

**Christy Farnsworth**  
Senior Division Energy & Transportation  
*Electrifying the World One Loop at a Time*

The purpose of this experiment was to determine if it was possible to use heat from a geothermal loop system to generate electricity and still use the forced air heat to heat the home. To conduct this experiment 15 TEG (thermal electric generator) modules were connected in series and parallel. Heat was simulated for the hot side with a griddle and ice water on the cold side. It was found that 2.73 watts were generated in this experiment. A 2000 square foot house could generate 174.24 kwh/month. Not only could electricity be generated for use in the home and excess sold back to the grid; but there is an even greater potential. Geothermal loops could be run under highways, farm fields, and parking lots. The roads would be ideal for the idea of using TEGs with geothermal. There are 85,400 miles of road in Colorado. Which means 224,168,961 kwh/month by placing geothermal loops under all of the roadways in Colorado. My experiment showed that electricity can be generated and the home heated at the same time. TEGs are a lot more efficient than my experiment shows. If 1/2 of their rated watts is achieved, the home could supply its own electricity and make \$2,259.00/month. The geothermal under the highways could generate enough electricity to power all the homes in Colorado (2,094,898), plus a surplus for other uses in Colorado. These ideas represent an untapped renewable energy source. This generation of electricity will be great for Colorado's future.