

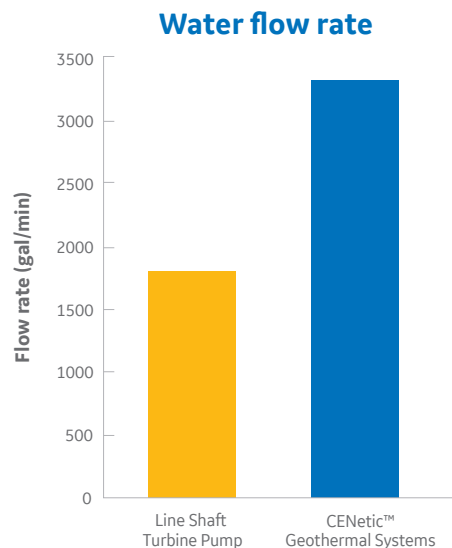
CENetic geothermal systems increased revenue \$9 million USD

Geothermal power plants near Reno, Nevada, generated electricity for commercial and residential use with naturally occurring hot water or steam produced from geothermal reservoirs to drive power plant turbines. The used water or steam was reinjected into the geothermal reservoir so the process could begin again.

Since hot water temperature varied and the operator wanted increased hot water flow rates beyond 1,800 gal/min, engineers recommended **CENetic™ geothermal systems** from Baker Hughes, GE company (BHGE), with **Xtreme Performance (XP™) series electrical submersible pumping (ESP) systems**, designed to operate effectively in conditions up to 450°F (232°C).

The high-temperature, high-volume systems use rugged technology. The design features an advanced high-strength shaft with proprietary materials, which enhance run life. The motors feature high load thrust bearings and an advanced hardened rotor bearing system.

With installation of CENetic geothermal systems, the operator increased the plant's hot water flow rate 83% and added 5 MW gross power production from the power plant expansion. Power plant revenue increased more than \$9 million USD annually.



Challenges

- High-pressure hot water drove power plant turbines but the operator wanted increased electric power output
- With power plant expansion, the operator needed to increase existing flow rates beyond the levels that the line shaft turbine pumps could deliver
- Water temperatures varied from 280 to 310°F (138 to 154°C)

Results

- Increased hot water flow rate from 1,800 to 3,300 gal/min (6,814 to 12,492 L/min)
- Robust CENetic geothermal systems provided longer run life in high-temperature conditions
- Annual electric power output increased by 5 MW
- Annual revenue increased \$9.13 million USD

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