

SHC Technology Position Paper PVT Collectors and Systems

January 2021. The quest to decarbonize society's electrical and thermal systems has never been more urgent. In this [Technology Position Paper](#), experts of IEA SHC Task 60 on PVT Systems layout how to support the development of PV/Solar Thermal (or PVT) collectors and systems. Below are key takeaways. To read the full paper click on the link above or visit our website, www.iea-shc.org.

PVT - TODAY AND TOMORROW

PVT technology is a hybrid technology combining a PV (photovoltaic) module and a solar thermal collector (ST) to produce electricity and heat simultaneously from solar without requiring more space than a PV-only collector would. Cooling (radiative and convective) can also be provided directly during the night using the PVT collector's thermal absorber or indirectly through a machine driven by the PV electricity.

Current Status

Uncovered PVT (or WISC) collectors

- **Products.** About 80% of the market are liquid- and air-cooled collectors.
- **Market.** DHW and space heating in renovated buildings (in combination with a heat pump) and new buildings (with or without heat pumps, for heating and cooling), space heating for low energy houses using air in the ventilation system or using water in a floor heating solution.
- **Labs.** Collectors tested and certified according to PV and/or T standard testing, but still missing a simple global PVT standard at a reasonable price and a simple solution when only the PV module is changed.

Covered PVT collectors

- **Products.** Several are on the market, and more are coming.
- **Market.** DHW in large buildings – commercial, residential and administrative. Hotels and resorts are an important target.
- **Labs.** A global PVT standard is still missing.

Concentrating PVT collectors

- **Products.** A few on the market with a trend to disrupt since heat costs tend to be high.
- **Market.** DHW and industrial thermal processes.
- **Labs.** No global PVT standard is available.

PVT Market

- An estimated **2 million m² PVT collectors** were installed over the last 5 years (this represents, according to conventional conversion factors, about 270 MW PV and 1,400 MW Thermal).
- The market is **slowly growing** with very strong competition from PV. In many cases where a heat demand in sunny months is present, PVT is more attractive than PV because it does the same plus heat!
- An **increasing number of PVT manufacturers** are producing high-quality products.
- Niche markets: **Air PVT in France** is a niche market that has boomed over the last years. **DHW for hotels** with unglazed or glazed collectors is an attractive market segment. The combination of **heat pumps with unglazed collectors** is a very efficient PVT application that early adopters have caught on to.
- The trend of installers establishing **franchises**.

NEWS RELEASE



Potential

If the PVT market grows by 10% each year, starting from the base of 2 million m² in 2018, it can be assumed that **40 million m² will be sold by 2050**. This would be **20 times the current market volume** and represent a significant part of the solar thermal market (around 180 million m² in 2020).

As **cooling needs** grow, so does PVT collectors' potential because they can 1) produce electricity for the operation of a compression chiller and 2) be used to reject heat to the environment via convection and heat radiation. This additional function as a heat sink will also increase the competitiveness of PVT.

Continued development of applications for the **agriculture** and **process heat sectors**.

Actions Needed

1. Increase **governments' awareness** of PVT solutions: PVT is an attractive alternative to PV and T solutions and air or ground-sourced heat pumps.
2. Propose clever and fair **subsidy schemes** for PVT collectors and systems to governments and support their adoption.
3. Increase **architects' awareness** of PVT solutions: PVT is more efficient than just PV.
4. Increase **planners' awareness** of PVT solutions: PVT can be more cost-effective than any other solar solutions, especially for some applications like hotels.
5. Increase **installers' awareness** of PVT solutions: PVT is as easy to install as PV and T solutions.
6. Increase **engineering students' awareness** of PVT solutions by giving classes and tools for simulation, such as the ones found on PVT collector providers' websites.
7. Inform **PV and heat pump industries** about PVT's possibilities as a heat source and train their installers.
8. Develop an appropriate **standard for combined PVT testing**.
9. Develop **Solar Keymark certification** for PVT.
10. Reduce PVT **collector costs** and ensure that they are as **durable and easy-to-install** as PV-only collectors.
11. Increase **automation** in the PVT industry so that the cost of producing collectors can be reduced without giving up quality and durability.
12. Use **KPIs based on testing and not just simulations** to ensure the evaluation is reliable and relevant and to increase customer and planner confidence.

IEA SHC Technology Position Papers

At the end of an IEA SHC Task, the participants produce a Technology Position Paper based on the Task's results and outcomes. The papers published to date can be found along with the other IEA SHC publications at <https://www.iea-shc.org/publications>.

About IEA SHC

The International Energy Agency, Solar Heating and Cooling Technology Collaboration Programme (IEA SHC) is an international research and information program on solar heating and cooling technologies. Over 300 experts from 19 countries, the European Commission, and eight international organizations conduct collaborative research on a wide range of solar heating and cooling topics from technical solutions to regional applications. SHC is one of the oldest Technology Collaboration Programmes of the IEA, founded in 1977 and one of ten addressing a specific renewable energy source.

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