Overview

In the efficiency section we are going to try to describe how efficiency is measured, and what the factors are for one system to always perform at its peak.
For any equipment that is geothermal {hoverbot HEAT PUMP}A heat pump is a machine or device that moves heat from one location (the 'source') to another location using work. Heat pump technology moves heat from a low temperature heat source to a higher temperature. Common examples are food refrigerators and freezers and air conditioners and reversible-cycle heat pumps for providing thermal comfort.
Heat pumps can be thought of as a heat engine which is operating in reverse. One common type of heat pump works by exploiting the physical properties of an evaporating and condensing fluid known as a refrigerant. In heating, ventilation, and cooling applications, a heat pump normally refers to a vapor-compression refrigeration device that includes a reversing valve and optimized heat exchangers so that the direction of heat flow may be reversed. Most commonly, heat pumps draw heat from the air or from the ground. Air-source heat pumps with a coefficient of performance (COP) 3 are developed in Japan at −20 °C.{/hoverbot}, gas fired, propane, electric, etc., the efficiency is measured in a manufacturing laboratory and is published in catalogs and other manuals.

The basic formula for measurement is:

EER = TOTAL COOLING POWER OUTPUT in BTU / POWER INPUT.

{hoverbot COP}A geothermal heat pump operating at COP 5,0 provides 5,0 units of heat for each unit of energy consumed (e.g. 1 kW consumed would provide 5,0 kW. of output heat). The output heat comes from both the heat source and 1 kW of input energy, so the heat-source is cooled by 4,0 kW, not 5,0 kW.

A heat pump of COP 3,0 could be less expensive to use than even the most efficient gas furnace.

A heat pump cooler operating at COP 2.0 removes 2 units of heat for each unit of energy consumed (e.g. such an air conditioner consuming 1 kW would remove heat from a building's air at a rate of 2 kW).

The COP of heat pumps compares favorably with high-efficiency gas-burning furnaces (90-99% efficient), and electric heating (100%), but the full costs of the energy consumed must be considered, and energy from gas is typically much less expensive than that from electricity.{/hoverbot}= HEAT CAPACITY / INPUT in BTU/hr.

When one ton natural gas is burned, it produces 100,000 BTU of heat. When we talk about 92% - 93% and even 95% furnaces, that means from 100,000 BTU we get out 95%efficienty, while the other 5% goes into the pipe exhaust system and into operational energy.
In this type of heating system we never can get efficiency over 100%.

To produce 100,000 Btu/Hr with natural gas as the energy source, we will pay $1.1 to $1.3 per term (ton?).
If we produce 100,000 Btu from an electric source, we have to use 29, 3 KW. (1KW= 3412 Btu)
Our cost will be $1.75 for a 100,000 Btu. In both examples, neither natural gas nor electric can exceed 100% efficiency.

Let’s examine what price we will pay when we produce 100,000 Btu from geothermal equipment (heat pump.)

Coming from an ordinary geothermal system with COP of 3.5, the homeowner will pay $0.46 for a 100,000 Btu.
With a Geothermal House advance installation of the same geothermal system, the home owner will pay $0.24 for 100,000 Btu of heat. Our company can provide even further energy savings.

The efficiency of one system depends on four different factors:
Entering water temperature into coax coil, water flow rate, entering air temperature, and air flow CFM (cubic feet per minute).
We want to mention here that all these numbers are not a real measurement of equipment functionality. The mean output capacity is measured immediately after the blower. Thus, a duct distributing system plays a major rule for proper equipment operation and maximum efficiency.