



DRAFT Minutes
Forty-Seventh Meeting of the Executive Committee of the
IEA Photovoltaic Power Systems Programme
Leuven, Belgium, 26-27 April 2016

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1. Welcome from Copper Alliance, IMEC and Belgium

10 The chairman, Mr. Stefan Nowak, opened the 47th meeting and thanked Mr. Fernando Nuno, ExCo Copper Alliance, Ms. Yolande Pianet, Copper Alliance Communications Assistant, Mr. Jef Poortmans, Program Director PV, IMEC and Ms. Inge Struys, External Communications IMEC, for organizing the ExCo meeting at IMEC in Leuven, Belgium, and expressed the Executive Committee's thanks for the use of the IMEC facilities and Faculty Club, Leuven.

15 On behalf of Copper Alliance, Mr. Nuno welcomed participants and thanked them for their strong presence and efforts, in spite of the recent tragic events in Belgium. He gave details on the meeting's logistics and events and highlighted points on the IMEC technical tour. He then introduced Mr. Jef Poortmans, IMEC.

20 On behalf of IMEC, Mr. Jef Poortmans welcomed the IEA PVPS Executive Committee, Operating Agents and meeting observers. Mr. Poortmans gave a presentation on "IMEC & IMEC's Energy Activities," as well as a brief outline on the IMEC Technical Tour.

25 On behalf of Belgium's Three Regions, Mr. Gregory Neubourg, ExCo representative of ExCo Belgium, welcomed all participants to Leuven and thanked both Copper Alliance and IMEC for providing this opportunity. Mr. Neubourg gave a presentation on "Photovoltaics in Belgium" with a review of energy targets and statistics, PV market development, the PV industry and research.

2. Welcome and Announcements by IEA PVPS

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Mr. Nowak welcomed and thanked Mr. Paolo Frankl, IEA RED Head, International Energy Agency, the ExCo members, Operating Agents and observers for their presence. The chairman was pleased to welcome Ms. Leen Van Lishout, ExCo Belgium, Ms. Laurence Polain, ExCo Belgium, Mr. Bart Hedeboom, ExCo Belgium, Ms. Ariane Catala, Observer, Brussels Environment, Dato Dr. Nadzri bin Yahaya, ExCo Malaysia, Ms. Siti Aishah binti Mohammad, Assistant to ExCo Malaysia, Ms. Thanyalak Meeshap, ExCo Thailand Alternate, Ms. Patthamaporn Poonkasem, ExCo Thailand Alternate, Mr. Ioannis-Thomas Theologitis, ExCo SolarPower Europe and Mr. Georgi H. Yordanov, Observer, EnergyVille, KU Leuven, to their first IEA PVPS ExCo meeting.

40 **3. Recognition of Meeting Participants**

The chairman apologised for the absence of the following ExCo members and Operating Agents:

- Mr. John Gorman, Canada
- 45 • Ms. Karin Wikman, Finland
- Mr. Yvonnick Durand, France
- Ms. Rona Sarfaty, Israel



EXECUTIVE COMMITTEE

PHOTOVOLTAIC POWER SYSTEMS TECHNOLOGY COLLABORATION PROGRAMME

- Mr. Salvatore Castello, Italy
- Mr. Jaime Agredano, Mexico
- 50 • Mr. Bouke Bussemaker, The Netherlands
- Mr. Pedro Valverde, Portugal
- Ms. Julia Hamm, SEPA
- Mr. Tom Kimbis, SEIA
- Mr. Stefan Oberholzer, Switzerland
- 55 • Mr. Thammayot Srichuai, Thailand
- Mr. Ahmet Yilanci, Turkey
- Ms. Carol Olson, Task 12 Deputy OA
- Mr. Roland Bründlinger, Task 14 OA

- 60 Mr. Stefan Nowak, Switzerland, welcomed participants:
 - Ms. Renate Egan, Australia
 - Mr. Hubert Fechner, Austria
 - Ms. Leen Van Lishout, Belgium
 - 65 • Ms. Laurence Polain, Belgium
 - Mr. Bart Hedebouw, Belgium
 - Mr. Gregory Neubourg, Representing the 3 Belgian Regions, Belgium
 - Ms. Ariane Catala, Observer, The Brussels Environment, Belgium
 - Mr. Xu Honghua, China
 - 70 • Mr. Fernando Nuno, Copper Alliance
 - Mr. Flemming Kristensen, Denmark
 - Mr. Peter Ahm, Denmark
 - Mr. Pietro Menna, European Commission
 - Mr. Fabio Belloni, European Commission
 - 75 • Mr. Jero Ahola, Finland Alternate
 - Mr. Paul Kaiijk, France Alternate
 - Mr. Christoph Hünnekes, Germany
 - Mr. Salvatore Guastella, Italy
 - Mr. Hiroyuki Yamada, Japan
 - 80 • Mr. Masanori Ishimura, Japan Alternate
 - Mr. Donngun Lim, Korea
 - Mr. Dato Dr. Nadzri bin Yahaya, Malaysia
 - Ms. Siti Aishah binti Mohammad, Assistant to ExCo Malaysia
 - Mr. Otto Bernsen, The Netherlands Alternate
 - 85 • Mr. Bjorn Thorud, Norway
 - Ms. Lisa Henden Groth, Norway Alternate
 - Mr. Ioannis-Thomas Theologitis, SolarPower Europe
 - Ms. Ana Rosa Lagunas, Spain
 - Ms. Thidarat Sawai, Thailand Alternate
 - 90 • Ms. Patthamaporn Poonkasem, Thailand Alternate
 - Mr. Lenny Tinker, United States of America
 - Mr. Gaëtan Masson, Task 1 Operating Agent
 - Ms. Hedi Feibel, Task 9 Operating Agent



- 95 • Mr. Garvin Heath, Task 12 Operating Agent
- Ms. Ulrike Jahn, Task 13 Operating Agent
- Mr. Christoph Mayr, Task 14 Operating Agent
- Mr. Michiel Ritzen, Task 15 Operating Agent
- Ms. Martje Van Horrik, Assistant to Task 15 OA
- Mr. Jef Poortmans, Program Director PV, IMEC
- 100 • Mr. Georgi H. Yordanov, Observer, Researcher, EnergyVille, KU, Leuven
- Mrs. Mary Brunisholz, PVPS Executive Secretary

4. Adoption of the Agenda

105 ExCo members received meeting documents in a PDF file package prior to the meeting. The same documents were posted on the internal website. All presentations made at this ExCo can also be found on the internal website.

Decision: The ExCo approved the agenda.

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5. Minutes of the 46th meeting of the IEA PVPS Executive Committee, Daegu, Korea

A few amendments were received and included in the final version.

115 Decision: The ExCo adopted the Minutes of the 46th IEA PVPS ExCo Meeting.

Action: The ExCo Secretary shall send the adopted minutes to the ExCo members and the IEA Secretariat.

6. Status of the Participation to the Technology Collaboration Programme

120 **(Brazil, Chile, Cyprus, DEWA, ECREEE, India, IPVEA/SOLARUNITED, Morocco, Singapore, South Africa)**

Brazil: Following contact through Ms. Muriel Watt, IEA PVPS ExCo Australia Alternate, in November 2015, the IEA PVPS chairman sent a detailed IEA PVPS information note regarding membership in IEA PVPS to the Scientific Directorate, Brazil.

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Action: The chairman shall inform the ExCo concerning Brazil's interest in participation.

Chile: Chile's Department of Renewable Energy of the Ministry of Energy formally asked the International Department of the same Ministry to endorse membership in the IEA PVPS TCP. There is a decree which must be signed by the minister, as well as by the Treasury and Foreign Affairs ministries.

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Chile is in the final step of the process which is expected to end during the coming weeks. Chile looks forward to confirming their PVPS membership participation.

Action: The chairman shall update the ExCo on Chile's IEA PVPS membership progress.

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Cyprus: Following discussions with Mr. Hubert Fechner, ExCo Austria and PVPS Vice-Chair, Mr. George E. Georghiou, Director, FOSS Research Centre for Sustainable Energy, PV Technology, University of Cyprus has conferred with the Ministry about the participation of Cyprus in IEA PVPS and they are willing to follow up on membership in detail.

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Action: The chairman shall update the ExCo on any progress concerning Cyprus's membership in PVPS.



145 **Dubai Electricity & Water Authority (DEWA):** In early April 2016, Ms. Ana Rosa Lagunas, ExCo Spain, met with DEWA in Dubai. DEWA has great interest in PV and is now building multi-megawatt PV plants. BIPV is also important to DEWA. They are building a PV R&D and test laboratory and recently they hosted a workshop together with NREL for soiling-related problems. DEWA has expressed interest in IEA PVPS membership.

Action: The chairman shall inform the ExCo concerning DEWA's interest in participation.

150 **ECREEE:** Mr. Jansenio Delgado and Hannes Bauer, both from ECREEE, recently participated in the Task 9 "virtual meeting" and expressed strong interest to join IEA PVPS as a sponsor member. IEA PVPS sent the invitation to membership letter to ECREEE in 2014. The conditions therein stated still apply.

155 Action: The chairman shall update the ExCo on any progress concerning ECREEE's membership interest.

160 **India:** India has been invited to contact IEA PVPS with their formal interest, and IEA PVPS shall provide the steps necessary towards membership. Ms. Dagmar Graczyk, IEA/EXD/GEP/APL noted that Mr. Fatih Birol, new IEA Executive Director aims to better promote TCPs such as PVPS and to broaden IEA's engagement with partners. India was present at the IEA Ministerial in Paris it is hoped that this will help to catalyse India's interest into membership.

Action: The chairman shall update the ExCo on any progress concerning India's membership in PVPS.

165 **Morocco:** The IEA PVPS Chairman began the process to formalize Morocco's PVPS membership. Morocco is going through a huge restructuring in their energy sector. Mr. Ikken has discussed with Morocco's Energy Minister, who agrees to sign the necessary documents to go forward with the IEA PVPS membership procedure. Morocco hopes to send the membership letter to PVPS as soon as possible.

170 Action: The chairman shall update the ExCo on any progress concerning Morocco's membership in PVPS.

175 **Singapore:** Dr. Thomas Reindl, Deputy CEO SERIS, Solar Energy Research Institute of Singapore, held further discussions with the relevant Ministry and is currently in the process of signing up the right government agency that would take care of IEA PVPS membership on behalf of the Ministry. SERIS participates in Task 14 as an observer.

