

CVEA Members Use Alternatives to Heat Their Homes

The economic uncertainty we're facing these days has many of us putting money into something we feel comfortable with: our homes. Making a few upgrades around the house generally pays big dividends. And when boosting energy efficiency is one of them, the decision becomes an easy one.

Hands-down, managing the temperature in a home or business has the biggest impact on energy costs. Trying to keep warm in winter and cool during summer, accounts for 56 percent of all home energy expenses.

While this can be trimmed by tweaking efficiency, some folks in CVEA's service territory have taken it a step further and installed alternative heating systems that still provide comfort but are much more cost effective.

Louis and Wanda Clark, CVEA members in Valdez, installed a geothermal heat pump. As the name implies, heat pumps simply move heat from one place to another. During winter months, they collect and consolidate heat from outside sources and move it inside; during summer months, they reverse the flow and send warm, indoor air out. Geothermal heat pumps, also known as ground-source heat pumps, use the earth itself or groundwater as a means of transferring heat.

Geothermal heat pumps come in two types: a groundwater (open-loop) system uses well water; an earth-coupled (closed-loop) model moves a water and



Above: Clark's water heater piped to the geothermal system. Bottom Left: Refrigeration pumps that produce the heat. Photos by Louis & Wanda Clark.

antifreeze solution through underground pipes.

They can cost anywhere from \$15,000 to \$40,000 for an average home—excavation, installation of underground pipes and well drilling accounts for much of the price tag. But annual geothermal energy savings average between 30-71 percent, according to the Geo-Heat Center, a part of the Oregon Institute of Technology, and provide fairly rapid payback.

The Clarks purchased their system for \$39,000 in January 2009 as they felt they were spending way too much on energy costs and their home was always cold. With the new system, they are able to completely heat their home, with twice as much space that now needs to be heated, at a fraction of the cost. The system also heats their hot water keeping even more money in their pocket. Louis and Wanda estimate their savings to be roughly \$9,000 annually.

In addition to monetary savings, the Clarks say the maintenance is less work. The only maintenance they have is to change the air filter twice a year. There is no stack or exhaust so there is no cleaning.

While the geothermal heat pump was a big investment, the Clarks say they are very satisfied. According to Wanda, "we love the fact that we are saving money, helping our environment with clean, renewable energy, and we always have heat and hot water. In addition, we have no fear of fire or carbon monoxide poisoning because the system has no open flame and doesn't produce CO₂." Wanda also mentioned that the system provides the added benefit of central air conditioning, as it works

in reverse during the warmer months, although she notes, “there isn’t much need for that in Valdez.”

CVEA members, Mel and Jaime Matthews, of Glennallen, also chose an alternative heating system in October 2008, when the cost of fuel skyrocketed. They replaced their oil fired furnace with a Seton Wood Boiler, which is a clean burning, high efficiency system. Purchase and installation costs were just over \$10,000. If fuel costs remain in the \$2-4 per gallon range, the system will have paid for itself within 3-6 years. (Costs vary depending on the unit purchased and the cost of installation. The Matthews installed their own unit, thus reducing their costs)

This system is a closed system, whole log boiler. It has a very low exhaust temperature (400 degrees) and an 80-85% efficiency factor. It is designed to turn the fire off until there is demand, therefore the wood lasts longer. The unit has approximately six inches of fire brick surrounding the fire box which retains heat in between burn cycles. The system is designed to turn the fire off until there is demand, at which time the hot fire brick will re-ignite the fire.

When asked if they were happy with their decision to replace the old system, Mel said, “we have been extremely happy with our new system. The benefits are fuel savings, and not feeling guilty about having the house at 70 degrees.” Prior to installing the wood fired boiler, the Matthews used approximately 1,100 gallons of fuel per year. Currently, they burn approximately 300 gallons per year. Most of this usage is during the summer months, when they are not operating the wood stove. When they have a fire burning 24 hours a day, they use zero fuel. That adds up to huge savings.

In addition, Mel commented that, “it has also made us more aware of where the energy goes. The wood stove is typically filled twice a day; morning and night. When temperatures are 50 below, it is filled three times a day. When temperatures are warmer, we can get almost 24 hours in between fillings. When we do things that require a lot of hot water usage, there is a noticeable increase in wood consumption, making us aware of how much energy it takes to heat and store hot water.” Mel further went on to say that the system works great. “This system heats approximately 2,500 square feet. We feel we get a more even heat throughout the house using hot water baseboard which runs at 180 degrees.”

The Copper River School District (CRSD) is also looking to make a change. They hope to replace the current heating system at the Kenny Lake School with bio-mass boilers or a wood pellet-fired heating system. At 2009 wood pellet and fuel prices, the district estimates annual savings at roughly \$25,000. To make this happen, the CRSD has submitted a grant application to the Alaska Energy Authority and are hoping to receive fund-



Top: Mel Matthews stoking the boiler with wood, a renewable energy source. Above: The Matthews' wood boiler producing heat. Photos by Jaime Matthews.

ing from the Renewable Energy Fund.

For certain energy efficiency work completed at your residence during the coming year, Uncle Sam will foot 30 percent of the bill. Through the 2009 American Recovery and Reinvestment Act – better known as the stimulus bill – the Internal Revenue Service offers a personal tax credit of up to \$1,500 for energy efficiency improvements made to existing homes during 2009-2010 that meet efficiency requirements.

CVEA strongly encourages homeowners considering heating alternatives to review their options. It is important to establish your goals and learn the ins and outs of available technology before you purchase. ■

Sources: National Rural Electric Cooperative Association; Cooperative Research Network; U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy; Internal Revenue Service.