

Task Force – Photovoltaic-Thermal collectors

21st October 2019

14.00-16.00

Web-meeting

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Secretariat: Costas Travasaros (**CT**), Pedro Dias (**PD**), Leopoldo Micò (**LM**), Ana Alegre (**AA**).

Abbreviations: **EU** – European Union; **CHP** – Combined heat and power; **SDH** – Solar District Heating; **EE** – Energy efficiency; **ST** – Solar thermal, **SHE** – Solar Heat Europe; **TF** – Task force; **RES** – Renewable Energy Sources; **RHC** – Renewable Heating & Cooling; **UWC** – Uncovered Water Collectors; **CWC** – Covered Water Collectors; **HP** – Heat Pumps

AGENDA

Item	Time	Agenda	Description
1	14.00	Introduction & expectations	Role of TF, introduction of participants and expectations for TF work
2	14.15	Main market barriers for PVT: - competitiveness, - quality (module and installation) and, - public awareness	Initial discussion on some of the main challenges for PVT and option on how to address them
3	15.00	Identifying additional market barriers	Tour-de-table among TF members, brainstorm on other market barriers for PVT
4	15.45	Wrap- up and next steps	Summary of main topics addressed in the meeting and next steps
5	15.50	Any other business	
	16.00	End of the meeting	



Minutes	
Item	Comments & Agreements
1	<p><u>Introduction & expectations</u></p> <p>PD introduced the TF formalities and competition law rules. Also introduced the scope and functioning of the TF. The creation of this TF was proposed by the Solar Hat Europe Board of Directors in order to bring PVT experts together and exchange information and identifying main barriers for the sector in order to propose actions addressing those barriers and challenges in the market, at European and national level. The result of this workshop will be during the pre-events to the Solar Heat Europe 2019 General Assembly on November 28th in Brussels. PD invited all the participants to the next PVT physical meeting, which will take place the same day. PD presented HD excuses for his absence and presented CT the President of SHE, he will be the one reporting back to the Board of Directors. PD introduced and thank LBr for her role as PVT TF leader.</p> <p>LBr introduced herself, her background and company and explained the reason and interests to join the TF PVT.</p> <p>A short round of introduction by all participants took place, were they also presented their main expectations:</p> <ul style="list-style-type: none"> - Share best practises and experiences in order to give the possibility to explore new areas where to apply PVT panels - Make an effort to certify and standardize PVT systems to get better trust from clients - Improve and transfer the know-how in PVT systems - Make a better lobbying for solar thermal and hybrid systems - Make sure that market engagement processes and policies are in place, to incentivise PVT as a solid platform for renewable heat in EU and around the world. - Stress what PVT can bring to the market and know the limitations of PVT integration in systems.
2	<p><u>Main market barriers for PVT</u></p> <p>LB introduce the point addressing the main market barriers for PVT. These shall be initially discussed within three main areas: Competitivity, quality assurance and public awareness.</p> <p>PD presented the current status of PVT market related to competitivity. The information available on the market is based on one report from IEA SHC Task 60. Regarding the geographical scope and applications covered the main highlights were:</p> <ul style="list-style-type: none"> - The total cumulated thermal capacity is 524.2MW_{th} and the nominal PV power is 178.2 MW_p.



- The most **distributed** collector type by PVT **manufacturers** are **uncovered water collectors** (48%), but there is also 28% of **covered water collectors**. Air collectors accounts for 12%, concentrator 8% and evacuated tube collector 4%. LBr stressed that this is the first survey so only **some** manufacturers **answered** the questions and maybe in the next report they will have stronger data.
- From the **estimated installed capacity** data (market) for each type of collector: UWC are the first, then air collectors, in third place CWC and finally evacuated tube collectors and concentrators.

One question addressed the availability of figures for the sales in 2018 or previous years to see the development of the market. It was noted that it was not the main focus of the study, as the study wanted to find the **current situation** of the market and keep track of the evolution of the market over the years. It was the first time they sent a questionnaire for PVT and the data for 2020 is also ensured. The only question mark is to **know how long PVT data will stay in the report** and what does that **continuation depend** on.

