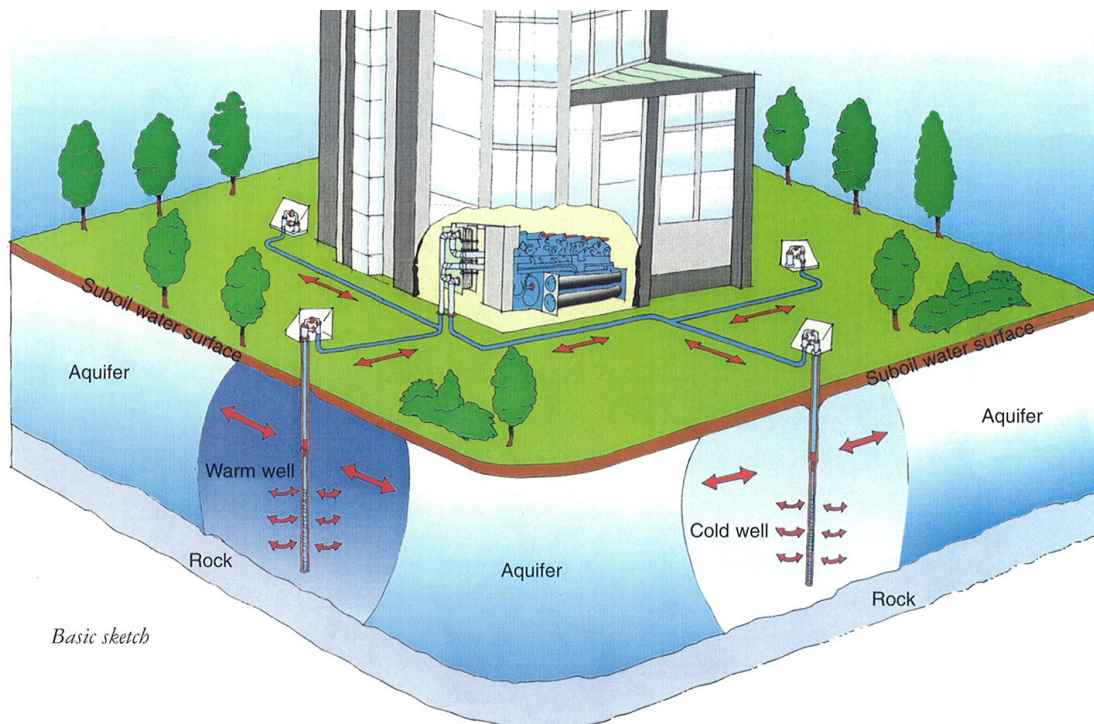


## New Heating/Cooling Plant makes the Central Hospital in Kristianstad More Energy Efficient



The Central Hospital in Kristianstad Sweden, contracted Malmberg to design and construct a new heating/cooling plant to replace their old and inefficient system. Malmberg provided the client with a turn-key solution that stores surplus seasonal heat and cold in a groundwater reservoir. Since the new plant was taken into operation, the hospital's purchased energy for heating/cooling has been reduced by 75-80 %.

The Central Hospital in Kristianstad is one of the largest hospital complexes in the south of Sweden, with over 2,400 employees. Reducing the hospital's overall environmental impact, with energy as one of the key focus areas, is an important goal for the hospital's management team and employees. In 1996 Malmberg was contracted to plan and construct a new heating/cooling plant for the hospital. The purpose of this project was to build a more energy-efficient heating and cooling system in a situation where the old system was consuming approximately 17,000 MWh annually.

**Energy storage in groundwater**  
By utilizing a heating and cooling system that uses groundwater to store heat and cold, → Malmberg constructed a plant that had all



the desired advantages and that reduced the Central Hospital's amount of purchased energy by 13,000-14,000 MWh or 75-80% annually.

The system is based on the technique of using cold subsoil water to cool the building by direct exchange. The surplus heat which is naturally stored in groundwater in the warmer period of the year is later, during autumn and winter, used to warm the building with the aid of heat pumps.

The plant includes groundwater wells that are about 100 m deep. There are three warm

wells and three cold wells. Each of these wells has a transporting capacity of approximately 130 m<sup>3</sup>/h. Heat pumps and heat exchangers are used to distribute the heat throughout the various parts of the building.

The heating and cooling plant has been expanded by Malmberg in three stages in the period 1996-2006. Today, it has a heat output of 3 MW and a cooling output of 4 MW.

### Advantages

Approximately 90 per cent of the hospital's cooling energy is now generated from the water reservoirs. Since the cooling energy generated by the heating/cooling plant is derived completely from natural sources, the electrical energy requirements are significantly reduced.

When compared with conventional systems, the heat pumps use less than a third of the purchased energy for heat production, which means that the system gets more than two thirds of its heating energy from natural sources.

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Do you want to know more about Sustainable Hospitals?

Sustainable Business Hub  
Anckargripsgatan 3  
211 19 Malmö, Sweden  
+46 40 628 51 30  
info@sbhub.se • www.sbhub.se  
www.sustainablehospitals.se

For more information on this solution, please contact:

Malmberg Water AB  
SE-296 85 Åhus  
Phone: + 46 44 780 18 00  
Contact: Peter Bäckström, +46 44 780 18 28  
peter.backstrom@malmberg.se  
www.malmberg.se



The project is financed by:

