. The activities described in this deliverable represent the outcome of the mentoring support offered in the second half of the project (i.e. months 19 to 36).

2. Support principles

The WP1 of the PV IMPACT project, through the organisation of several match-making events, has created the opportunity to bring stakeholders from the PV sector together and facilitate new collaborations among them. Along the different sessions, the organising partners from the consortium provided information about different national and international funding mechanisms throughout Europe as well as relevant funding agencies. These initiatives were introduced to the participants as informative presentations during the opening of the match-making sessions.

Here is a summary of the principles of the mentoring support offered:

1. Each participant of the Matchmaking event received a detailed individual report made by WP1 PV IMPACT partners after each event, identifying the best "matching" interactions they had during the session, according to the scoring they gave and the scoring they received from every other participant.

2. Apart from the individual report, the winners of each session were selected by the participants through a voting and ranking scheme, as explained in D1.3 and D 1.4.

3. PV IMPACT project remained available beyond the match-making events to provide further support to these winning participant(s) with information on the know-how of forming a consortium and applying for calls different from EC funding mechanisms, focusing on local, and national funding calls.

4. For those winning participants interested in the mentoring support, the consortium partners offered relevant information and facilitated contacts within the national funding agencies, dissemination, and collaboration spacing (i.e. support to consortium building by finding additional partners if required using the existing PV IMPACT project contact networks).

As part of the reporting commitments of the PV IMPACT project, in theory, this deliverable should have presented a series of success stories as an outcome of the mentoring support given. In practice, PV IMPACT's match-making events provided leaders and professionals from the PV industry an opportunity to network with other relevant experts and pitch their project ideas to find potential collaborations that would impact the industry. The reality is that these networking events did indeed promote innovative concept sharing, which shall eventually lead to successful project applications. However, quantifying such success stories with straightforward, tangible outcomes within the timeframe of the PV IMPACT's project execution was proven to be complicated. Once this was realised, an internal discussion among the organising partners was started, which supported by the feedback received from the participants lead to the conclusion that the landscape should be broadened to address such limitations to report success stories. Satisfaction surveys are also included in the reporting process, in place of any successful funding applications or

collaborations. The consortium partners periodically reached out to participants with the questionnaire, which provided feedback on the effectiveness of the PV IMPACT events as a professional network initiator.

3. Support for winning project ideas

3.1 Ranking Principles

The Matchmaking events included a ranking procedure, where each participant scored his/her interaction with the other participants. At the end of the event, all scores were evaluated and the three top-ranked partcipants were determined and presented in two categories:

- Best project idea (with score higher than 60/100)
- Highest collaborative potential with the other participants

The first ranking was established based on the evaluation made by the participants, who scored the project ideas they have heard. The first three top-ranked project ideas (having a score above 60/100) were offered mentoring support from the PV IMPACT consortium as defined in Section 2.

The second ranking was established based on the results of the evaluated collaborative potentials of participants, the idea being to trigger effective collaboration. As defined in Section 2, after the event, participants received a detailed individual report made by the consortium partners with the information obtained through the voting system.

3.2 Mentoring support

Event #6: Building-integrated PV (February 2021, online event)

Two projects received support following the BIPV match-making sessions. Dieter Geyer from ZSW received support by looking into the latest Horizon Europe calls (cluster 5) to identify which would be relevant for their application. This fulfilled the interest of ZSW in the PV impact support.
The other project was presented by Prof. Estefanía Caamaño-Martin from the Universidad Politecnica de Madrid (CIMEA – UPM) with an idea for BIPV solutions for integrated energy renovation actions. The support provided by PV impact consisted in identifying the best suited project proposal calls from the Horizon Europe program to further fund their research activities.

Event #7: Manufacturing Technologies (May 2021, online event)

Two projects received support following the Manufacturing Technologies match-making event.
Fistly, a project idea from Imec/Solliance, for a new PV product called enFoil, which is based on a thin film technology fully embedded in a flexible element. They consider that their technology is mature enough to go straight for manufacturing and aim for various market sectors (such as BIPV and VIPV). The support provided by PV impact consisted in advising viable financing sources for their product development, including the different instruments from the EU and from InnoEnergy.

