Heat Pumps: So many choices, so many decisions.

Heat pumps are considered one of the most energy efficient products for heating and cooling today, but home owners and building operators have a choice of either an air-to-air heat pump system or a geothermal heat pump system. Unfortunately there is no easy answer, since economic values will vary for each building and preferences will vary for each individual making the decision. To make the choice as a consumer or homeowner, one should first learn the differences between the two types of heat pumps to make an educated decision. With choices about energy efficiency and the potential for tax credits, even a knowledgeable consumer can find the decision difficult.

Geo-thermal heat pumps obtain their heat from the ground. Since the earth absorbs solar energy, keeping a constant 55°F hundreds of feet underground, utilizing that temperature to heat your home in the winter and cool it in the summer is very efficient. To access that constant temperature, pipes and conduit are buried underground horizontally or vertically, or submerged in a lake or pond or in a well. An antifreeze/water solution liquid circulates inside these loops and is used with a heat exchanger, which concentrates the heat, to release warm air inside the home. In the summer, the process is reversed and heat inside a structure is transferred underground where it is released. Geo-thermal systems not only provide warmth in the winter and cool air in the summer, but they are also very efficient hot water heaters. The efficiency originates from the earth, rather than using energy that is created. However, the initial price of installing a geo-thermal is substantially more expensive than an air-to-air heat pump. To offset some of the installation cost, the IRS allows a tax credit for 30% of the cost. The Department of Energy has budgeted $750 million for geothermal development and Congress has appropriated $129 million for other geothermal programs.

Instead of utilizing geo-thermal heat, an air-to-air heat pump absorbs heat from the atmosphere. Warmth is collected from outside air, concentrated and circulated inside in the winter, and the process is reversed in the summer to provide cool air to the interior of a building. An air-to-air heat pump has an optimal temperature range of about 35-65°F. If the outside air temperature varies beyond optimal operating conditions, a backup furnace may be necessary to create enough heat to maintain a comfortable winter temperature inside a home. An air-to-air heat pump can be extremely efficient when the outside temperature does not vary much from optimal operating conditions, and can save about 30-50% on heating and cooling bills. The higher the SEER rating the heat pump has, the more efficient the heat pump will be. As with the geo-thermal heat pumps, there are green incentives for home owners to install air-to-air heat pumps and there may be financial assistance available from your local utility company for such installations.

Always remember that with any type of a heat pump, air leaks must be sealed and the home must be properly insulated for the unit to achieve energy efficiency.

The Energy Education Council is a non-profit educational organization dedicated to promoting energy efficiency and safe use of electricity. EEC and its Safe Electricity program offer information year round to help consumers conserve electricity and reduce the risk of electrical accidents. For more information and tips to help cut energy costs and improve home safety, visit the Web sites www.EfficiencyResource.org and www.SafeElectricity.org.