



## Ground source (geothermal) heat pumps are the answer to energy efficiency for this family

Tim Kesteloot and his family couldn't be happier with their heat pumps – one in the house and one in the shop. The Econar Ground Source Heat Pump installations were completed in late 2009. Prior to that, just as Tim was renovating an older barn into a shop, fire destroyed the building. Decisions had to be made about constructing a new shop that would be energy efficient as well as meet his need for more space. They also needed a new heating system in their house to replace an aging propane boiler. They wanted to make a decision that would be the most beneficial to them into the future. The end result is a new heat pump in the house and another in the new 50 by 50 foot shop that houses his hobbies and other equipment. The shop includes a work bench area, office, bathroom, utility room and the loft on one side of the structure has a storage area and future playroom that he is working on as time permits. There are two large overhead doors so that if his father's farm machinery is in need of repair, it can be brought into the shop to be worked on. Two large windows that let in the sun in the winter are fitted with shades so that the sun can be blocked out in the hot summer months. All the pipes for the two heat pumps lay in the same trench, but the two 4-ton units operate completely independent of each other.

The ground source heat pump (GSHP), or geothermal heat pump, in the Kesteloot home is a forced air unit that has a blower fan similar to a regular furnace. The fan blows air across a coil sending it throughout the ductwork of the house. This unit will both heat and cool the home. An earth loop is the heat exchanger portion of the

GSHP on the outside of the house. The loops are filled with water and a propylene glycol solution that is circulated underground to either capture heat and bring it into the house in the winter or reject it into the



*The shop and home of Tim Kesteloot both have ground water source (geothermal) heat pumps.*

*Continued on page 4*



## Manager's Message

*Pat Carruth  
General Manager*



### Mid-year financials in good shape

**T**his year we have had consistently above normal energy sales up through May, buoyed by the cold winter and spring. The first five months of this year we sold 89 million kWhs compared to 80 million last year. This helped produce a total margin, which is above where we had budgeted to be through May. Our total margin is \$715,000 compared to a budgeted \$487,000 through May of this year. Anyway, we are in good shape financially at this point in the year and ahead of budget. This is good because it looks as though sales will drop off their normal pace this summer with the cooler than normal summer. We do, however, expect some corn drying sales this fall which we haven't seen in some time.

### Help us keep your lights on

When our trimming crews come through and ask permission to trim trees back from the lines, please let them take what they need. The pay-off for you and your neighbors will be a better chance of having lights during and after ice storms and heavy windstorms. Trees in or near the power lines will knock out and, in many instances, knock down power lines in the right conditions. This can add hours or days to power restoration efforts. Maintaining proper right-of-way clearance is one of the most effective steps we take around here to keep your power reliable.

We try and rotate through our project every three to four years, which means our goal is to cut back the trees far enough so they will not have grown into the line by the time we get back. The tree contractor we use is Minnesota Valley Tree Service, which is solely owned by Minnesota Valley. The right-of-way crews will be mostly working in the southwest quadrant of our system for the balance of the year.

Have a safe and enjoyable rest of the summer!

### Keep children at a safe distance!

**N**ow that school is out, there are often children playing in the area where our crews are working. This is just another reminder, to please alert your children to stay as far away as possible from these work areas until the job is completed. There are many unseen dangers in playing around power lines and line maintenance equipment. Most of our work only takes a short period of time in one area, so there should not be any long term inconvenience. Warn them that although they may watch from a distance, going close could mean a serious accident. Your concern and words of caution could save a child's life.



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## Engineering & Operations



*John Williamson*

*Mgr. of Engineering & Operations*

**T**his is a very busy time of year for our crews and contractors as they try to get projects done. The replacement lines for the CapX project continue to be installed. This is the largest project we are working on this year. We have several service upgrades to be completed as the odds are we will be seeing a larger fall peak load than we have in the past three years.

Widespread storms came through our system in the early morning hours of the 21<sup>st</sup> of June and continued right on through the 22<sup>nd</sup>. We were just getting caught up from one storm and then the next one came through. The lightning was terrible and, with the accompanying winds, we lost about a dozen poles and had several downed wires from trees. One lightning strike in the early morning hours of the 21<sup>st</sup> was so severe it knocked out our Appeldorn delivery station that takes care of four of our substations. Later on in the afternoon, another wave of storms came through and took out another transmission circuit for a short period of time. That circuit delivers power to three other substations and the City of Madison. Crews worked diligently throughout each day and evening restoring power systematically. These types of storms keep you on your toes awareness wise. Working conditions are never normal when widespread outages occur. Below are some pictures taken by a line crew out on the job in problem areas following the storm.

