

KidWind / Know Energy

IVc. Wind Turbine Terms and Concepts

- Foundation
- Tower
- Nacelle
- Hub
- Blades
- Gears
- Generator
- Pitch
- Rotors
- Yaw

Foundation

- The concrete base that holds turbine up and keeps it from blowing over.



Tower

- The enclosed, steel structure that keeps the nacelle and blades up high enough to capture optimum winds.



Nacelle

- The part of the turbine that sits on top of the tower and contains the generator and gears



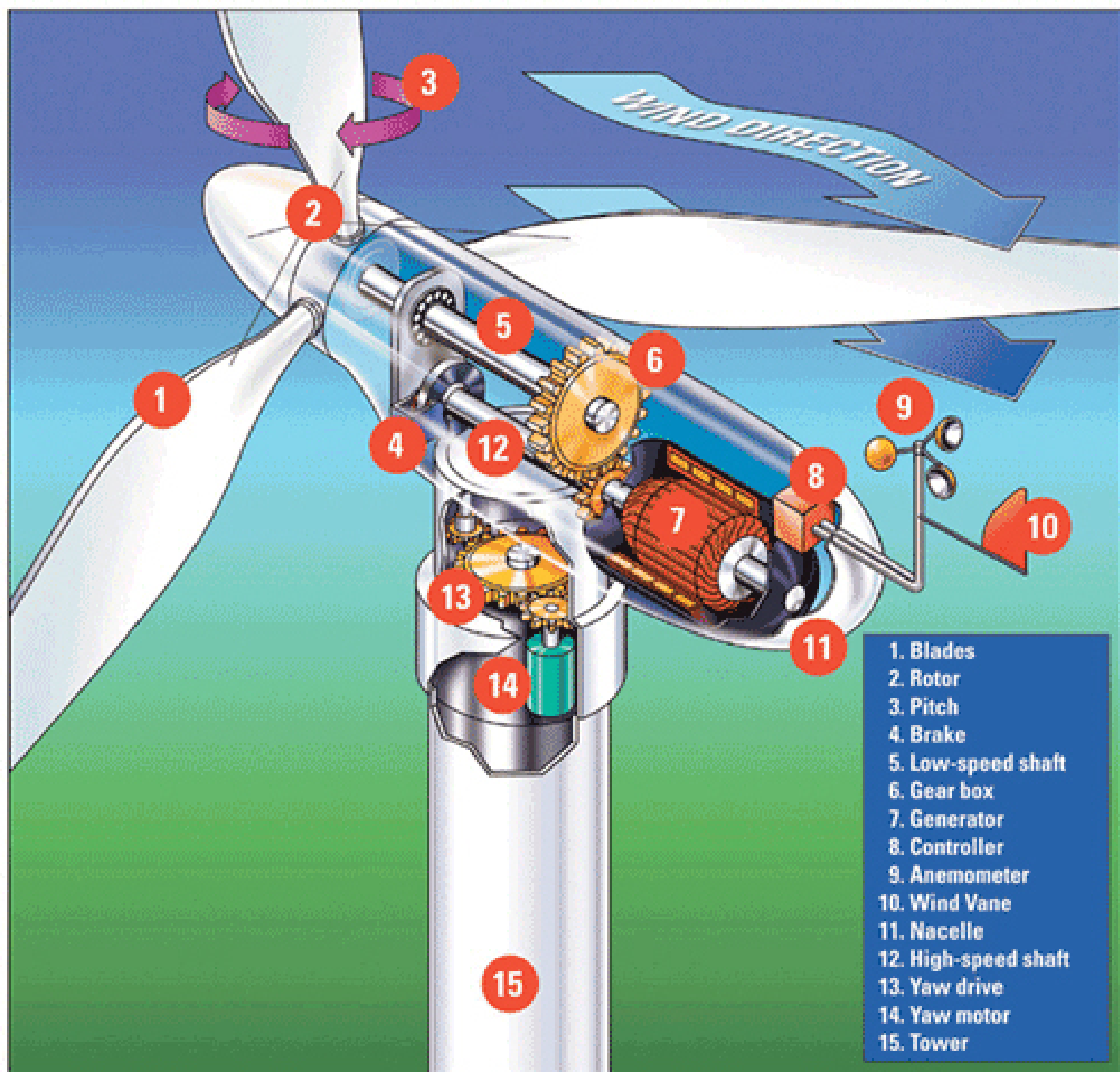
Workers



Blade
112' long

Nacelle
56 tons

Tower
3 sections



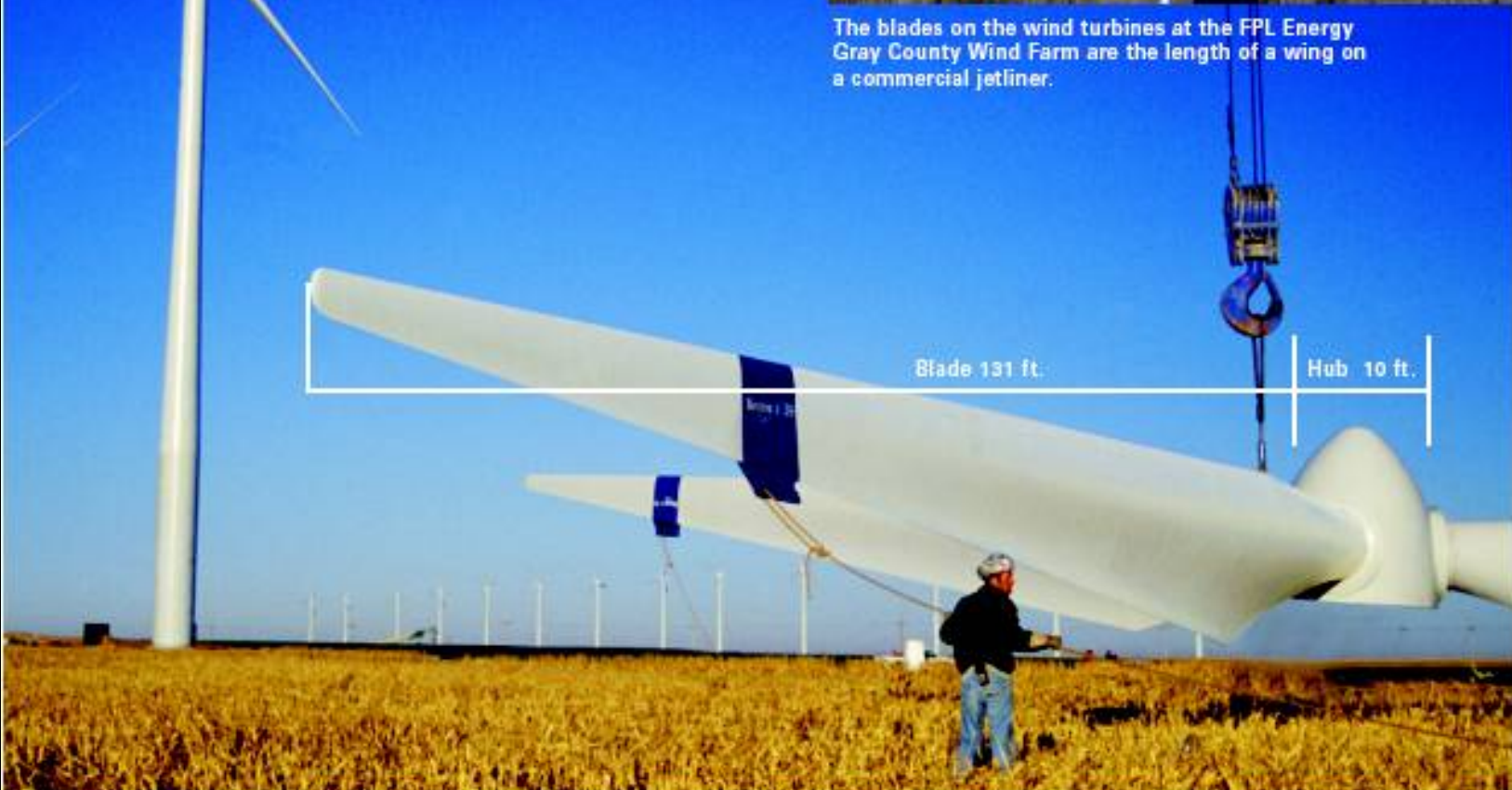
- 1. Blades
- 2. Rotor
- 3. Pitch
- 4. Brake
- 5. Low-speed shaft
- 6. Gear box
- 7. Generator
- 8. Controller
- 9. Anemometer
- 10. Wind Vane
- 11. Nacelle
- 12. High-speed shaft
- 13. Yaw drive
- 14. Yaw motor
- 15. Tower

