

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

19 The energy picture for the country and the world has changed. The price of oil keeps rising, and it
37 is becoming scarcer. Changes in the global climate, which are related to our use of fossil fuels, are
55 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.

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

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

161 A typical horizontal wind machine stands as tall as a twenty-story building and has three blades that
178 span 200 feet across. The largest wind machines in the world have blades longer than a football field!
196 Wind machines stand tall and wide to capture more wind.

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

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

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

388 *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?
