

*EC Grant Agreement n°609788*

# **CHEETAH**

**Cost-reduction through material optimisation and Higher EnERgy output of solAr pHotovoltaic modules - joining Europe's Research and Development efforts in support of its PV industry**

## **Deliverable**

**D4.3 – Workshop with external participants**

**WP4 – Dissemination, internal and external communication**



## Section 1 – Document Status

### Document information

Deliverable name	CHEETAH_D4.3_Workshop with external participants
Lead beneficiary	JUELICH
Due delivery date from Annex I	M48
Actual / forecast delivery date	M48
Dissemination level	Public

### Document validation

Name	Organisation	Date	Visa
Karsten Bittkau – WP4 leader	JUELICH	03/01/2018	OK
Jan Kroon - Coordinator	ECN	04/01/2018	OK

### Document history

Version	Date	Modifications	Name
01	03/01/2018	Creation	K. Bittkau
02	03/01/2018	Corrections implemented	K. Bittkau
VF	04/01/2018	Final version validated by Coordinator	J. Kroon

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## Section 3 – Publishable summary

As a part of the final CHEETAH event, entitled “European Solar Technology Forum – From Research to Industrial Application”, the main technical achievements from the project were presented by the Consortium (represented by Work Package Leaders) on November, 30<sup>th</sup> 2017 at HZB in Berlin, Germany. The event was offered to the general public. In addition, external industry participants were invited for each technology that was investigated within the frame of the CHEETAH project. During the session breaks, several partners presented their posters summarizing more specifically the achievements of the project.

## Section 4 – Executive summary

### **Description of the deliverable content and purpose**

In order to disseminate the scientific results from the project to a wide audience, different events were planned within the scope of the CHEETAH project. One is the final dissemination of the technical project results to external participants. Those participants might come from other international scientific organizations but also participants from industry are of high importance. This workshop was part of the final event, organized in WP5 by SolarPower Europe and hosted by HZB. The Work Package leaders presented an overview to the project results during parallel sessions which were followed by a panel discussion with representatives from industry. The link to the industry is reported in more detail in deliverable D5.7. As the whole event was dedicated to be a one-day event, in order to increase the availability for possible participants, the technical presentation of the WP leaders was comparatively brief. Therefore, posters were presented by several partners during the session break and the networking reception to allow a more detailed dissemination of the scientific results of the project.

### **Brief description of the state of the art and the innovation brought**

NA

## Section 5 – Deliverable report

### 1. Agenda of the final event

11:00-11:30	Registration					
Opening Plenary Session: CHEETAH – Four Years of PV Research Innovations <i>Moderator: Jan Kroon, ECN and CHEETAH Project Coordinator</i>						
11:30-12:00	Welcome notes			James Watson, CEO, SolarPower Europe		
12:00-12:30	The CHEETAH project – Four years of PV research innovations			Jan Kroon, ECN and Project Coordinator		
12:30-14:00	Lunch break					
Parallel Round Table Debates						
	Crystalline silicon based PV “Getting below a 100 microns” <i>Moderator: Ivan Gordon (Imec)</i>		Thin film PV “Thinner and more efficient through smart cells” <i>Moderator: Rutger Schlatmann (HZB)</i>		Organic PV + Perovskite “Intrinsic long term stability without special encapsulation” <i>Moderator: Sjoerd Veenstra (ECN/Sollance)</i>	
14:00-14:30	Input presentations <i>Kris Van Nieuwenhuysen (Imec), Adrien Danel (CEA), Paul Sommeling (ECN)</i>		Input presentations <i>Martina Schmid (University of Duisburg-Essen), Guillermo Farias Basulto (HZB)</i>		Input presentations <i>Suren Gevorgyan (DTU) – OPV Aldo di Carlo (UTV) – Perovskites</i>	
14:30-15:00	Reactions from the industry Confirmed speakers: - Kristin Lüdemann, VP cSi PV, Von Ardenne - Lars Oberbeck, Head of Solar R&D, Total - Thomas Söderström, Head of Technology Solar Modules, Meyer Burger - Anna Battaglia, Engineering Manager, 3SUN		Reactions from the industry Confirmed speakers: - Andreas Wade, President, PVthin - Michael Bauer, Managing Director, Calyxo - Lars Stolt, CTO, Solibro		Reactions from the industry Confirmed speakers: - Andre Weiß, VP R&D, Heliatek - Erik Gabrielsson, CTO, Dyenamo - Chris Case, CTO, Oxford PV	
15:00-16:00	Open discussion	<i>All participants</i>		Open discussion	<i>All participants</i>	
16:00-16:30	Coffee break					
Closing Plenary Session: CHEETAH – The Way Forward <i>Moderator: Jan Kroon, ECN and CHEETAH Project Coordinator</i>						
16:30-16:45	Insights from the round table debates			<i>Moderators</i>		
16:45-17:00	After CHEETAH – The Way Forward			<i>Ivan Gordon, Imec, Coordinator of the Joint Program on Photovoltaics, EERA</i>		
17:00-17:15	Priorities for new and improved PV Standards			<i>Nigel Taylor, Joint Research Centre, European Commission</i>		
17:15-17:30	Q&A			<i>All participants</i>		
Networking Session						
17:30-18:45	Networking Reception					

### 2. Organization

The organization of the final event was mainly done by SolarPower Europe. The local organization was done by HZB as the hosting partner. The registration platform for participants was made

available by Ayming. The agenda and general structure of the event was prepared in a small group with people from Ayming, SolarPower Europe, CIEMAT, JÜLICH, ECN, JRC, HZB, IMEC.

