

## **June 2015 EnergyWise<sup>SM</sup> Tip: Ground Source Heat Pumps**

*Have you received your first electric bill for the summer yet? Most public power utilities in Nebraska have higher rates during the months of June through September to offset higher costs associated with generating electricity during peak-use periods. Rather than worry about how fast your air conditioner is making your electric meter spin and raising your monthly bill, wouldn't it be nice to know your system is the most efficient way to not only cool, but heat your home all year round? Read on for the solution!*

Also called an earth-coupled heat pump or a geothermal heat pump, a ground source heat pump operates by transferring heat, rather than creating it. Below the frost line, the temperature of the earth in Nebraska stays fairly constant at 50 – 55°F. Heat pumps provide summer cooling by extracting heat from your home and transferring it into the earth through a mechanical process. In the winter, that process can be reversed so the heat pump extracts heat from the earth and “pump” it into your home. Since it is much more efficient to transfer heat than to create it with electrical resistance or fossil-fueled furnaces, a ground source heat pump can provide up to five units of heating or cooling energy for each energy unit used to run the system.

Ground source heat pump systems generally fall into two categories: closed-loop and open-loop. Most closed-loop systems circulate an antifreeze solution through a closed loop, which is usually made of plastic tubing that is buried in the ground or submerged in water. A heat exchanger transfers heat between the refrigerant in the heat pump and the antifreeze solution in the closed loop.

Open-loop systems use well or surface water as the heat exchange fluid that circulates directly through the heat pump system. Once it has circulated through the system, the water returns to the ground through the well, a recharge well, or is discharged above ground. This option is especially practical when there is an adequate supply of relatively clean water and all local codes and regulations regarding groundwater discharge are met.

Ground source heat pump systems are reasonably warranted by manufacturers and their working life is estimated at 25 years for inside components. The plastic tubing for closed-loop systems will last from 50 to 100 years. Maintenance costs tend to be significantly less with a ground source system when compared to fossil-fueled heating systems.

Setup costs for ground source heat pumps are higher than for conventional systems, but the difference is usually returned in energy savings within 3 to 10 years. Even faster returns on investment are recognized with federal tax credits and EnergyWise<sup>SM</sup> efficiency incentives. Now through the end of 2016, homeowners may claim 30% of qualified expenditures associated with installing a ground source system. You may also qualify for cash incentives up to \$1,700 from your local utility. With all of that going for ground-source heat pumps, why wouldn't you consider one for your home?

Your local utility and Nebraska Public Power District want to help you make the most of your energy dollar and reduce cooling costs without costing you a fortune. For more ideas on how you can make your home or business EnergyWise<sup>SM</sup>, along with possible energy efficiency financial incentives, contact your local utility or visit [www.nppd.com](http://www.nppd.com).