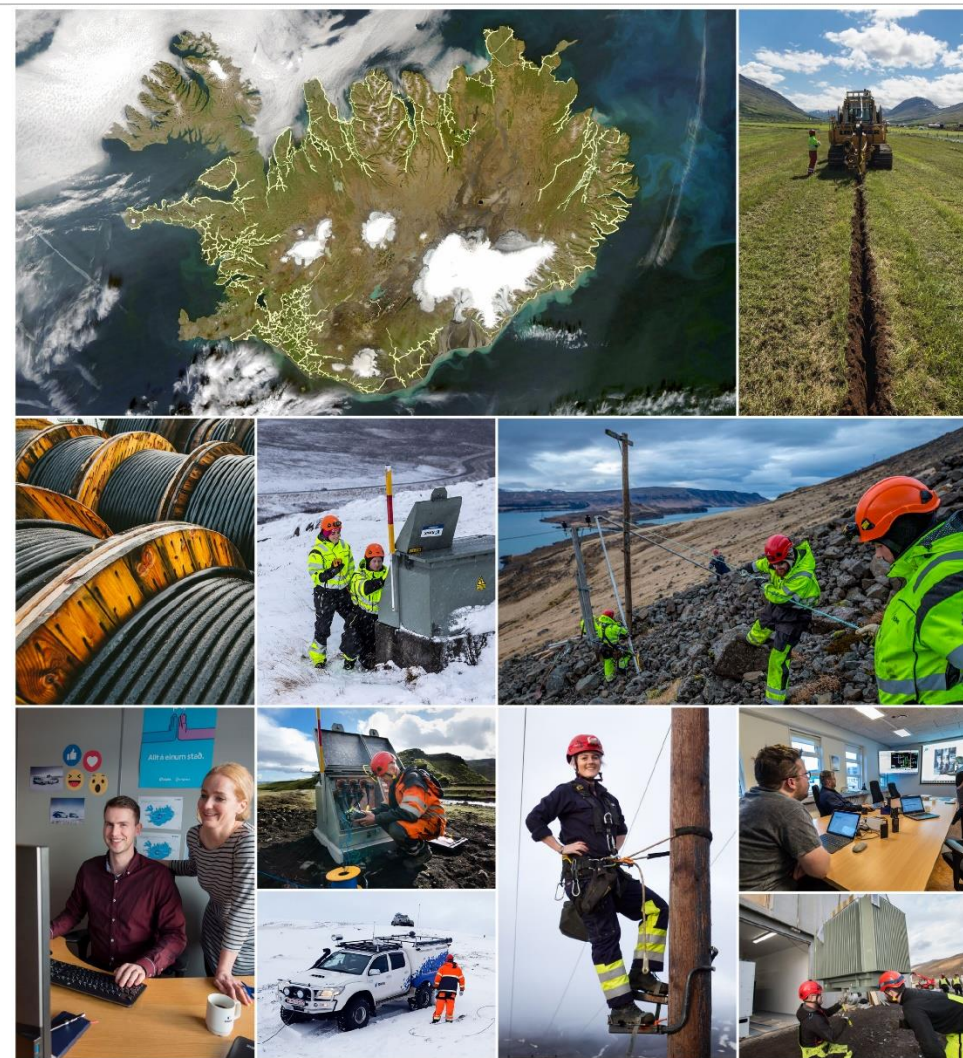


# The development of a new district heating system at Hornafjörður



# About RARIK

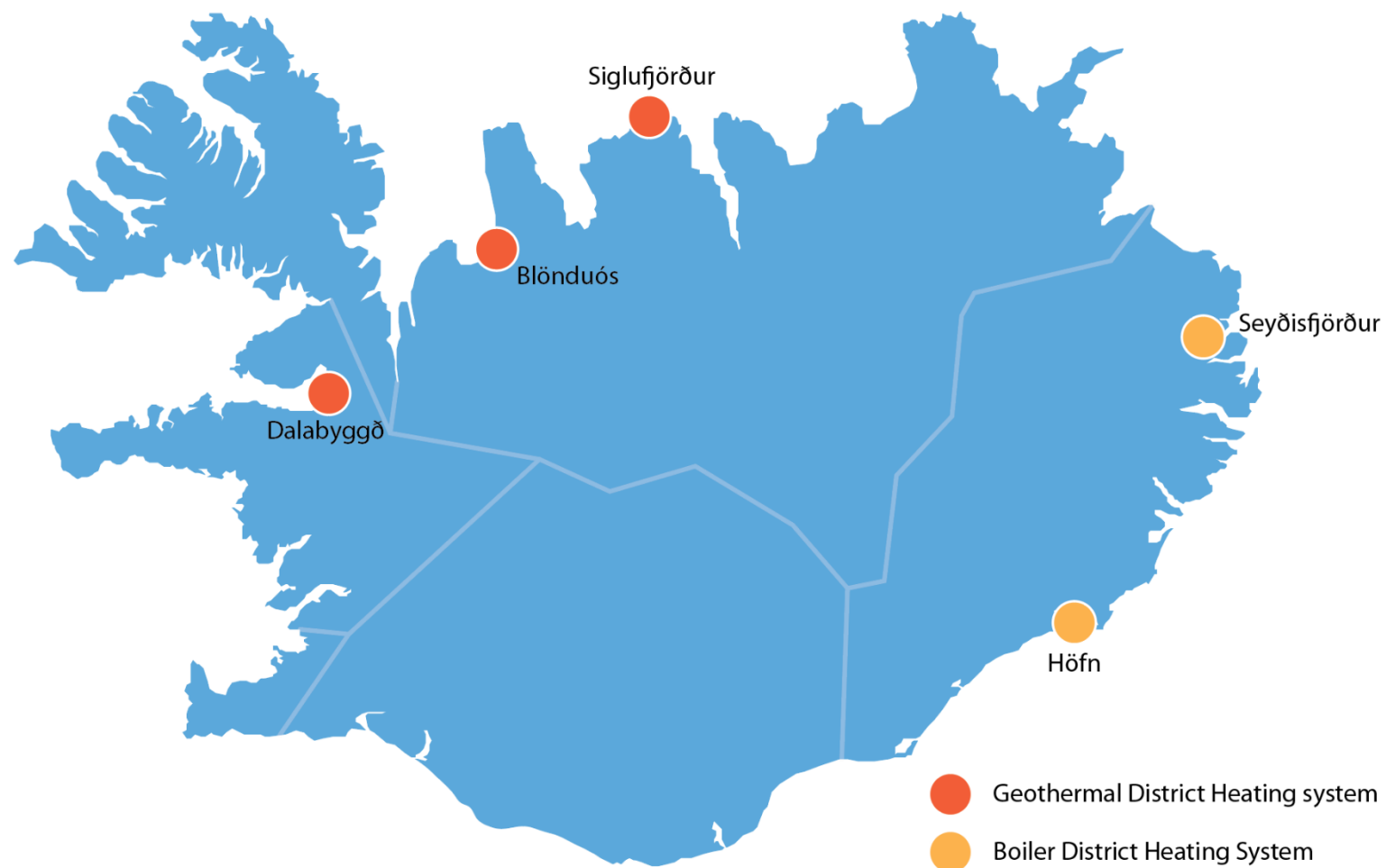
- RARIK (Iceland State Electricity) was established on 2nd April 1946
- On establishment the company's main objective was to procure sufficient electrical power to the general public and industries in a favorable manor.
- Today the company's main objective is distribution of electric power.



# RARIK's heating plants

**RARIK also owns and runs five heating plants:**

- **Geothermal district heating systems** in Búðardalur, Blönduós and Siglufjörður.
- **Boiler district heating systems** in Seyðisfjörður and Höfn in Hornafjörður.



# Höfn in Hornafjörður



# Current system

- In the 70's, a significant portion of electricity generation for Höfn was produced by diesel generators.
- The concept was to at first use excess heat from the diesel generators to supply hot water for a district heating system in Höfn. (1980).
- Once Höfn would be connected to the grid, the system would be powered by an electric boiler operating on curtailable energy using diesel boilers as backup (1981).

