

# NET ZERO HOMES

## Advanced Design Applications

Net Zero homes are ones that produce as much energy as they consume, the result being a net zero consumption of energy. There are many ways to accomplish this feat, but it requires two things – having a home that is super energy efficient in everything it does, from heating, lighting, and appliances, to producing energy in one way or another.

The more energy a home consumes, the more will have to be spent on having a system of producing energy. This home will be all electric, meaning that the appliances, the heating, and the water heater will all be electrical to account for the energy consumption of the home. To begin with, all appliances have to be accounted for as far as the electricity they use. In addition, any other energy usage in the home has to be determined. To get a good assessment of the energy your home design will use follow the following steps:

1. Make a list of all appliances found in a home, and research the most energy efficient ones that can be purchased on the market, and determine how much electricity they use on a yearly bases.
2. Determine how many rooms (and specifically, what kinds of rooms), the house will have to determine the lighting requirements. Even if you are using windows for lighting, electric lights will be necessary after sunset.
3. Decide on the heating method for the house. There are many options, but again, it must be run off electricity. Burning wood is a good alternative, but there is no guarantee that this home will be in a location where wood is abundant, and it would be difficult to determine the energy value of the wood to verify that the home is net zero. Things like solar and geothermal can be used, but they are not 100% free of electrical usage, and do not work all of the time.
4. How will water be heated for the home? As with heating the home, there are several options, but the result must be one that produces hot water 24 hours a day 365 days a year, regardless of the weather conditions.

After creating an assessment of the total electrical usage of this home, develop a plan to create electricity. Research the different methods, and how large an electrical generating plant you will need for this house. Solar and wind do not work 100% of the time, so when determining how large you need it to be, include the loss due to calm days, cloudy days, and nights.

Now that you have done all the research, you can design the house with all of this in mind. If you are using the sun for lighting, all rooms need a good amount of windows. If you are using solar panels, where are they going to be located, and how much room will they take up. If you are using solar heating of the house, what is the mass storage for this energy? These are just a few of the questions to think about as you design this house.

To accomplish this in a timely manner, divide up the research among the members of your group.