

EngineerGirl – Engineering Energy for the Future – Essay Contest

In mid February my team, consisting of three 5th grade girls, participated along with 19 other teams at the 2008 Lower Hudson Valley FIRST LEGO League Tournament. This year's theme focused on solving the "energy puzzle". We had to design a robot out of Legos and program it to accomplish 10 predetermined missions in 2.5 minutes. In addition we also had to conduct an energy audit of a building of our own choosing and then come up with ideas on how the building could be more energy efficient. It was through this experience that I realized not many people (including myself) knew much about renewable energy. This is how I came up with my essay's topic. I hope you enjoy it.

Engineers, Perfect Advocates for Renewable Energy

There are three different directions that engineers can pursue to contribute to providing energy for the future. One way is for engineers to discover new and innovative forms of renewable energy. Another method is to uncover breakthroughs in technology for current renewable energy forms, like fusion. Lastly engineers can find means to make renewable energy more affordable. All three approaches are great and worth striving for. However engineers can make a major impact if they themselves are strong advocates and champions for renewable energy use. They must be unwavering supporters and committed to spreading this information to the public. Engineers can educate the public that it is feasible and necessary to use renewable energy in their homes. Once home buyers understand this opportunity, they can demand builders to build homes with energy efficient and environmentally friendly materials. Currently energy efficient homes tend to be more expensive to build, but future energy savings will offset the extra initial costs. A geothermal system in an average sized home costs \$6,000 more to install over a less energy efficient method. With significant cost savings in energy (ranges from 40% to 75%), over the lifetime, the homeowner's outlay will be less when compared to a conventional system. As demand for renewable energy for homes increases the incremental cost to install a geothermal system will disappear.

To prevent heat loss engineers have long concentrated on creating products that increase the R factor (ex: insulation, triple glazed windows). Engineers should focus on making homebuyers aware that a geothermal system is a more direct and efficient way to reach a comfortable temperature indoors. A home with a geothermal system uses the heat from the earth. Wells are drilled into ground about 400 to 500 feet deep for a vertical system or 4 to 5 feet deep for a horizontal system. Pipes are installed into these wells which will contain water. Since the earth is at a constant temperature of 50°F to 55°F degrees, in the winter with an outside temperature of 30°F, the heat pump acts as a boiler to extract heat from the loop. Conversely in the summer, the opposite happens with an outside temperature of 80°F, the heat pump acts like a cooling tower and extracts the hot air and sends it down the loop to cool. Heat loss can be minimized in geothermal homes when the temperature change is reduced.

With the current geothermal system, pipes are filled with water below ground. Why stop there? Engineers should design a house in which pipes run between the inner and outer walls of the house (where the insulation currently is). This is similar in concept to the radiant floor heating system. Underneath the floors of the homes, pipes are filled with heated water to provide warmth to the room. However with traditional radiant floor heating system, it does not benefit from the geothermal warmth of the earth. Imagine if the pipes throughout the floors and the walls of the house were filled with water from a geothermal system, the home would be encased with warmth in the winter and coolness in the summer.

Presently using renewable energy in homes is similar in situation to when the computer was first introduced to the public. A long time ago computers were rarely found in households. Now the majority of households have a computer because the price has been drastically reduced and people also see the need for them. The same thing could happen to using renewable energy in the home. When engineers promote the need for renewable energy use in the home, more people will install them and costs will come down. However, engineers should also continue to find ways to reduce the overall expense for installing a renewable energy system. Lowering the price of a renewable system is a great way to spread the message to the public so they become aware and can make a difference for the environment.

Engineers must not be content to just think up new ways to provide energy for the future. They hold in their hands the responsibility to educate. Since engineers are respected in their field they would be ideal ambassadors for renewable energy use. Everyone needs to be brought together to make change happen.