They had already applied for an EIC project. Further support was requested for the development of business cases for their product, but the preparation of such a study goes beyond the time allocation for project support in the frame of PV IMPACT.
Secondy, a project from Dansk Solarenergi, for the manufacturing of solar tiles and solar roofs in colors. Dansk Solarenergi was searching for paths to increase the production capacity of his product. Different financial instruments were presented to Mr. Rivadeneira, including those proposed by InnoEnergy and those from the EU (e.g. the EIC). Mr Rivadeneira was also invited to present his project in the subsequent PV Impact BIPV match-making event in order to support his search for further investors.

Event #8: Operations and Diagnosis (June 2021, online event)

The most voted participant of this session was Stephan Abermann (7.90/10) - AIT Austrian Institute of Technology. Stephan Abermann was voted in the first event, reported in D 1.5. The project idea from Stephan Abermann was already quite mature and opted to go for funding under a H2020 call. Therefore, no further support/mentoring was given to him following the first event, due to EC funding's "equal opportunities/treatment" principle. However, during event No. 8, he pitched a new idea to develop digital solutions for PV power plants O&M, such as models and algorithms that automatically identify, classify, and evaluate potential problems based on error patterns and subsequently provide recommendations for action to answer the most relevant technical, economic questions. This time, mentoring support was provided from 3E on calls from ERA.NET, EUREKA, and INTERREG. Moreover, the pathway to InnoEnergy's three fundamental instruments to support innovation in the energy sector was also explained. Apart from that, Pierre-Jean Alet from CSEM was also selected for follow-up. He didn't have a concrete project idea, but there was a keen interest to learn about funding possibilities. He was looking for partners with new use cases in the area of developing and transferring algorithms for production asset management, optimal control of energy flows and flexibility, and forecasting to industry.

Event #9: Building-integrated PV (October 2021, online event)

In the BIPV session (October 2021), Astrid Schneider from the TU Vienna received the best ranking for her idea, unlocking further support from the PV impact project. The project she presented was about solar window shutters. She received information about potential funding sources for her project idea. She was particularly interested in a specific Solar ERA NET call. The support provided by PV Impact was centered around a throughout read of the call text to understand the scope required and help her assess whether her project would match it. Further help to prepare the proposal was requested, but considering that solar ERA NET is a cofunded action also linked to the EC, which is considered within the scope of the European funding schemes, no further support was given to Mrs. Schneider by PV Impact, in order to conform to the "equal opportunities/treatment" principle.

Event #10: Floating PV (November 2021, online event)

The winning proposal for the match-making event on Floating PV in November 2021 was lead by Karolin Baltins, Head of Group PV Power Plants at Fraunhofer ISE. Her project idea dealt with

innovative system solutions for Floating PV, which could significanly bring down costs. In this case, the topic of the event was very specific – an area in which Fraunhofer ISE already has big expertise – which limited the support available from the rest of the partners. Nevertheless, the PV Impact team supported the winning proposal by call-scouting for the project idea and was able to help in sharpening the project proposal through expert feedback discussions.

Event #11: Agri PV (November 2021, online event)

The match-making event on Agri-PV was of a very high level of quality. Consequently, three winning proposal were awarded. One of the winners was Michael Salvador from Mirai Solar. He presented the concept of foldable solar foils, which can be implemented inside a greenhouse to produce electricity and to reduce exposure of the plants. Support was provided in the form of discussion of the technical challenges and business opportunities, followed by consulting on solution options and further contact points. Another idea was from Mike van Iseghem from EDF, who presented new applications for Agri-PV. He received consulting support on challenges and opportunities of Agri-PV implementation. The third idea was from Philippe Vermeulen (Avalon), who presented the idea of initiating Agri-PV business activities in Tunisia through an existing company active in agriculture. The PV impact team provided consulting support on technical opportunities and in particular helped in developing a business case for this activity. Specific follow-up is still ongoing with Mirai Solar, by looking into potential investment opportunities through InnoEnergy and also with Avalon, where the InnoEnergy team is also guiding them on the launch of a call for proposals.

