GeoExchange systems move about 70% of the energy to heat and cool a home, a school, a business facility, from the earth. The remaining energy percentage is electricity, the energy needed to operate the geothermal heat pump. Building owners selecting a GeoExchange system “lock in” the price they will pay for over two-thirds of their heating and cooling energy costs - free, renewable, stored solar energy in the earth – for as long as the GeoExchange system operates.

A prudent question is about the price of the remaining 30% of the energy used by a GeoExchange system; will electricity rates increase so that in the future a GeoExchange system looses its economic advantage over fossil fuel alternates?

The pricing of energy, electricity, natural gas, oil, propane, gasoline, and the others, are dependent on a number of complex factors. These factors can change, making energy cost prediction very difficult. No one in the GeoExchange industry has a better “crystal ball” than others in the energy business; however there is a simple and compelling market force that weighs in favor of GeoExchange systems – “Supply and Demand”.

The chart on the left illustrates the impact GeoExchange systems can have on electrical demand.

Demand for electrical energy is highest in the summer, when cooling systems add their demand for electricity to the system.

Since GeoExchange systems can be twice as efficient as conventional cooling equipment, they can reduce the summer demand for electricity. Reducing summer electrical demand helps keep electrical energy prices from increasing.

Electric energy suppliers are recognizing the benefit of GeoExchange systems in reducing summer electric peak demand and many are exploring pricing options that would tailor electric rates for GeoExchange systems. It is possible a growing list of electrical energy providers will offer pricing options that could lower energy costs for GeoExchange consumers, while maintaining a good rate of return for the benefit of their shareholders or consumer owners.

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The chart on the right illustrates the seasonal demand on the fossil fuel system.

Demand for fossil fuel energy is highest in the winter, when heating systems add their demand for fossil fuels to the system. Consequently the price charged for fossil fuels rise dramatically in the winter, sometimes a 100% increase over fuel prices in the summer, when the demand for fossil fuels is lower.

Since GeoExchange systems heat a building with energy from the earth and electricity, when the demand for electricity is lower, energy rates (electricity) are more stable than fossil fuel energy prices during the winter.

When comparing space heating operating costs between fossil fuel systems and GeoExchange it can be difficult to determine the appropriate fossil fuel cost per unit to use, because of the large seasonal swings. Fossil fuel energy providers often will provide a 12 month average cost per unit, however this may not be the most accurate way to determine space heating costs for comparison purposes.

A better way to determine the comparative fossil fuel price is with the seasonal weighted average method. Based on historical weather data, each month of the heating season represents a percentage of the total heating requirement. A calculation can be made using historical energy pricing and the monthly percentage to develop the weighted average. A worksheet is available to help determine this factor.

Bear in mind that historical pricing information may not reflect future pricing; however the seasonal weighted average is a more equitable figure to use in making economic decisions.

If you have further questions on this GeoTech Bulletin please contact us toll-free

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