

Research and development projects to meet injection demands at Hellisheidi

The results of research and development projects from 2015-2017 indicate that increasing volumes of geothermal water can in large part be reinjected back into the geothermal reservoir. The projects will continue in 2018 as there are possibilities for improvement. The reception of the injection fields at Hellisheidi Power Plant is not sufficient to fulfil reinjection requirements. It is clear that, in the foreseeable future, the operation of the power plant requires solutions and new ways need to be explored. A special effort has been made in the injection at Nesjavellir and preliminary results are promising.

Hellisheidi

- Geothermal water has been injected to production wells that are not used for steam production in Sleggjubeinsdalur. In this manner reinjection is dispersed throughout the production fields of Hellisheidi Power Plant. In late 2016, three such wells were used for reinjection on mt. Skarðsmýrarfjall. That injection was ceased in the autumn of 2017 and two other wells were used for the reinjection instead..
- In late 2016, injection started into wells in the CarbFix site, located outside of the plant's production fields.
- Water rich wells on the western production fields of Hellisheidi power plant have been rested and that has reduced pressure on the reinjection utility.
- Stimulation of injection wells with alkali did not deliver desired results.
- By mixing condensate water, scaling in injection wells is minimised.
- Drilling additional reinjection wells is being considered, as well as channelling geothermal water to the ocean.
- Tracer tests are implemented to find out whether geothermal water injected into the reservoir is re-extracted in production wells. Results indicate that the reinjection helps to maintain pressures in the geothermal reservoir. Cooling in production wells as a result of reinjecting water is also an option.
- The mixing of gas saturated condensate water and separated water to prevent silica scaling has started and looks promising.
- Injection utility pressure has been raised and the resulting higher reception of injection wells is in on par with expectations. However, this has resulted in operational complications, for which solutions are currently sought.

Nesjavellir

- Geothermal water previously released on the surface, is currently pumped through three injection wells.
- Experimental injection of excess volumes of heated groundwater through two 170 m deep wells in Mosfellsheidi and in 2016, through a single well in Kýrdalur by Nesjavellir that extends down to the geothermal reservoir. Measurements indicated that the injection in Kýrdalur adversely affected production wells and was therefore discontinued.
- Redesigning of a cooling tower so it can cool water from two engines instead of one. By doing so, the demand for cooling water from the water supply at Grámelur is lessened by a third, which should reduce the need for injecting heated groundwater in the summer.
- Tracer tests for exploring whether geothermal water released through 300-600 m deep injection wells show that tracers resurface at springs in Lake Thingvallavatn.
- In 2018, it is likely that experimental reinjection of geothermal water will be tested in order to see how the deep geothermal system will react.