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France Country Update

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ABSTRACT

The French individual geothermal heat pump market has stabilized for a few years at around 3000 geothermal heat pumps sold in 2020 (Observ'ER). This rate is very low compared to 10 years ago and represents a small percentage of a market dominated by air/air heat pumps and thermodynamics water-heaters (around 100 000 units sold each year) whereas geothermal energy has numerous advantages: discretion (visual and sound), no heating island effect, very high performances, …

In the shallow geothermal energy sector, the situation is contrasted: if the private market has fallen in recent years, the collective one shows a permanent-growth (+10% per year). Several innovative technologies have shown a strong dynamism, like the geothermal temperate water closed-loop also known as "thermal smart-grid" or geothermal spiral heat exchanger. According to this market study, around 3,6 TWh of shallow geothermal energy have been produced in 2020 in the individual market and 1,17 TWh in the collective and tertiary sectors. If the ongoing dynamics are in line with the 2019 PPE objectives, it is essential to support his development to be able to reach the new ambitious objectives set at the horizon of 2028, and even exceeds them!

Direct uses of deep geothermal energy, estimated at 2,00 TWh in France in 2020, are mainly delivering energy to district heating networks in Île-de-France (Paris basin) with 50 doublets (or triplets), representing 81% of the total French production. Other applications are with an order of priority: industrial application (182 GWh, with a huge site situated in the Upper Rhine Graben at Rittershoffen); fish farming (40 GWh, with 2 sites in the Aquitaine basin); swimming pools, greenhouses, and thermal baths (11 sites representing 45 GWh). Considering 10 geothermal district heating networks outside the Paris area, there are 74 geothermal plants in operation. Since 3 years, several projects have been drilled and will be connected in 2022 (Champs-sur-Marne, Bordeaux, Evry, Rueil-Malmaison, Saint-Germain-en-Laye, Velizy). A dozen of projects are expected to be drilled in the next 2 or 3 years. The geological risk guarantee fund (SAF-Environment; short and long terms) is currently reshaped to encourage the deployment of deep geothermal projects in more risky zones (where the underground is less known).

Regarding electricity production and since 2019, there is no additional power plants in operation (Soultz-sous-Forêts in Alsace and Bouillante*2 in Guadeloupe), representing 17 MWe of installed capacity and 127 GWh of gross electric production. The two projects around Strasbourg (Vendeheim and Illkirch) are currently on standby (following the seismic events of 2020). A project in Massif-Central in the Puy-de-Dôme area has just received the green light from authorities to start the drilling phase (the project considers 2 doublets) with a crustal fault target. Research permits have been recently delivered overseas (Mayotte, Guadeloupe, Martinique) and the mainland (Massif-Central, Alsace). These permits are dedicated to electricity production, heat production, or both (co-production), some of them including lithium co-extraction. The French geothermal association AFPG is currently building a dedicated cluster to structure a nascent green lithium industry.