PowerLines

A monthly publication for member/owners of Eastern Illini Electric Cooperative

November 2015

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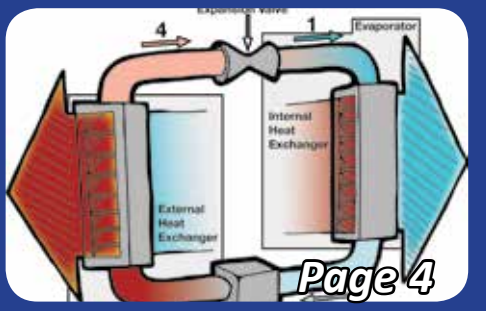

Heat pumps explained

PLUS:

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Holiday Update

Our offices will be closed on November 11, 26 & 27 as our employees celebrate Veteran's Day and the Thanksgiving holiday.

To report an outage or other issue at any time, please call us at 800-824-5102 or use SmartHub.

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A Touchstone Energy® Cooperative

Happy Thanksgiving

At this time last year, we wrote a column about our system reliability and new substations that we had planned for construction. Pictured below is progress made on our St. Joseph substation, which we hope to complete by the end of the year. Site work has been completed on our Loda substation, and the property purchase has been completed for our Tolono substation. We expect to complete the Loda substation early in 2016, with completion of the Tolono substation likely in the spring or early summer of 2016. We will keep you updated on the progress of these substation additions.

The weather has definitely changed and the harvest season is coming to a close. It seems like just yesterday the crops were being planted. Now, the fields are mostly barren and the trees have turned colors or lost their leaves entirely. We know that we are well into the fall season, with the winter season ahead of us. Let's hope this winter is a bit more mild than our last two. The forecasters expect a milder and wetter than normal winter.

We have much to be thankful for in this great country. The United States is one of the most prosperous and free countries on earth. As we enjoy the various holidays in November, let us remember and be thankful for all those who have served and are serving in the armed forces on our behalf.

MESSAGE FROM THE PRESIDENT

Also during the Thanksgiving period, let's take time to recall all that we have to be thankful for. Enjoy your gatherings with family and friends and please travel safely.

On behalf of our employees and our Board of Directors at Eastern Illini, we wish you a Happy Thanksgiving.

Sincerely,

Bob Hunzinger

The parts of an electric pole

Our electric system is made up of several complex systems, all working in sync.

You probably don't pay much attention to the utility poles found throughout Eastern Illini's service territory, but did you know these tall structures are the backbone of our distribution network?

Strong, sturdy utility poles ensure a reliable electric system, which is why we routinely inspect the thousands of poles found on our lines. Throughout the year, our crews check poles for decay caused by exposure to the elements. They know which poles are the oldest and conduct inspections through a rotational process. Typically, a standard wooden distribution pole is expected to last more than 50 years.

Occasionally, poles need to be replaced for other reasons besides decay and old age. Weather disasters, power line relocation and car crashes are potential causes for immediate replacement. When possible, we will communicate when and where pole replacements will take place so that you stay informed of where crews will be working.

Here is a quick breakdown of how crews replace a utility pole: when a pole needs to be replaced, crews may start the process by digging a hole, typically next to the pole being replaced. The depth of the hole must be 15 percent of the new pole's height. Next, the new pole must be fitted with bolts, cross arms, insulators, ground wires and arm braces – all of the necessary parts for delivering safe and reliable electricity. Then, crews safely detach the power lines from the old pole. The new pole is then raised and guided carefully into position, and the lines are attached, leaving the new pole to do its job.

So, the next time you come across a Eastern Illini crew replacing a pole, use caution and know that this process ensures a more reliable electric system for you, our member/owners.

>> What's on that pole?

This illustration shows basic equipment found on electric power distribution poles. Not all poles have all this equipment on them. They vary according to location and the service they provide.