### 3. Participation

A detailed evaluation of the registered and participated people is given below:

Number of participants	CHEETAH	Non-CHEETAH	Non-CHEETAH	
			Research	Industry
114	74	40	6	34

### 4. Poster session

During the session breaks and the networking reception, all partners had the opportunity to present their achievements from the CHEETAH project on a poster. The poster area was located in the same area as the catering, allowing a detailed discussion between CHEETAH partners and external workshop participants. In total, 12 posters were presented.

### 5. Evaluation

After the final public event, a questionnaire survey was sent to the participants to get their feedback. A total of 26 responses were registered which represents approximately one fourth of the total number of participants in the event. For this report, the answers to the following questions were analyzed in detail: “Which topics represented a major interest or relevance to your organisation?” and “How would you rate the networking possibility offered by the conference?” The former question was split into the three technology branches of the CHEETAH project, namely ultra-thin crystalline silicon technology, thin-film based technology and organic and perovskite technology, as well as the possibility for networking. The latter question was dedicated to rate the offered networking forum during the final event. To elucidate the networking further, the participants were asked whether they identified new potential collaborations thanks to the networking and whether these potential collaborations may be related to the achieved CHEETAH results. The following figures present the results from this survey.

## Interest or relevance in topics

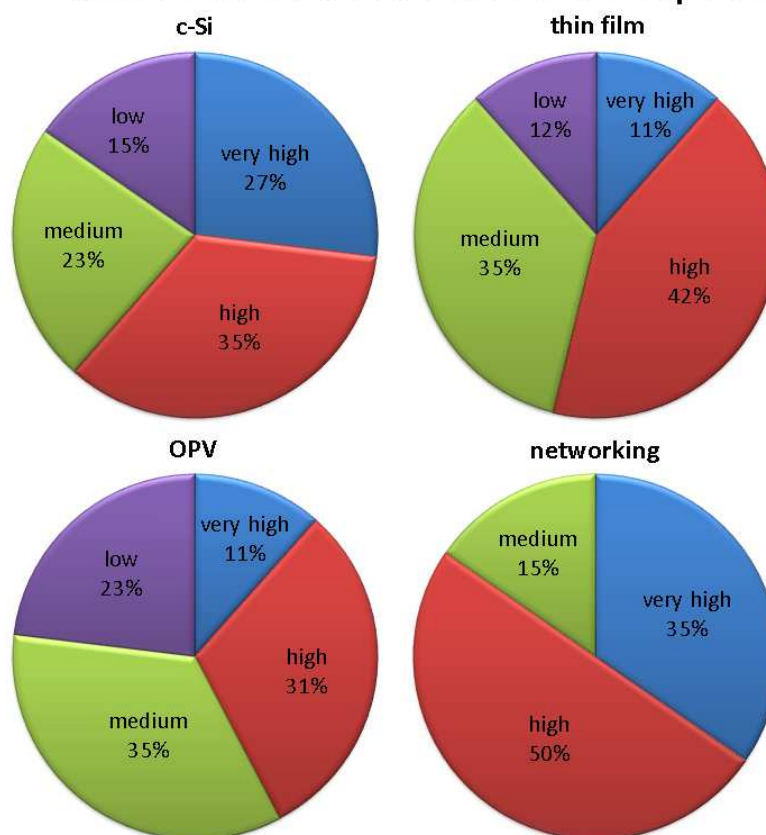


Figure 1. Analysis of the participants' interests in the final workshop.

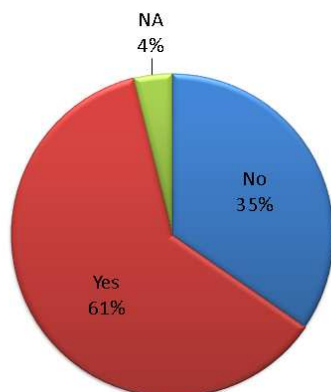
The overview of the interests of the participants in the different topics is shown in Fig. 1. Obviously, the highest technological interests were recognized in the crystalline silicon technology. This is reasonable as c-Si technology dominates the PV technology. 62% of the participants rated their interests in this field with “high” or “very high”. For the thin film technology, 53% rated their interests with “high” or “very high”. The lowest interests were recognized in the OPV and perovskite technology (42% with “high” or “very high”). Besides the interests in the different technologies, the participants were asked to rate their interests in networking. 85% rated their interests with “high” or “very high”. Because of this high interest in networking possibilities, we further analyzed the offered networking quality with a special look to further collaborations and, thereby, exploitation of CHEETAH results. The overview of this analysis is shown in Fig. 2.



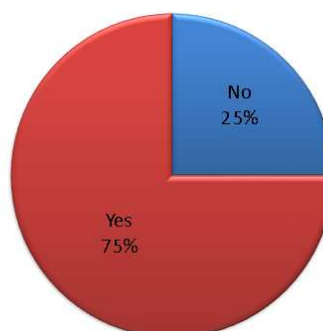
## How would you rate the offered networking?



## Have you identified new potential collaborations?



## May the collaborations identified related to CHEETAH results achieved?



*Figure 2. Analysis of the offered networking.*

The networking possibility during the workshop achieved a very good rating by the participants. 27% voted with “excellent”, 58% with “very good”. This demonstrates the great success of this part of the event. In more detail, 61% of the participants identified new potential collaborations thanks to the networking possibility. 75% of these potential collaborations were related to the results achieved by CHEETAH.