Research and development projects to meet injection demands at Hellisheidi and Nesjavellir

The results of research, development and implementation of projects 2015-2019 is that all separated geothermal water from the geothermal power plants can be reinjected back into the geothermal reservoir. The projects will continue in 2020 with an emphasis on implementing improved techniques to further mitigate negative impacts. A special effort has been made in the injection at Nesjavellir

Hellisheidi

- Geothermal water has been reinjected into 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 due to negative effects on the production fields. Instead two other wells further away from the production fields. The reinjection has so far been successful.
- In late 2016, injection started into wells in the CarbFix site, located outside of the plant's production fields. It was not successful.
- Örvun niðurdælingarhola með lút skilaði ekki þeim árangri sem vonast var eftir.
- Stimulation of injection wells with alkali did not deliver desired results.
- By mixing condensate water, scaling in injection wells is minimised.
- 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 a possibility.
- The mixing of gas saturated condensate water and separated water to prevent silica scaling has started and is a success.
- Well HE-55 has been temporarily connected to the reinjection utility. The injection in late 2018 was an initial success but had to be discontinued due to technical problems at the power plant. The injection was restarted in August 2019 and is a success.
- The operational pressure of the injection utility at Gráuhnúkar was raised in August 2019. Success is in line with expectations.
- Drilling additional reinjection HN-18 near Gráuhnúkar and Hverahlid. It is expected to come into operation late spring 2020.

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.
- A cooling tower was redesigned so that it could 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 exploring whether geothermal water released through 300-600 m deep injection wells show that tracers resurface at springs in Lake Thingvallavatn.
- Injection in well NJ-18 started in November 2019. The injection is progressing well and around 10-15% of the geothermal water from the power plant is reinjected into the well. It is considered unlikely that geothermal water will mix with groundwater.
- Drilling additional reinjection wells at Nesjavellir is in preparation.