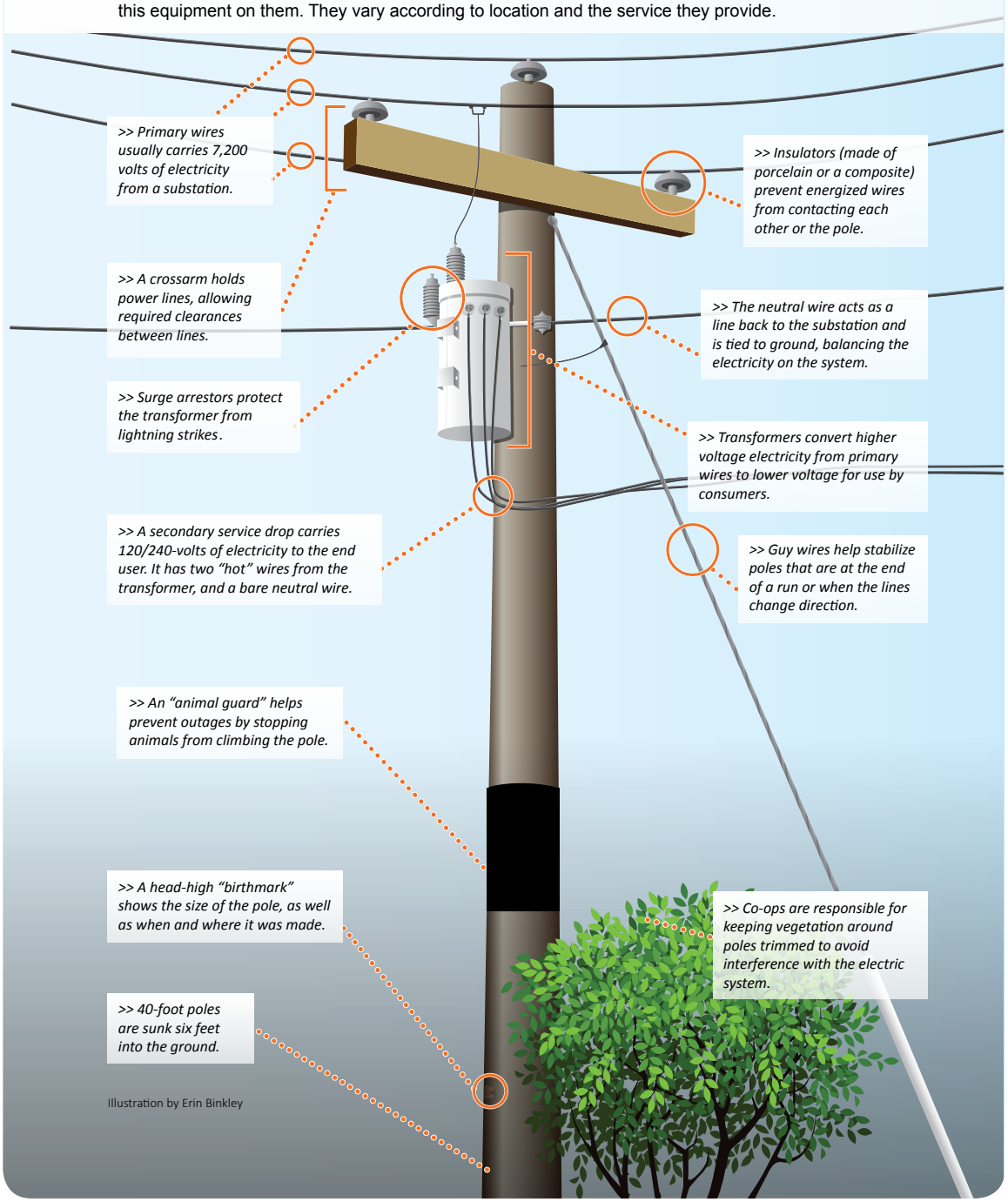


Illustration by Erin Binkley

Proper HVAC sizing

When it comes to your HVAC system, are you suffering from the Goldilocks Syndrome?

A Department of Energy study shows that most HVAC (heating, ventilation, and air conditioning) systems don't run as efficiently as they could because they are not installed correctly or they are the wrong size. This translates to not having the comfort level you are seeking and over-paying on your utility bills. According to Terry Townsend, president of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), "oversizing is common in commercial as well as residential applications because contractors use the rule-of-thumb sizing – a load calculation based on square footage." Unfortunately, this type of simple calculation is outdated, which could cost you money.

Is your unit too big?
Why is an oversized system problematic for the average homeowner? Heating and cooling account for more than half of the energy used in a typical U.S. home. So, if your HVAC unit is too big, it means that it may be "short cycling," or constantly turning off and on. When the unit runs in short bursts, it will not run long enough to eliminate all of the humidity in your home. If you are in a warmer climate and rely on the air conditioning mode, it could mean a short-cycling system leaves more moisture in the air, making your home feel sticky and warm; this can also lead to growth of mold and mildew. Heating and cooling in short bursts results in uneven temperatures and hot or cold spots in your home. Lastly, the unit's parts wear down prematurely.