Action: The chairman shall update the ExCo on any progress concerning Singapore's membership in PVPS.

180 **South Africa:** The South African National Energy Development Institute (SANEDI), through Dr. Thembakazi Mali, indicated that they still have IEA PVPS membership interest and are keen to join IEA PVPS. The IEA PVPS Chairman renewed the formal IEA PVPS Letter of Invitation to South Africa to become a PVPS member. Dr. Mali aims to designate CSIR as Contracting Party. Mr. Stephen Koopman, CSIR, continues to follow up on this matter with Dr. Mali, SANEDI and South Africa's Department of Energy. *N.B. IEA PVPS was informed on 10 May 2016, that South Africa's Chief Directorate: Energy Planning, Department of Energy, wrote to Mr. Fatih Birol, IEA's Executive Director, that they accepted the IEA PVPS membership invitation.*

185 Action: The chairman shall update the ExCo on any progress concerning South Africa's membership in PVPS.



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Action: ExCo members, Operating Agents and the Executive Secretary shall develop contacts and hold discussions with potential new PVPS members. Formal steps on PVPS membership to be provided to interested parties.

195 **7. Changes in ExCo Delegates and Operating Agents**

Mr. Pierre-Jean Rigole is the new ExCo Sweden Alternate, replacing Ms. Gunilla Andrée. Mr. Kuson Chivagon, is ExCo Thailand Alternate. Mr. Bulent Yesilata is ExCo Turkey Alternate. Mr. Lenny Tinker, new ExCo USA, has succeeded Ms. Lidija Sekaric. Mr. Andreas Wade, SolarPower Europe's Strategy Committee Vice-Chair, is proposed as the new Task 12 Deputy Operating Agent (see item 200 18.1), succeeding Ms. Carol Olson.

Action: The PVPS Secretariat shall send out the IEA template form letter to ExCo delegates, to announce ExCo changes to the IEA. The updated ExCo member and Operating Agent list shall be sent to all ExCo members. 205

8. Report from the PVPS Chair (Nowak)

Mr. Stefan Nowak, PVPS Chairman, reviewed the last 6 months of PVPS and presented a brief 210 overview on PVPS outreach in cooperation and membership, strategic internal discussions, progress in the cooperation with international organizations and coordination/interaction within the IEA, including TCPs and recent PVPS Task publications.

PVPS outreach and the consequent visibility through PVPS reports, press releases and events has led 215 to more worldwide references to PVPS publications, a growing number of invitations to international events, as well as increased interest from media, e.g. CNN, A-magasinet (the largest subscribed news magazine in Norway), etc.

IEA PVPS shall be presenting and actively participating at the WEO Workshop on Renewable 220 Energy, Paris, April 2016, Photovoltaica Morocco, May 2016, IEEE PVSC 43, Portland, Oregon (USA), June 2016, EUPVSEC 32, Munich, June 2016 (along with Intersolar at the same time and location) and at Eurosun 2016, Palma de Mallorca, October 2016.

The chairman thanked the ExCo for their attention. 225

9. IEA and REWP Issues (Frankl)

Mr. Paolo Frankl, Head of the Renewable Energy Division, IEA, presented recent issues from the RE 230 Division and the IEA Secretariat Report.

A New Energy Era: The IEA views the universal agreement from COP21 as a historic milestone. With the pledges of 185+ countries accounting for 95% of energy-related emissions, renewables were explicitly referred to in around 100 pledges. Additionally, new records for renewable capacity additions over the last two years and the downturn in prices for all fossil fuels, point to a new energy 235 era.

Emerging Markets and Developing Countries: In this moment of profound change, RE growth is shifting to emerging markets and developing countries. As the OECD slows, non-OECD countries



account for two-thirds of RE growth, driven by fast-growing power demand, diversification needs and local pollution concerns.

240 **IEA Modernization:** There is a new opening to non-member countries and activation of association with China, Indonesia, Thailand, Brazil, India and South Africa, along with a broadening concept of energy security worldwide, in line with the *Electricity Security Action Plan*. The IEA aims to be a hub for clean energy that includes RE and EE, including added value to and from IEA TCPs. Accompanying this modernization is a changing work framework for the IEA RED.

245 **IEA RED's Core Analysis and Products 2016-2017:** The Medium-Term RE Market Report 2016 (October 2016); Grid Integration of Variable Renewables (GIVAR) 4: "Accelerating Power System Transformation: (Q1 2017) is available on the IEA renewables website <http://www.iea.org/topics/renewables/> and the Renewable Policies and Measures Database: <http://www.iea.org/topics/renewables/renewablesiea/policiesmeasuresdatabasepams/> .

250 **Clean Energy Ministerial (June 2016):** The ETP 2016 and Tracking Clean Energy Progress report shall be published in conjunction with the event along with the special report, "*Securing the Value of Wind and Solar.*"

WEO 2016: Will have focus chapters on renewables that IEA PVPS will be asked to comment and review.

255 **REWP 70 Meeting:** Shall be held back to back with China Wind Power 2016, 17-18 October 2016, Beijing, China. The RIAB meeting is scheduled for 18 October 2016, in the afternoon, in Beijing.

New CERT Communication Framework: TCP annual written briefing to the relevant WP (Annual Briefing); PVPS is invited in October 2016. TCP in-person oral report to the CERT meetings or workshops (Status Update); PVPS is invited in February 2017. TCP strategic communication with CERT through Working Party (Strategic Communication); PVPS invited to provide this in the first half of 2017.

265 ExCo members commented on the confusion generated by WEO interpretations, especially concerning the difference between the terminology use of "forecast" and "scenario" and how they should be understood. Mr. Frankl noted IEA does not make long-term forecasts but instead does long-term scenarios. IEA scenarios are linked to assumptions and this shall be re-emphasized. In the upcoming WEO, the IEA shall look at how to assess PV cost reduction and shall require PVPS help to play a major role on this work. Together, IEA RED and PVPS will have to analyze, correct and explain this sensitive matter well for the WEO and the MTRMR reports.

270 Action: PVPS cooperates with the IEA towards contributions to the WEO and MTRMR 2016.

Action: PVPS TCP presents written Annual Briefing to the REWP.

Action: Provide CERT's communication items 2016-2017 for TCPs to the ExCo.

Action: Fulfil IEA requests, according to needs.

275 The chairman thanked Mr. Frankl for his presentation.

10. IEA PVPS Collaboration with International Organizations (Nowak)

280 IEA PVPS is increasingly seeing relationships developing with international organizations. IEA PVPS would like to share a common understanding of the collaboration with the organizations listed in the draft matrix and examine the steps undertaken to formalize collaboration.



285 Action: ExCo members and Operating Agents are encouraged to inform the chairman and ExCo Secretary on their own contacts with international organizations and complete the draft matrix accordingly.

10.1 IEA PVPS Collaboration with IRENA

290 The PVPS chairman introduced this topic and asked for examples of ongoing collaboration between IEA PVPS and IRENA.

Mr. Gaetan Masson, Task 1 Operating Agent: Task 1 started with preliminary contact and exchanging market data with IRENA. Data is being supplied and shared between each organization. 295 For example, IRENA has information from certain countries that are not PVPS countries. PVPS material is more reliable than IRENA and Task 1 sees that it can contribute to what IRENA is doing. For the moment, Task 1 hasn't tried to go further.

Ms. Hedi Feibel, Task 9 Operating Agent: Task 9 invited an IRENA representative from Bonn to its last Task Experts meeting. The IRENA representative is highly interested in Task 9 activities and sees 300 options for cooperation in exchanging data and information. Task 9 would like to know if this cooperation should be formalized and if results of collaboration are published, should they appear in a joint report or individual ones for each organization. For the moment, Task 9 is lost on how to proceed. If we don't formalize cooperation, would the IRENA representative still participate in Task 9 meetings? IRENA has a strong focus on developing countries and how to handle aspects. There are 305 more cooperation options than for overlap. IRENA wants to benefit from our Task 9 output. Therefore, should there be an agreement in case of a joint publication and what would be the procedure to follow?

Mr. Garvin Heath, Task 12 Operating Agent: Task 12 came to the ExCo at its last meeting for the development of a joint Task 12/IRENA report on regulation for recycling PV modules, review on 310 waste management practices and the projection of waste volumes going over 2030. In November 2015, it was agreed that a joint report would have separate covers in order to agree on meeting requirements from both organizations. Then it was decided for this report to have a public launch at the EUPVSEC in June 2016, with dignitaries speaking from both organizations. It was then decided that it was not smart to have two separate reports and instead to have one report. IRENA then relaxed 315 their position on the cover and it was decided to have a joint report with a joint cover. However, we see that co-branding shall not happen on the IRENA side.

Ms. Ulrike Jahn, Task 13 Operating Agent: Task 13 has received a request from IRENA in Bonn on quality infrastructure for PV systems and it has been distributed to our own experts. IRENA is 320 interested in Task 13's expertise. There is ongoing contact through the topics.

Dato Dr. Nadzri bin Yahaya, ExCo Malaysia: Cooperation between IRENA and IEA PVPS is important to Malaysia, since we are members of both. However, we feel this cooperation is fine, as long as the strength of IEA PVPS is recognized. In such an agreement, it's important to see that PVPS has the strength on the technical side and probably in legal or policy matters, it could be from IRENA. This could be especially so when we do policies on RE.

Mr. Paolo Frankl, IEA RE Head: The IEA seeks good collaboration with IRENA and a formal Memo of Understanding (MoU) has been drawn up and both share a common data base including costs on technology. The objective is to have the same strong messages on renewables. There is a similar narrative on RES, underlining this objective. The IEA strongly encourages TCPs to engage with IRENA.

330 Conditions are to inform the IEA properly, firstly contact Paolo Frankl. Secondly, the collaboration should take place with some caution. Some data is shared with IRENA and not shared with the IEA.



Some data is shared with IRENA and not shared with IEA. However, for example, when we talk about costs data, PVPS Task 1's data is more reliable than IRENA's. There is no intention for the IEA Secretariat to use IRENA information over the TCPs.

335 Finally, when and what IEA PVPS decides to do with IRENA, have this is written form and make sure IEA PVPS has full credit for the information provided to IRENA. Whatever the agreements, make sure what PVPS gives is fully acknowledged in the exercise. The general message is the IEA encourages PVPS to engage but there has to be a strict method to this. Be aware that some of the IRENA work is extremely useful, some of the other work is not always at the right level, with not
340 enough thoroughness of review and acknowledgement of sources.

