

Geothermal Residential Heating Testimony

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In the winter of 2008-2009, while constructing a new house in St. Johnsbury, my family had geothermal heating system installed. We have used this as our primary source of heating ever since, with only an electric buffer tank as a backup. No repairs have been made on the system, and the only regular maintenance was the bleeding of air in the closed loop system in 2012. Our system was designed by Eagle Mountain, located in the Finger Lakes Region of New York. At the time they had been operating for over 25 years and have experience designing and installing geothermal heating systems in winter environments, even more extreme and north than Vermont.

Our house is approximately 4,200 square feet and has a 5 Star energy rating from Energy Efficiency Vermont. We have six zones and heat anywhere from 67-70F.

The cost for the design, installation, and equipment associated with the geothermal heating system (8 ton capacity) was approximately \$20,000, and we received a federal tax credit of \$3500. Vermont did not offer a state tax credit. We financed this expense (\$16,500) into our 30 year mortgage, at a cost of \$848/year. The electrical operating costs for the heating season are typically \$900-1000 (about 8,000 kW at Rate 61 from GMP) depending on how cold and long winter is. We typically heat from Oct. 1-April 30.

Our heat is delivered through a radiant floor heating system. We did not have our house ducted, and thus do not use our geothermal for cooling, but we could have, and in fact it would have made the entire operation more efficient by stuffing heat in the ground during the summer months and then drawing it out during the winter, and vice versa.

The heat pump itself is projected to last 30 years, and the vertically installed closed-loop field is rated at 100 years plus. The loop field is vertically set in five 170 foot holes that are thermally grouted.

Geothermal heating, in my opinion, is a no-brainer. It is cost effective from a cash flow and payback standpoint and is environmentally friendly in Vermont because most of GMP's electric energy portfolio comes from clean generation.

There are four things holding back geo-thermal that you should be aware of:

1. It is relatively new to Vermont and unfamiliarity leads to reluctance.
2. There are individuals installing these systems that shouldn't be. Choose a firm that has significant experience installing in this area.
3. When we took the plunge, banks would no consider geothermal as a plus when determining fair market value due to federal regulations. Most analysis

indicates it adds 8-10% to the fair market value of the house. This makes financing more difficult.

4. With any heating system, weatherization is paramount. In retrospect, I would have constructed the house with more weatherization. I think it would have reduced the amount of my geothermal system on a 1:1 basis, and my annual operating costs would have been even lower than they are.