Or is it too small?
On the other hand, if your HVAC equipment is too small, you have a different problem – the unit is constantly running in order to try to keep up with demand. This also means that your space is never heated or cooled adequately, and you have unnecessarily high energy bills.

Choose the right energy professional
So, how can you ensure that you get the right size HVAC system for your home? It all starts with choosing the right contractor. We can help you by recommending a knowledgeable and licensed HVAC professional. Together, we can find the HVAC system that's the perfect fit for your home.

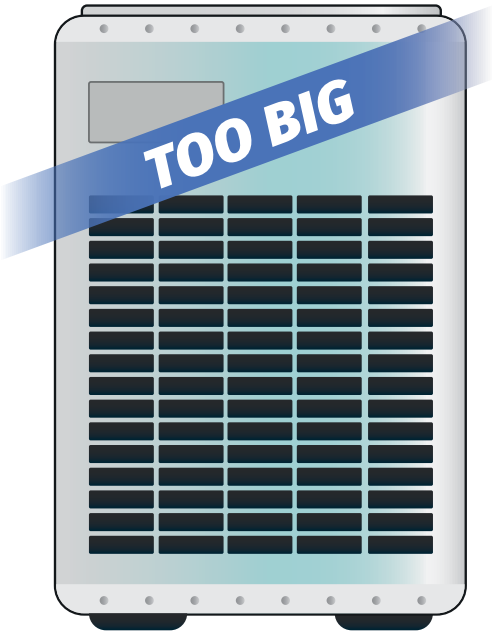
THE GOLDILOCKS SYNDROME

All too often, homeowners have the wrong size HVAC system. It's called the "goldilocks syndrome." If the unit is too large, it runs frequently in short bursts, never running at maximum efficiency. It also results in uneven heating and cooling areas. In warm climates it may mean humidity is not eliminated and mold and mildew can result.

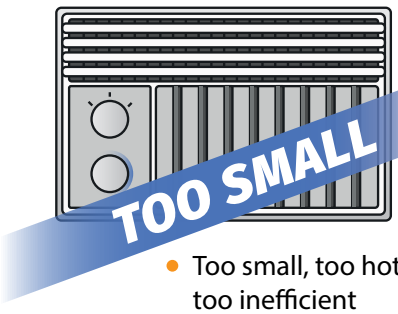
If the unit is too small, it is constantly running, parts wear down prematurely, and your utility bills are needlessly higher.

A unit that is properly sized using detailed load calculations (not outdated, inefficient "rules of thumb") leads to the "just right" fitting resulting in optimum efficiency, comfort and reduced bills.

YOUR HVAC SYSTEM MIGHT BE:



- Too large, too humid, too inefficient



- Too small, too hot, too inefficient

- Right size, right comfort level, right efficiency level

What exactly is a heat pump?

