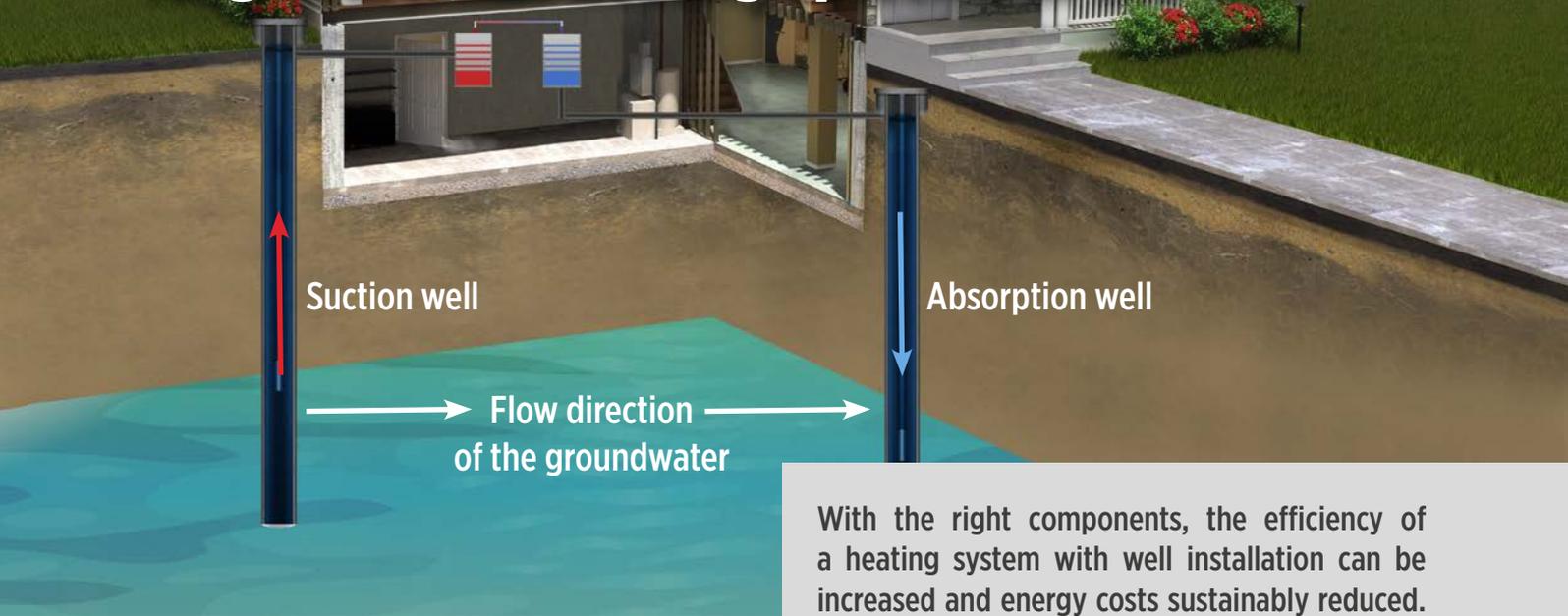




# How the Franklin Electric High Efficiency System provides sustainable energy savings for geothermal heating systems in the UK.



## Energy savings with geothermal heating systems

The increasing demand for renewable energies is causing the increasing numbers of geothermal heating systems in both the commercial and private sectors. Savings of up to 80 % compared to conventional fossil fuels and the reduction of CO2 emissions are among the advantages. In addition, there are various possibilities of financial subsidies from the legislators.

**In addition to systems with geothermal probes and geothermal collectors, there is the option of operating a heating system with a well system. The two wells, the so-called suction and absorption wells, transport groundwater to the surface and use the heat of the groundwater as an energy supplier for water-water heat pumps, which extract the heat from the groundwater to heat rooms and process and drinking water in the house.**

Since groundwater is an important resource for plants and living organisms, it must be recirculated. The pump in the suction well pumps the groundwater to the surface. After the thermal energy has been recovered in the heat exchanger, the now colder water is pumped back into the ground water via the absorption well. When positioning the two wells, it is important to consider the flow direction of the groundwater.

