



Pecos Wind Power has been developing the PW85 turbine since 2017. This 85-kilowatt wind turbine leverages an industry-leading 30-meter rotor diameter to minimize the cost of energy in low-wind-speed markets. *Graphic from Pecos Wind Power*

U.S. Department of Energy Competitiveness Improvement Project (CIP)

2021 Prototype Manufacture and Installation Awardee: Pecos Wind Power, Inc.

Project Dates: Nov. 1, 2021–July 31, 2023

Project Overview

85-Kilowatt Wind Turbine Designed Specifically for U.S. Distributed Wind Energy Market Could Result in Expected Cost of Energy 55% Lower Than Comparable Installations

Through the 2021 Competitiveness Improvement Project (CIP), [Pecos Wind Power](#) will manufacture a prototype of its 85-kilowatt (kW) horizontal-axis distributed wind turbine, the PW85, a new wind turbine that began development in 2017 when the company was founded. The PW85 wind turbine includes an industry-leading rotor diameter (30 meters) and full-span variable pitch blades to target a levelized cost of energy (LCOE) of \$0.103/kilowatt-hour in low annual wind speeds (6 meters per second). This is 55% lower than the average small wind turbine project installed in 2018.

The goal of this project is to spur the development of increasingly lower-cost, high-capacity-factor distributed wind turbines. As a result, Pecos Wind Power will manufacture and install wind turbines that increase the geographic area in which distributed wind power is cost competitive with retail-priced electricity and other distributed energy resources—primarily solar energy.

“Because of this CIP award, the lessons we learn from the PW85 prototype will drive down the levelized cost of energy of future wind turbines and spur the development of increasingly lower-cost, higher-capacity-factor distributed wind turbines.”

Josh Groleau, Pecos Wind Power CEO

Project Outcomes and Deliverable

The project will result in deliverables that include:

- A manufacturing and tooling plan for prototype manufacturing and assembly that specifies vendors for each component, suppliers for materials, and tooling required for each component
- Prototype wind turbine construction and assembly report, which documents the construction of the wind turbine and will be the foundation for a service manual
- Wind turbine installation and dynamometer testing, which will result in a prototype wind turbine being packed and shipped to the National Renewable Energy Laboratory's (NREL's) Flatirons Campus for temporary installation and dynamometer testing.

Project Approach

Through an iterative research and development process, the utility-scale wind energy industry proved that LCOE can be reduced by as much as 70% in one decade. Pecos Wind Power's approach to reducing LCOE for distributed wind energy is rooted in these same design practices, including:

- Increasing the rotor-swept area—which achieves utility-scale capacity factors of more than 40% in Pecos Wind Power's target market of geographic areas with annual wind speeds of 6 meters per second. The result is a wind turbine specifically tailored to operate in Class 4 winds.
- Leveraging a bigger-is-better philosophy for economies of scale —the PW85 has a tip height below 200 feet, which is regulation height according to Federal Aviation Administration requirements, and a blade length of less than 53 feet, to keep transportation (trucking) costs low.
- Using off-the-shelf components—with commercial components produced in high volume for other industries keeping costs low.
- Minimizing balance-of-station costs— eliminating the need for a crane and expediting on-site assembly and installation with an innovative tower and installation system.

Project Collaborators

Current and future project partners include:

- [Renewable Concepts, Inc.](#)—a contract manufacturer
- [National Renewable Energy Laboratory \(NREL\)](#)—a prototype wind turbine dynamometer testing site.

Project Financial Information

Award Amount: \$369,609

Awardee Share: \$369,610

Total: \$739,219

“Pecos Wind Power is an excellent choice for this CIP award because of their foundational R&D on the PW85 wind turbine since 2017. The company has adopted innovative design techniques to address the unique challenges of the U.S. distributed wind energy industry.”

Scott Dana, NREL technical monitor

Prototype Manufacture and Installation Award

One of eight types of CIP awards, Prototype Manufacture and Installation projects support the construction and installation of a production prototype of the full turbine system that is ready for field or dynamometer testing and, if applicable, certification.

About the Competitiveness Improvement Project

The U.S. Department of Energy's (DOE's) CIP supports U.S. leadership in distributed wind technologies. Managed by NREL on behalf of DOE's Wind Energy Technologies Office, CIP supports innovation to advance wind energy as a low-cost, distributed generation technology option.

More Information

Visit NREL's website at www.nrel.gov/wind/competitiveness-improvement-project.html

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