



Investment in Thermia Mega pays for itself in just one year



In 2022, the Bø Hotel in Norway switched from a 50-year-old energy system to renewable heat pumps from Thermia.



Bar garden

With a very old energy system using a standard electric boiler, Bø Hotell was consuming about 660.000 kWh/year and, with the ever-increasing electricity prices, the heating costs had got to €170.000 a year. Something had to be done. The hotel has an enormous demand for hot water, particularly in the mornings when the rooms are filled with guests travelling to the Waterpark in Bø Sommarland, often a whole family per room.

The owner of the Bø Hotell, Stein Helge Solberg, recognised the need for a completely up to date new heating system. After considering various options, Thermia was chosen, together with Haugestøl VVS AS as the installation contractor, to provide heat pumps using the very latest hot gas technology to deliver high temperature hot water. This technology was ideal for the Bø Hotell and had already proven its

efficacy for numerous housing associations and blocks of apartments.

A commercial solution – Mega heat pumps

The solution was to install two Thermia Mega XL heat pumps. The Mega XL is a ground source heat pump with inverter technology. At a brine temperature of 0°C the Mega XL delivers 21 - 88 kW. If the brine temperature increases by a few

degrees, the heat pump can quickly deliver 100 kW.

The Mega series features hot gas technology. All pipes and wire connections are on the top of the heat pump, which makes it easy to install. These include separate supply and return pipes connected to an exchanger for the hot gas from the compressor.

The temperature here is typically close to 100°C. In this way, the hotel gets 70-80°C hot water



Swimming pool



Restaurant

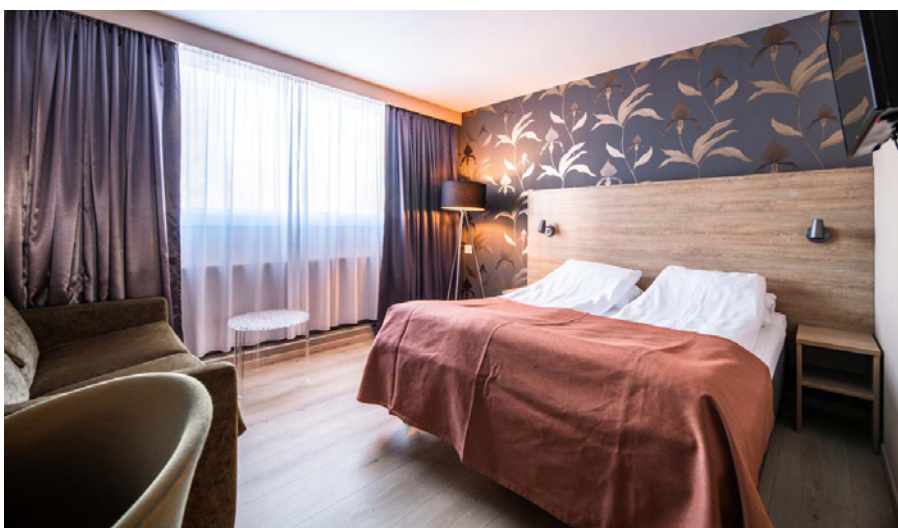
throughout the heating season without using the auxiliary heater in the hot water tank. This in turn increases the SCOP for the whole system. Normally, the hot gas circuit provides about 10% of the total hot water demand.

A standard borehole wouldn't work

The most common source of energy for a ground source heat pump is a borehole which goes down into the earth to a sufficient depth. This is possible in 95% of cases. A normal borehole delivers 100 - 150 kWh/m/year, with an average of 125 kWh/m/year. The typical depth of borehole is 200 - 400 metres. The challenge is that it is difficult to predict how efficient the borehole will be and how deep the driller can go. With a consumption of 660.000 kWh and a SCOP of about 3, the well must deliver 440.000 kWh/year if the heat pump is to deliver 100%. It is often calculated slightly

'Without Thermia's heat pumps, it would have been difficult to run the hotel with the electricity prices we have had to live with in recent years. Remember that businesses like this do not receive subsidies for electricity.'

Stein Helge Solberg, Bø Hotell owner



Hotel room



Stein Helge Solberg - the owner of Bø Hotel, Tommy Andersson - sales manager Thermia Norway and Kjell Runde Kilen from Haugestøl VVS AS contracting company at Thermia Mega XL heat pump.



Thermia Mega XL in hotel's machinery room

less, so that 5-10% is supplied by the electric boiler, for example. However, now that electricity is so expensive, it makes sense to plan for the heat pump to deliver 100%, with the electric boiler only as a backup. An estimate would be $440.000/125 = 3520$ meters of total length of borehole, which is equivalent to 10 boreholes of 350 metres.

However, it didn't work out that way. When they started drilling, so much ground water came out of the borehole that the conventional approach had to be cancelled.

Need for a specialist solution

This required non-standard solution, in which water became the energy source. The water

taken from the ground needed to be returned to the ground, so we needed a second borehole, called a discharge well.

The two wells were each about 50 meters long, allowing water to be pumped up from one well, passed through an intermediate exchanger and then returned to the discharge well. The secondary side of the exchanger is connected to the brine side of the heat pumps. This winter, the water temperature has not dropped below 6°C, which has resulted in higher heat pump output and a better SCOP.

Plans to expand the system

The hotel is now planning an expansion and wants to see how much energy can be extracted from these two wells. The hotel

Fact Box

Investor: Bø Hotell

Location: Bø in Norway

Characteristics of the building

- Property: Hotel with conference center and pool
- Hotel capacity: 63 rooms with 126 beds and 7 conference rooms (up to 160 people)
- Annual energy demand for heating: 660 000 kWh
- Year of installation: 2022 ???

Applied solution:

- Completion date: 2023 / 2024
- Type of heat pumps: Two Thermia Mega XL (21 – 88 kW)
- Source of energy: ground water / well
- Heat distribution system:
 - radiators
 - fan coils

and Thermia are looking forward to working together to explore how much more power can be generated and how much the system can be expanded.

Self-financing within a year

The system has now been in operation for over a year and, after paying off the loan each month, the hotel is now in profit. This means that the entire investment has self-financed, with the increased value of the hotel an additional benefit. This is usually the case, as even with energy prices at 1 NOK per kWh, such systems are usually self-financing. The owner of the hotel is clearly delighted and the result has been more profitable than Stein Helge Solberg could have imagined.



THERMIA NO.1 IN GREEN ENERGY SINCE 1923



PIONEERING HEAT PUMPS

For 50 years, we have dedicated all our resources and knowledge to developing and endlessly refining one product: the heat pump. Our focus on geothermal energy has given us world-leading knowledge in heat pump technology.



ENGINEERED WITH PASSION

Developing truly sustainable renewable energy solutions can only be achieved with passionate, dedicated and uncompromising experts. Some of Europe's most highly qualified engineers can be found in our own R&D center.



BORN IN SWEDEN

All our products are designed, manufactured and tested in Sweden using the latest technology and the highest quality components. All components inside our ground source heat pumps are made in Europe by world-leading industry specialists.

