

National Day Shines Light on Future Potential and Market Realities



At the German National Day at the beginning of November entitled “Solar Technology for the Future,” the heat experts clearly pointed out the huge gap that currently exists between long-term potential studies and the actual market development

of solar heat technologies. They made clear and precise demands to policymakers for better framework conditions. The two German representatives of the IEA Solar Heating and Cooling Programme (IEA SHC), Kerstin Krüger and Dr. Daniela Rolf, organized the National Day, which also offered a deep dive into important fields of application: solar district heating and solar process heat.

“The packed hall demonstrated the great interest in the question of how solar heat can support the decarbonization of the German heat sector,” said Krüger. “The composition of the speakers on the agenda, with internationally active IEA SHC experts and German industry and association representatives, offered a good mix with something new for all participants.”

Several speakers highlighted the huge potential that solar heat has for the energy transition.

Hans-Martin Henning, for example, illustrated the latest results for solar heat from simulations with REMod, a national energy model that analyses cost-effective paths toward carbon neutrality in 2045. In four different scenarios, solar heat contributes between 27 and 40 TWh to overall heat production by 2045. At the end of 2023, German solar thermal systems supplied 9.3 TWh, according to BSW Solar statistics. This means three to four times more collector area will need to be installed over the next 20 years.

However, market figures from BSW Solar show the opposite trend. The new collector area installed each year needs to increase to compensate for the collectors decommissioned due to age. This means that the total collector area in operation in Germany is decreasing instead of increasing.

“The discussions about the national subsidy scheme for efficient Buildings (BEG) have unsettled homeowners and paradoxically have given gas boilers a boost,” complained Juliane Hinsch from the German association BSW Solar. “Research, industry, and politics must work together to develop growth opportunities for solar heat solutions.”

Solar District Heating: Accelerating The Authorization Process

Germany is the European leader in solar district heating. In terms of newly installed capacity in 2023, Germany was number two worldwide after China, according to the report Solar Heat Worldwide. At the National Day, the SDH solar project developer Ritter XL Solar reported on the construction of what will become the largest solar district heating system in Germany: a 41 MWth vacuum tube field for the city of Leipzig. The system is scheduled to go into operation in 2026 and is expected to achieve a solar fraction of 1.6 %.



▲ **Prof. Dr. Hans-Martin Henning, Director of the Fraunhofer ISE, during the Q&A session after presenting the latest results from the study “Paths to a climate-neutral energy system.”** (Photo: project sponsor Jülich)

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The German SDH market is developing dynamically, reported Magdalena Berberich from Solites. While 58 SDH plants with a capacity of 114 MWth have been commissioned in the last 20 years, 12 plants totaling 100 MWth are currently being realized. “We should work to accelerate the authorization process,” demanded Berberich, as project development times are still far too long.

She quoted targets from the Climate Neutral Germany 2045 report from the consulting company Prognos. According to this, collector fields are expected to feed 13 TWh into heat networks by 2045. This corresponds to 30 million m² of collector area (21 GWth), assuming a specific yield of 433 kWh/m². This is an extremely ambitious increase compared to the 114 MWth currently in operation.

Heat Transition Plans Are A Mindset Shift

The biggest challenge for the German district heating sector is the requirement to create a heat transition plan. “It is more cost effective to decarbonize heat grids than individual heating systems, which is why we need heat transition plans”, explained Christian Maass, Head of the Department for Heat, Hydrogen and Efficiency at the Federal Economy Ministry (see photo above). The national Heat Planning Law has been in force since January 2024. It requires municipalities with a population of over 100,000 to develop a heat transition plan by June 2026 that describes the path to climate neutrality. Municipalities with fewer than 100,000 inhabitants have until June 2028.

“This is a shift in the mindset because until now, it was left to building owners to decide on the most favorable CO₂-reducing heating solution. Now municipalities must support building owners in this decision”, said Maass. Another important starting point for successful heat transition is the “awareness that we will have to change infrastructure.” It is indeed a problem, according to Maass, that “a lot of people are convinced that we can just make the gas green and leave all the infrastructure the same.”

Solar Process Heat: Rapid Depreciation Reduces Payback Period

The biggest gap between potential and actual market development in Germany is in the solar process heat segment. So far, 48,172 m² of solar industrial heat systems have been installed countrywide, a large proportion of them for solar drying. Felix Pag from the University of Kassel highlighted the results of a potential study forecasting 20 TWh of solar heat contribution to industry. Potentially, 50 million m² of collector area would be necessary to cover that demand.

Pag underlined the fact that solar process heat solutions are flexible in terms of integration and typically contribute to optimizing energy efficiency. To speed up deployment rates, the researcher suggested two important measures: subsidizing feasibility studies and implementing faster depreciation.

“You can’t give enough subsidies to ensure that the payback period for a solar process heat plant is perhaps only three years, which is what industry is demanding,” stressed Prof Klaus Vajen from the University of Kassel. He calls for very rapid depreciation because that has an extraordinarily positive effect on the payback period.

This article was contributed by Bärbel Epp of solrico, Germany, for IEA SHC.



▲ **Christian Maas,** Department Head at the German Federal Economy Ministry. (Photo: Bärbel Epp)



▲ **The Green Chiller Association** offered a tour around a mobile sorption classroom. The completely open absorption cooling system makes it possible to explain the technology clearly and illustrate various operating states. **Christian Kemmerzell,** Managing Director of EAW Energieanlagenbau, demonstrates the unique system. (Photo: Bärbel Epp)