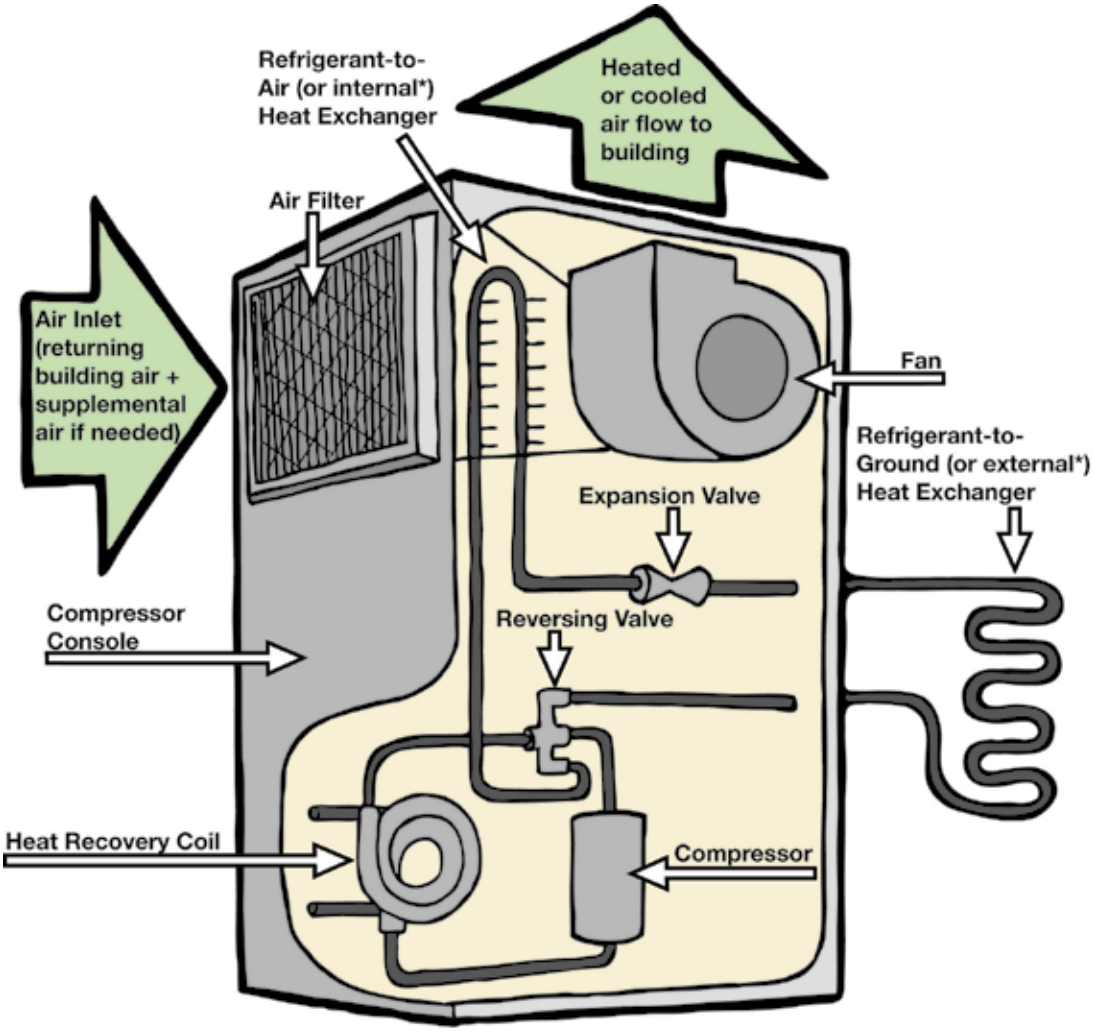
Heat pump technology has been around a while. Understanding how it works isn't as tricky as it may seem.

Think of the name, "heat pump." It likely conjures all sorts of images to mind, none of which reflect the fact that these systems operate using the Second Law of Thermodynamics. Yes, I hear the groans, but stick with me; it isn't going to be that bad, and you may learn something new!

There are two basic types of heat pump technology – air source and ground source. In an air source heat pump, the equipment uses the outside air to provide the means for heating and cooling your home. A ground source heat pump uses good old Mother Earth's dirt.

Since ground source heat pump operation is a little easier to describe, I will start there. Once you get a short distance below the surface, around a depth of four feet, the temperature of the ground stays a reasonably constant 50 - 55 degrees Fahrenheit year-round. Have you ever gone into a cave or toured a cavern? In the summer, it is nice and cool. In the winter, it seems cozy and warm. What you sense is the difference between the outside temperature and that of the cavern below ground.

Ground source heat pumps use this temperature difference to heat and cool. These systems need some sort of heat exchanger installed underground, either vertically or horizontally, and filled with a fluid. The equipment at the house itself resembles a typical HVAC system.



*Either, neither, or both may reside in the compressor console, depending on type and configuration

It uses pumps and compressors to move the fluid through pipes inside the house and in the ground where it picks up or gives off heat, depending upon the need. The process is rather simple, using a fluid to move (or pump) heat from one place to another.

Air source heat pumps may seem harder to grasp. How can such a system cool my home when the outside air is so hot? Or, heat it when it is so cold? Again, the mechanics of the system take advantage of very small differences in temperature using the proper compressor and refrigerant mix.

Just like its ground source cousin, the air source heat pump moves heat from one spot to another. The difference is that the medium to exchange heat is the outside air, rather than the ground. Both air source and ground source heat pumps use refrigerant to capture the heat and carry it to where it is exchanged – either in the ground or using the outside air.

