



Polybutene
Piping Systems Association

Case Study

Bogafjell, NO



Thermaflex | Flexalen



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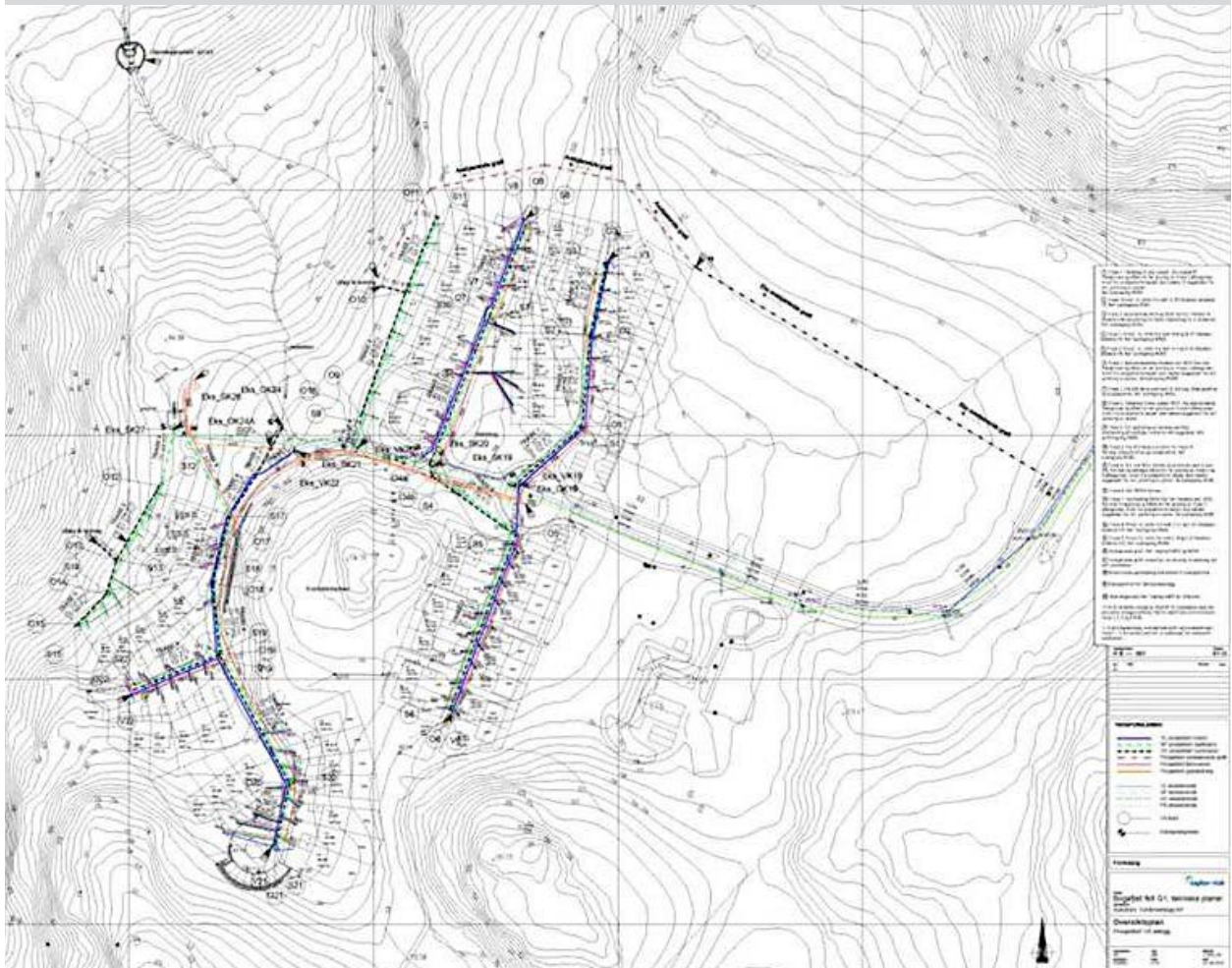
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Biomass district heating in Bogafjell, Norway

Bogafjell is a borough of the city of Sandnes located at the foot of the Bogafjell mountain, in Rogaland county, Norway. As part of Norway's national policy to move away from fossil fuels towards renewable energy, the borough has implemented a thermal biomass-fueled district energy program from Thermaflex using a flexible, pre-insulated Flexalen piping system made from Polybutene-1, combined with Flexalink ready-made house connections. The abundance of a sustainable source of energy was readily available for Bogafjell, where the vast forests in the region supply bio-mass feedstock for the local energy system.



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Robust district heating system delivered with local, turnkey energy solutions

Nærenergi, the regional energy provider and close collaborator of Thermaflex following a successful pilot project in Lyngdal, is a strong presence in the Scandinavian energy market. It has been effectively spearheading this energy transition through the development of sustainable energy solutions for residential and industrial markets.

Also, the Bogafjell project clearly demonstrated how local resources can be used to establish resilient, independent communities, while securing a stable supply of affordable energy.

The project objective was to construct a new community in the Rogaland mountains for young families. The aim was to supply at least 40% of the area (68 houses) with biomass heating and domestic hot water, organized as a community collective through a district network.

It was determined that a 300 kWh woodchip-based biomass installation could be easily supplied by the widespread forests around the area. A second 300 kWh gas alternative would act as a back-up for peak loads in winter, as required by Norwegian legislation.

STATISTICS

- 1 day to connect an entire street with 2 installers
- 40%-50% savings installed cost vs. traditional systems
- 68 homes with affordable energy
- Project duration: 1 year



Details

The total accumulated length of the network was 2,241 meters, with an average service temperature between 60° and 80° Celsius. To ensure optimal installation speed and operational performance with minimal heat loss and risk of leakages, all connections were made with Flexalink pre-fabricated housing connections.

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Goals

With the individual electricity price in Norway at an all-time low, the value of localized (biomass-fueled) thermal energy and district solutions would be a challenging one to demonstrate.

On a strategic level, the project had to show how localized, turn-key solutions based on thermal energy can outperform individual, electricity-based systems when it comes securing a reliable, and future-proof level of thermal comfort at minimal cost. That would also require an efficient, and sustainable distribution network.

Regarding implementation, a flexible network solution with a minimal number of connections was key to tackle the leveling difficulties posed by the mountainous landscape of Bogafjell. In this way, time, labor and material components comprising the installation cost of the district heating network could be minimized.



As parts of the system would also need to run under the road, future access to it would be very limited. A maintenance-free system was also crucial.



Results

The project proved to be a great success, in terms of both installation cost and overall performance. The flexible, pre-insulated Flexalen piping system, combined with Flexalink ready-made house connections proved ideal in addressing the time, leveling and labor challenges during implementation. On the first day, an entire street of houses was already connected by just 2 of our fully trained certified system partners.

Pre-calculated dimensioning and network optimization by Thermaflex was done in close cooperation with Naerenergi and the contractor Risa A/S, to ensure high and sustainable efficiency. Since its start of operation in 2014, zero network disruptions have occurred.

The Bogafjell case now serves as an ideal example as to how a local, community-based energy supply can create value for all stakeholders involved through turnkey solutions. Both current, and future residents get to enjoy a stable level of clean comfort, while maintaining a low energy bill.

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Organisations

- Nærenergi
(Energy supply, maintenance, installation)
- Østerhus Tomter (real estate developer)
- Risa A/S (contractor)

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