The IEA PVPS chairman summarized on the topic of how to collaborate between IEA PVPS and IRENA. When there is IRENA participation in the work that IEA PVPS does, distinguish between informal information exchanges up to a certain point, as long as sources are cited. The second most
345 tangible point is to determine where to have joint results.

The chairman asked the ExCo to approve IEA PVPS taking a pragmatic approach to PVPS/IRENA collaboration; referring to these as collaboration partnerships. Depending how these collaborations take place, be sure to inform the IEA. Each Task expert team has to see that there is sufficient give
350 and take for a win/win partnership. IEA PVPS shall try to develop a MoU that takes into account these points, how we approach collaborative results and can complement each other.

Mr. Frankl emphasized IEA can support IEA PVPS in this matter by engaging the IEA Legal Office in further steps with IRENA. Mr. Frankl shall inquire with the IEA Legal Counsel on a formal MoU
355 for TCPs with IRENA.

Action: The Chair, Task OAs and the IEA RED Head shall develop a MoU between PVPS and IRENA with the support of the IEA and IEA Legal office, in order to further explore collaboration with IRENA.

360 Decision: IEA PVPS approved taking a pragmatic approach to PVPS/IRENA collaboration; referring to these as collaboration partnerships. Depending how these collaborations take place, be sure to systematically inform the IEA.

10.2 IEA PVPS Collaboration with IEC TC 82

365 The PVPS chairman noted IEA PVPS relations to the IEC standards organization were defined in the past and have intensified again, with the matter of Task 12. IEA PVPS sees a need to take this up again and to formalize better PVPS cooperation with IEC.

370 Task 12 has two experts in common with IEC TC 82. PVPS guidelines could be used for the IEC standards process and that is Task 12's intent on collaborating with the IEC.
Task 13 has some expert members who are working with the IEC TC 82 technical committee. These experts report back to Task 13 on the latest phases.
The PVPS chairman noted the framework of cooperation exists and to simply attribute the liaison
375 officer function.

Action: Task 12 OAs, Task 13 OAs shall enhance collaboration between PVPS and IEC.



380 10.3 IEA PVPS Collaboration with Global Solar Council

Global Solar Council (GSC) was founded in the framework of COP 21 and brings together global regional industry associations to form a body with a single voice. Mr. Bruce Douglas, COO, SolarPower Europe holds the GSC chair. GSC looks for opportunities to engage with IEA PVPS.

385 Mr. Ioannis-Thomas Theologitis, ExCo SolarPower Europe, speaking on behalf of Mr. Douglas, GSC, noted GSC is now reviewing cooperation in the form of an association and is trying to assess all valuable partnerships that they could have, as well as finding their position on a global map. GSC shall contact PVPS again in the coming weeks. This will come with a general discussion, also taking
390 place with IRENA. GSC looks for commitments to a platform and to explore combining different synergies, as well as the different associations. The PVPS chairman stated PVPS is open to partnership or collaboration in the future with the GSC.

The chairman thanked Mr. Theologitis for his comments.

395 Action: The PVPS Chair and Mr. Ioannis-Thomas Theologitis, ExCo SolarPower Europe shall explore different associations and synergies with the Global Solar Council.

400 11. Future Development of IEA PVPS (Fechner)

Mr. Huber Fechner, ExCo Austria and PVPS Deputy Chairman, reported on the “IEA PVPS Strategy Process 2016+,” and reviewed the future IEA PVPS challenges and opportunities.

405 A PVPS Strategy Team has been formed since the 46th PVPS ExCo Meeting. The 11 Strategy Team members are Ms. Renate Egan, ExCo Australia, Mr. Hubert Fechner, ExCo Austria, Mr. Peter Ahm, ExCo Denmark, Mr. Paul Kaaijk, ExCo France Alternate, Mr. Christoph Hünnekes, ExCo Germany, Mr. Hiroyuki Yamada, ExCo Japan, Mr. Masanori Ishimura, ExCo Japan Alternate, Mr. Otto Bernsen, ExCo The Netherlands Alternate, Ms. Ana Rosa Lagunas, ExCo Spain, Mr. Tobias Walla, ExCo Sweden, Mr. Stefan Nowak, ExCo Chairman and Mr. Lenny Tinker, ExCo USA.

410 The PVPS Strategy Team has been working together on the future PVPS goals, collaboration, communication, new membership approaches, management and structure during the last 6 months.

415 11.1 Follow up – Strategy Team Meeting

The Strategy Team Meeting was held on 25 April 2016, the day before the 47th PVPS ExCo meeting.

At the meeting, five main areas of focus for the PVPS Management Board were determined to be Collaboration & Cooperation, Task Mentoring, Day-to-day Management, Communication &
420 Outreach and Strategy. It was agreed that the Management Board (MB) cares of activities and structures which are *beyond the daily business* of the chairman in order to make the TCP more vital. The MB members commit for an *additional ≥ five days* of work in the MB – sourced by their own means. MB members care for their work items continuously and *report at each ExCo Meeting* about their work. The chairman and MB communicate at least via *two annual meetings* (before each ExCo)
425 as well as *two phone conferences* in between. However, the PVPS Chairman remains the final responsible person for the PVPS TCPTo implement the work of the MB in the best way possible, a structure was defined.



430 **Three Vice-Chairs for Regional Representation:** Vice-Chairs shall represent IEA PVPS in their own regions. They shall oversee relationships/cooperation among PVPS members; as well as the formal aspects of collaboration and acquisition of new members, etc. The proposed vice-chairs for regional representation are: Mr. Hiroyuki Yamada, ExCo Japan (Asia), Mr. Lenny Tinker, ExCo USA, (Americas) and Ms. Renate Egan, ExCo Australia (Pacific).

435 **Vice-Chair for Communication & Outreach:** This vice-chair should maintain an overview about communication coming out of all Tasks and optimize a targeted outreach. He/she should oversee PVPS related communication in countries and sustain close collaboration with the Task 1 Operating Agent.

The proposed vice-chair for communication & outreach is Mr. Otto Bernsen, ExCo The Netherlands Alternate, with support from Mr. Tobias Walla, ExCo Sweden.

440 **Vice-Chair for Strategy:** This vice-chair should draft the PVPS strategy paper, maintain the ongoing strategy processes and is responsible for evaluation of the PVPS TCP. The proposed vice-chair for strategy is Mr. Hubert Fechner, ExCo Austria, with support from Mr. Peter Ahm, ExCo Denmark.

Vice-Chair for Task Mentoring: This vice-chair should oversee and coach the Tasks, Task OAs and Experts further optimizing all work of each Task. The proposed vice-chair for Task Mentoring is Mr. Christoph Hünnekes, ExCo Germany, with support from Ms. Ana Rosa Lagunas, ExCo Spain.

445 **Chairman for Day-to-Day Management:** Mr. Stefan Nowak, Switzerland, is prepared to carry on his work and is available to continue the role of PVPS chairman.

Mr. Fechner thanked the MB members for their efforts and commitment.

450 Action: The PVPS Management Board shall develop a Workplan for the PVPS topical Vice-Chairs. Discuss proposals at the next Management Board phone conference.

11.2 PVPS End of Term Report, Strategy and Request for Extension

455 The IEA PVPS current term shall end in February 2018. The question of the PVPS TCP's extension shall be open for a formal vote at the 48th IEA PVPS ExCo meeting. Then the procedures for the extension shall be established. As mentioned by Mr. Paolo Frankl, IEA, (see item 9 above), PVPS should present an in-person oral report to the CERT meetings or workshops (Status Update) and is invited in February 2017. PVPS should present their strategic communication to the CERT through the REWP (Strategic Communication) and is invited to provide this in the first half of 2017.

Action: Continue procedure towards formal extension of the IEA PVPS TCP.

465 12. Elections and Management

The members of the PVPS Management Board are chairman and vice-chairs of the PVPS TCP. The experience continues to prove positive and the PVPS Management Board model shall continue to be followed.

470 Five years ago at the start of the Management Board, it was decided that the Board should cover regional responsibilities. This notion has been reinforced, following the Strategy Team Meeting, as well as to better support responsibilities on collaboration & cooperation, Task mentoring, communication & outreach, strategy, as well as the continued day-to-day management.

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12.1 PVPS Management Board

The Management Board is ready to guide PVPS for another year. The following ExCo have been proposed for chair and vice-chairs: Mr. Hiroyuki Yamada, ExCo Japan (Asia), Mr. Lenny Tinker, ExCo USA, (Americas) and Ms. Renate Egan, ExCo Australia (Pacific), Mr. Otto Bernsen, ExCo The Netherlands Alternate (Communication & Outreach), Mr. Hubert Fechner, ExCo Austria (Strategy), Mr. Christoph Hünnekes, ExCo Germany (Task Mentoring), Mr. Stefan Nowak, Switzerland, (Day-to-Day Management).

Action: The PVPS Management Board shall develop a Workplan for the PVPS topical Vice-Chairs. Discuss proposals at the next Management Board phone conference.

12.2 Chair and Deputy Chair(s)

Mr. Hubert Fechner, ExCo Austria, Deputy Chairman, requested the ExCo to vote to elect the Chair and Vice-Chairs as members of the Management Board.

Decision: The ExCo unanimously voted for Mr. Hiroyuki Yamada, ExCo Japan (Asia), Mr. Lenny Tinker, ExCo USA, (Americas) and Ms. Renate Egan, ExCo Australia (Pacific), Mr. Otto Bernsen, ExCo The Netherlands Alternate (Communication & Outreach), Mr. Hubert Fechner, ExCo Austria (Strategy), Mr. Christoph Hünnekes, ExCo Germany (Task Mentoring), Mr. Stefan Nowak, Switzerland, (Day-to-Day Management) as PVPS Chair/Deputy Chair(s) on the PVPS Management Board.

Decision: The ExCo unanimously voted for the continuation of Mr. Nowak as Chairman.

Mr. Fechner congratulated Mr. Nowak as chairman. Mr. Nowak congratulated the new PVPS vice-chairs and on behalf of the Management Board, thanked the ExCo members for their vote of confidence on working within the new structure of shared responsibilities.

