**Electricity and “the Grid”**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

We have been studying renewable and nonrenewable energy. These energy sources are used to make electricity. Answer the questions below to better understand electricity in the U.S. and in your home.

1. What are power plants? How many are there in the United States?
2. How does a power plant work?
3. Use the pie chart to fill in the percentages of U.S. energy electricity production by source.

Coal: \_\_\_\_\_\_\_ Renewables: \_\_\_\_\_\_\_

Natural gas: \_\_\_\_\_\_\_ Other nonrenewables: \_\_\_\_\_\_\_

Nuclear (uranium): \_\_\_\_\_\_\_

1. Briefly explain what happens at each step in the movement of electricity.

Step 1) Power is generated – covered in question #2 above

Step 2) Transformer steps up voltage:

Step 3) Transmission lines:

Step 4) Transformer steps down voltage:

Step 5) Distribution lines:

Step 6) Neighborhood transformer:

Step 7) Electricity enters your house:

1. What is “peak demand” and how can energy companies prepare for this?
2. Look at the map on page 56. The lines represent the electric grid. What is the grid?

(*read on to page 57 to help answer this*)

1. Look at the map on page 57. What is the average price per KWH in Iowa? How do we compare to other states?
2. How is the cost per KWH determined?
3. What is the current efficiency rate of power plants? What does this mean?
4. Future Demand:
   1. Why are Americans using more electricity each year?
   2. By how much will power plants have to increase capacity in the next 20 years?
   3. What causes power outages?
   4. What are issues to consider as we move forward with electricity production?
5. What are Independent Power Producers?
6. What are smart grids?