

Take Control & Save[®]

Residential energy efficiency pilot program

Conrad family pilot project - Donnellson, Iowa

The problem

Frank and Susan Conrad's heating system, an old fuel oil furnace, was nearly inoperable, so they were using five electric space heaters to heat their home. Their home was also lacking insulation and weatherization; all of which resulted in a less than energy efficient home.

With a mission of turning their home into a more energy efficient one, the Conrads were selected by their local electric cooperative, Access Energy Cooperative, to participate in a pilot project through the Take Control & Save energy efficiency program.

Finding some answers

The first thing to do for the Conrads was to get a complete analysis of their home, so an energy audit and blower door test was conducted May 12, 2009 on their home by Access Energy Cooperative energy advisor, Alan Raymer.

The audit revealed a variety of areas where significant energy could be saved.

Conrad home statistics:

Construction type: frame
Exterior: metal
Home style: House with farm
Age of home: 150 plus years
Square footage: 2,500



The Conrads stand in front of their home with Access Energy Cooperative energy advisor, Alan Raymer (right.) The couple was chosen by Access Energy to receive a home energy makeover.

Energy audit results

A blower-door test was completed as part of the audit process. This test measures the airtightness of a home by pulling air out using a special fan called a blower door, which lowers the air pressure inside. When the inside air pressure is lowered, the higher outside air pressure flows into the home through all unsealed cracks and openings, showing where your home is in need of weatherization. The test revealed the home had a CFM (cubic feet per minute) of 3,864, and an ACH (air exchanges per hour) of 10.24, indicating there was much room for improvement!¹

The audit revealed specifically that, among other issues, the Conrad house was lacking insulation, entry doors had significant air leakage and the heating system was nearly inoperable, resulting in a dependence on the use of several space heaters to heat the home.

So, Access Energy Cooperative got to work helping the Conrads make their home more energy efficient through this one-time pilot project.

¹Typically, a "leaky" home has a CFM over 4,000 and ACH over 10.

The work will pay off

Work began with the addition of foam insulation throughout the house in February 2010, and the Conrads experienced an instant improvement in the comfort of their home. By May 2010, old entry doors were replaced with new energy-efficient models, all duct work was repaired or replaced and a new, highly efficient ground-source heat pump was installed.



Frank and Susan Conrad are more comfortable, and paying less in energy bills in their now more energy efficient home.

They are pictured here in their home with Access Energy Cooperative energy advisor, Gary Stevens (right).

The results are in!

After all improvements were made, a new blower door test was conducted on May 27, 2010. The air exchange rate went from a 10.24 to a 3.99, or a reduction of 61 percent! The Conrads reported a far more comfortable home environment to live in. They were extremely appreciative of all the improvements made to their home and were excited to be a part of the pilot project.

Before	After	Reduction/savings
CFM ¹ = 3,864	CFM ¹ = 1,505	CFM ¹ = 2,359
ACH ² = 10.24	ACH ² = 3.99	ACH ² = 6.25
Used 37,360 kWh³ from 06/09 - 05/10	Used 28,320 kWh³ from 06/10 - 05/11	Saved 9,040 kWh³ in the first year!
\$3,377 for electric use from 06/09 - 05/10; an average of \$281/month	\$2,560 for electric use from 06/10 - 05/11; an average of \$213/month	Saved \$817 in the first year!

¹Cubic feet per minute (CFM): a measurement of airflow that indicates how many cubic feet of air pass by a stationary point in one minute.

²Air exchanges per hour (ACH): a measure of how many times the air within a defined space is replaced.

³Kilowatt-hours



You can Take Control & Save too!

To find out how you can take control of your energy use and start saving like the Conrads did, contact your local electric cooperative or visit www.TakeControlAndSave.coop.

Adding spray foam insulation



Installing horizontal loops for the ground-source heat pump



Major energy-efficient improvements

1. Replacement of old, inefficient heating and cooling system with highly efficient ground-source heat pump
2. Foam insulation added in basement, attic, kitchen area crawl space and exterior walls
3. Replaced leaky entry doors with energy-efficient models
4. Air-sealed all windows
5. Replaced all lighting with compact fluorescent light (CFL) bulbs
6. Repaired/replaced all duct work

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A Cooperative Effort for Energy Efficiency

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