13. Common Fund

13.1 Approval of Accounts 2015

All participants received the 2015 accounts for their approval prepared by Mr. Nowak and the PVPS accountant in Switzerland.

Decision: The accounts for 2015 were approved by the ExCo.

13.2 Contribution Status 2016

Common Fund 2016: 13 member contributions have been paid in full and half of Italy's contribution (RSE). Still missing are contributions from Austria, two regions from Belgium, Canada, China, the European Commission, Finland, France, ½ Italy (ENEA), Japan, Malaysia, Mexico, Portugal, SolarPower Europe, Spain, Switzerland and Turkey.

Action: ExCo delegates are requested by the chairman to inform the appropriate parties in their home countries or organizations to make the necessary payments and to follow-up on this request.

13.3 Budget and Contribution 2017



525 A copy of the Budget 2017 was received by the ExCo members in their document pack. The Budget totals EUR 243 000 (27 members contribute). The individual country contribution amount to the Common Fund remains unchanged at EUR 9 000.

530 Decision: The Budget for 2017 was approved by the ExCo. The individual member contribution amount to the Common Fund remains unchanged at EUR 9 000.

14. Items Arising from OA Meeting (Masson)

535 Mr. Gaetan Masson, Task 1 Operating Agent, chaired the Operating Agents Meeting, 25 April 2016. Ms. Hedi Feibel, Task 9 Operating Agent, Mr. Garvin Heath, Task 12 Operating Agent, Ms. Ulrike Jahn, Task 13 Operating Agent, Mr. Christoph Mayr, Task 14 Operating Agent, Mr. Michiel Ritzen, Task 15 Operating Agent, Ms. Martje Van Horrik, Assistant to Task 15 OA and Mrs. Mary Brunisholz, PVPS Executive Secretary participated in the meeting.

540 Task OAs exchanged information and best practices (how to deal with a Task), while maintaining understanding of the PVPS scope and managing cross-cutting issues.

545 **Tasks' Events and Meetings:** EUPVSEC in Munich, Germany, 20-24 June 2016 shall feature IEA PVPS workshops in "Parallel Events" <https://www.photovoltaic-conference.com/programme/parallel-events.html> : Task 1's *Enhancing PV Competitiveness with Energy Storage Workshop* shall take place on Monday, 20 June 2016, 13:00 – 16:00 hours. Task 15's *Acceleration of BIPV by International Collaboration Workshop* shall be held on Tuesday, 21 June 2016, 08:30 – 12:30 hours. Task 12's *End-of-Life Management of Photovoltaic Modules - Current Global Status and Future Prospects Workshop* shall be held jointly with IRENA on Tuesday, 21 June 2016, 13:30 – 17:30 hours.

550 PVSEC Singapore, 24-28 October 2016 shall host a Task 1 Workshop and the Task 14 Experts Meeting shall be held near the venue. Task 1 and Task 14 are exploring the possibility of a joint action in Singapore during this time.

555 Task OAs discussed the possibilities of holding joint meetings; Task 1 & Task 9 / Task 12 & Task 15. They ask the ExCo to consider hosting a joint meeting for all the Tasks in 2018.

Key Messages to the ExCo:

Task Management: Task OAs ask the ExCo to assure the official Task representatives are those who are present at Expert Meetings. There is a need to limit the number of accredited people in order to keep meetings manageable.

560 **Tasks' Cooperation:** Tasks have ongoing cooperation with other IEA TCPs, such as SHC, DSM, ISGAN; RETD. WIND, etc., and look to enhance coordination groups.

Tasks' Communication: Successful webinars with new PVPS products as a theme have been implemented by Leonardo Energy (on behalf of Copper Alliance). PVPS is discussing with ISES for further webinars to promote PVPS work, as well.

565 OAs continue to examine how to fine tune Task reports for different audiences and to know the broader audiences they would like to reach.

Proposed New Task Work: Complex electricity systems and high renewables penetration has been often discussed by the OAs, especially on the topic, *PV on Islands – 100% RES PV Driven Cases*. The OAs propose that they begin working on this topic informally and asked opinions from the ExCo.

570 The ExCo commented:



EXECUTIVE COMMITTEE

PHOTOVOLTAIC POWER SYSTEMS TECHNOLOGY COLLABORATION PROGRAMME

ExCo Australia: Australia is interested to have work done on this topic and has both expertise and examples in the Pacific area, as well as in remote Australia.

ExCo Spain: This could be of interest. There was a conference held in the Caribbean Islands concerning “renewables and islands.” Spain has people dealing in this topic.

575 **ExCo China:** China has experts on this topic and is interested.

ExCo Sweden: We work on a program with India that focusses on micro-grids in islands and this as a PVPS topic could be tied in with the program. This is likewise from a smart-grid position.

580 **ExCo Italy:** We are in favour of working on renewables in islands as a topic. We have already started analysis in 20 smaller islands that are not connected to national grids. The Italian government’s intention is to support instruction on renewable use in smaller islands. Something should be done quickly on the topic, starting with at least two pilot projects and demonstrate how this can reduce the cost of electricity production in islands. This work would have good support from Italy.

ExCo Malaysia: We would support this work, too, with interest in the use of solar PV, hybrid, macro-grid and off-grid systems.

585 **ExCo USA:** This needs to be worked on and we are interested in this. There is experience, especially with Hawaii.

ExCo France Alternate: France has a study on this in the works. Our participation would have to be confirmed and we could bring our results to the PVPS work on this at some point.

ExCo Korea: We have some results from our work in Jeju Island.

590 **Mr. Paolo Frankl, IEA:** PVPS should really engage with IRENA on this since they have a project in the advanced stage.

Task 9 OA: Task 9 brought up this topic. Recommend that both non-technical and technical aspects are taken up. We are especially interested in island states who decided to implement this. We would like to benefit from Geoff Stapleton, Australia’s expert experience in the Pacific islands and also from an expert in the USA. If PVPS see a broader interest, this activity could be broadened to bring in more technical aspects, as well. I have taken note of the different ExCo comments. We can form a small group and arrange a virtual meeting to discuss these points. Since there appears to be general interest we’ll contact Geoff Stapleton with the suggestion that this begins as a Task 9 Subtask, and then see if it would be developed more.

600 **Chairman:** Suggest to deal with this separately as a topic under Task 9. It could be good to start it in Task 9 and see what develops after.

Future Task Meetings:

605	Task 1	18-21 October 2016 Spring 2017	Sydney, Australia Italy (tbc)
	Task 9	20 September 2016	Bad Hersfeld, Germany
610	Task 12	7-9 September 2016	Perrysburg, OH, USA
	Task 13	27-29 September 2016 20-24 March 2017	SANDIA, Albuquerque, NM, USA SUPSI, Lugano, Switzerland
615	Task 14	23-25 May 2016 24-28 October 2016	Denmark SERIS, Singapore
	Task 15	23 June 2016 8-10 November 2016	Munich, Germany IRESEN, Morocco

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Action: OAs provide Tasks' meeting dates and agendas to the ExCo Secretary.

Action: OAs maintain and update individual Tasks' Experts lists on the PVPS website. Task 15 OA establishes the Task 15 Experts list on the PVPS website.

Action: ExCo members should be current on their Task Experts status.

625 Action: Tasks' OAs shall include a Task Events Calendar, listing Task activities at events and partner(s), within every Status Report.

Action: ExCo Secretary provides OAs with templates for Task Reports and presentations.

Action: ExCo members encourage only official accredited Task experts to attend Task expert meetings in order to keep meeting manageable.

630 Action: ExCo members explore hosting a Joint Task Meeting in 2018.

Action: OAs encourage Tasks to have new products promoted through Leonardo Energy and ISES webinars.

Action: OAs explore ways to tune PVPS Tasks reports to a wider audience.

635 Action: Task 9 (leads), OAs and all Tasks investigate OAs subject proposal, "PV on Islands – 100% RES PV Driven Cases."

The chairman thanked Mr. Masson for his presentation.

15.Task 15 (Ritzen)

640 15.1 Task 15 Status Report

Mr. Michiel Ritzen, Task 15 Operating Agent, presented the Task 15 Status Report, with the following key issues for the ExCo:

645 **Task 15 Subtasks Update:** Subtask A has received many projects with diverse BIPV cases from 11 countries for the database. All projects shall be screened in the coming months and outreach documents shall be developed. Subtask B is focussing on large scale BIPV deployment, selected BIPV applications and solutions, as well as evaluating two business innovation models. Subtask C continues its work on regulations. Missing evaluation procedures for relevant BIPV properties and suggested improvements are being collected by the Subtask's experts. Subtask D on environmental issues has an ongoing exchange with PVPS Task 12 for life cycle assessment, while defining BIPV functions, classifying BIPV solutions and developing methodology. Subtask E on field testing has developed the first draft of its BIPV testing facilities inventory. Subtask F on dissemination still requires a Subtask leader to be identified, or it might have to be considered to allocate different deliverables to other Subtasks.

655 **Task 15 Matters for the ExCo:** The majority of participating experts still lack financial commitment. Most experts are from Europe and Task 15 looks for other world regions to participate. ExCo members are requested to support their experts and Subtask leaders, as well as assisting them in finalizing the NPPs. Finally, Task 15 asks ExCo members to consider taking on the leadership in Subtask F.

The ExCo commented.

665 **Task 1 OA:** There are plenty of good subjects inside Task 15 but it is not clear what Task 15 would like to do exactly. Recommend Task 15 considers how to package all topics together. At the moment, it doesn't appear there is a Subtask that brings everything together. Recommend to state clearly what Task 15 wants to achieve and what shall be the results at the end of the Task.



Task 15 OA: Task 15's end result is the framework, so that the Task 15 audience can select all the products that are important to them. There will not be simply just one end report.

670 **ExCo SolarPower Europe:** Task 15 needs to foresee the effective response from all questions under the Subtasks.

Mr. Paolo Frankl, IEA RED: Task 15 touches a very important topic. PVPS has no competitors in the RE field that works on this. Even though Task 15 Subtasks are covering everything, don't forget that we would expect the top five positive points of Task 15 that state what should be specifically recommended by this BIPV Task. That is what we would expect for every topic.

675 **ExCo Turkey Alternate:** Concerned how Task 15 normalizes the comparison of BIPV test sites. Where is the information from, how shall it be compared and how shall Task 15 use the data?

Task 15 OA: There are now 13 countries that have sent Task 15 information on this and we are setting up the procedure to follow.

