Wind Energy*

Pre-reading

Questions:
- What do you know about the subject of this reading?
- What more would you like to know? What questions do you have about it?

Definitions:
- Fossil fuels – fuels that take millions of years to form, nonrenewable
- Kinetic energy – the energy of motion
- Conventional – ordinary or commonplace

Reading

The energy picture for the country and the world has changed. The price of oil keeps rising, and it is becoming scarcer. Changes in the global climate, which are related to our use of fossil fuels, are happening at an alarming rate. The need for alternative energy sources has paved the way for the re-entry of the windmill to generate electricity.

Like old fashioned windmills, today’s wind machines use blades to collect the wind’s kinetic energy. Windmills work because they slow down the speed of the wind. The wind flows over the airfoil shaped blades causing lift which causes them to turn. The blades are connected to a drive shaft that turns an electric generator to produce electricity.

One wind machine can produce 1.5 to 4.0 million kilowatt hours of electricity a year. That is enough electricity to power 150 to 400 homes. The most common type of wind machine is the horizontal axis type. Its blades are like airplane propellers.

A typical horizontal wind machine stands as tall as a twenty-story building and has three blades that span 200 feet across. The largest wind machines in the world have blades longer than a football field!

Wind machines stand tall and wide to capture more wind.

Wind power plants, or wind farms as they are sometimes called, are clusters of wind machines used to produce electricity. A wind farm usually has dozens of wind machines scattered over a large area. The Big Spring Wind Power Project in Texas has forty six wind turbines that generate enough electricity to power 7,300 homes.

Wind machines generate electricity in thirty different states. The states with the most wind production are California, Texas, Minnesota, Iowa, and Wyoming. All together, wind machines in the United States generate 17 billion kilowatt hours of electricity per year. That is enough to serve 1.6 million households.

Wind energy offers a viable, economical alternative to conventional power plants in many areas of the country. Wind is clean fuel. Wind farms produce no air or water pollution because no fuel is burned. The most serious environmental drawbacks to wind machines may be their negative effect on wild bird populations and the visual impact on the landscape. To some, the blades of windmills on the horizon are an eyesore; to others, they’re a beautiful alternative to conventional power plants.

*Text used with permission from the Energy Information Administration

Level 7.5
Understanding

1. How widespread is wind machine use? ____________________________________________________________

2. What are the pros and cons of wind energy? ______________________________________________________

3. Why is there a need for new sources of energy? ____________________________________________________

4. What do the words **viable** and **economical** mean? How do those two words apply to wind? _______

5. What kind of machine is used to harvest the wind? Describe it.______________________________

6. How much energy can the wind produce? __________________________________________________________

7. Which states are the leaders in wind-use? Why do you think those states are the leaders? _________

8. What does the word **alternative** mean? __________________________________________________________

Writing

**Option A:** Summarize the reading in your own words.

**Option B:** What are your thoughts about energy? Is it an important question to consider? Why or why not? What new things did you learn about wind energy? How is it used in your area?