The next point was about **temperature**. The report **doesn't show concrete data** on the temperature ranges that are covered by the nominal thermal power, but it would be interesting to explore further. IEA SHC Task 60 doesn't have any regulation to say what is the nominal thermal power for PVT. It was pointed out that UWC can deliver very different thermal power depending if the collector cuddled to a heat pump or to the hot water system. There is the **need** for a **reference to calculate** the nominal thermal power in the future. It was noted that the calculation of temperature range **can vary** around **2-4%** depending on the PV cells used.

In terms of geographical scope, **France** is by far the main EU market in terms of PVT **air collectors** and there is a small penetration as well in the **UK**. While **UWC** is the main technology for the **rest of Europe** besides **Spain**, partially **Italy**, the **Netherlands** and **Austria** where **CWC** have an impact.

Finally, regarding the **PVT systems in operation by type of application**. There is a dominance from **solar air systems** (41%) but there is also a huge quantity of **not specified** (46%) and the 'others' category (13%) is split between different application similar to the tradition ST applications.

3 Identifying additional market barriers, feedback from participants

PVT competitiveness across markets

Participations were presented an open question: What defines difference of PVT market in EU countries? It was pointed out that the **market** is **defined** by the **manufacturers** present in the said market, in some cases being even a mainly local (regional) market. This was agreed and it was stressed that if some market barriers are eliminated manufacturers could more easily enter other countries.



Air PVT collectors are leading worldwide, mainly thanks to the French market. In Germany UWC are the main segment. PD asked the audience what they think about the **future scenario for EU market**? It was referred that there is a tendency for **UWC in north** Europe and **CWC in the South**, but she believes that in the future there will be a **mixed picture**. Additionally, **latitude** had an **impact** on the **early stage** of this technology and in the French case the success for air collectors was the requirement that PVT panels had to be built on the roof space. Some believe that the market will hybridise depending on the application of PVT systems and **HP** will **broaden the application of PVT** in different latitudes.

One of the main obstacles PVT faces in the market is the difficulty to **compete** with other energy sources, such as **very cheap gas**, without a substantial policy or **incentive** to drive the customer to change their behaviour. Another barrier is the **early high capital cost** associated with new technologies and **scaling to get market** without appropriate **financial mechanisms** (incentives or grants). Also **closing the commercial gap** that consumers are expecting to pay as an alternative heating requirement.

There was the opinion that, since the **price of fossil fuels** is very volatile, clients are **not confident** in the investment because they don't see the **price issue** in the picture (it is uncertain when fossil fuels are going to be more expensive). In this sense, it is not a strong sales pitch arguing about PVT price being stable (flat price).

Furthermore, it was highlighted that the main **decision factor** for clients is the **payback time** for the investment in a PVT system. This is a particular challenge for **domestic (residential) clients** as it is difficult to prove that the PVT technology is **competitive if there aren't strong price signals regarding an energy price increase**. As such, **payback time** being the main argument to convince clients, this is more effective with **corporate** and **public authorities**, within a threshold.

In the Spanish case, it was explained that PVT is a new technology, making it harder to prove that it will work for 20 years or longer. **PVT technology is less attractive in the market** in comparison with **PV** installations (more notoriety, lower investment, more mature). There is a **lack of knowledge about PVT technology** and potential clients require many examples and proofs of the system performance and reliability.

It was also noted that the **sales cycle for big installations** is quite long (**2 years**), so it is hard for a company to roll out their solution in the market and grow sales in a short period of time. It was also referred that, in order to increase success chances with PVT, it is important to interact with a project in the very beginning, as it will be easier to convince them to consider PVT as option. It was also stressed that **architects** don't know about PVT. They are not familiar with the technology and in many cases, contacts are established when projects are already too advanced to consider PVT in a new buildings.

Public support schemes or policies for PVT

Regarding PVT public **support schemes**, it was noted that in **Australia** there are some restrictive design requirements, which constitutes a barrier, together with the lack of knowledge. In **Spain**, there are subsidies at **regional level** (Aragon and Andalucía) for PVT as well as for PV and ST, but



there is no **national support** (from the state general budget). PVT can be eligible for single technology subsidies, i.e., either PV or ST.