With the right components, the efficiency of a heating system with well installation can be increased and energy costs sustainably reduced. Geoquip Water Solutions in the UK recommends the combination with the High Efficiency System from Franklin Electric.



## This is how the thermal heat is obtained

The water-to-water heat pump transfers the thermal energy to a special refrigerant. This is initially liquid and evaporates when it absorbs the thermal energy. It then flows through a scroll compressor, which in turn increases the pressure and temperature of the medium. In the process, the steam is passed through two interlocking spirals. As one of the spirals moves eccentrically in circles, several gas spaces are created between the spirals, which become smaller and smaller towards the inside of the component, thus causing the pressure to rise. In the middle of the scroll compressor, the gases are finally pressed into the connected pipe. Here, the transported energy is transferred to the heating water. The refrigerant vapour cools down and liquefies again.

The efficiency of the system depends on the temperature difference between the design temperature of the heating system and the temperature of the environmental heat source. The groundwater is about 10 °C all year round. The compressor therefore does not have to use as much energy to raise the temperature, which makes the system very energy efficient.

## Immense savings potential through the right borehole pump

With geothermal heating systems, special care must be taken at the planning stage, because the potential savings over the lifetime of such a system are immense if the system is correctly dimensioned from the outset. The cost of purchasing and installing a typical geothermal heat pump system in an average house in the UK is around 14,000 to 19,000 pounds. A multiple of this costs the energy that is invested over the entire life of the system. It is therefore worthwhile to design the system ideally in order to achieve the maximum benefit.

The first thing to do is to make sure that the most efficient geothermal heat pump is used for operation, which also applies to the extraction pump in an open-loop system.



This may sound obvious, but it makes no sense to have a „green“ geothermal heating system if the source pump is working around the clock and consuming far more electricity than necessary to move the water in the loop.

Therefore, the selection of the right components in particular is crucial. In an open-circuit system, the borehole pump is an important component of this. If the right pump for the job is not chosen here, the system cannot run effectively.

## For Geoquip Water Solutions, the HES is the most energy-efficient solution

Mike Deed, Managing Director of Geoquip Water Solutions, has more than 30 years' experience in the water treatment and solutions sector. He works with strategic partners to ensure customers receive the maximum benefit from their investment. He believes that the most energy efficient solution on the market is the High Efficiency Borehole System (HES), designed and manufactured by Franklin Electric.



Mike Deed

» Here, Franklin Electric has set new standards in energy efficiency, because unlike most systems on the market, this system is not equipped with an - usually less energy-efficient - asynchronous motor, but uses an asynchronous NEMA standard permanent magnet motor, which has achieved motor energy savings of up to 21 % compared to standard asynchronous motors in numerous installations worldwide.«

For more information on the High Efficiency System, see [franklinwater.eu](http://franklinwater.eu).

## Permanent magnet technology as the key to outstanding efficiency

The key factor in these energy savings is the efficiency of the motor's permanent magnet technology. Instead of a short-circuit induction rotor, Franklin Electric uses a permanent magnet rotor design with integrated magnets. The total electrical rotor losses of a motor are eliminated, resulting in a significant improvement in efficiency. In addition, the PM motor has lower heat generation and requires less current to run at the same pump load. A frequency converter is required to operate a PM motor.

## Remote control via App

The system is available in the sizes 4" 6", 8" and 10". Included are a submersible motor, a submersible pump, a frequency converter and the matching output filter.

The 4" system also offers the ability to remotely control and monitor system performance in real time using an App. Franklin Electric's support team can also access the system in this way to assist with problems or setting new parameters.



The *HES selection and sizing tool provided on the Franklin Electric website* helps to select the right system. This tool can also be used to compare energy savings based on runtime and current energy prices. Systems typically pay for themselves within the first two years.

As with all things, being armed with the right information and components makes a difference. Given the long-term benefits that can be achieved through geothermal systems, it is definitely worth investing in the best.