Heat pumps are very efficient, much more so than traditional heating and cooling systems. Let's use a heat pump with a COP (coefficient of performance) of 3.0 as an example: For every unit of energy used, the system produces three units of heating/cooling. It's not a bunch of hocus pocus – just that law of thermodynamics.

Efficient as they may be, it should be noted that heat pumps can have drawbacks. In extremely cold climates, air source models lose their ability to heat effectively at around 17 degrees Fahrenheit. Below that temperature, they have to use resistance electric heat to keep up and can quickly become expensive to operate. In temperate climates, they are likely your best choice for heating and cooling, especially

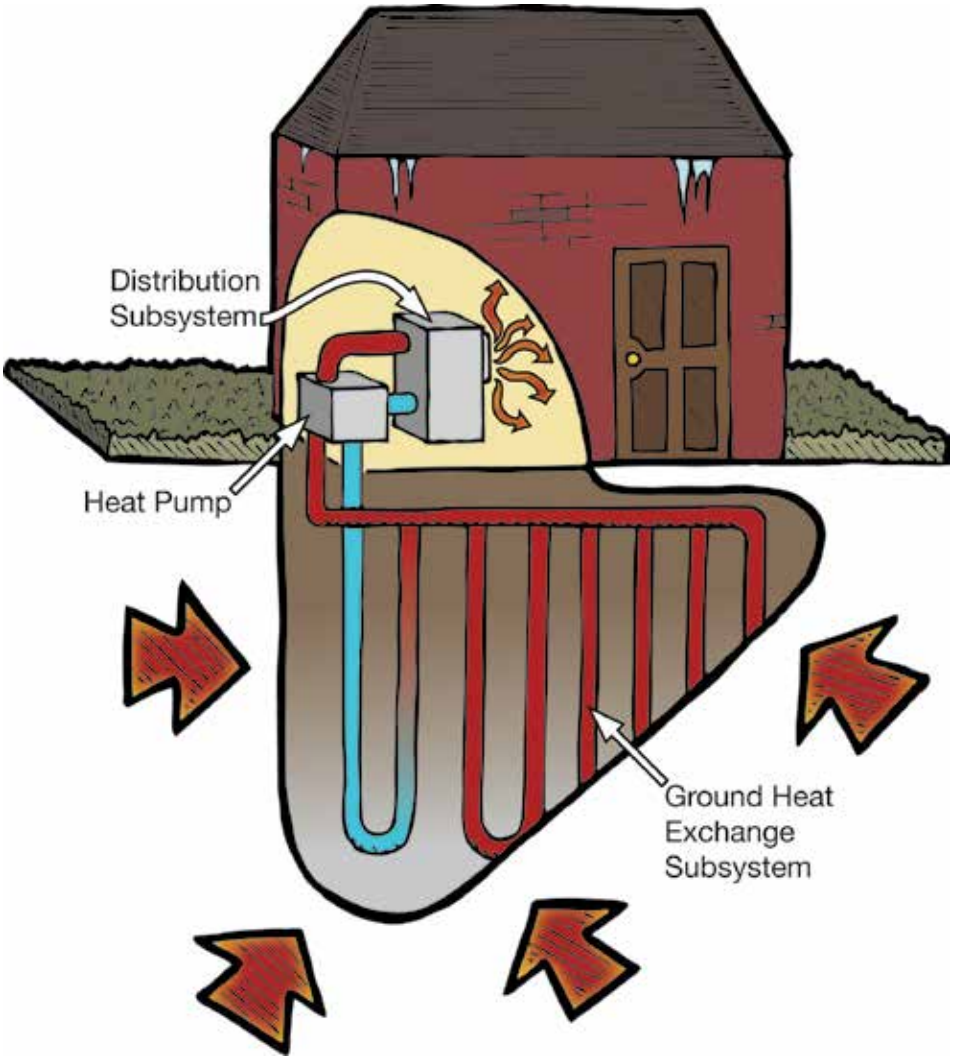
Heat pumps, cont.