We also sent a crew, along with a bombardier, to assist neighboring Agralite Electric Co-op in Benson. They received much more damage than we did from the nasty weather. D four thirteen zero four

We appreciate your patience during these extended outage periods. I hope you all had an enjoyable 4<sup>th</sup> of July!

***The picture at left shows how the top foot of this pole has been vaporized by lightning and the transformer fuse was blown. It could have been worse - and reminds us why it's not a good idea to be on a pole when lightning is close.***

***Below, the crew found an old farm windmill that had blown over onto the line and the co-op's triplex was still holding it up. As soon as they cut the wire down, the yard pole, which was also broken at the ground line, fell. The entire service will need to be rebuilt.***



## *Ground source heat pumps - Continued from page 1*

ground in the summer. A compressor, indoor air coil and blower fan then work together inside the home to complete this heat transfer process. The Kesteloot's have electric heat backup and the heat pump is plumbed into the water heater to also supply a portion of the hot water for the home.

The GSHP in the shop also has an underground earth loop heat exchanger. The outside geo loop works the same way to transfer heat into the shop in winter. The main difference between the house and shop GSHP is that the shop is a hydronic heating system. The hydronic heat pump system warms the water and propylene glycol solution with heat extracted from the outside loop and circulates it in the floor. The shop does not have air conditioning at this time. Tim said he is considering air conditioning the shop in the future. To do so, he would have to install an air handler with a water coil to circulate warm air from the shop across that coil. The chilled water from the heat pump would then absorb the heat from the building making it cooler. The air handler/coil combination could also be used to heat the building in the spring and fall without having to warm up the entire concrete floor.

A lot of things contributed to the Kesteloot's decision to install the heat pumps. They relied on the positive experiences of others who were already benefitting from their own heat pump installations. Talking with his uncle as well as that uncle's son and daughter who all have them in their homes, hearing from some customers he deals with at work and his own research, helped Tim make the decision to go ahead with purchasing the heat pumps. Now he gets calls from other people who are contemplating installing one. The Federal Stimulus Energy Efficiency Tax Credit, along with rebates on the purchase of a heat pump, were also factors in the decision.

The family is happy with their lower heating and cooling costs since installing the heat pumps. They are now heating their house and shop for less than it used to cost to heat just the house with the aging propane boiler. The units have been basically trouble free. Tim and his family are pleased with how it has all turned out.



*In the pictures at left, Tim Kesteloot visits with Member Services Representative Duane O'Malley in the shop where Tim enjoys his hobbies. The loft above the work area will house a storeroom and playroom when finished. The shop is also used to repair farm machinery.*

*The picture below shows the heat pump with other components to incorporate the earth loop into the system.*





## Member Services



*Bob Walsh, Member Services Mgr.*

### Let the earth heat your building

Judging by the amount of inquiries we had about heating your shops or garages with radiant and heat pump systems, our June feature article was a success. The article last month covered the advantages of air source heat pumps coupled with radiant floor heating. Those two combined types of heat, although very good, can be upstaged by the ultra-high efficient Geothermal, or Ground Source, heat systems. These systems can claim efficiencies of over 350-400%. That means you can get four Btus of heat for every Btu

of energy you use. Many different applications of geo source heat have been installed in the past years, and that number just keeps increasing. Shop and garage heating are an excellent place to put the geothermal technology to use, with radiant floor heating being probably the best application for efficiency and comfort.

Geothermal heating systems that are installed in heating applications can easily be expanded to include air conditioning as a reasonably priced adder. The geothermal system efficiency, clean operation, safety and low maintenance costs have been making it the system of choice in many larger shop installations. The above mentioned advantages along with Minnesota Valley's heat rate, low interest financing and rebates, make this system something you really should be looking into. For assistance G four zero six zero two with any phase of shop construction or if you have questions about a geothermal heating system, please contact the Member Services Department at 320-269-2163 or 800-247-5051 for more information.

### Things are heating up

With summer finally here, so is air conditioning season. Minnesota Valley offers an air conditioning service program to keep your air conditioner and heat pump working through these warm summer months. For \$60, Minnesota Valley will service your air conditioning system to assure it is operating at peak energy efficiency. For an appointment, contact the Member Services Department during business hours.

Have a great summer!

## Simplify your life!

### Sign up for Minnesota Valley's Automatic Payment Plan

**You** can enjoy the convenience of having your electric bill paid directly from your bank account each month. That saves you postage, checks, possible late payment or disconnect notice charges and, best of all, time. We will send you a monthly bill as usual stating that payment is going to be made directly from your bank account on the 27th of each month at no charge to you.

