

Modern Marvels
Renewable Energy

Name: _____

Directions: answer each of the following questions as you watch the film. You will be held responsible for them on future quizzes and tests.

SOLAR

1. What renewable energy did FedEx make use of to power their plant in California?
2. What percentage of the FedEx facility's needs are met by the solar array on the roof of the building?
3. Sunlight knocks _____ free from the **silicon** cells to form an electric current.
4. During the 25 year operating life of this solar power plant approximately _____ tons of carbon emissions will be offset.
5. Name 5 major forms of renewable energy for which the technology has been developed to the point that it is ready to be used to meet some our energy needs.
 1. _____
 2. _____
 3. _____
 4. _____
 5. _____
6. **How much land** would be needed to be covered in photovoltaic cells to meet the entire electrical needs of the United States.
7. What “**passive**” design was used by the Greeks, Romans, and Anstazi Indians of the American southwest?
8. What is the number one use of natural gas for many homeowners?
9. **What scientist** first proved that light consisted of photons that could be converted into electricity?
10. Name two **modern uses** of solar photovoltaic cells.
 1. _____
 2. _____
11. What limits the widespread use of photovoltaic cells at this point in their development?
12. What are “**building integrated**” photovoltaics?

WIND

13. How many homes are powered by the Fenner wind farm?
14. The general idea of a wind turbine is to convert wind energy into _____ energy.
15. What is the main challenge for wind power?

continue on back

16. What are clusters of wind turbines called?
17. Name two parts of the United States that have the greatest potential for the production of wind energy.
1. _____ 2. _____
18. What caused the early use of wind power in this country to fall out of favor?
19. In general, what has happened to the size of wind turbines?
20. At the moment what percentage of the electricity needs of the United States are being met by wind power? _____% What percentage has the Department of Energy identified as the target? _____%

GEOHERMAL

21. What **island nation** makes efficient use of geothermal and hydroelectric power to meet their energy needs?
22. What does it mean to say a plant is a “**dual use**” facility?
23. Iceland hopes to convert its cars and fishing fleet to _____ power using its renewable geothermal resources.
24. What type of geothermal can almost any homeowner use?

BIOFUELS

25. What is the best fuel for many cars converted to use biofuels?
26. Name two other biofuels these cars can use.
1. _____ 2. _____
27. **What percentage** of the world’s global warming greenhouse gases come from automobiles?
28. What **prairie grass** may prove the best source of biofuel?
29. What is gasoline used for in modified hybrids (100 mpg)?
30. What is one **major disadvantage** associated with using more and more biofuels to produce energy?

TIDES/CURRENTS/WAVES

31. Briefly describe how a **tidal barrage** works.
32. What **disadvantages** are associated with the use of tides and currents to produce energy?
33. Does the technology exist today to make the switch from non-renewable energy sources (fossil fuels) to renewable sources.