Hub

- The part of the turbine which connects the blades to the nacelle.



The blades on the wind turbines at the FPL Energy Gray County Wind Farm are the length of a wing on a commercial jetliner.





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Blades

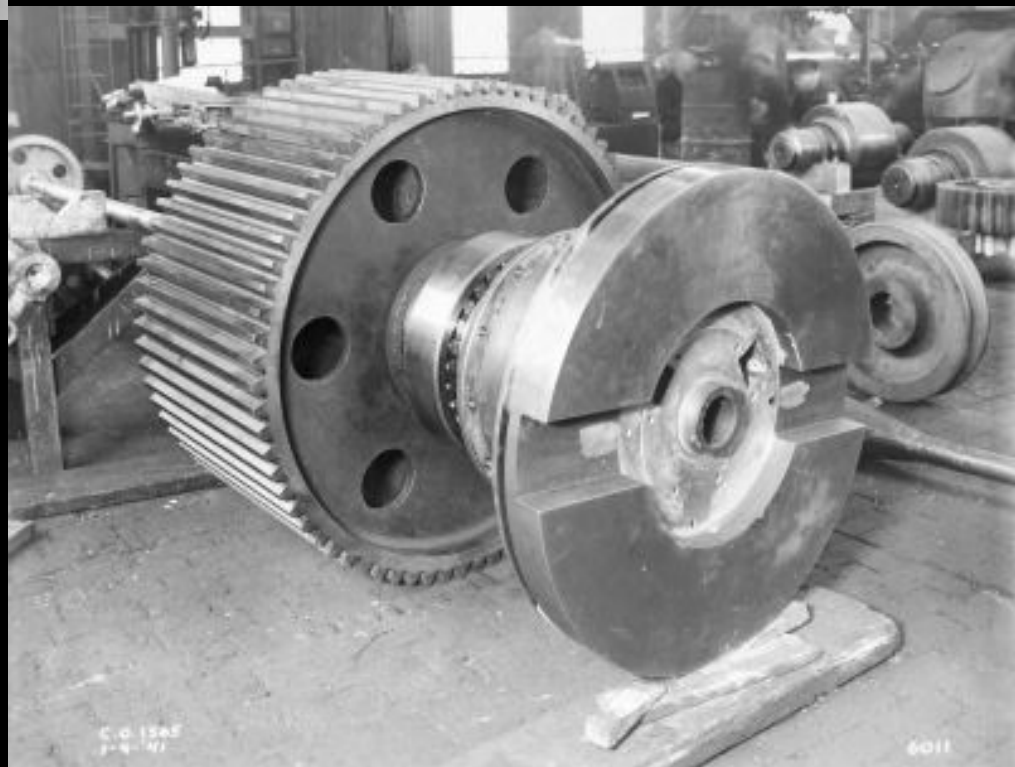
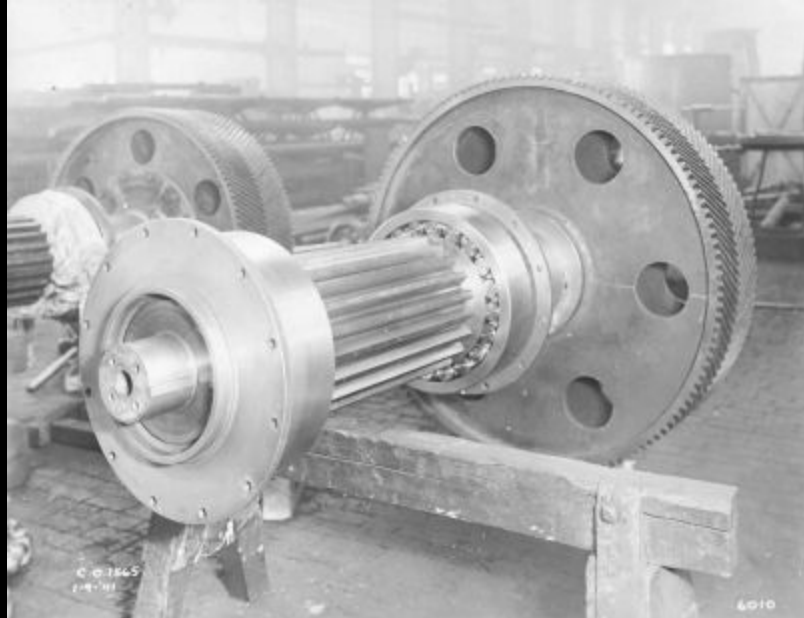
- Blades catch the wind. As they spin, they turn the shaft in the generator which makes electricity