Event #12: Perovskite-silicon tandems (December 2021, online event)

A high interest was shown for participating in this match-making session under the topic of Perovskite-silicon tandems, having very top profiles among the participants and as a result, very high valuations given. The most voted participant was senior researcher at Imec, Hariharsudan Sivaramakrishnan Radhakrishnan, specialised in world class research on advanced thin film and wafer-based technologies, who presented different collaboration opportunities in the areas of different material combinations, different cell architectures and module interconnection options, next generation technologies and application domains and application of sustainable solutions. When approaching Mr Radhakrishnan to offer the mentoring support, he stated that his main interest was now focused on further exploring the conversations he had started with other participants, which had good potential for collaborations. The second most voted participant was Dirk Hauschild, researcher scientists at Karlsruhe Institute of Technology (KIT). Mr Hauschild's project idea was based on the characterisation of the chemical and electronic structure of surfaces and interfaces to aid in the development of long term stable and Pb free perovskite/silicon tandem solar cells. The mentoring team supported him by introducing him to different device manufacturing partners to enable conversations on structural levels, providing crucial input for further development of perovskite based tandem solar cell devices. The third most voted participant was Dr. Weiyuan Duan, who works at the Institute of Energy and Climate Research (IEK)

and is an expert in the areas of Semiconductor Device Physics and Solar Energy Materials. In her case, she was also focused on exploring the contacts she had made during the session.

Event #13: Operations and Diagnosis (December 2021, online event)

For this event focused on operations and diagnosis, two winning participants were selected. Kaan Yurtseven (Solar Energy Institute at Ege University) and Gofran Chowdhury (3E) received the same voting points in best project ideas. As Gofran Chowdhury is already working in 3E, a PV IMPACT consortium partner, only Kaan Yurtseven (Ege University, Turkey) was selected for the mentoring follow-up. In the webinar, Kaan Yurtseven represented the solar PV research team led by Engin Karatepe. The research group didn't have concrete project ideas, but they exhibited interest to formulate a consortium and apply for funding soon. They have some experience with research collaboration with German commercial PV companies. Therefore, as the participant is from Turkey, the mentoring activity was tailored to funding opportunities where Turkey is eligible to apply. The group expressed interest in future collaboration in calls from EUREKA clusters funded by TÜBİTAK. However, the deadline for the 2022 call was on the 17th April, so it was too late to apply this year. Moreover, they do qualify to apply for funding through Interreg too and the deadline is in Q4 2022. Even though the PV IMPACT project will be concluded by that time, 3E remains available to introduce the Ege University research group to the right companies/ research institutes to create a consortium.

Event #14: Vehicle-integrated PV (March 2022, online event)

Three project ideas were awarded in the match-making event on vehicle-integrated PV in March 2022. The most voted one was from Adolis Jančiauskas from Metsolar, a European manufacturer of custom-made solar panels for BIPV, lighting and other applications. There was no mentoring support in this case, based on the highly-mature commercial status of the company, aiming for further customer engagement and industrial collaborations out of the partners' scope of action. The second project idea was from Bertrand Chambion from CEA. However, there was no specific project idea, as Mr Chambion was more focused on facilitating innovation and networking on VIPV domain and technical discussions on R&D subjects dedicated to VIPV, thus further follow-up was not viable. The third project idea was from Kaining Ding, from Forschungszentrum Juelich, automotive manufacturer on VIPV R&D focused on the cell and module fabrication for VIPV. A follow-up call took place to further discuss his idea; operation of a silicon heterojunction cell and module line, which can contribute with flexible cell and module R&D to innovative VIPV solutions. Conversations for further support are still on-going.

Event #15: Perovskite PV (March 2021, online event)

Concerning the Perovskite PV match-making session organised in March 2022, there was one winner idea brought by Guy Beaucarne, Scientist at Dow Silicones Belgium srl. Mr Beaucarne and his team are working on a glass lamination technology using a new silicone material which can cure at low temperature, even room temperature, and provide gas tight laminates. Further mentoring

services were offered to support their encapsulation technology, but there has been no reaction to our offer to the date.