The same situation happens in **France**, PVT needs to fall either on the PV or the ST side to be eligible of subsidies. Also, subsidies are **not covering unglazed PVT**. Currently there is single **tax credit for the thermal** part but in 2020 can change. For **large projects** there are **no subsidies** for the ST part.

In **Italy** there are two different subsidies: **tax refund PV of 50%** in 10 years and **Conto Termico** designed for **ST** collectors. This last fund is **hard** to get because it is required a **minimum of kWh/m²** that PVT can't reach.

In **Germany**, it must be decided if to take the investment subsidy (as ST) meaning that ST requirements need to be fulfilled - the **thermal output** is calculated based on **Solar Keymark** data sheet $\text{KWh}_{\text{th}}/\text{a}$. Most PVT systems are **not eligible** and even if they are, it is **not possible to combine with FIT PV subsidy** because one same product can't have two different subsidies. By definition, **UWC are not included** in any subsidy. Finally, there are two other possibilities: **additional €500 if PVT is combined**, as a source, with a **HP** and the most attractive option, **50% of refund** in the investment when using **PVT for process heat**. The most common situation in Germany is getting additional €500 with a HP and save on electricity bill.

From the **Netherlands** case, not a lot of information regarding public support was provided but PVT systems have a certain degree of subsidies depending on the size of installation (**large installations**). It was referred that there is a program focused on replacing gas and the calculation is based on **carbon savings**.

In **Switzerland**, the calculation doesn't favour PVT either, because there is a thermal minimum threshold calculated for higher temperatures, that PVT can't deliver.

The participants agreed that there is **no clear support** in general in Europe because they don't understand the technology, and it's hard to calculate the subsidy for ST because it's based on m^2 definition. They also agreed that the **promotion** of PVT systems should be done at the **very beginning of the project**.

In a **nutshell** the financial barriers come from: PVT being between two technologies (ST and PV), financial support is limited to a concrete type of collector and if the subsidy relies on PV or ST alone, it is only considered as a single technology solution so ignoring the hybrid solution of PVT.

Quality Assurance

LBr introduced the next point for discussion, the issue of **quality** and **performance** of PVT and asked for the inputs of the participants. One of the points to consider is the difficulty to demonstrate to costumers how PVT technology works and the potential output from PV and ST combined. In this regard, it would be helpful to have an **independent software to validate** the data for the costumers (bigger installations). As a **short-term approach**, PVT performance should be measured using the **separated standards for ST and for PV**. On a later stage, PVT should have a clear framework that measures its performance in a synchronised way (taking into account the interaction in the data).

	<p>In Spain there is a reference program to calculate thermal efficiency which, if applied to PVT collectors, gives poor results in comparison with ST. It is a challenge to explain that PVT generates both thermal and electric energy and that any comparison needs to be done on the basis of the overall output.</p> <p>Participants were informed that in December 2019 there will be an open project for manufacturers to contribute in screening technology monitoring (with German subsidies), which will try to help to answer such questions. It will help manufactures to know what they can guarantee, and it will set a more attractive threshold for policies to be able to create a subsidy program.</p> <p><u>Awareness raising</u></p> <p>The last point of the meeting was about Awareness. Participants agreed that the target group to whom PVT should be promoted was policy makers at EU level with a clear message: PVT is a key enabler for achieving climate targets. This should be a starting point, as a top-down approach in this regard might be easier. Though it shall evolve into reaching the national level. In particular, PVT knowledge should be reaching the installers and engineering side because they are the ones who can influence costumers.</p>
4	<p><u>Wrap- up and next steps</u></p> <p>PD asked the participants to fill the survey “Identifying target and priorities for PVT”.</p> <ul style="list-style-type: none"> - SHE will elaborate a document with the inputs discussed during the meeting and with the results from the survey, that narrows down the main topics to address and ways to assess them.
5	<p><u>Any other business</u></p> <p>The result of this workshop will be presented in the pre-events of Solar Heat Europe 2019 General Assembly on November 28th in Brussels. PD invited all the participants to the next PVT face-to-face meeting.</p>

Annex: [PPT Presentation](#)