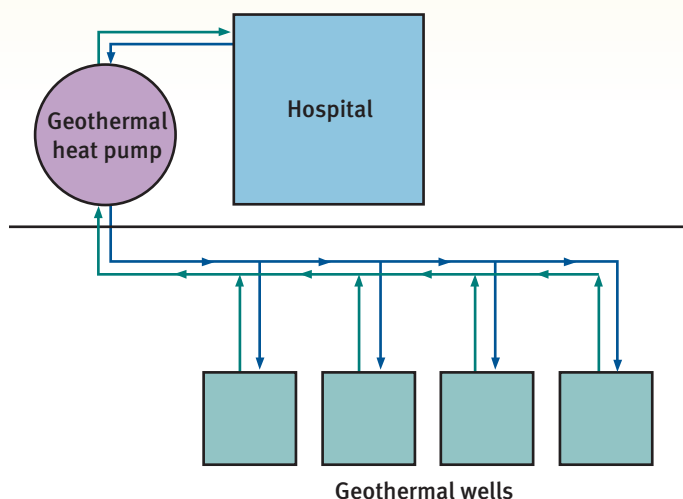


# TAPPING INTO THE EARTH'S ENERGY FOR HEATING AND COOLING

Sustainable building design is one of the key principles of Gundersen Health System's Envision® program. When the health system began designing a new Hospital, they incorporated a number of sustainability principles, and included an ambitious energy target. Their goal was for the building to run at 115 kBtu per square foot per year. The most significant element that helped them achieve this goal was the inclusion of a geothermal heat pump system.

A geothermal heat pump uses the earth as either a heat or cooling source. The system takes advantage of the moderate temperatures underground to greatly improve efficiencies of HVAC (heating and cooling) equipment. Gundersen installed a 300-ton heat pump along with 156 wells buried about 400 feet underneath a parking lot. At that depth, the ground is at a relatively constant temperature of roughly 48 degrees, providing an efficient heating and cooling source year-round.

Here's how it works. During the winter months, water from the geothermal wells is sent to the geothermal heat pump. There the energy (heat) from that water is used to add heat to the building. The water that had the energy removed is then sent back to the geothermal well to again have energy transferred to it from the earth. This method of heating is more efficient than burning fossil fuels.



The opposite happens in the summer months.

The cool water inside the geothermal wells is sent to the geothermal heat pump where energy (heat) is transferred from the building to the water. The warmed water is then sent to the geothermal wells to transfer its heat back to the earth. This results in an efficient way to cool the building.

In addition to using the Earth for heating and cooling, hospitals have continuous heating and cooling requirements all year long, regardless of outdoor temperatures. For example, heat is always needed for the sterilization of medical instruments, dehumidification or for laundry. The geothermal heat pump system at Gundersen has a unique set up that allows for the heating to occur in the most efficient way. Heat is always being generated from medical equipment, electrical equipment and computer systems. The geothermal system captures this heat and sends it to areas where it can be used. By taking advantage of this heat, less energy is needed from the geothermal wells in the winter, thus increasing the efficiency of the system.

The geothermal heat pump resulted in a savings of 70 to 80 kBtu per square foot annually—by far the largest energy saving component of the building. This system drastically reduced Gundersen's dependence on fossil fuels and exposure to fuel price volatility.

The geothermal heat pump project is part of Gundersen Health System's Envision® plan to lead the healthcare industry in environmental stewardship and lower energy costs. Gundersen Health System is headquartered in La Crosse, Wis., with hospitals and clinics in Wisconsin, Minnesota and Iowa. For more information, call (855) 669-1653 (toll free), email [envision@gundersenhealth.org](mailto:envision@gundersenhealth.org) or go to [gundersenenvision.org](http://gundersenenvision.org).