680 **ExCo Italy:** A few days ago, Italy held a national meeting to prepare the Task 15 NoP. Italy has some concerns now on the final scope of this Task. We want to avoid to work in a small specific research project. In general, we want work to be done on the strategy, on addressing the market with BIPV. We suggest to work on how BIPV could be implemented and in which way. In Italy, we have several architects working in this field, Italy pushes you to work on the Task 15 strategy and in reaching the targets. Also, the deliverables should be more carefully focussed.

685 **ExCo Spain:** We have to see some of the standards of testing BIPV. Many laboratories don't have the capacity right now to test BIPV elements.

ExCo The Netherlands Alternate: Until now on Subtask F, talks have not resulted in the formal or informal leadership being taken on. The Netherlands is willing to support this Subtask but not on its own. If there is a country in Task 15 who would like to participate in Subtask F, let us know.

Action: Task 15 ExCo members are encouraged to support their Task 15 Experts in finalizing and submitting NPPs and NoPs.

695 Action: The Task 15 Operating Agent and Task 15 Experts should focus carefully and pinpoint direction on Task 15 deliverables. Give clear messages on BIPV acceleration.

Action: ExCo members are encouraged to consider providing expert lead for the Task 15 Subtask F: Dissemination.

Decision: The ExCo approved the Task 15 Status Report.

700 The chairman thanked Mr. Ritzen for his presentation.

16. Task 14 (Mayr)

16.1 Task 14 Status Report

705 Mr. Christoph Mayr, Task 14 Operating Agent, presented the Task 14 Status Report and the following key issues for the ExCo:

Active Support of National Task 14 Participants: The Task 14 ExCo members are requested to enable national Task representatives and named participants to actively contribute to the planned activities, to lead and coordinate Subtasks and activities of Task 14 in the new term.

710 **Resources:** This especially applies for countries which have named representatives with dedicated expertise. On the Cross-cutting Subtask: proposed lead by experts about PV markets (e.g. Australia, Solar Power Europe, etc.) On Subtask 1 there is a lack of resources for the Subtask leader (Switzerland). The USA has been leading four Task 14 activities but recently support has been



EXECUTIVE COMMITTEE

PHOTOVOLTAIC POWER SYSTEMS TECHNOLOGY COLLABORATION PROGRAMME

715 eliminated (Sandia, NREL). ExCo members are strongly asked to support their experts in funding their participation in the second term of Task 14.

Task 14 Participation: Currently, experts from 18 countries are participating in the Task, with one additional country (Greece) attending the meetings as observer. With Thailand recently joined the PVPS TCP, an official NoP for Task 14 can be expected, naming the experts being involved in Task 720 14. In addition, Singapore attended five Task 14 expert meetings as an observer. It looks promising, that SERIS (Solar Energy Research Institute of Singapore) will become an official partner of Task 14 and a PVPS member.

Deliverables in 2016: Task 14's report on "*Network Driven Demand Side Management and Storage in Households*" is due for publication in Q2 2016. Task 14's report on "*How an Energy Supply System with a High PV Share Handled a Solar Eclipse*," was sent to ExCo members for review and approval on 21 April. Publication is due in June 2016. The report, "*Opportunities for Smart PV Inverters in High-Penetration Scenarios*," is being prepared for the approval process in July 2016.

Inter-Task Coordination Update: Task 14 is intensifying collaboration with IEA Wind Annex 25 and a joint Task 14 / IEA-WIND Annex 25 meeting is planned to be held in Denmark, 25-26 May 730 2016.

Task 14 Operating Agents shall meet and ensure inter-task coordination with IEA DSM Task 17 when they organize a symposium on the focus topic of "*Demand Flexibility and Integration of DER*," since several specific tasks are already dealing with the topic of flexibility and the related integration of DER under different aspects, viewpoints and focus. It will be during the Smart Grids Week Austria on 9 May 735 2016.

As mentioned in item 14 above, PVPS Task 1 and Task 14 are exploring the possibility of a joint action in Singapore during PVSEC Singapore, 24-28 October 2016.

The ExCo commented.

740 **ExCo Copper Alliance:** What is the extent of a link between Task 14 and system operators? Copper Alliance would like to try making contact with DSOs to make sure that their contact is assured with Task 14.

745 **Task 14 OA:** Previously, contact with transmission specialists and operators has been through SolarPower Europe, but has somewhat diminished recently. Therefore, Task 14 would appreciate Copper Alliance's encouragement.

750 **Mr. Paolo Frankl, IEA RED:** First point, please don't forget the IEA Secretariat that you link to and include this in Task 14's coordination diagram. Second point, IEA encourages you to make a simple Task 14 message for policy making, especially since there is very little literature on what you are doing. It is really important to raise the profile on this so the outside world knows about what you are doing.

755 **ExCo Austria:** Task 14's huge knowledge can be beneficial on a worldwide basis for network operators, etc. Is a Task 14 workshop the real end of our PVPS dissemination? Is there a value to go on further to develop a training program for network operators, in order to have a more intensive involvement in this topic? It's important to consider having more material coming from Task 14 that could be used worldwide. For example, a basic set of slides that could be used for training would be good. Suggest going beyond the real experts and taking this forward to the experts who are doing the actions.

760 **ExCo The Netherlands:** Concerning Mr. Frankl's remark, you will solve some problems with Task 14 information quickly but you will get into more complicated problems the further you go. There's a limitation on Task 14 information from where you will start. There should be an awareness of the content and to what extent the Task is limited.



ExCo SolarPower Europe: Would suggest a very simple document, maximum of 20 pages, to cover this for policy making; with adjustments and conclusions. It would be a good way to go forward.

765 **ExCo EC, P. Menna:** Thank you for Task 14's substantial work, which could be discussed for many hours. Under Subtask 5 - Communication and Control for High Penetration of PV, besides the physical infrastructure, how do you choose what to analyze and how do you communicate these? Do you have experience to share on this aspect?

770 **Task 14 OA:** We do not research or implement new concepts. We collect material and supply it to the international community. There are theoretical concepts but there are not solid ones to share and there is not enough experience as of yet. We are tracking in this Subtask, under Singapore's and Germany's lead. Singapore is doing a huge roll out of smart meters all over the country and they are keeping Task 14 updated on this.

775 **Chairman:** Thanks to Task 14 for doing a great job. We have heard here the importance of getting out Task 14's message to a broader target audience, as well as securing the resources and participation of countries.

780 **Action:** Task 14 ExCo members are encouraged to enable national Task 14 Experts to actively contribute to the planned activities as well as support funding; to lead and coordinate Subtasks and activities in this Task 14 term.

Action: ExCo Australia and ExCo SolarPower Europe shall explore expert commitment to leading Task 14's Cross-cutting Subtask.

Action: ExCo Switzerland is encouraged to explore provision of resources for Task 14's Subtask 1 leader.

785 **Action:** ExCo USA is encouraged to explore securing funding for the lead on four Task 14 activities.

Decision: The ExCo approved the Task 14 Status Report.

The chairman thanked Mr. Mayr for his presentation.

790 **17. Task 13 (Jahn)**

17.1 Task 13 Status Report

Ms. Ulrike Jahn, Task 13 Operating Agent, presented the Task 13 Status Report and the following key matters for the ExCo:

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Resources: ExCo members are asked to support their experts in funding the participation and their lead role. Commitment by Task 13 member countries is essential to perform the work in each Task 13 Subtask until Task 13's end.

800 **Participation:** Task 13 has recently increased Expert participation from Finland, Germany, Japan, Norway, Sweden and Switzerland. Task 13 still waits for NoPs and decisions on participation from ExCo Belgium (Laborelec, KU Leuven), ExCo Thailand (CSSC) and ExCo Turkey.

ExCo members are asked to note and resolve that some Task 13 experts have been changed or added without proper Notice of Participation to IEA from the following countries: Belgium, France, Germany, Italy, Spain and Switzerland.

805 Task 13 participation now includes 20+ countries, 36+ institutions, which means 45 participants and 60+ expert members.

Cancellation of the Subtask 2.2 Deliverable: ExCo are asked to approve the cancellation of ST 2.2's deliverable D2-4 "Revisiting Inverter Efficiency," due to lack of funding.

810 **Future Task 13 PV Modelling Workshops:** Following the overwhelming success of the 4th Workshop held in October 2015, the following are scheduled to be held: 9 May 2016: 5th PVPMP



Workshop, Sandia/EPRI, Santa Clara, CA, USA; 24-25 October 2016: 6th PVPMC Workshop, Fraunhofer ISE, Freiburg, Germany. 13 March 2017: 7th PVPMC Workshop, SUPSI/Photoclass, Lugano or Locarno, Switzerland.

815 Mr. Fabio Belloni, ExCo EC, commented on the impressive and exhausting amount of work undertaken by Task 13 and asked Ms. Jahn, Task 13 OA, what future she envisions for Task 13. The Task 13 OA first aims to have this phase's work of Task 13 completed, namely compiling the rest of the documents and dissemination. Besides Task 13's collection of performance data, Task 13 also analyzes the uncertainties; going to the field and recording what happens onsite, examining power
820 loss, how to model these losses and understand what goes on in the field. Issues such as soiling are very important, too. Task 13 needs to include new stakeholders, as well. Keeping this in mind, Task 13 believes that there would be some future work developing for a possible Task 13 extension. The chairman noted that more can be explored in operation and maintenance, as well as the costs.

825 Action: ExCo The Netherlands is encouraged to support Task 13 Experts in funding, participation, and lead role (Subtask 2 lead).

Action: ExCo Belgium Regions (Laborelec, KU Leuven), ExCo Thailand (CssC), and ExCo Turkey are asked for their clear decision on Task 13 participation, to prepare and send NoPs to the IEA.

Decision: ExCo approves the cancellation of Subtask 2.2's report, due to lack of funding.

830 Decision: The ExCo approved the Task 13 Status Report.

The chairman thanked Ms. Jahn for her presentation.

18. Task 12 (Heath)

835 18.1 Task 12 Status Report

Mr. Garvin Heath, Task 12 Operating Agent, presented the Task 12 Status Report and the following key issues for the ExCo:

840 ***Joint PVPS Task 12 & IRENA Recycling Report:*** The draft "End-of-Life Management of Photovoltaic Panels – Regulatory and Technological Aspects," report, as reviewed at the last ExCo meeting, shall be submitted for ExCo approval soon.

The Task 12 OA reviewed the report's key findings. This report is expected to be published as a joint PVPS/IRENA report, with a single cover, with both organizations clearly represented. Publication and launch is planned for 21 June 2016, Tuesday afternoon at the Task 12/IRENA Workshop, Parallel Event, EUPVSEC. The workshop shall include review of report messages and findings, speeches on recycling from papers submitted to EUPVSEC, speakers from PVPS and IRENA, as well as promotional activities (press release, etc.), with a webinar follow-up.

850 ***Web Service on Environmental Assessment of PV:*** As demonstrated at the last ExCo meeting, this web service produces screening level environmental performance maps for current and prospective PV around the globe. Task 12 looks to have the web service's technical content approved in Q2 2016. ExCo members shall be provided with a link to the web service, have the opportunity to review it and shall be asked for its approval later this year.

855 The Task 12 OA asks ExCo members to consider forming an ExCo subgroup to discuss and decide upon the web service's hosting and branding option, including consideration of budget implications of various options.

Task 12 Goals in 2016: Task 12 shall update and expand life cycle assessment capability of the web service through use of recent Task 12 reports (2015) to assess a wider range of PV technologies,



EXECUTIVE COMMITTEE

PHOTOVOLTAIC POWER SYSTEMS TECHNOLOGY COLLABORATION PROGRAMME

860 current PV performance (latest Task 12 LCI), PV in 2050 performance (Task 12 report), update to
NASA SSE solar irradiation data with global coverage and compare PV results to those of grid-
average.

865 **New Task 12 Activity:** “*Trends in PV Module Recycling Technologies*,” shall summarize current and
near-future perspectives of module recycling from analysis of patents and public R&D. The foreseen
deliverable is aimed at the PV and recycling industry, R&D managers and researchers. Task 12 hopes
to issue the technical report end Q4 2016.

870 **Task 12 & IEC TC 82 (PV Energy Systems) Collaboration:** Task 12 was asked to formally
contribute to the new standard (PT 62994-1) “*EH&S Risk Assessment for the sustainability of PV
module manufacturing - Part 1. General principles and definition of terms*,” which is meant to
include Risk Assessment and LCA. Currently, a background paper is being developed and it is not yet
at the stage of being a standard. The IEC Project Team 62994-1 has liaison officer nominees (as
members of both IEC and PVPS Task 12): Rolf Frischknecht, Task 12 Expert Switzerland and
Parikhit Sinha, Task 12 Expert USA. It is planned to prepare a Circulation Draft. The TC 82
Secretary has asked the Project Team to publish a strawman of the 62994-X standards which are
875 expected to cover the topics of principles and methodologies for EHS assessment of PV modules,
LCA and EHRA. This operationalizes IEA PVPS/IEC cooperation which has been formalized at an
IEC Technical Committee level.

880 **Task 12 Participation:** Twelve countries and one industry association have experts in Task 12. The
Task 12 OA asks Germany to consider filling their expert vacancy. The Task 12 OA is very pleased
with the level of involvement of all countries in Task 12 and thanks the experts, countries and ExCo
members.

885 **Task 12 Deputy OA:** Carol Olson, Task 12 Deputy OA for more than two years has experienced
health issues that have challenged her contribution. Task 12 would like to transition to a new Deputy
OA and nominates Mr. Andreas Wade, SolarPower Europe’s Task 12 Expert for this position and asks
for ExCo approval.

Action: The Task 12 OA, Task 12 Deputy OA and Task 12 Experts shall speed up the approval
process for the joint Task 12/IRENA recycling report and submit it to the ExCo for approval in early
June 2016.

890 **Action:** ExCo SolarPower Europe is asked to submit the formal announcement for the new Task 12
Deputy OA.

Action: The Task 12 OA shall provide a link and access to the Task 12 web service to the ExCo for
their comments; eventually exploring support for the web service’s maintenance.

Decision: The ExCo unanimously voted for Mr. Andreas Wade, as the new Task 12 Deputy
Operating Agent.

895 **Decision:** The ExCo approved the Task 12 Status Report.

The chairman thanked Mr. Heath for his presentation.

900 **19. Task 9 (Feibel)****19.1 Task 9 Status Report**

Ms. Hedi Feibel, Task 9 Operating Agent, presented the Task 9 Status Report and the following key
issues for the ExCo:



905 **Task 9 Participation:** Australia, Denmark, France, Germany, Japan, Sweden and Switzerland continue their expert participation in Task 9. There are positive signs for further expertise to be contributed by China, Finland, Malaysia, Norway, Thailand and Spain.

Ms. Feibel, Task 9 OA, also has ongoing contact with relevant international organizations who have expressed interest in Task 9: GIZ, ADA, ARE, IRENA, SE4ALL and ECREEE. The Task 9 OA
910 continues discussions with ECREEE, which has once again expressed their IEA PVPS membership interest, in spite of budget constraints.

Task 9 Exchange Workshop and Task 9 Experts Meeting: Was held with representatives of SDC, REPIC, SFOE, IRENA, GIZ, various representatives from private sector and Task 9 members
915 Australia, Germany, France, Spain and Switzerland. Experts discussed the Task 9 Subtasks, planned activities and Workplan.

Task 9 Publications: “A User Guide to Simple Monitoring and Sustainable Operation of PV-diesel Hybrid Systems; Handbook for System Users and Operators,” was published in December 2015 and can be downloaded [here](#). Future reports include “Guideline on Mainstreaming PV-related Training in National Training Frameworks” (expected June 2016) and “PV Development as Prosumers: the
920 role and challenges associated to producing and self-consuming electricity from grid-tied small PV-plants in developing countries” (expected end of 2016 / beginning 2017).

Task 9 Events and Meetings: The 35th Task 9 Experts Meeting, will be held in Bad Hersfeld, Germany, September 20, 2016. The International OTTI Conference on “Solar Technologies & Hybrid Mini Grids to Improve Energy Access,” Bad Hersfeld, Germany, September 21-23, 2016, will have a
925 presentation on Task 9’s achievements and ongoing activities (acceptance awaited). Task 9 presentations shall be made in at least two webinars (tbd).

19.2 Task 9 Workplan

930 Ms. Feibel, Task 9 OA, presented the draft Task 9 Workplan.

Task 9’s General Approach: Are divided into topics of high interest for emerging countries and outreach and impact. Topics of high interest are related to mini-grids (PV and hybrids), as well as distributed generation with PV. Topics under outreach and impact include contributions to other
935 groups/standardisation (IEC, CIGRE, etc.); strengthening existing contacts and gaining new partners.

Subtask 1 – PV Hybrid Systems: 1.1. Undertakes the evaluation of existing PV hybrid systems (how are they operating, what are main difficulties; technical and economic); with consideration of Task 11 results, making recommendations on how to improve system operation and long term O&M structure.
940 1.2. PV as fuel saver: how to improve system operation, in particular to save fuel e.g. by increasing PV generation (calculation / modelling of best practice cases).

Subtask 2 - Deployment Strategy for 100% RE on Small Islands: Analyzes technical, social, economic and regulatory aspects to be addressed in case an island state has made the decision to go for 100% RE. Compilation and analysis of about 5 (successful) case studies will be made to provide guidance for others; e.g. penetration rate of different RE technologies, size of systems, required land
945 area, storage, control requirements for grid stability, tariff structure, capacity building, etc. Task 9 shall cooperate with Task 14 on this topic.

Subtask 2 needs a “critical mass” of input / information: Mr. Peter Lilienthal, Homer Energy, USA, would be interested to cooperate but would require support (ExCo USA).

Subtask 3 - Mainstreaming PV Related Training in National Training Institutions Framework:
950 Task 9 creates a list of activities that should be undertaken providing (technical) quality PV training programs that can be part of national training efforts.



955 **Subtask 4 - PV Development as (Residential) Prosumers:** Examines the role and challenges in producing and self-consuming electricity from grid-tied small PV plants in developing countries (mirror study); based on the Task 1 study in 18 PVPS member countries. 10 case studies and best practices shall be collected and analyzed (Asia, Africa, Middle East, Latin America) on net-metering, self-consumption and related aspects. There shall be a review of success stories and problems; systems of different scale. Important parameters include the right to self-consume, revenues from self-consumption, charges to finance grid, value of excess electricity, etc.; with the main focus on non-technical aspects.

960 **Subtask 10 - Outreach and Dissemination:** Includes contributions to IEC TC-82; safety issues within IEC 62109; to CIGRE, C.628 WG; to the IEA Wind Task 28 (with links to PVPS Tasks 1, 13 and 14); as well as networking and dissemination.

965 Ms. Feibel concluded that Task 9 has a well-defined clear vision for its future work, with the Subtask reflecting a new strategic direction. For the moment, the Task 9 experts group is small and there are concerns that the current dynamic may be challenging in the long-term, in the event that there is no additional support from other countries. Therefore, the Task 9 OA asks ExCo members to advocate for stronger support and for Task 9 and greater contribution from their respective countries.

970 The chairman asked ExCo members for their comments on the Task 9 Workplan, as well as which countries can confirm their interest in Task 9 for now or in the future.

975 **Task 1 OA:** The activity on self-consumption is clearly a Task 9 activity and not a Task 1 activity, since it is not in Task 1's scope. Even though Task 1 can help to support Task 9, the work must be done by Task 9. Concerning Subtask 2, the scope could be enlarged to cover small islands, but all kinds of islands, not just those in developing countries. Suggest starting from the experience and knowledge in Task 9 for PV in islands in general. We would be pleased to have a joint Task 1/Task 9 meeting in the future.

980 **Task 9 OA:** With the interest in this topic, we could arrange a virtual meeting. Task 1 could contribute and see what the specific interests could be.

985 **ExCo Turkey Alternate:** As you remember, Turkey has a very strong interest in Task 9, as noted in the Istanbul meeting. We feel we have to make a clear definition of some measurement frames in Task 9. We are targeting emerging countries and also emerging technologies. There are big gaps between these. When we think about macro items and defining Task 9 Subtasks, we realize we target emerging technologies as well as applications in emerging countries. We are still trying to fit into Task 9 but we need more clear definitions of the Subtasks. Every country has rural regions and we need PV for rural development.

990 **ExCo France Alternate:** France compliments the efforts on the Workplan. With small means Task 9 has big impacts. Concerning France's contribution to Task 9, IED has the green light to participate and shall be financed for the meetings. Also, agree on the Task 1/Task 9 issue, with Task 1 open to discuss, but the work should be done in Task 9.

