

WIND TURBINE DIAGRAM AND LIMITED DEFINITIONS

NACELLE: The nacelle is the cover that houses all of the generating components of a wind turbine, including the generator, gearbox, low and high speed shafts, controller and brake assembly.

TRANSFORMER: A piece of electrical equipment used to step up or step down the voltage. Most turbines have a dedicated transformer to step up their voltage to the grid voltage.

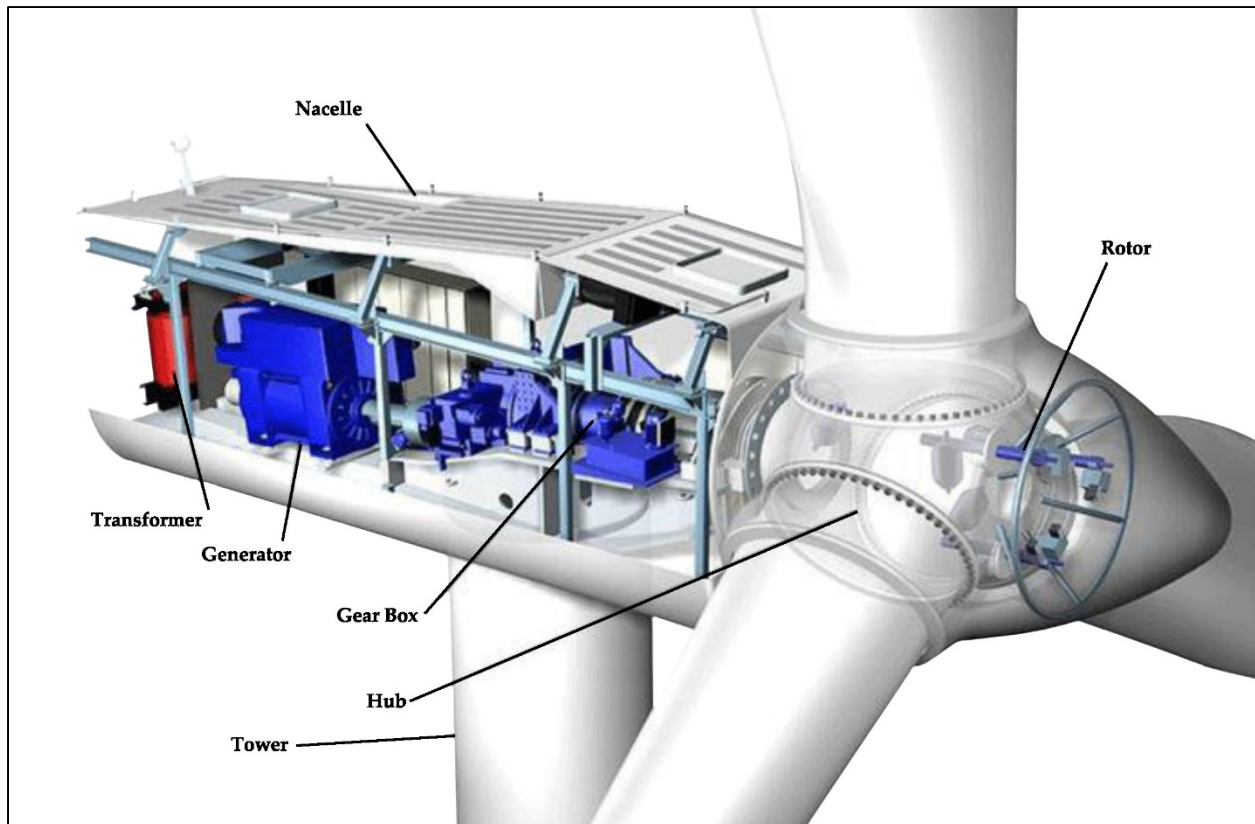
GENERATOR: Usually an off-the-shelf induction generator that produces 60-cycle AC (alternating current) electricity.

GEAR BOX: Gears connect the low-speed shaft to the high-speed shaft and increase rotational speeds from about 30 to 60 rotations per minute (RPM) to about 1200 to 1500 RPM, the rotational speed required by most generators to produce electricity. The gear box is an expensive and heavy part of the wind turbine. Some turbines now utilize “direct-drive” generators that operate at lower rotational speeds, therefore eliminating the need for gear boxes.

HUB: A cast structure that attaches to the blades and created the rotor (the hub plus three blades).

TOWER: Towers are made from tubular steel. Because wind speed increases with height, taller towers enable turbines to capture more energy and generate more electricity.

ROTOR: The blades and the hub together are called the rotor.



Turbine diagram courtesy of Vestas Wind Systems.