

Photovoltaic-thermal solar tiles

Germany's Paxos is currently testing the solar tile in a testing facility connected to an air heat pump. The panel can provide heat and electricity at the same time, while also improving the heat pump's coefficient of performance by around 25%.

OCTOBER 21, 2022 **SANDRA ENKHARDT**

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Image: Paul Seeger, Paxos

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Germany's [Paxos](#) has partnered with the TH Köln University of Applied Sciences to develop a solar roof tile that could be used to generate electricity and heat at the same time.

The photovoltaic-thermal (PVT) tile's appearance barely differs from conventional roof tiles, which could make them attractive for homeowners. Paxos and TH Köln fabricated a tile prototype to test its temperature, walkability, high resistance to environmental influences, and safety. They also analyzed the glass to minimize optical losses through reflection or scattering.

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“Thanks to the adjustments we made to the actual roof tile, the physical properties and also the energy yield have been significantly improved. The system was thus ready for continuous use under real conditions,” explained Christian Dick, project manager at TH Köln.



The solar system preheats air for the coupled air heat pump. *Image: Costa Belibasakis/TH Köln*

Performance tests started under real conditions in October. The system shows comparable values in terms of electrical performance as a reference system with conventional, elevated solar modules.

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“An air duct for cooling the solar cells was integrated into the solar roof tile, which improves the working point, just like the rear ventilation in conventional systems,” Dick said. “Our data shows that correspondingly comparable electrical performance is to be expected. According

to him, initial data also showed an increase in the coefficient of performance of the heat pump by around a quarter, depending on the heat requirement and the prevailing weather conditions.

TH Köln said the results show that the solar roof tile can also make a contribution to the heating supply of a building, increasing the overall efficiency of the system.

“Many roof areas in Germany are not used to generate energy – this would be an important building block for the success of the energy transition,” said Julian Münzberg, a project manager at Paxos. “We would like to create an offer for the listed building and for people who have previously avoided solar because of the optics.”

Paxos has already sold the patents for the solar roof tile to an undisclosed photovoltaic manufacturer. It will take over series production. Paxos is also behind the PV roof tile that Meyer Burger will sell and is currently putting it into series production.

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