ExCo China: We have many big "pro family" programs to have family households grid-connected. Through this, I will find an expert from China to participate in Task 9.

995 The chairman encourages countries to put in the efforts and to consider if a contribution can be managed in some way from more countries.



1000 Action: ExCo members from Australia, China, Denmark, Finland, France, Germany, Malaysia, Spain and the USA are encouraged to have stronger expert participation and give funding support to Task 9 participants. NoPs should be completed.

Decision: The ExCo approved the Task 9 Workplan, April 2016 - April 2018.

Decision: The ExCo approved the Task 9 Status Report.

1005 The chairman thanked Ms. Feibel for her presentation.

20. Task 1 (Masson)

20.1 Task 1 Status Report

1010 Mr. Gaëtan Masson, Task 1 Operating Agent, presented the Task 1 Status Report with the following key issues for the ExCo:

1015 **Task 1 Participation:** There has been increased participation with new representatives to Task 1 but long term commitment from several countries remains to be improved. The Task 1 experts' profile has evolved and should deserve more attention: more expertise on PV in general. Communication is not the number one required skill, but instead, access to official data sources, knowledge of PV policies and market development, in his/her country, industry understanding, good contacts, technical profiles (engineers, economists, policy experts, etc.) are welcome.

1020 Task 1 requires a physical participation from the same experts (consistent attendance from the same expert from one meeting to another is important). There is a clear need in some countries to streamline their expert participation.

Quality of Deliverables: National Survey Reports (NSRs) and data collection in general for several countries require improvement in quality, quantity and reliability of data. Liaising with the expert's ExCo for data collection to avoid providing different numbers for different reports is highly recommended.

1025 **NSRs:** Template shall be provided in the coming days. Countries completed data should be provided by 1 June 2016 to the Task 1 OA.

Inter-Task Cooperation: Task 1 would like to collaborate more with Task 9 and Task 15, but also with other Tasks on subjects to be defined.

1030 **PV in Developing Countries:** As discussed in item 19 above, Task 1 would like to enhance its understanding of PV development in developing countries. In addition to the focus inside Task 1 (China, Malaysia, Thailand), Task 1 would like to continue exchanging with the new Task 9 in the future.

1035 **Task 1's New Proposal for PVPS Activity - Flexibility Enablers:** The IEA has pointed out that PV is the disruptive technology in buildings. Other TCPs are focusing on buildings, but there are none with a PV perspective. This potential activity would look at how to tune flexibility sources in buildings (H&C, EVs, DSM, etc.) to maximize PV penetration and how to maximize self-consumption. This would study flexibility enablers from a PV point of view. The following countries and organization expressed strong interest in this activity: Austria, China, Copper Alliance, France, Norway, Spain, Sweden and Turkey.

1040 Action: ExCo Israel, ExCo Mexico, ExCo Portugal and ExCo Turkey are strongly encouraged to fulfil their obligatory Task 1 expert participation.

Decision: The ExCo approved the Task 1 Status Report.

1045 20.2 Task 1 Action Plan 2017-2018



Task 1 has started to work on a new action plan for the years 2017-2018. The first subjects have been identified and will continue to be refined in order to present a concrete action plan at the 48th IEA PVPS ExCo meeting in November 2016.

1050 **20.3 PVPS Communication**

Mr. Masson, Task 1 OA, gave a brief overview of Task 1 publications, the new website and upcoming events.

Snapshot: 4th edition was published on 6 April 2016 and is available [here](#).

1055 **Trends:** The 2016 edition shall continue to provide adequate information with some possible changes. It has been discussed to reduce the text and favor figures in order to limit the number of pages, while the number of subjects are increasing.

PV Registering Guidebook: A small guidebook is being written by Task 1 experts and being led by Switzerland. Publication due in Q2 2016.

1060 **Costs and Competitiveness – Soft Costs:** Data collection has taken more time than expected. Due to the change of the US representative, the project was put on hold. The European Commission has volunteered to check the quality of already available data in order to restart the process.

Self-Consumption Report: Was published in Q1 2016 and is available [here](#).

1065 **New Task 1 Reports on Specific Topics:** Task 1 has decided to try writing small reports on dedicated subjects. The first topics are: Analysis of the impact of retroactive measures in Spain (led by Spain). Analysis of the success of BIPV policies in Italy and France (led by Italy). France will be contacted in the coming weeks by Italy in order to identify how to go forward. Analysis of the success of Green Certificates policies. Without specific commitment, it has been decided to put this subject on hold for the time being.

1070 **New PVPS Website:** Is available for review at: test.iea-pvps.org. Task 1 and all Tasks' OAs are reviewing the website. Task 1 organizes the migration of all documents.

Task 1 Events in 2016: A workshop shall be held on 25 May 2016 in Shanghai, China, in the frame of the SNEC 2016 exhibition. China, with the support of Japan, is organizing this event that will focus on the development of PV in the distributed segments.

1075 A workshop will be held during the EUPVSEC, Munich, Germany, on PV competitiveness and storage. See item 14 above on "Parallel Events."

The OA will look to set up a possible workshop during the Intersolar conference in Dubai in September 2016. The subject would be the role of utilities in developing PV businesses.

A workshop will be held in Australia together with the 47th Task 1 experts meeting, also on PV & Utilities. The organization will be ensured by Australia, with the UNSW.

1080 A workshop will be held during PVSEC-26 in Singapore on PV in the built environment, co-organized with SERIS and possibly with Task 14. The organization will be undertaken by Japan.

1085 As a follow up to PVPS communication and recommendations from Mr. Paolo Frankl, IEA RED, Mr. Fernando Nuno, ExCo Copper Alliance, volunteered to define and formulate five key policy recommendations from each new PVPS report, organize a market webinar for each and supply the information graphics. Copper Alliance would like to offer this to Task 1.

Action: ExCo members and Operating Agents are asked to review the new PVPS website at: test.iea-pvps.org. Please provide comments to the Task 1 OA by 30 June 2016.

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20.4 PV & Utility Task Force & 2nd Workshop Follow Up (Masson/Fechner)

Task 1 contributed to the organization of the successful, well-attended second workshop organized in January 2016 at the IEA. Meeting minutes and presentations are available from the ExCo Secretary. A



EXECUTIVE COMMITTEE

PHOTOVOLTAIC POWER SYSTEMS TECHNOLOGY COLLABORATION PROGRAMME

1095 third workshop is foreseen in September 2016 with some support from Task 1 with the invitation of national utilities representatives. It has been decided to focus the efforts region by region rather than going for a global set of workshops. A workshop will be organized in China during the SNEC conference in Q2 2016.

1100 **High PV Penetration Workshop:** Is proposed to be held at the IEA, 10 October 2016, as a continuation of the Task 8 work. It shall focus on policy targets, best practices, transition management and policy recommendations.

The chairman thanked Mr. Masson for his presentation.

21. Special Presentations1105 **21.1 Copper Alliance (Nuno)**

Mr. Fernando Nuno, ExCo Copper Alliance, made a presentation on “*Copper Alliance’s Activities in the PV Field.*” Mr. Nuno gave an overview on copper in renewables and electrical efficiency, as well as the strong link between copper use and energy stability. Mr. Nuno also cited the PVPS Self-Consumption Models for PV report, in the context of Copper Alliance’s participation in PVPS.

1110 Copper Alliance provided policy recommendations and infographics for the report in coordination with PVPS. It is a useful report for advocacy purposes.

The chairman thanked Mr. Nuno for his presentation.

1115 **21.2 European Commission (Menna/Belloni)**

Mr. Pietro Menna, ExCo European Commission, made a presentation on “*The European Energy Union.*” Mr. Menna detailed the Energy Union and its five dimensions, with a view on the major policy initiatives currently under preparation, i.e. the Electricity Market Design, the Revised

1120 Renewable Energy Directive and the Energy Efficiency Package. He also gave a brief summary of the EU’s innovation strategy: the Strategic Energy Technologies (SET) Plan.

The chairman thanked Mr. Menna for his presentation.

1125 **22. Collaboration with IEA TCPs and other IEA bodies (Nowak)**

Mr. Stefan Nowak, Chairman, prepared and distributed the draft matrix on the IEA PVPS Collaborations with IEA entities and TCPs (see item 10) in the ExCo Document Pack. Mr. Nowak asks ExCo members and Operating Agents to review the matrix and inform him on each contact maintained within the IEA network.

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Action: ExCo members and Operating Agents are encouraged to inform the chairman and Executive Secretary on their own contacts within the IEA network and complete the draft matrix accordingly.

1135 **23. PVPS Collaboration with IEA-RETD on the RE-Prosumer Project (Masson)**

Mr. Gaëtan Masson, Task 1 OA and Mr. Otto Bernsen, ExCo Netherlands Alternate and Task 1 Expert Netherlands, have represented the IEA PVPS programme in the steering committee of the IEA RETD “PV Prosumers” project. Task 1 provided information to the implementing body and provided information on this project. See: <http://iea-retd.org/archives/publications/e-prosumers-report> . The

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collaboration has continued with a second edition of the report that has been published in Q1 2016
<http://iea-retd.org/archives/publications/re-com-prosumers> .

24. SHC Task 46 Solar Resource Management in 2016/2017 (Nowak)

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The chairman updated the ExCo on this topic. Among the comments from the PVPS ExCo at the 46th PVPS ExCo meeting, a request was made to get a few end-users involved in the SHC Task 46. Task participants are currently working to identify 2-3 end users to become members of the new Task.

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Because of time commitments required to prepare the draft Workplan and securing funding, the proposed OA requested that a time be set aside to present the new Task at the November 2016 PVPS ExCo meeting (rather than at this meeting, which was the original plan).

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Mr. David Renné, the Task 46 OA, requests that moderate collaboration (as opposed to a Joint Task) be established for SolarPACES, and minimal collaboration for SHC. Moderate collaboration still entails a fair amount of active engagement with SolarPACES, including review of reports.

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Because of these collaboration arrangements with SolarPACES and SHC, SHC Task 46 asks to check on the possibility to reduce the administration load of the OA or co-OA's, e.g. by reducing the reporting requirements and participation in PVPS ExCo meetings from 6 to 12 months.

