

# WIND POWER FUNDAMENTALS

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- # The **first windmill** used for the production of electricity was built in Scotland in **1887** by Professor James Blyth in Glasgow. It was 10 meters high and used cloth-covered blades to power the lights in his cottage, the first house in the world to have wind-powered electricity.
- # Today's wind farms consist of **several hundred individual wind turbines** distributed over an extended area.
- # Tri-Global Energy is developing one of the **largest community wind farms in the world in West Texas**. Hale Community Energy will have 650 turbines with the potential capacity of 1,738 megawatts.
- # The capacity factor of wind farms (how much electricity actually produced versus its nameplate capacity) is steadily increasing from 20 to 30 percent for older farms **to above 50 percent for newer ones**, according to the National Renewable Energy Laboratory (NREL).
- # The median levelized cost of wind energy (LCOE), which is an estimate of **total electricity cost, is \$0.05/kWh**. The only energy source with a lower LCOE is hydropower at \$0.03.
- # Almost all large wind turbines have the same design – a horizontal axis wind turbine with an upwind rotor consisting of three blades, attached to a nacelle on top of a tall tubular tower. **Rotors have grown in size from 70 to more than 120 meters**.
- # Individual turbines are interconnected with a medium voltage power collection system. The electric current is increased in voltage before connection to the **high voltage electric power transmission system**.
- # The United States has more than **200,000 miles of high-voltage transmission lines**, which serve like an interstate highway, facilitating electricity commerce and providing consumers with lower-cost electricity.
- # **The U.S. transmission network is broken up into three main sections**, the Eastern Interconnection, the Western Interconnection and the Texas Interconnection also known as the Electricity Reliability Council of Texas (ERCOT).
- # The Competitive Renewable Energy Zones power transmission project, also known as CREZ, consists of power lines that were built by ERCOT to link areas with potential wind capacity to key populated areas. **The CREZ project was completed in 2013 and can deliver approximately 18,456 megawatts** of wind power from West Texas and the Panhandle to highly populated metropolitan areas in the state.

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