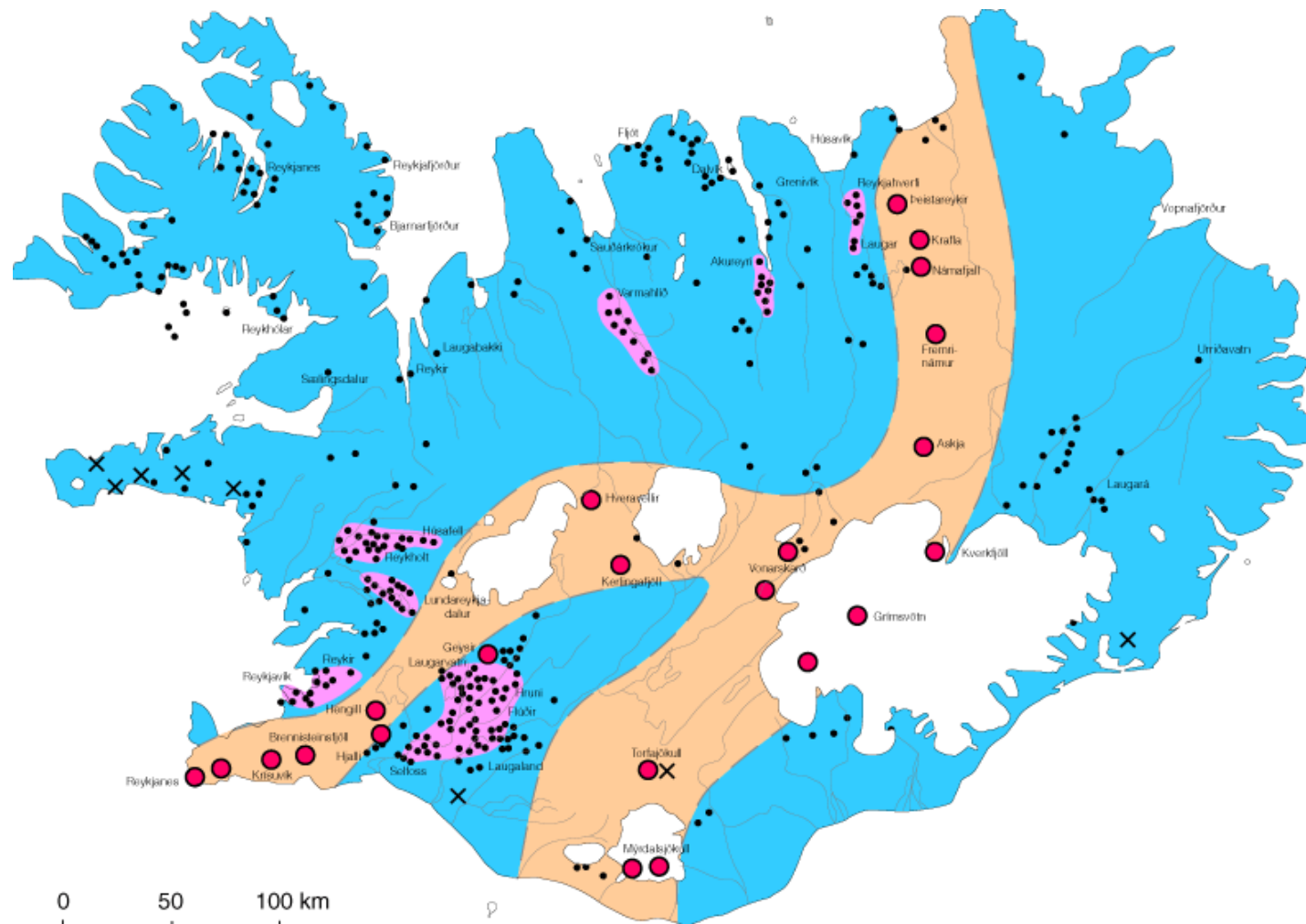


# Current system

- In 1991, RARIK took over the operation of the distribution system from the municipality and has since then operated the system in its current form.
- Approximately  $\frac{3}{4}$  of the town is connected to the system, the rest is heated directly by electricity.
- With the increasing price and diminishing availability of curtailable energy, the system is becoming less economically sustainable.