Action: PVPS ExCo members and SHC Task 46 members shall clarify the prospects of continuing SHC Task 46 in PVPS as new Task 16. For countries already active in SHC Task 46, establish a link to ongoing contributions in this Task (experts & funding).

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Action: Mr. David Renné, SHC Task 46 OA and Mr. Jan Remund, SHC Task 46 Expert Switzerland, shall prepare a draft Workplan for presentation as a new PVPS Task at the 48th IEA PVPS ExCo Meeting,

25. Other PVPS Collaboration with SHC TCP

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25.1 SHC Task 51 Solar Energy in Urban Planning

Ms. Maria Wall, SHC Task 51 Operating Agent, submitted a brief status of Task 51 to the PVPS ExCo. A new report, "Best Practices and Case Studies," will be finalized in June 2016, along with PDF brochures showing single case studies as well as comparisons between cases of solar energy in urban planning. Please check the webpage for additional information about the Task and current participation; <http://task51.iea-shc.org/Default.aspx>.

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25.2 SHC Task 53 New Generation Solar Cooling & Heating Systems (PV or solar thermally driven systems) (Masson)

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IEA PVPS Task 1 continues to monitor IEA-SHC Task 53 work closely. Task 1 Experts participated in the Task 53 IEA SHC Industry Workshop on the latest R&D developments in solar cooling in Madrid, Spain, 11 April 2016. For more information on Task 53, see: <http://task53.iea-shc.org/> .

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Action: PVPS Task 13 OAs, PVPS Task 14 OAs, PVPS Task 14 Expert Switzerland Jan Remund (who is also SHC Task 46 Expert Switzerland), PVPS Task 1 OA, SHC Task 53 OA, SHC and PVPS Chairs & Secretariats shall maintain communication, expert exchange and collaborative work on joint topics between SHC and PVPS. Send periodic updates to ExCo Members.



EXECUTIVE COMMITTEE

PHOTOVOLTAIC POWER SYSTEMS TECHNOLOGY COLLABORATION PROGRAMME

1190 **26. PVPS Collaboration with Energy Storage TCP (ECES)**

No recent update has been received by PVPS from IEA ECES. See website at: <http://iea-eces.org/>.

1195 Action: ExCo Secretary, ECES ExCo Chair, Task 14 OAs shall maintain information exchange between ECES and PVPS. Review structure of ECES activities and look to potential interaction.

27. Collaboration with ISGAN TCP (Walla/Bründlinger/Mayr)

1200 Mr. Tobias Walla, PVPS ExCo Sweden and expert in ISGAN, and Mr. Russell Conklin, ISGAN Deputy Chairman, provided the following update:

1205 ISGAN's new Annex 8 has been recently launched, "ISGAN Academy" (<http://www.leonardo-academy.org/course/index.php?categoryid=80>). This is a partnership with Leonardo Energy and is complementary to DSM TCP's DSM University, the Clean Energy Solutions Center and 21st Century Power Partnership's Clean Energy Regulators Initiative, etc.

1210 ISGAN's community had a strong presence at the India Smart Grid Week, March 24. India is a very important emerging economy for smart grids and RE integration. Find the most important and recent reports at: <http://www.iea-iscgan.org/index.php?r=home&c=5/378>

1210 ISGAN research facility network (SIRFN) is having influence on the update of the UL 1741 certification standard, in particular for test protocols for advanced inverter functions. Building on that work, a new paper is forthcoming that looks at similar functions for energy storage systems. Mr. Roland Bründlinger, Task 14 OA can be contacted for more information.

1215 Action: ExCo Sweden, Task 14 OAs, Task 14 Experts USA and Korea, ISGAN ExCo Deputy Chairman (R. Conklin) shall liaise between ISGAN TCP and PVPS. Establish and have minimum collaboration between PVPS Task 14 and the ISGAN TCP.

28. Collaboration with ISES (Masson/Brunisholz)

1220 Mr. Gaëtan Masson, Task 1 Operating Agent and Mrs. Mary Brunisholz, Executive Secretary, are discussing with Ms. Jennifer McIntosh, Head of ISES Secretariat and Ms. Joanna Costello, Coordinator ISES webinars, who are interested in holding webinars on behalf of ISES for new PVPS reports and topics.

1225 For more information about ISES, see: www.ises.org.

Action: The PVPS Task 1 OA, PVPS Executive Secretary and the Head of the ISES Secretariat shall liaise between PVPS and ISES.

1230 **29. Conferences****29.1 IEEE 43rd Photovoltaic Specialists Conference (PVSC), Portland, OR, USA, 5.-10.06.16**

IEA PVPS shall be actively represented at the IEEE 43rd PVSC.

1235 Mr. Stefan Nowak, PVPS Chairman, shall present "*IEA PVPS – Global Co-operation towards Sustainable Deployment of Photovoltaic Power Systems*" at the Plenary Session, Area 12, 9:30 am, 9 June 2016. Mr. Lenny Tinker, ExCo USA and Vice-Chair Americas Region, shall present



EXECUTIVE COMMITTEE

PHOTOVOLTAIC POWER SYSTEMS TECHNOLOGY COLLABORATION PROGRAMME

1240 “Emerging PV Technologies: The Path to Market Competitiveness,” at the Session on Trends in PV Deployment, Area 12, 1:30 pm, 9 June 2016. Mr. Hiroyuki Yamada, ExCo Japan and Vice-Chair Asia Region, shall participate in the panel discussion, “Taking PV to the TW level at the Session on International Collaboration towards TW-Scale PV,” Area 12, 10:30 am, 10 June 2016. Ms. Renate Egan, ExCo Australia and Vice-Chair Pacific Region shall also participate. For more information, see: www.ieee-pvsc.org.

1245 **29.2 32nd EUPVSEC & Intersolar Europe, Munich, Germany, 21.-24.06.16**

1250 IEA PVPS shall be present with a booth in the Intersolar Exhibition Hall A, at the A2.416 location, 22-24 June 2016. See Tasks Events at the EUPVSEC, item 14 above, for the three IEA PVPS parallel events taking place. Details at: <https://www.photovoltaic-conference.com/programme/parallel-events.html>.

1255 The following shall be actively participating in the EUPVSEC: Mr. Gaëtan Masson, Task 1 OA, Mr. Garvin Heath and Mr. Andreas Wade, Task 12 OAs, Ms. Ulrike Jahn, Task 13 OA, Mr. Michiel Ritzen, Task 15 OA, Mr. Hubert Fechner, ExCo Austria and ExCo Vice-Chair Strategy, Mr. Gregory Neubourg, Belgium representative of ExCo Belgium’s Three Regions, Mr. Masanori Ishimura, ExCo Japan Alternate and Ms. Ana Rosa Lagunas, ExCo Spain.

1260 Action: Task 1 OA and Task 1 Experts, Task 12 OAs and Task 12 Experts, Task 15 OA and Task 15 Experts shall prepare and implement Tasks’ Workshops and contributions to the 31st EUPVSEC & Intersolar Event, Munich, Germany.

Action: The Management Board, Tasks’ OAs and the ExCo Secretary shall provide support for PVPS presence at the 31st EUPVSEC & Intersolar Event, Munich, Germany.

1265 **29.3 PVSEC-26 International Photovoltaic Science and Engineering Conference, Marina, Bay Sands Convention Center, Singapore, 24.-28.10.16**

Task 1 Experts shall hold a PV in Buildings Workshop, 27 October 2016, co-organized with SERIS at this event. For more information, see: www.pvsec-26.com/.

1270 **30. Non-PV Conferences**

No particular conferences were noted.

31. Plans for the Next Two ExCo Meetings

1275 The 48th IEA PVPS ExCo Meeting dates are fixed for 14-16 November 2016. The meeting’s exact location along with further details shall be forthcoming.

Mr. Lenny Tinker, ExCo USA and Vice-Chair Americas, offered to host the 49th IEA PVPS ExCo Meeting in the USA, in Spring 2017, with the dates and location to be confirmed. The chairman thanked Mr. Tinker for the invitation.

1280 Mr. Jero Ahola, ExCo Finland Alternate, offered to host the 50th IEA PVPS ExCo Meeting in Autumn 2017, with dates and location to be confirmed. The chairman thanked Mr. Ahola for the invitation. Australia, Malaysia and Thailand have offered the possibility of hosting the 51st IEA PVPS ExCo Meeting in Spring 2018. More information on future ExCo meetings shall be given at the 48th PVPS ExCo meeting.

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EXECUTIVE COMMITTEE
PHOTOVOLTAIC POWER SYSTEMS TECHNOLOGY COLLABORATION PROGRAMME

Action: The Chairman and the Executive Secretary shall organize the next ExCo Meeting, communicate details to the ExCo and send out meeting invitations as soon as possible.

32. Any Other Business

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The “Solar Together” paper was sent to IEA PVPS recently. The “Solar Together” program, as proposed by Mr. David Sandalow, Inaugural Fellow, Columbia University Center on Global Energy Policy, is proposed to bring national solar PV R&D programs together with each other and members of the Breakthrough Energy Coalition for annual meetings to review research results and discuss research plans. The paper is available at: <http://energypolicy.columbia.edu/on-the-record/solar-together-proposal> .

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The IEA PVPS Annual Report 2015 can be downloaded [here](#). The print version shall be posted in May 2016.

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Mr. Otto Bernsen, ExCo The Netherlands Alternate and Vice-Chair Communications and Outreach, proposed Ms. Renate Egan, ExCo Australia and Vice-Chair Pacific Region, to take on the role of PVPS Ombudsman.

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Action: Executive Secretary shall publish and disseminate the PVPS Annual Report 2015.
Decision: ExCo members approved Ms. Renate Egan as the PVPS Ombudsman.

33. Closing of the Meeting

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On behalf of the ExCo, the chairman thanked and congratulated Mr. Fernando Nuno, ExCo Copper Alliance, for making the Executive Committee meeting a great success. Mr. Nowak thanked the ExCo members for their contributions and energy in making the ExCo meeting a productive one. Mr. Nuno warmly thanked the ExCo for their participation, presence and support during the ExCo meeting. Special thanks were extended to Ms. Yolande Pianet, Copper Alliance Communications Assistant, Mr. Jef Poortmans, Program Director PV, IMEC and Ms. Inge Struys, External Communications IMEC, for all their contributions over the last several months towards making this meeting a successful one.

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The chairman brought the 47th Meeting of the Executive Committee of the IEA Photovoltaic Power Systems Programme to its official close.