

PG&E RAPIDLY EXPANDS AMERICA'S  
ONLY GEOTHERMAL POWER PLANTUNIVERSITY OF UTAH  
RESEARCH INSTITUTE  
EARTH SCIENCE LAB.

Pacific Gas and Electric Company's geothermal electric generating capacity will reach 502,000 kilowatts with completion of Unit 11 at The Geysers Power Plant this month, making it the largest geothermal facility in the world.

America's only commercial producer of electricity generated by natural underground steam, The Geysers Power Plant is 90 miles by automobile north of San Francisco in mountainous Sonoma County.

In service since 1960, The Geysers Power Plant is being expanded steadily and is scheduled to reach about 908,000 kilowatts capacity by 1977. The plant gained to world leadership in geothermal power production with completion of Units 9 and 10 in October and December 1973.

In 1969, PG&E entered into new agreements with the Union Oil Company of California and PG&E's earlier steam suppliers, Magma Power Company of Los Angeles and Thermal Power Company of San Francisco. These agreements provide for orderly development of geothermal resources by Union Oil Company for the three producing companies and installation by PG&E of additional electric generating capacity each year, contingent on the demonstrated long-term availability of enough new natural steam at The Geysers.

Early in 1973 PG&E reached a similar agreement for purchase of steam from the Burmah Oil and Gas Company. Burmah's leaseholds are adjacent to The Geysers in the Castle Rock Springs area of Lake County. Five months later PG&E contracted with Pacific Energy Corporation to purchase steam produced in the Happy Jack-Sulphur Bank area of The Geysers field in Sonoma County.

In 1971 the Company installed the first of a series of turbine-generator units having a capacity of 53,000 kilowatts, considerably larger than any geothermal steam power units elsewhere. A 106,000 kilowatt unit is being placed in service this month. PG&E projects a 106,000 kw and a 110,000 kilowatt unit, Nos. 12 and 14 on the Magma-Thermal-Union holdings in 1976 and 1977, and a 135,000 kilowatt unit, No. 13, on the Burmah Oil and Gas Company holdings in 1977, along with a 55,000 kilowatt Unit 15 on the Pacific Energy leasehold.

PG&E pays the producers for purchased steam at a rate which will make electric generation from this source entirely competitive with electric power from PG&E's most economical alternative source.

Here is the record of PG&E's development of geothermal energy:

				Plant Capacity
1960	Unit 1	11,000 kilowatts	\$1,750,000	11,000 kilowatts
1963	Unit 2	13,000 "	2,200,000	24,000 "
1967	Unit 3	27,000 "	3,790,000	51,000 "
1968	Unit 4	27,000 "	3,170,000	78,000 "
1971	Unit 5	53,000 "		
	Unit 6	53,000 "	11,500,000	184,000 "
1972	Unit 7	53,000 "		
	Unit 8	53,000 "	11,900,000	290,000 "
1973	Unit 9	53,000 "		
	Unit 10	53,000 "	13,500,000	396,000 "
1974	Unit 11	106,000 "	13,400,000*	502,000 "
1976	Unit 12	106,000 "	14,700,000*	608,000 "
1977	Unit 13	135,000 " (Signal)	20,200,000*	
	Unit 14	110,000 " (Union)	16,350,000*	
	Unit 15	55,000 " (Pacific Energy)	11,300,000*	908,000 "

\*Estimated Cost

The Geysers is the third area of the world to produce geothermal steam-electric energy on a large scale. The first generation began in Italy in 1904 at Larderello. Today this plant and several smaller fields nearby generate approximately 400,000 kilowatts.

The second field to be developed was at Wairekei in New Zealand. This field began power generation in 1958 and had a 1972 capacity of 192,600 kilowatts. It produces about 10% of the total New Zealand power supply. That nation has announced the suspension of further geothermal power development for the time being.

Recently completed is a plant south of Mexicali, Mexico, with a 75,000 kilowatt capacity. Exploration for geothermal resources is in progress in the Imperial Valley of California.

The Geysers Power Plant represents a useful source of energy for Pacific Gas and Electric Company, but geothermal steam electricity production remains small in relation to PG&E's total system capacity of more than 10 million kilowatts. It will continue to be so for the foreseeable future.

Steam of suitable quality close to the earth's surface occurs relatively rarely, and at present technology does not exist for reaching and utilizing the immense resource of latent heat deeper in the earth's crust.

While PG&E consultants believe it is virtually impossible to give a definite estimate of the capacity that will ultimately be developed in The Geysers area, they now believe it could approach two million kilowatts. Geothermal capacity might well become 10 per cent of the total available to the PG&E area.

