

# Ground-source heat pumps for Wisconsin homes, businesses and schools

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Wisconsinites have a safe, reliable and affordable source of efficiency right beneath their feet. The stable temperature of the ground can be used to efficiently heat and cool our homes and businesses. A Ground-sourced heat pump is the most efficient technology for electrically heating Wisconsin homes and buildings.

### HEAT-PUMP SYSTEMS

Ground-source heat-pump systems use a series of underground tubes to take advantage of the constant temperature beneath the Earth's surface. In winter, heat is transferred from the ground to your house or building. In summer, the process is reversed. Indoor heat is transferred back into the ground, keeping you comfortable through the same process that chills your refrigerator. Ponds and lakes can also be used as a stable heat source and sink. These systems are used in homes, offices and schools throughout Wisconsin and the United States.

### HOMES

Wisconsin homeowners can save energy costs year round, conserve energy, increase comfort and reduce home maintenance with ground-source heat-pump systems. The underground coils are safely installed out of sight in the yard. Homeowners also can receive the benefit of supplying their home's hot water with the system, further reducing energy costs.

A ground-source heat-pump system requires no natural gas or propane and may cut your total energy consumption. However, it uses more electricity than fossil-fuel heating systems.

Wisconsin homeowner Scott Fahey built his 2,100-square-foot house with a ground-source heat pump. In its first year, the system supplied constant 100°F air to the home all winter, except during a period of extreme cold, when a backup



LIEUTENANT KEVIN LEMKE

**This Fond du Lac, Wisconsin, high school uses a heat-pump system for heating and cooling.**

propane furnace was used as a supplement. Electric resistance heaters are commonly used to provide backup heating needs.

### SCHOOLS

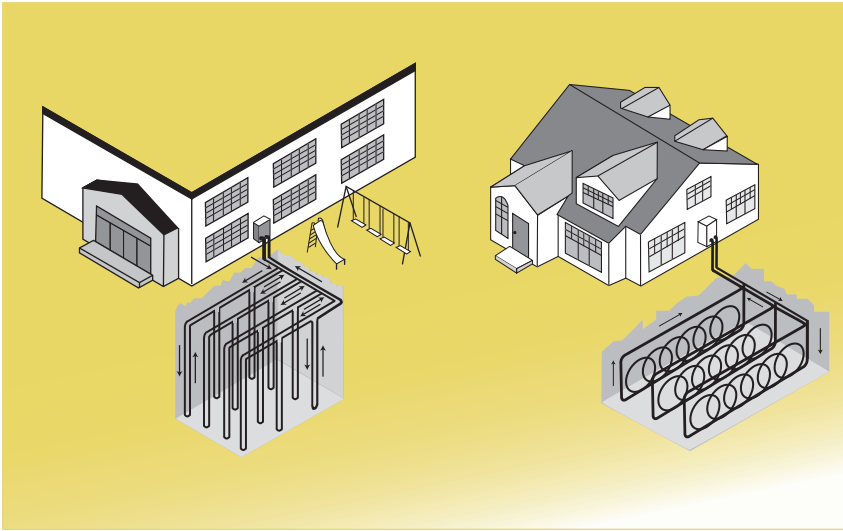
Heat-pump systems can increase comfort and decrease costs for Wisconsin schools. Many schools choose this technology because it allows each teacher to control his or her own system for improved comfort in the classroom. Temperature control can be applied to heat or cool whole buildings or events in just one area.

Onamia Elementary School, located 100 miles north of the Twin Cities in Onamia, Minnesota, is heated and cooled by a ground-source heat-pump system. The system cost \$50,000 more than a conventional heating system, but when the price of an air conditioner is added in, the system actually costs less. Onamia is one of 16 schools in Minnesota proving that ground-source heat-pump systems can handle tough, northern climates. Two new Wisconsin schools in Fond du Lac and Evansville have recently installed the geothermal systems.



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Ground-source heat-pump systems can be used in residential and commercial settings.

### OFFICE BUILDINGS

Ground-source heat-pump systems are especially applicable to office buildings, where the system's up-front costs can be competitive with traditional heating and cooling systems. There are no roof-mounted components, which saves extra expenses in roof maintenance. Because the systems have fewer mechanical parts, they can reduce your operation and maintenance costs.

In many cases, significant construction costs can be saved if the mechanical room can be eliminated.

Size is no barrier for ground-source heat-pump systems. The 1.7-million-square-foot Galt House East Hotel and Waterfront Office Building in Louisville, Kentucky, saves tens of thousands of dollars per month in reduced energy costs with a system that initially cost less to install than a conventional heating and cooling system.

### COMMERCIAL SPACE

Heat-pump systems can help Wisconsin businesses become more competitive. Because the systems cost less to run, they enable you to redirect your resources to your customers. The comfort provided by these systems allows your employees to work in a healthier, more pleasant environment.

The Skunk Creek Conoco Station located 85 miles north of the Twin Cities shows that northern businesses can benefit from ground-source heat-pumps. Its system heats and cools the 4,300-square-foot facility, provides hot water for the car wash, refrigerates food and makes ice. Since the system is not roof-mounted, the need for a flat roof is eliminated, which allows for a more architecturally interesting design. Estimated savings are \$5,000 per year in energy costs alone, and more from reduced maintenance costs. Payback on the system is estimated to be between four and six years.

### DETAILS

- The success of a system depends largely on the design of the ground (or pond) heat-transfer loop. Heat-transfer loops in contact with ground water (or in pond or lake water) tend to perform well.
- Work with a well-established design and installation team. Focus recommends getting three bids and checking references.
- The economics of Ground-source heat-pumps depend largely on future trends of electric and natural gas or propane prices.

### FOR MORE INFORMATION

#### Focus on Energy

Contact Focus on Energy to learn more about smart energy choices. Call 800.762.7077 for more information.

[focusonenergy.com](http://focusonenergy.com)

#### Renewable Energy Yellow Pages

Search for consultants and installers for ground-source and geothermal heat pumps.

[focusonenergy.com](http://focusonenergy.com)

#### Wisconsin Geothermal Association

Call 866.GEO.7757

[wisgeo.org](http://wisgeo.org)

#### Geothermal Heat Pump Consortium, Inc.

Geothermal heat pump consortium Web site.

[geoexchange.org](http://geoexchange.org)