# The search for hot water



# The search for hot water 1002-2006

- Höfn is located in “cold” area.
- From 1992 to 2002 the municipality lead a search for a geothermal heat source at Hoffell.
- RARIK joined the exploration efforts in 2002 and they continued as a combined effort until 2006.
- 30 shallow (<60m) and 4 deeper (<300m) exploratory wells were drilled from 1992 to 2006.
- One of the wells produced 55°C hot water.
- A chemical analysis of the fluid indicated a reservoir temperature of 80°C.





# The search for hot water 1912-2018

- In 2012, RARIK resumed the exploration efforts without the municipality.
- 20 additional wells were drilled in the area from 2012 to 2018.



# The search for hot water 1912-2018

## From 2013, RARIK has drilled 5 deep wells at Hoffell:

- 2013, HF-1 is 1608m deep and produces 15-20 l/sec of 74°C water.
- 2014, HF-2 is 1686m deep and is dry.
- 2016, HF-3 is 1084m deep and produces 25-35 l/sec of 74°C water.
- 2017, HF-4 is 1750m deep and produces 35-40 l/sec of 83°C water.
- 2018, HF-5 is 1728m deep and produces 25-30 l/sec of 78°C water.



# The Project



**After good results from HF-4, RARIK was convinced of the viability of the project.**



# The Project

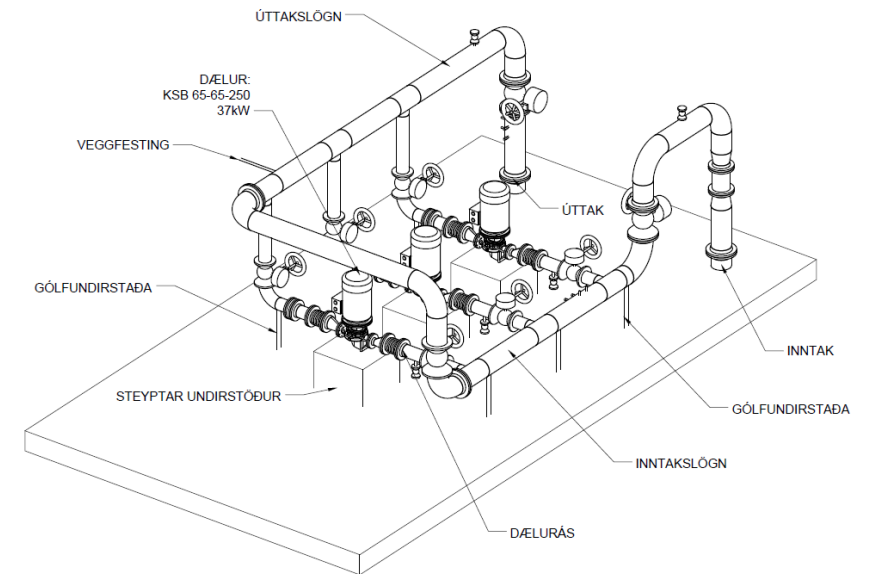
Early in 2018 RARIK commenced with the design of a district heating system that includes:

- 3 well head pumps and housing.
- 2,2 km DN200/315 collection pipes in Hoffell.
- 314 m<sup>3</sup> reservoir tank in Hoffell.



# The Project

- Pumping and control station located in Hoffell.



