



# Wind energy is renewable source of energy

Wind energy is renewable source of energy

Upgrading the existing grid by building new transmission lines to better move power ...

Wind can do amazing things: carve canyons, move boats across oceans, power machines that grind grain, and--when channeled correctly--create electricity to run our appliances and gadgets. People have been harnessing the power of the wind since the windmill was invented in eighth-century Persia. The vertical windmill exploded in popularity in medieval Europe and is the forebearer of the massive white wind turbines increasingly common on land and sea. Today, as climate change compels us to pursue a net-zero emissions pathway, wind energy and other renewable forms of power, such as solar, geothermal, hydro, and biomass, could play a key part in the broader energy transition. In this article, we take a deep dive into these winds of change and what makes those huge turbines turn.

Learn more about our Sustainability and Electric Power & Natural Gas Practices.

Wind is harvested when it turns the blades of a wind turbine. When the turbine's propeller-like blades turn, they spin a generator that creates electricity. A medium-voltage power collection system transfers that electricity via a current to a substation, where a transformer increases the current's voltage and connects it to a high-voltage electric-power-transmission system.

A wind farm is a collection of many wind turbines. An offshore wind farm is a collection of turbines at sea; an onshore wind farm is a set of wind turbines on land. The largest wind farm in the world is the Gansu Wind Farm in northwest China, which has around 7,000 turbines. Generally speaking, offshore wind turbines produce more megawatts than onshore ones because winds are usually more powerful at sea. But with onshore wind farms, the land between the turbines can be used for agricultural or other purposes.

Global energy demand has been soaring for decades. Between 1950 and 2000, global energy demand grew by 3 percent annually. This growth has slowed and will continue to do so, though demand for electricity is still predicted to grow at seven times the rate of that for other energy sources. And meeting energy demand is becoming more complicated, as environmental concerns lead to calls for new non-carbon-emitting energy technologies.

As the world shifts to meet the demands of a warming climate, wind energy has the potential to provide a substantial proportion of the clean energy our industries, societies, and economies will need. In the 2010s, the offshore-wind industry experienced significant growth. The global commissioned capacity of offshore wind increased from three gigawatts in 2010 to approximately 66 gigawatts in 2023. That's roughly enough to meet the entire electricity demand of Spain for a whole year. During this period, the cost of offshore-wind generation decreased by about 60 percent, as a result of increased competition, low interest rates, and



# Wind energy is renewable source of energy

technological advancements.

Renewable-energy generation is growing worldwide. Globally, between 2010 and 2023, the installation capacity of renewable energy grew about 20 percent per year. As of September 2024, wind power deployments (onshore and offshore) are expected to grow by more than 20 percent per year until 2050. Yet despite this expectation, wind generation pipelines are generally delivering below what's needed to achieve the 2015 Paris Agreement's decarbonization targets for 2030.

Learn more about our Oil & Gas and Electric Power & Natural Gas Practices.

Until recently, offshore wind turbines were installed onto bottom-fixed foundations grounded on the seafloor in waters up to 50 meters deep. These depth requirements limit the areas of the ocean where turbines can be installed.

New turbines with floating foundations are expanding the possibilities. These can be installed regardless of the terrain that lies below, potentially in waters as deep as 1,000 meters or more. This advancement increases the viable sea area for offshore wind by a factor of five. France and Italy are already exploring floating-foundation offshore wind farms.

The power rating of wind turbines is also growing quickly. By the end of 2024, 13- to 15-megawatt models are likely to hit the market--a significant improvement from the three- to four-megawatt models that used to be the standard. Turbines with capacities of more than 15 megawatts are expected to be available within a few years.

Contact us for free full report

Web: <https://www.kary.com.pl/contact-us/>

Email: [energystorage2000@gmail.com](mailto:energystorage2000@gmail.com)

WhatsApp: 8613816583346

