



Could a ground source heat pump work for you?

What type of HEAT DISTRIBUTION do you have?

FORCED AIR

IN-FLOOR HYDRONIC



BASEBOARD

Baseboard does not work well with heat pump systems

Where would you INSTALL the heat pump?

FAIRBANKS and SOUTH



NORTH of FAIRBANKS

There are no precedents for GHSP working north of the Fairbanks area

What KIND OF SITE do you have?

SHALLOW GROUND WATER, SOUTH FACING SLOPE, LAKE, OR OTHER SUNNY LOCATION



NORTH FACING SLOPE or SHADED AREAS

There are no precedents for GHSP working in these conditions

What are your available ENERGY SOURCES?

DIESEL HEATING FUEL

NATURAL GAS



NO

What are your ENERGY COSTS?

IF **Electricity x14** [\$0.____/kWh] IS LESS THAN

Fuel Oil (\$____/gallon)

IF **Natural gas** IS MORE THAN

\$1.10/ccf

AND **Electricity** IS LESS THAN

\$0.10/kWh

A GSHP would not be cost-effective compared to your other heating options.

Your site has the potential to support an operational, cost-effective GSHP!

NOTE: Costs vary by site, but typically range from \$25k to \$35k installed.

Be sure to calculate the payback period for your system

For more information, visit cchrc.org or contact a GSHP expert in your area.



Ground source heat pumps can be a cost-effective heating system if you live in Interior Alaska. Whether or not it's the best choice for you depends on many factors—including your site, your home's heat distribution system, and your existing heating system and fuel costs. This report highlights the main points you should consider before contacting an installer.

Distribution System

Heat pumps produce lower output temperatures than oil boilers or natural gas furnaces. Because of the lower output temperatures, a heat pump needs less electricity to run. Radiant floors and forced air distribution systems generally work well with a GSHP because they require lower temperatures: between 90°-120°F for radiant floors and between 110°-140°F for forced air. Baseboards, on the other hand, require water temperatures up to 180°F, hotter than a heat pump can deliver efficiently.

Climate

Heat pumps have not been proven to work north of the Fairbanks area, as they perform more efficiently in warmer soils and the ground needs to recharge in the summer. A long heating season can eventually lower the temperature of the ground, which will reduce the efficiency of the heat pump.

Site Conditions

Ground loops can be placed in the soil in a vertical or horizontal formation. Vertical wells take up less surface area than horizontal ground loops. Your site must be big enough to accommodate the loop field and drilling equipment. An area with good southern exposure is important for the best solar recharge in the summer. Ground loops also can be located in the ocean, a lake, or other body of water.

Fuel prices

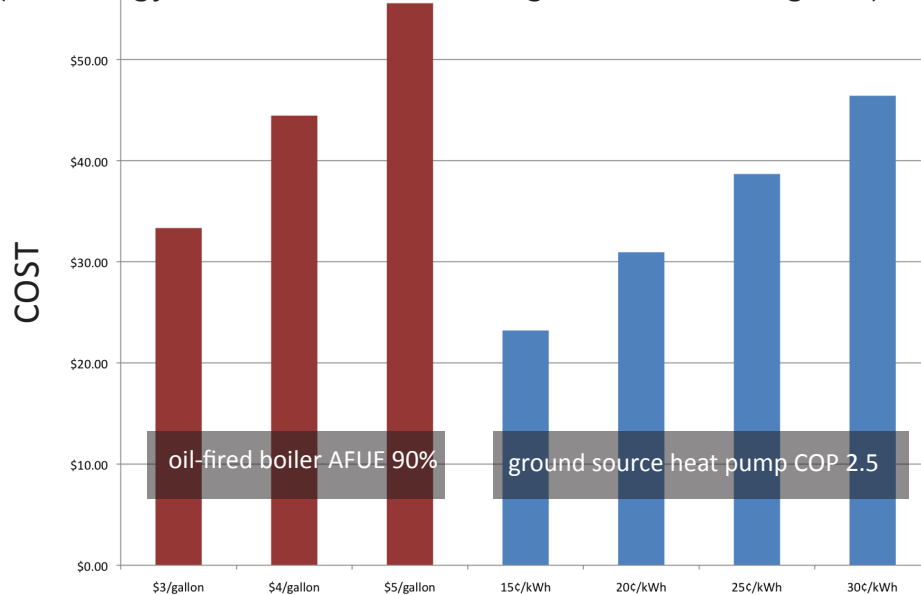
The affordability of a heat pump depends on the cost of other available fuel types in your area. For example, a heat pump can be competitive if your other fuel options are expensive (like heating oil) but not if you have access to lower-cost fuel (like natural gas or biomass). Because heat pumps use electricity, they can be a good option if your electric rates are reasonable. Of course, the efficiency of your home and your appliance also affects your annual energy cost because it determines how much fuel you use to meet your heating needs.

To compare heat pumps to oil boilers, consider the monetary cost of producing 1.32 million BTUs of heat energy (the amount of heat contained in 10 gallons of diesel fuel) for both, considering a range of fuel costs. When considering costs you'll need to factor in the efficiency of the heating appliance. A newer oil-fired boiler that is 90% efficient will be able to transfer 90% of the energy in the fuel oil into heat for the house. A heat pump with a COP of 2.5 will transfer 2.5 times the amount of electricity it uses into heat for the house. The graph below shows a rough cost estimate of what each appliance would cost to deliver the same amount of heat, using various energy costs.

Questions for Potential Installers

- What is the efficiency of the heat pump?
- Is it ENERGY STAR rated?
- Do you provide maintenance?
- Will you check the distribution system for leaks?
- Any rebates the heat pump may qualify for?
- Equipment manual and warranty information
- Written proposal with a timeline and itemized estimates
- Past customer references
- A copy of the contractor's insurance. Your contractor should be licensed by the Division of Corporations, Business, and Professional Licensing.

Cost to produce 1,320,000 BTUs of heat energy (the energy contained in about 10 gallons of heating fuel)



The cost of heating with a ground source heat pump vs. an oil-fired boiler at varying rates of electricity and heating oil. The outlined bars show a common scenario in Fairbanks at the date of publication. Note that when electricity is 25¢/kWh or less and heating oil is \$4 per gallon or more, a heat pump is cheaper than an oil boiler.