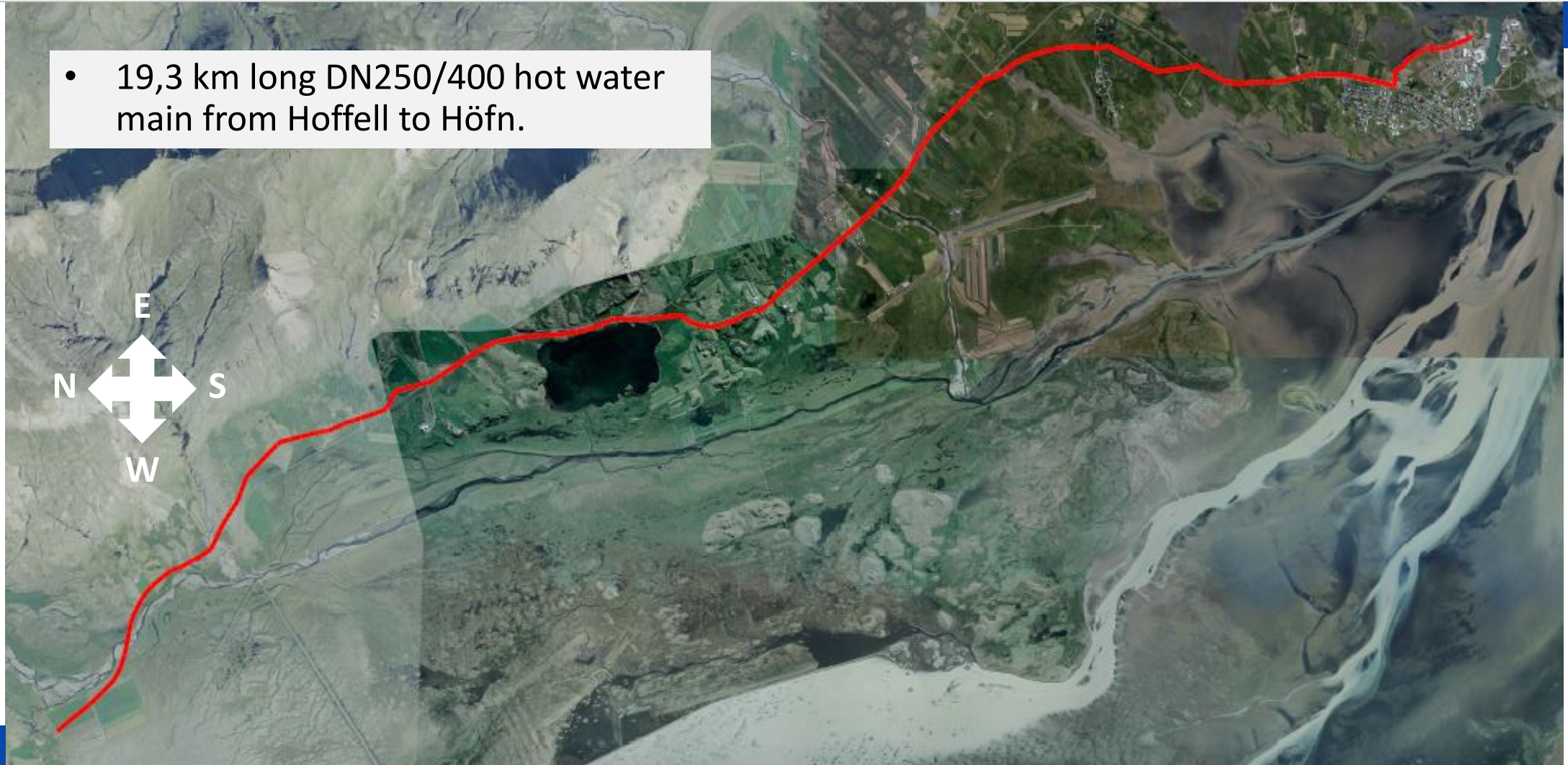
# The Project

- Pumping station (booster) located halfway between Hoffell and Höfn.



# The Project

- 19,3 km long DN250/400 hot water main from Hoffell to Höfn.



