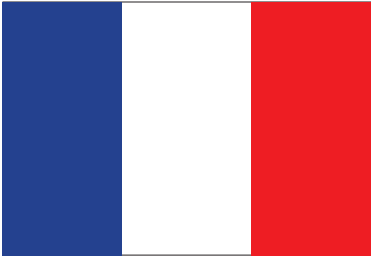


# France in a Dynamic Solar Thermal Renewal



*The planets seem to be aligned once again for solar thermal in France. The solar thermal market is finally on the rise again, with 53,600 m<sup>2</sup> installed in 2021 compared to 46,130 m<sup>2</sup> in 2020, an increase of 16% after eight years of decline. Solar thermal technology is benefitting from the upturn in renovations and replacement of old boilers in the residential sector and the rising cost of conventional energy. Solar thermal also has benefited from more appropriate support measures. This is good news for the fight against*

*climate change and the willingness to reduce the dependence on Russian hydrocarbons.*

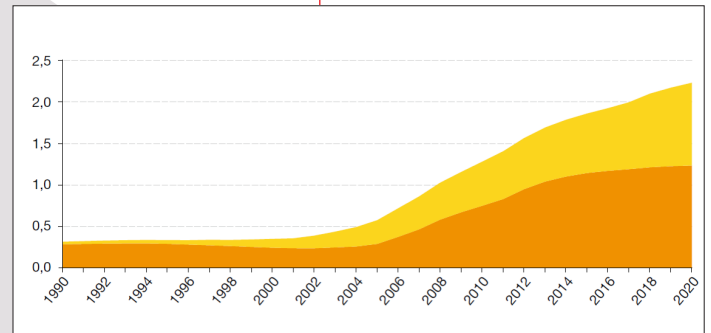
The French market, including its overseas territories, is back on the growth track, rising by 18.9% to reach an installed base of 164,000 m<sup>2</sup> in 2021. It should be noted that more than half of the French market is in its overseas territories, approximately 90,000 m<sup>2</sup>. In 2020, France's total solar thermal cumulated energy was about 2.2 TWh (+2.8 % compared to 2019).

The French market also benefitted from the commissioning of four heating networks and Europe's largest industrial solar heating project, Creutzwald, where no such installations were connected in 2020.

The growth outlook for the current year remains positive overall in the European Union and France, in particular, with an expected revival in large-scale installations for heating networks.

In 2021, France was the most active country in the European Union, with four new heating networks commissioned incorporating solar energy (Creutzwald, Narbonne, Pons, and Cadaujac) for a cumulative surface area of 11,219 m<sup>2</sup>, and ahead of Denmark.

The largest plant is Creutzwald (5,621 m<sup>2</sup> collector area, 4.3 MWth) operated by La Française de l'Énergie (LFDE). The Narbonne plant has a 2,996 m<sup>2</sup> solar thermal collector field that will replace 2,410 MWh of heat previously supplied by a gas-fired boiler. This plant is owned by Newheat, an ESCO energy service company that owns the equipment and markets the solar heat. The third French solar heat network completed in 2021 was that of the city of Pons (1,661 m<sup>2</sup>, 1.2 MWth), also owned by Newheat and built by Savosolar. The solar thermal collectors on this site have the distinction of being positioned on solar trackers. This innovation was done to optimize the annual solar production using a limited surface area. The plant, operated by Dalkia, will deliver solar heat (about 1,000 MWh each year) into the network of the city of Pons.



▲ **Evolution of French solar thermal energy production (in TWh, orange: France and yellow: overseas territories).** Source: SDES, from Observ'ER



◀ **Panoramic view of the Pons solar thermal system.** Source: Newheat

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The smallest heating network is in Cadaujac, in southwest France, with a collector surface of 941 m<sup>2</sup>. (720 kW). This is a turnkey solar power plant built by Savosolar to meet the heating needs of an eco-responsible residential area and produces 510 MWh per year. The solar production is linked to inter-seasonal geothermal storage, allowing this new district to cover 100% of its heating and domestic hot water needs with renewable energy.



▲ **Panoramic view of the Kyotherm solar thermal plant at Malterie Franco Suisse (Issoudun).**

Source: Kyotherm

Another growing market segment is solar thermal systems for industrial processes. This sector is becoming increasingly structured with the arrival of more and more ambitious projects in fields as varied as the food industry, paper mills, and greenhouse heating. The largest industrial project to be commissioned in 2021 is the Issoudun plant in France. With an area of 13,243 m<sup>2</sup> (consisting of 893 Savosolar Savo 15 SG-M collectors), it is the largest solar heating system in France and the largest solar thermal system producing industrial heat in Europe. The plant owner is Kyotherm, a company specializing in financing renewable heat projects by third parties. The solar unit will supply heat to a malt drying plant operated by the Franco-Swiss Maltsters.

Another project for which a contract was signed in early February 2021 is expected to be completed in 2022. What should become the largest solar thermal power plant in France will be built by Newheat to supply heat to the Lactalis group. The unit will have a collector surface of nearly 15,000 m<sup>2</sup> for a maximum power of about 13 MWth (for the production of approximately 8,000 MWh). This project, located in Fromeréville-les-Vallons, near Verdun, will provide solar heat to preheat the air in a new whey drying tower (from 15°C to 80°C) and will enable the site to reduce its gas consumption by 11% and its CO<sub>2</sub> emissions by 2,000 tons per year.

As for innovation, the government is providing public support mechanisms, and private companies are stepping up, such as Newheat in large-scale solar thermal systems and DualSun with its particular PVT technology. These two companies are not only innovators but also active participants in several Tasks of the Solar Heating and Cooling Programme.



▲ **Schematic view of the Dualsun PVT concept.** Source:

Dualsun

Finally, ADEME, the French agency for energy transition, is likely to publish a call for projects by the end of 2022 that will support innovation in the following areas: lower investment and operating costs, development of innovative system management solutions, and optimized integration of storage for solar thermal systems. Undoubtedly, the planets' alignment will continue to mean a bright 2023 for solar thermal in France.

*This article was contributed by the French IEA SHC Executive Committee members Daniel Mugnier of Planair and Paul Kaajik of ADEME.*