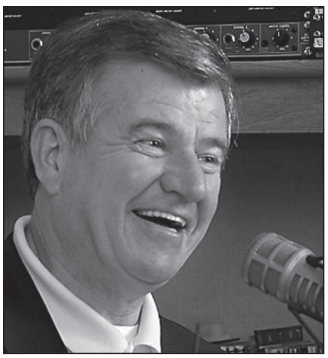
The Dreaded Delta T



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If you've read and implemented the information in my past columns, your floors should be warmer and your walls should be more energy efficient, therefore making your whole house more comfortable.

Certain types of wall insulation perform better than others when it is cold outside and, particularly, when the wind is blowing. When it is 75 degrees outside, no one really worries about wall insulation. In fact, they may open the windows and go fishing. When it is 25 degrees outside and the wind is blowing, no one wants to go out outside, much less go fishing.

You are no doubt aware that the wind chill temperature can be considerably lower than the real temperature. Generally speaking, non-heated moving air is not conducive to comfort in the winter. You may be asking, "What is Doug getting at?" Well, just bear with me, I'm getting there. You probably are aware of wind chill, but you may not be aware of another type of air movement, which we call a "driving force." This phenomenon occurs when there is a temperature difference between two locations, such as the interior and exterior of a house. That temperature difference is called a Delta T.

In nature, warm air always moves toward cold air.

Think of it this way – the hot air is trying to get out of my house in the winter, but in the summer, the hot air is trying to get in my house. The greater the Delta T, the faster the air movement and the greater the driving force. Here's a good example:

When you open an oven door, you can feel the hot air rush out. You can literally feel the "driving force" of the hot air as it escapes. And, in your house, the greater the driving force, the faster you'll lose the heat, which means your heating system has to work harder.

If there are cold spots on your wall, the warm air goes to those spots and heat is lost as long as the wall remains cold. In other words, you are going to keep losing heat until you fix the problems. If you take steps to make the wall warmer, such as caulking and installing insulation, the Delta T and the driving force are less.

Here's something else to consider. In most cases, the warm air also contains moisture. When that warm air hits a cold spot, such as your window glass, it may well turn to water. It can do the same thing on or in your wall, causing mold or mildew to appear.

Well, I think you understand the problem so what is the solution? Simply stated, just caulk and insulate the wall and other locations to eliminate cold spots.

I have learned through the years that cellulose or foam insulation is best for this purpose. Warming the wall will reduce the driving force by reducing the dreaded Delta T.

But, the Delta T can create positive outcomes, too.

If it were not for the Delta T phenomenon, we would have a difficult time cooling our house in the summer.

Consider this. When the thermostat says that cooling is needed, your air conditioning unit sends warm, humid air through the cold coil. The air is cooled, condensation occurs in the coil and then trickles to a drip pan and through a little pipe to the outside of the house. The larger the Delta T, the better this system works. Geothermal systems, which use ground loops to tap earth's constant 58-degree temperature, have an advantage with the Delta T. That's because a geothermal coil is simply colder than most other air conditioning coils as it is working from cool ground temperatures and not the hot outside air. A regular air conditioning unit has an outside coil and on a hot summer day, the fan in the outdoor coil is pulling hot outside air across a coil in an effort to cool that coil.

I have checked temperatures of that coil on numerous occasions and found it to regularly be more than 115 degrees. I think that you all can understand that the heat transfer is better using cold groundwater in a geothermal unit than hot outside air from a standard air conditioning unit.

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In addition to your air conditioning units, there are other things in the house that use Delta T in a positive way. Those include refrigerators, clothes dryers and water heaters, among others.

Until next time, stay warm and enjoy the good effects of the Delta T.

Doug Rye, a licensed architect living in Saline County, Ark., is the popular host of the "Home Remedies" radio show and a promoter of energy efficiency building. To order Doug's video, call Doug at 1-888-Doug-Rye.

Teacher Energy Seminar Offered

Basin Electric, the Lignite Energy Council and the American Coal Foundation are sponsoring a teacher seminar titled Lignite – Our Regional Resource: Energy, Economics and Environment at University of Mary in Bismarck, N.D., June 17-19, 2008.