Höfn

Hoffell

# The Project

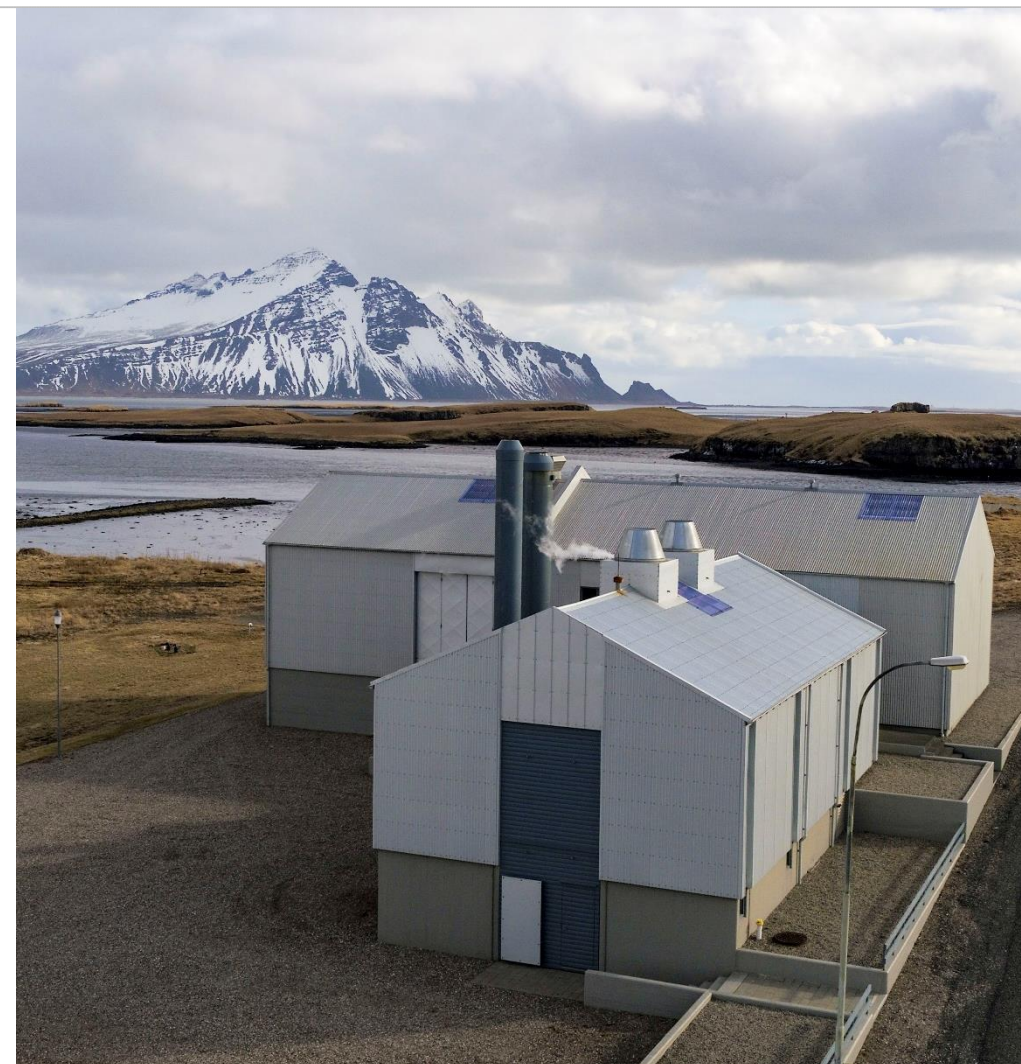
- Approximately 25km distribution network to add the remaining  $\frac{1}{4}$  of Höfn and several farm settlements in proximity to the main.
- We expect to add 241 users to the district heating system, now 372, for a total of 613.
- Total project cost is estimated to be 18-21m euros (including drilling of the production wells).
- The system is design for a maximum capacity of 80 l/s.
- Working temperature of 80°C.
- Expected average consumption is 30 l/s.





# Project Timeline

- Preparations and planning. – 2018/2019
- Hot water main from Hoffell to Höfn. – 2019/2020
- Pumping and control station located in Hoffell. – 2019/2020
- Reservoir tank in Hoffell. – 2019/2020
- Pumping station (booster) between Hoffell and Höfn. – 2019/2020
- Pumping station (distribution) at Höfn. – 2020
- Expansion of the distribution network. – 2020/2021



Tank you.

