

WELCOME to the Hub City Wind Farm Project newsletter. We are excited to share project and wind industry facts with the Marathon County community. We look forward to communicating with you through our newsletters to continue our outreach and education efforts to share the benefits of wind energy.

Wind History

Humans have been harnessing energy from wind for centuries. Whether it's to push a sail to propel a boat, to spin a sail for grinding grain, to pump water from a well to water crops or livestock, or simply to produce power for the grid, wind has been a vital resource for thousands of years. Here are some interesting historical facts about the technology:¹

- The first windmills were designed in 500-900 AD in Persia and were used to pump water and grind grain.
- In the 1300's, the first horizontal-axis windmills were constructed in Western Europe. These windmills looked very similar to a pinwheel.
- In the 1850s, Daniel Halladay and John Burnham built and sold the Halladay Windmill, which had an open tower design with thin, wooden blades.
- In the 1880s, Thomas O. Perry conducted over 5,000 wind experiments in an effort to build a more efficient windmill. From his experiments, he designed what is known as the "Mathematical Windmill," which uses gears to reduce the rotational speed of the blades. This design allowed the windmill to operate in lighter winds. In addition, steel blades were designed and manufactured to make windmills even more efficient. Homesteaders settling across America used these windmills to pump water, shell corn, saw wood, and mill grain.
- In 1888, the first large windmill, which was then termed *wind turbine*, produced electricity in Cleveland, OH.
- In 1973, the cost of oil skyrocketed, increasing the interest in other energy sources, such as wind energy.
- In the 1970s, the National Aeronautics and Space Administration (NASA) developed 13 experimental wind turbines with four major designs: 200 kilowatts, 2 megawatts (MW), 2.5 MW, and 3.2 MW. This experiment was conducted to increase the potential to utilize wind as a source of power.
- By 1999, over 2,000 megawatts of wind energy were generated across the U.S.
- In 2023, about 10% of the U.S. utility-scale electricity generation was produced by the wind industry.²

Wind energy continues to play a vital role in diversifying the U.S. energy portfolio, providing the grid with a clean, cost-effective, and efficient form of energy production.



How Wind Works

By utilizing wind turbines, we can capture free energy from the wind to power our homes, businesses, and communities. This may raise a question, however: how do wind turbines work and how do we use them?

Wind turbines used for utility-scale wind projects, such as the proposed Hub City Wind Farm Project, likely range in size from 4.5 MW to 6.5 MW per turbine, allowing for fewer turbines to be used within the project footprint. When wind flows past the blades, it forces movement of the blades in a clockwise direction rotating around a central rotor. As that rotor is rotated it spins gears located within a gearbox inside the nacelle (control housing at the top of the turbine). The gears convert the low-speed, high-torque rotation of the turbine's blades into electrical energy. The generator, where the electricity is produced, transfers the alternating current (AC) electricity through cabling that runs from the nacelle, down the tower of the turbine, to the transformer, which is either located at the base of the turbine or just outside. The transformers increase the voltage to deliver the power to the substation, where it will be stepped up to be distributed to the electric transmission grid.³

The wind power that is harnessed and produced by the turbines can power homes, businesses, and communities in the area. This energy flows similarly to water by utilizing the path of least resistance, meaning that if there is energy demand close to the wind facility, then power from the turbines and other available energy resources likely flows from the grid to fulfill that need. Once the need for energy at that source is fulfilled, energy will continue to move down the line to meet additional energy demand. Adding power generation to the electric grid, sourced from a local wind facility, allows our county and state to harness energy from a renewable power source – **wind**.

Did You Know?⁴

- Wind turbines have a limited footprint, leaving 98% of the land undisturbed.
- Utilizing wind power instead of fossil fuel power generation reduces air pollution, including nitrogen oxides, sulfur oxides, and mercury, which harm both humans and wildlife.
- Wind energy doesn't require water and has no direct impact on water quality.

Upcoming Events

- Our team hosted our first Open House on May 29th, 2025! We had the opportunity to meet with community members in the area and answer questions about the project. Please reach out if you have follow-up questions.
- April 2025: Hub City Wind was excited to contribute towards the Marshfield Area Chamber of Commerce & Industry's Power of Ag event, helping high school students of Central WI learn more about the agriculture industry.
- May 2025: Hub City Wind supported the dairy industry through sponsoring the Marshfield Dairyfest.

¹ <https://www.eia.gov/kids/history-of-energy/timelines/wind.php>

² <https://cleanpower.org/facts/wind-power/>

³ <https://www.energy.gov/eere/wind/how-wind-turbine-works-text-version>

⁴ <https://cleanpower.org/resources/clean-power-climate/>