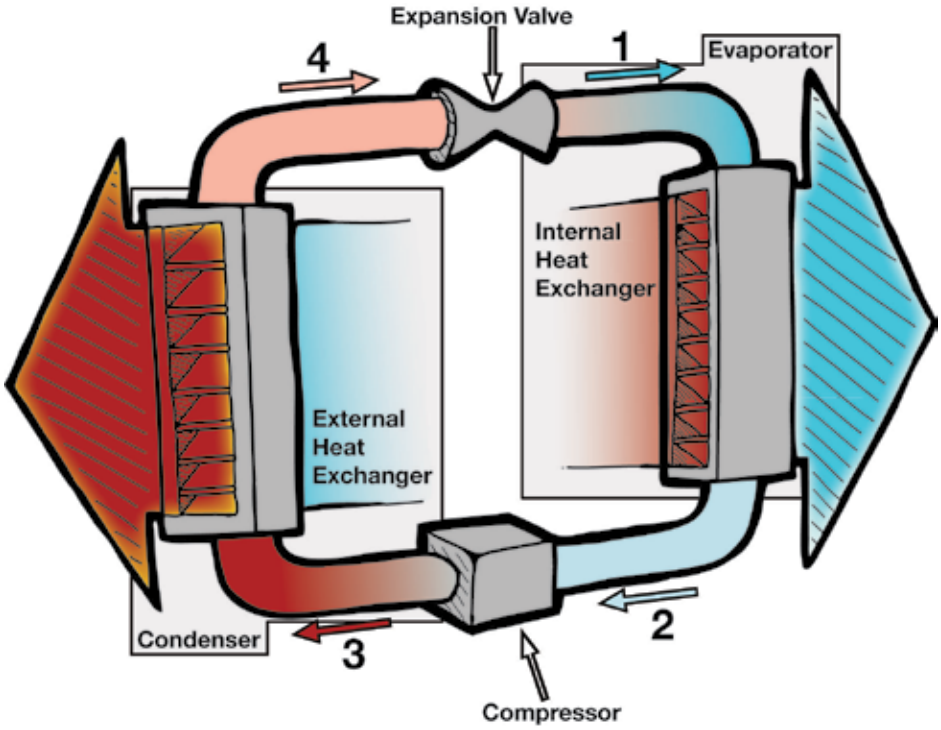
for forced air applications. While some companies have worked to build a cold climate model, it is still a work in progress.

Ground source systems can operate in nearly any climate and work well with both baseboard hot water and forced air systems. However, they can be expensive to install because of their need for a ground loop of some sort.

Recently, a number of companies have introduced heat pump water heaters in response to EPA rulings to bring this efficient technology to domestic water heating. While the jury is still out, many of the same air source benefits and drawbacks apply, including a steep price tag at present.

Heat pumps, properly applied, can make a world of difference to your monthly bill as well as to your comfort. Talk to the energy experts at Eastern Illini, and find out if a heat pump is the ticket for your heating and cooling needs.





Geothermal Heating & Cooling

A geothermal system is actually the same thing as a ground source heat pump. To date, there have been well over 1,000 geothermal systems installed within Eastern Illini's service territory.

Visit our website at www.eiec.org or call us at 800-824-5102 to get a list of geothermal dealers in our area.

Thomas H. Moore
IEC Memorial Scholarship Program

The Illinois Electric Cooperatives (IEC) Memorial Scholarship Program awards **ten** $2,000 scholarships annually to students entering college to assist them with educational costs. The fund was designed to financially assist deserving students in the "electric cooperative family," while also providing a means for co-ops and individuals to honor deceased members of the co-op family through memorial gifts.

About the scholarships

5 scholarships are awarded to students who are the sons or daughters of an Illinois electric cooperative member receiving service from the cooperative (deadline to apply Dec. 31, 2015).

3 scholarships are reserved for students enrolling full-time at a two-year Illinois community college who are the sons or daughters of Illinois electric cooperative members, employees or directors (deadline to apply Dec. 31, 2015).

1 scholarship, the Earl W. Struck Memorial Scholarship, is awarded to a student who is the son or daughter of an Illinois electric cooperative employee or director (deadline to apply Dec. 31, 2015).

1 scholarship, the LaVern and Nola McEntire Lineworker's Scholarship, is awarded to a student to attend the lineworker's school conducted by the Association of Illinois Electric Cooperatives in conjunction with Lincoln Land Community College, Springfield, IL (deadline to apply April 30, 2016).

For more information about the IEC Memorial Scholarships, please contact:

Eastern Illini Electric Cooperative
800-824-5102
www.eiec.org/community/scholarships