

Milestone reached in geothermal deep drilling project

The EU-funded DEEPEGS project has managed to drill 4 659 meters into a geothermal field in what is being described as a 'significant milestone' for the geothermal industry.

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The [results and lessons](#) learned from the drilling process, which took 168 days, have just been published by the EU-funded DEEPEGS (Deployment of Deep Enhanced Geothermal Systems for Sustainable Energy Business) project whose well now has the deepest casing of any in Iceland. The work was done in two phases, the first to deepen an existing, 2 500 metre well to 3 000 metres and then to drill still further to an ultimate depth of 4 659 metres.

The project's long-term goal is to use deep wells for highly efficient energy production, opening up new dimensions in the use of geothermal as a source. DEEPEGS needed to find supercritical fluid at the bottom of their well as this has a much higher energy content than conventional high-temperature geothermal stream resulting in a more efficient energy source – the project was able to report that it had done so.

Surmounting obstacles and gaining valuable experience

DEEPEGS explains that drilling a well this deep and hot presents challenges that are hard to overcome. As they drilled further down the complexities developed, and since this well went deeper than any that preceded it, DEEPEGS gained new insights into the type of problems that arise.

Extracting drill cores proved particularly difficult, it took 13 attempts to extract 27.3 metres and the last core to remove was at the bottom of a shaft of about 4 500 metres. Conventional drilling methods were not an option, so the project had to develop new means of tackling the challenges. All obstacles apart from the last, circulation loss, were overcome.

The project found the complete loss of circulation below 3 060 metres could not be dealt with through lost circulation materials, or by sealing the loss zone with cement. As a result, drill cores were the only deep rock samples recovered. However, as DEEPEGS set out to drill deep and extract cores, measure temperatures, search for permeability and find fluids at supercritical condition, the main objectives were reached.

So how viable is the source?

DEEPEGS believes the scope for potential utilisation will not be known until the end of 2018 when all research, including substantial well simulation and flow testing, has been conducted. But, says the project, initial indications are positive. The temperature at the bottom of the well has already been measured at 427°C, with fluid pressure of 340 bars, drill cores were retrieved, and the rocks appear to be permeable at depth. If deep, supercritical wells can produce more energy than conventional geothermal wells, fewer will be needed, resulting in the same amount of energy capture for less environmental impact.

For more information, please see:
[project website](#)

Source: Based on project information and media reports

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