

ThermaGenix* ESP System

Operation in Geothermal well at 195°C (383°F) reservoir temperature

Customer Challenge

- Reservoir Temperature 195°C (383°F)
- Decreased production from 200 to 120 m³/h (881 GPM to 528 GPM)

Resulting Benefit

- Well fluid production recovery to its historical maximum
- Extra 1 MW to power plant

Levare Solution

- First HT system in market that is specially engineered for geothermal systems
- Equipped with Metal bellow protector, first in its era for high temperature applications
- 980HP Permanent Magnet Motor (PMM) withstanding to 230°C (446°F)

European geothermal area being explored and operated with ~ 200 completed geothermal wells. The area of operation is known as one of the highest potential geothermal areas in the world. Currently the power production of 6 operating power plants is of ~ 160 MW.

During field exploration the different reservoirs at different depths with temperature values of up to 237°C (459°F) were discovered.

In March 2017 the customer - as the first company to discover geothermal resources for power generation in the developed area - started operation of its first power plant with 24 MW installed capacity.

The customer – one of the basins operators - contacted Levare for reliable solution to increase production back to its historical maximum. Wellhead temperature increase was also a desirable output of ESP installation.

Historically the well had artesian flow of 200 tons per hour which decreased to 120 due to drop of NCG content in the brine. No artificial lift was ever applied before. Additional challenge to overcome was extremely high reservoir temperature – 195°C (383°F).

In December 2021 Levare installed first High Temperature ESP system in market that is specially engineered for geothermal operation:

- 675 series ESP to deliver 5,500 m³/d (3.5M GPD) of the fluid
- 562 series 980HP Permanent Magnet Motor withstanding up to 230°C (446°F). PMM is the



energy-efficient solution assuring lower power consumption in comparison with induction motor, resulting in decreased carbon footprint as well

- Metal bellow protector, first in its era, developed for high temperature geothermal

Well production got back to its historical maximum of 200 m³/h (1.3M GPH).

Levare ESP expertise and innovative technology helped the geothermal operator to increase power plant capacity that fulfilled customer's expectations. The customer informed that the Levare ESP contributes around 1 MW of extra energy in comparison with natural flow operation in the same well.

At the moment of the case study preparation ESP operates stably at 48 Hz with 5,250 m³/d (1.4M GPD) flowrate. Measured wellhead temperature of the fluid is 160°C (320°F) which is 20°C (68°F) higher than during natural flow operation.