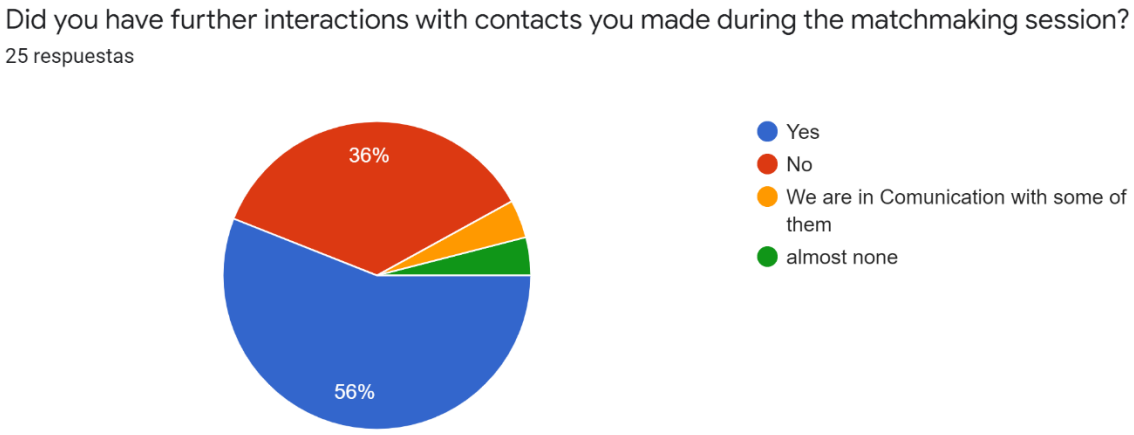
4. Impact of this activity based on survey results

Impact of match-making events based on the answers from the surveys:

As previously mentioned, in order to quantify the impact of the match-making sessions, WP1 partners sent out a survey to all the participants that had taken part in the sessions since the beginning of the project. The questions in the survey were oriented towards understanding the following critical success factors:

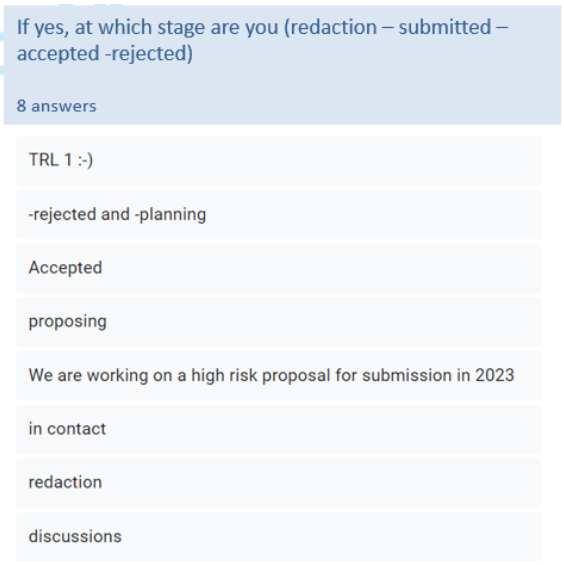
- What benefits did they obtain from the session?
- Were they still in conversations/business with any of the other participants?
- Were they collaborating in any way?
- Were they involved in a project proposal triggered by the match-making sessions?
- What was the status of their project proposal?

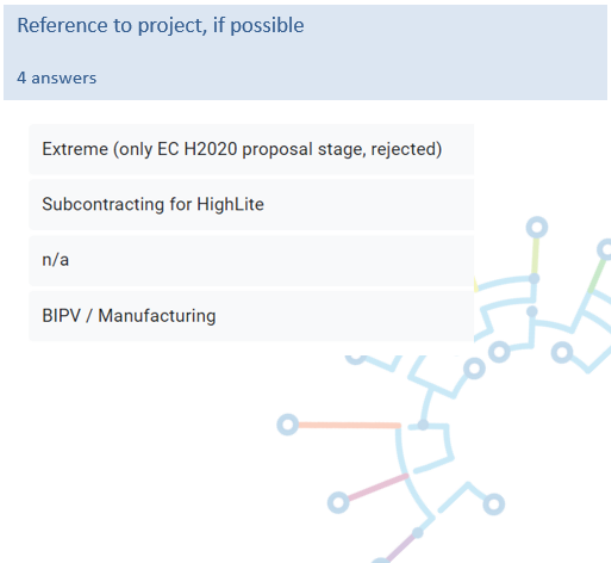
The survey was sent to a total of 140 participants who had attended the match-making sessions. Out of these, 25 had participated on more than one occasion, which is a positive indicator. The answer rate was 25 answers out of 140. However it should be considered that some of them had already changed their email addresses (probably due to a change of company). From these 25 replies, it can be highlight that all the participants found the match-making experience enriching and valuable. 50% of them confirmed that they had followed-up with some new contacts (i.e. other participants) after the event, and 7% answered they were still working closely with some participants.



