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France: Survey of low temperature geothermal energy

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Geography

Area 52,9200,000 (1976)

Information

The questionnaire was sent to J. Varet. No reply was received but the BRGM was visited by the author and information obtained in discussions with J.M. Lejeune and O. Goyeneche. Papers by J. Varet (1978) and A. Ten-Dam (1978) were also consulted. A book by Cerisier (1978) gives information about thermal springs in France.

Utilization

The main use of geothermal in France is in space heating. There are 4 heating systems in the Paris Basin and two in the Aquitaine Basin. Table 1 shows all the particulars. There are presently at least 11,700 flats heated by geothermal. Varet (1978) stated that about 20,000 flats are heated. At Mont de Marsan the district heating systems serves a hospital and military barracks.

There are plans to increase the use of geothermal in the next few years. Several wells have already been drilled. At Mellerary a 17,000 m^2 greenhouse will be connected and at Cergy, Coulommiers, Jonzac and Dax, district heating systems are being built. There are (were) hot springs at Dax used for baths.

Exploration

There are several exploration projects being carried out in France. However, there is already good information about the main sedimentary basins in France because of oil exploration.

Assessment

Lavigne (1978) has reported an assessment study of geothermal energy in France. The study was based on the method presented by Muffer & Cataldi (1978). The identified resources of France are 380 x 10^{18} cal (1.6 x 10^{21} J) of which 300 x 10^{18} cal (1.3 x 10^{21} J) are in the Aquitain Basin and 67 x 10^{18} cal (0.3 x 10^{21} J) in the Paris Basin. The reserve (réserves en place) are 10.8 x 10^{18} cal (4.5 x 10^{19} J) of which 7.2 x 10^{18} cal (3.0 x 10^{19} J) are in the Paris Basin. Based on experience in the Paris Basin Lavigne (1978) stated that 1.8 x 10^{18} cal (7.5 x 10^{18}J) of the geothermal reserve is recoverable (reserves récupérables).

Bibliography

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TABLE 1

Utilization of geothermal energy in France for district heating

Name	Year when operational	Heated apartments	Flowrate		Boreholes		Temp. °C		Installed thermal power MW		
			m^3/h	l/s	P	R	P	R	>0°C	>15°C	>40°C
Melun l'Almont	1970	3300	95	26.4	1	1	70	35	7.7	6.1	3.3
Villeneuve la Garenne	1976	1800	180	50.0	1	1	54	30-40	11.3	8.2	2.9
Creil	1977	3400	220	61.1	2	2	57	20	14.6	10.7	4.3
Melun le Mee Sur Sein	1978	1450	200	55.5	1	1	72	30-35	16.7	13.2	7.4
Blagnac	1976	1750	45	12.5	1	0	60	—	3.1	2.4	1.0
Mont de Marsan	1977	?	300	83.3	1	1	58	?	20.2	15.0	6.3
Total	—	(11,700)	1040	288.8	7	6	—	—	73.6	55.6	25.2

P: Production

R: Reinjection