

Wind Power Key Huntley Invitational

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|---------|--------------------|
| 1. A | 13. A |
| 2. C | 14. B A |
| 3. D | 15. A |
| 4. D | 16. D |
| 5. A | 17. AB |
| 6. Abe | 18. B |
| 7. E | 19. B |
| 8. D | 20. C |
| 9. D | 21. C |
| 10. B | 22. C |
| 11. c | 23. D |
| 12. abc | |

24. Charles Brush

25. "The terms "wind mill" and "wind turbine" are sometimes used interchangeably, but there are important differences. Windmills generate mechanical energy, but they do not generate electricity. People started using windmills centuries ago to grind grain, pump water, and do other work."

<http://www.awea.org/Resources/Content.aspx?ItemNumber=900>

26. **Not In My Back Yard**. Indicates the preference of individuals to place wind turbines in areas not close to their homes (due to various reasons) even if they support the idea of wind energy.

27. "Pumped storage: Reusing water for peak electricity demand

Diagram showing daytime with water flowing downhill to produce electricity and night time, water pumped back to storage pool above turbines, for later use. Demand for electricity is not "flat" and constant. Demand goes up and down during the day, and overnight there is less need for electricity in homes, businesses, and other facilities. For example, here in Atlanta, Georgia at 5:00 PM on a hot August weekend day, you can bet there is a huge demand for electricity to run millions of air conditioners! But, 12 hours later at 5:00 AM, not so much. Hydroelectric plants are more efficient at providing for peak power demands during short periods than are fossil-fuel and nuclear power plants, and one way of doing that is by using "pumped storage", which reuses the same water more than once.

Pumped storage is a method of keeping water in reserve for peak period power demands by pumping water that has already flowed through the turbines back up a storage pool above the power plant at a time when customer demand for energy is low, such as during the middle of the night. The water is then allowed to flow back through the turbine-generators at times when demand is high and a heavy load is placed on the system.

The reservoir acts much like a battery, storing power in the form of water when demands are low and producing maximum power during daily and seasonal peak periods. An advantage of pumped storage is that hydroelectric generating units are able to start up quickly and make rapid adjustments in output. They operate efficiently when used for one hour or several hours. Because pumped storage reservoirs are relatively small, construction costs are generally low compared with conventional hydropower facilities." <https://water.usgs.gov/edu/hyhowworks.html>

28. Tesla

29. Flywheel

30. "Corona loss is caused by the ionization of air molecules near the transmission line conductors. These coronas do not spark across lines, but rather carry current (hence the loss) in the air along the wire. Corona discharge in transmission lines can lead to hissing/cackling noises, a glow, and the smell of ozone (generated from the breakdown and recombination of O₂ molecules).... Unlike resistive loss which where amount of power lost was a fixed percentage of input, the percentage of power lost due to corona is a function of the signal's voltage. Corona discharge power losses are also highly dependent on the weather and temperature."

<http://large.stanford.edu/courses/2010/ph240/harting1/>

31. AC; Leads to decreased efficiency in transferring current across transmission lines.

32. Vortex