Nine of them also explained that they were collaborating on a project definition. However, due to the long incubation period of funding applications, it would take some time before a successful application could be reported.

More details on the survey results are reported in D1.4. There were multiple successful partnerships and consortiums that originated from the PV IMPACT's match-making events.





On top of this, through the mentoring support, both InnoEnergy and the technical partners supported some of the most voted participants/entities in searching for private investments, research opportunities, or improving the quality of their business models or written applications.

5. Overall lessons learned

Both the match-making events and the mentoring activity were a steep bi-directional learning curve for PV IMPACT partners. The organisers were continuously in the loop receiving feedback from participants and the match-making topics and style were also improved based on this feedback. After internal discussion among the project partners, based on the feedback received from the participants, these are the different hypotheses to explain the outcomes/impact obtained from this WP:

- Participants who had concrete project ideas pitched their ideas during the match-making events and found a good overlap of expertise to prepare a consortium and apply for funding. This is the best-case scenario where a clear connection was drawn between the PV IMPACT and a consortium creation.

- Participants who didn't have concrete project ideas listened to each other's offerings. At some point, they were introduced to a secondary network through their primary contacts. A few months down the line, they formed project ideas/proposals to create a consortium and submit a funding application. However, by this point, it has not been easy to track those secondary network collaborations and link PV IMPACT match-making as the reason behind the collaboration.

- There were cases where participants who joined the match-making event knew each other professionally. As the participants are from a similar field of expertise, it is not surprising that they had prior encounters. In this situation, even if the participants form a consortium and apply for funding, the connection between the event and their application could have been the trigger, but this is hard to prove.

- Furthermore, the incubation period of any successful funding application is long. Therefore, the impact cannot be quantified with many successful projects only a few months after the match-making event has taken place.

- There was a key limiting factor within the scope of the mentoring activity. As it was limited to national applications, there were considerably lower collaboration opportunities among cross-national participants. Participants' feedback highlighted that it would have been more effective for the mentoring support to be based on financial support for launching the project proposal or consortium building. As PV IMPACT was limited to mentoring activity combined with knowledge base creation, it didn't have scope to expand to such context.

6. Conclusions

PV IMPACT has offered, as planned, mentoring and general guidance to the winning participants from each workshop, including lessons learned from previous project funding applications, tips, and tricks to write a winning proposal, or finding potential partners for the companies´ project idea. In the 2nd reporting period (month 19-36), the offered match-making webinars were increased. Mainly thanks to continuous feedback from participants we received during the 1st period, the webinars were improved to attract the attention of the industry. The number of participants was also reduced to provide more time and enable more focused pitches. To do this, a rigorous selection was done on the applied participant list.

As it has previously been highlighted, not being able to provide support on EC funding opportunities has been proven one key limiting factor of the mentoring activity. Nevertheless, the consortium partners were able to find, on many occasions, other areas of support which added value to the winning participants such as introduction to interesting parties along their value chain, marketing and communication tips and opportunities, access to expert knowledge and feedback or guidance on national funding opportunities.

One of the conclusions drawn from this second part of the mentoring activities is that many participants were already satisfied with the interactions created during the match-making sessions, thus not requesting further support from the consortium partners. This has not been considered as a sign of little value added from the services offered through mentoring, but on the other hand, of a strong impact already created through the interactive sessions, based on a good selection of profiles for the discussions.

All in all, based on the feedback received from the participants and our own experience from the organising partners, we can conclude that the PV IMPACT project has succeeded in creating a rigth platform/environment to foster collaborations which will lead to interesting and impactful projects in the PV industry.

7. Contacts

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