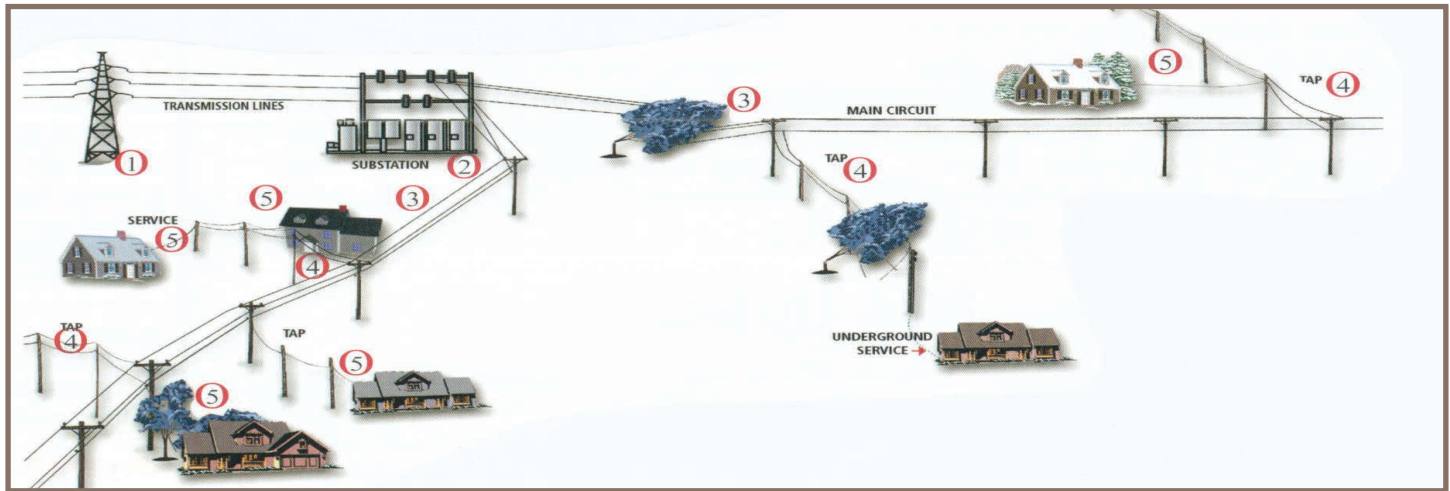
*If a little more free time is something you'd be interested in, you can sign up for this service by calling the Minnesota Valley Billing Department at 320-269-2163 or 800-247-5051 and tell them you want to begin letting your bank make your payments for you with the Automatic Payment Plan. Then, we'll take care of the rest ... so you can sit back and relax!*



## Restoring power - here's how it's done

Minnesota Valley prides itself on providing safe and reliable power to its members. However, when a storm strikes or an accident damages power lines, outages are inevitable. In the case of widespread, prolonged outages, restoring power is often a complicated process. When we experience multiple power outages, **our goal is to get power restored to the most people in the least amount of time and in the safest way possible.** Here's how we decide which power lines to fix first.

As outage calls start coming in, they are answered by our after-hours answering service, the Cooperative Response Center (CRC). If the outage is widespread, CRC contacts employees who will come into the office to answer calls. While some people answer phones, the Operations Department assesses the damage and determines how many crews are needed to handle the problem. In a major storm, they must decide if our own crews can restore the power or if we need to bring in outside help.



**Transmission lines (1)** bring power to our system from generation plants. Basin Electric and Western Area Power Administration (WAPA) maintain transmission lines up to delivery points in Gary, South Dakota, Granite Falls, Minnesota and Boyd, Minnesota. Minnesota Valley maintains transmission lines past those points. **Substations (2)** are where transmission voltage is reduced to distribution voltage so it can be delivered to Minnesota Valley members. The first priority during widespread outages, is to get our substations back up. If we are lucky, service to several hundred members can be restored immediately by replacing a fuse on the substation transformer. If that is not the cause, the linemen then work their way out on the **main distribution feeder lines/circuits (3)** going out of the substation to look for problems. During a major storm, it is not unusual to have several feeders down at each substation. Restoring these lines will restore power to the largest number of members in the shortest time.

After service is restored to the main feeder lines, **tap lines (4)** are checked for further problems. These lines carry power from the main feeders to a smaller group of members. These tap lines are generally fused at various points so that if a problem occurs, only that part of the line will be out of service. The priority for which of these tap lines to restore first is based on the number of people served by that line and the critical nature of some of the loads located on that line.

