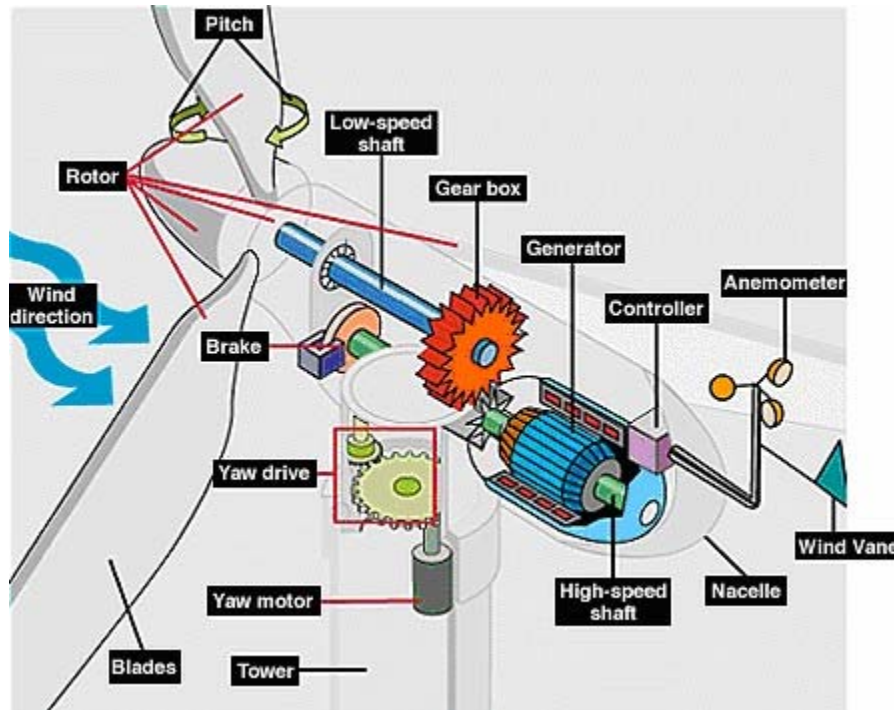


## Introduction to Wind Power

Wind turbines come in all different sizes— from the smallest turbine that charges batteries to the largest that can power a town – but the way they operate is similar. What are the similarities and differences? Read on and find out:

### A Look Inside a Wind Turbine

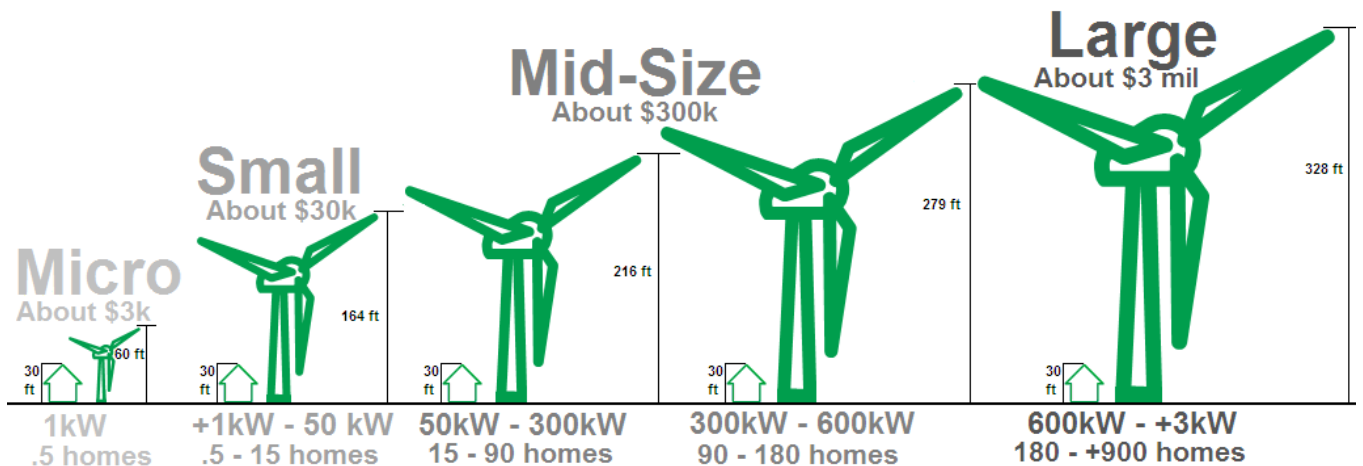


<b>Anemometer:</b>	Measures the wind speed and transmits wind speed data to the controller.
<b>Blades:</b>	Most turbines have either two or three blades. Wind blowing over the blades causes the blades to "lift" and rotate.
<b>Brake:</b>	A disc brake, which can be applied mechanically, electrically, or hydraulically to stop the rotor in emergencies.
<b>Controller:</b>	The controller starts up the machine at wind speeds of about 8 to 16 mph and shuts off the machine at about 55 mph. Turbines do not operate at wind speeds above about 55 mph because they can be damaged by the high winds.
<b>Gear box:</b>	Gears connect the low-speed shaft to the high-speed shaft and increase the rotational speeds from about 30 to 60 rpm to about

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	1000 to 1800 rpm the rotational speed required by most generators.
<b>Generator:</b>	Usually an off-the-shelf induction generator that produces 60-cycle AC electricity.
<b>High-speed shaft:</b>	Drives the generator.
<b>Low-speed shaft:</b>	The rotor turns the low-speed shaft at about 30 to 60 rpm.
<b>Nacelle:</b>	The nacelle sits atop the tower and contains the gear box, low- and high-speed shafts, generator, controller, and brake.
<b>Pitch:</b>	Blades are turned, or pitched, out of the wind to control the rotor speed and keep the rotor from turning in winds that are too high or too low to produce electricity.
<b>Rotor:</b>	The blades and the hub together are called the rotor.
<b>Tower:</b>	Towers are made from tubular steel, concrete, or steel lattice. Because wind speed increases with height, taller towers enable turbines to capture more energy and generate more electricity.
<b>Wind vane:</b>	Measures wind direction and communicates with the yaw drive to orient the turbine properly with respect to the wind.
<b>Yaw drive:</b>	The yaw drive is used to keep the rotor facing into the wind as the wind direction changes.
<b>Yaw motor:</b>	Powers the yaw drive.

## Sizes of wind turbines



Information obtained from: U.S. Department of Energy: [www.eere.energy.gov](http://www.eere.energy.gov)