"The cost of the seminar and travel expenses will be paid by Basin Electric Power Cooperative for South Dakota, Minnesota and Montana teachers," said Anika Schaff, Basin Electric government relations secretary.

Now in its 23rd year, Schaff said the seminar provides teachers with a broader understanding of the lignite coal industry and the important role it plays in providing electricity to consumers, farmers and businesses. The seminar will provide teachers with the information and educational materials they need to teach their students about how lignite is mined and converted into energy. Lignite's economic impact on the region, as well as important environmental issues affecting the mining and power plant industry will also be discussed

The seminar includes tours of a lignite mine, a power plant fueled by lignite and the Great Plains Synfuels Plant. The Synfuels Plant converts coal into synthetic natural gas and other valuable byproducts. A tour of the visitor's center at Fort Mandan, the location where the Lewis & Clark Expedition spent its first winter, is also included. The visitor's center was constructed with the use of coal combustion byproducts.

The seminar is being held in cooperation with University of Mary and the Center for Economic Education at the University of North Dakota. Teachers can earn one semester graduate credit in economics from the University of North Dakota by successfully completing the seminar requirements.

Teachers from all grade levels are encouraged to apply to the program, but earth science, social studies and energy education teachers will be placed first. There are 120 spots available.

Registration information for teachers from South Dakota, Minnesota and Montana is available in the "Online registrations" section of Basin Electric's Web site at www.basinelectric.com. North Dakota teachers can find more details on the seminar at www.lignite.com/teachers.

For further information or to register contact Anika Schaff at 1717 E. Interstate Ave., Bismarck, ND 58503. You may also call her at 1-800-242-2372 or e-mail her at aschaff@bepc.com.

"Our Energy" Asks You to Get Active in Energy Challenges

By Mike Lynch, Cooperative Communications Manager, East River Electric

How much will you be willing to pay for your electric bill in the years to come?

The choice may be made for you unless you begin a dialogue with representatives, voicing concerns over proposed legislation which would result in drastic price increases.

As our population continues to grow, many factors will influence what you pay; these include a strained economy, a spike in the demand for electricity and proposed climate change legislation.

At the forefront of proposed electric bill increases is the Lieberman-Warner bill (S. 2191), scheduled for review and further scrutiny this summer. The bill aims to reduce greenhouse gas emissions up to 12 percent by 2012. Critics of the bill feel that environmental mandates are far too aggressive for commercial technologies to effectively minimize emissions at acceptable levels. An analysis provided by Dr. Anne Smith, CRA International, to the Senate Environmental and Public Works Committee, indicates wholesale electricity prices would increase by 36 percent to 65 percent by 2015 under Lieberman-Warner. This would amount to an average of $1,300 per household.

During the 2008 National Rural Electric Association annual meeting in Anaheim, Calif., NRECA members invited consumers to become proactive in "asking tough questions and requiring straight answers" from all elected officials. The "Our Energy, Our Future" campaign implores citizens to become proactive in this issue by asking the following questions to policy makers:

• Experts say that our nation's growing electricity needs will soon go well beyond what renewables, conservation and efficiency can provide. What is your plan to make sure we have the electricity we'll need in the future?

• What are you doing to fully fund the research required to make emissions free electric plants an affordable reality?

• Balancing electricity needs and environmental goals will be difficult. How much is all this going to increase my electric bill and what will you do to make it affordable?

These questions can be simplified into the following categories: 1) Benefit vs. Cost, 2) Personal Cost to Me and 3) Cost to the Economy.

The energy challenges that face all of us are daunting, but through a grassroots effort to increase awareness which would ultimately evolve into a national dialogue, the power of conversation will prevail and decision-makers will make well-reasoned decisions on energy-related legislation.

Our Energy, Our Future
A Dialogue With America

As Glenn English, CEO of the National Rural Electric Cooperative Association states, "Policy makers must seek out solutions that are feasible technologically and can be sustained economically – remedies that will allow electric co-ops to continue providing reliable, affordable power in an environmentally responsible fashion."

To learn more about "Our Energy," visit www.ourenergy.coop. There, you can compose a letter or an e-mail to U.S. senators and representatives. "Our Energy" has simplified the process by providing the body of the message, which poses the above-stated questions and invites the elected officials to respond.

As the campaign states, "It's our time." What are you going to do?