Only after tap lines are restored, is work done to restore power to **individual services (5)**. These are the lines that connect members' homes to the tap lines. They are generally fused at the transformer, so if there is a problem, only that member will be without power. Of course, any problem posing immediate danger is taken care of as quickly as possible.

Sometimes a member might notice lights have come on in the area around them, but they are still out of power. Usually what has happened is that a main feeder line has been energized, but tap lines or individual services are still damaged. If this is the case for you, call the office to let us know that you are still without power.

Again, the goal is to get power restored to the most people in the least amount of time and in the safest way possible. This procedure accomplishes this goal and is how power will be restored in the event of any major outages.

**Always stay away from downed power lines!**

## Standby generator safety tips

**W**hile owning an emergency generator comes in handy during an extended power outage, it is important that you consider the following:

To safely use standby generators, operate them only in well ventilated areas or outdoors so emissions can't enter your home. In addition, always turn off a generator when refueling it and store gasoline, diesel fuel or propane outside of living areas. Plug appliances directly into a generator or use a properly rated extension cord. Do not try to power a home's wiring by plugging the generator into a wall outlet.

A permanently installed standby generator for a home or business requires a transfer switch to isolate it from the power grid. The main breaker on an electric panel does not qualify as a transfer switch under the *National Electrical Code*.

Transfer switches are critical for two reasons:

- ◆ They prevent the backflow of current across distribution lines that could electrocute lineworkers trying to restore power during an outage.
- ◆ They protect the generator from damage when electric service has been restored.

Installation of a standby generator should be done by a licensed electrician and must comply with the *National Electrical Code* as well as state and local codes.



## Spot Your Number!



As of this writing, no one has identified their hidden number in last month's issue of this newsletter, but they have until the end of June to do so. Keep looking each month - next time it could be your number!

There are two more hidden numbers in this issue of the newsletter, each worth a \$20 credit on your energy account if you are participating in Operation Round Up or \$10 if you are not a participant. If you find your number in the newsletter, call the office at 320.269.2163 or 800.247.5051 by July 31, 2013.

It's easy to start contributing to Operation Round Up - simply call 320.269.2163 or 800.247.5051 or send a note with your next energy payment telling us that you want to be added to the Operation Round Up list. Your small change, when added to the contributions of other members, can amount to big help for those in need.

## COMPARATIVE REPORT

	<u>Jan.-May '13</u>	<u>Jan.-May'12</u>	<u>Jan.-May '93</u>
kWhs purchased	93,435,761	84,353,403	60,532,560
kWhs sold	88,914,886	79,876,843	54,990,183
Cost of purchased power	\$4,060,217	\$3,646,153	\$1,978,077
Patronage capital margins	\$715,040	\$178,125	\$289,992
Reserve for taxes	\$133,001	\$124,124	\$95,351
Cost per kWh purchased	43.45 mills	43.22 mills	32.68 mills
	<u>May 2013</u>	<u>May 2012</u>	<u>May 1993</u>
Total Plant	\$60,932,438	\$60,035,061	\$21,982,807
# Members receiving service	5,249	5,247	5,141
Average residential bill	\$149.65	\$143.61	\$91.51
Avg. res. kWh consumption	1,212 kWh	1,188 kWh	1,300 kWh
Avg. usage all consumers	2,537 kWh	2,563 kWh	1,692 kWh
KW Demand (Peak Load)	26,279KW	25,949KW	18,482KW





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## Help us update our critical power needs call list

Minnesota Valley strives to maintain the best possible service with a minimum of outage time. However, occasional unexpected outages or planned outages do occur. During the construction season, you may be without power for a short period of time to allow Minnesota Valley crews to make repairs or for building moves. For those pre-planned outages, we keep a list of members who have critical power needs such as: those who depend on life support equipment; livestock confinements; and home computers or businesses that are seriously affected by power outages. In the situation of a planned power outage, we make every effort to notify those members in advance and give priority in restoring service to those locations.

**If there is this type of urgency at your account and it is necessary for you to be called in case of a planned outage, you should complete and return the form below. We need to know all the requested information in order to be able to reach you on short notice. It is important that our information be accurate and current, so if you have signed up for this service in the past, please call our office only if there have been any changes in your information.**

### Please put this account on the planned outage call list:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Location Number(s): \_\_\_\_\_

Phone #s: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Alternate contact name: \_\_\_\_\_

Phone #s: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Reason you need to be notified: \_\_\_\_\_

Do you have a working emergency standby generator? Yes \_\_\_\_\_ No \_\_\_\_\_