Gears

In order to make the “type” of electricity used by modern homes, the generator needs to be spinning very fast. But large wind turbines generally turn relatively slowly. Gears are used to make the generator spin fast enough to make the right “type” of electricity.



Generator

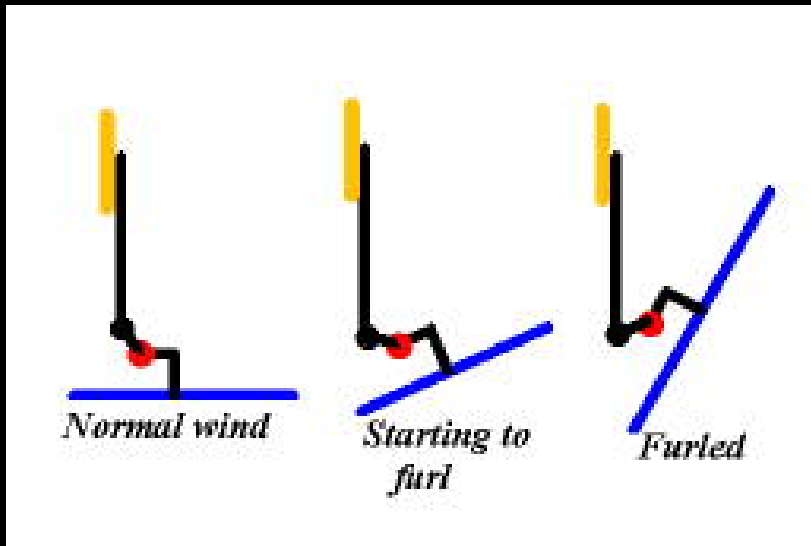
- The part of the wind turbine which converts the spinning of the shaft into electricity. The generator is contained in the nacelle and spins a coil of wire inside a magnet.

Pitch

Pitch is the angle of the blade with respect to the wind direction. The pitch of the blades has a large impact on how fast or slow the blades are spinning. In large wind turbines the pitch can be changed depending on the wind speed.

Rotor Controls

In large wind turbines, rotors control the angle of the blades with respect to the wind direction. In high winds, the rotors can change the angle of the blades so the blades stop spinning thus protecting the turbine.



Yaw

Turning the nacelle into or out of the wind is called yaw. Yaw can be controlled passively by putting a tail on the wind turbine. It can also be controlled mechanically.



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