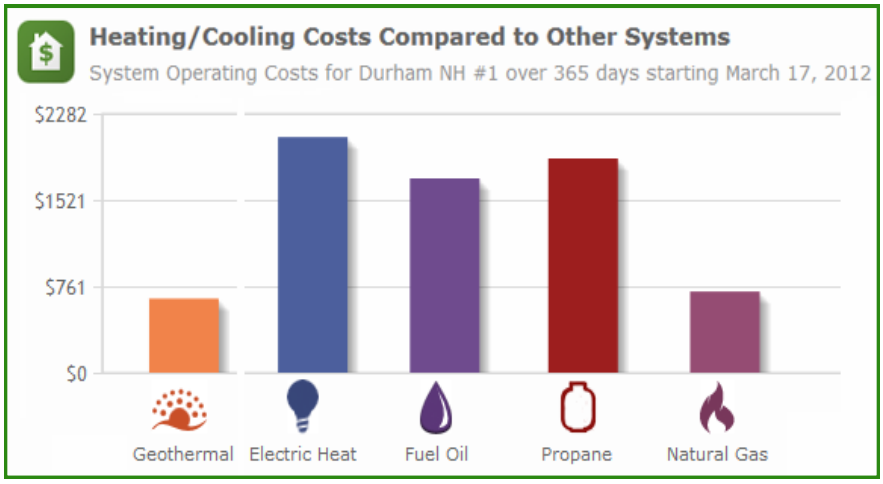
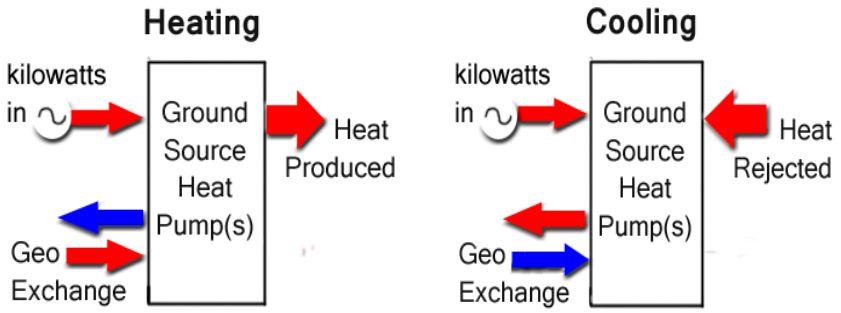
GxTracker™ Cost Savings Analysis

For systems that monitor individual heat pumps, the GxTracker™ data processing software computes both Cost and Carbon savings for the GSHP system. This Datasheet summarizes the methodology used to compute the **Cost Savings**

Heating/Cooling: Monitoring a GSHP system enables the calculation of both the total heating/cooling benefit and operating cost of the system. By comparing the heating/cooling benefit with conventional systems (e.g. fuel oil for heating and air conditioning for cooling), the costs of both the GSHP and equivalent conventional system can be determined. This cost comparison is particularly useful as it removes heating load variables such as user comfort preferences and weather.



In Heating Mode, the Heat Produced by the GSHP system is the sum of the energy from the ground and the power from the heat pump. In Cooling Mode, the Heat Rejected (Cooling Benefit) is the difference between the energy sent to the ground and the power consumed by heat pump.



Cost of Conventional Fuels: GES maintains a database of regional residential fuel prices obtained from the US DoE Short Term Energy Outlook and supplemented with information from state agencies. Users can input their own electric rates as regional values may not reflect local incentive programs.

Calculation:

$$\text{GSHP Operation [kWh]} \times \frac{\$}{\text{kWh}} \rightarrow \text{GSHP Operating Cost}$$

$$\text{Heating/Cooling Benefit [BTU]} \times \frac{\text{Fuel}_{\text{Equiv}}}{\text{BTU}} \times \frac{\$}{\text{Fuel}_{\text{Equiv}}} \rightarrow \text{Cost of Conventional Fuel}$$

Savings in New England: While New England has some of the higher electricity rates, it also has a very high heating load. The high efficiency of GSHP systems result in a very competitive cost per BTU compared to fuel oil, propane, and natural gas. Savings with respect to fuel oil and propane are already significant at current prices and the same should be true for natural gas in the coming decades. The DoE Annual Energy Outlook (AEO2013) is projecting that natural gas prices in (2011 dollars) will increase 141% from 2013 to 2040, relative to a 17% increase in electricity.