An improved manufacturing process will make the generator for the 3.5-kilowatt Sonsight prototype turbine more cost effective to produce.
Photo from D. R. McIntosh, Sonsight Wind

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

2022 Prototype Manufacture and Installation Awardee: Sonsight Wind

Project dates: Oct. 24, 2022–July 23, 2024

Project Overview

Efficient, Dependable Small Turbine Brings Wind Energy to Areas with Moderate Wind Speeds

Geographic areas with only moderate winds have not previously supported reliable or affordable wind energy. For residential and light industrial customers in these regions, rooftop solar power has offered adequate performance at a lower cost than small wind turbines. For these potential users, as well as those in locations with poor sun exposure, the Sonsight Wind turbine offers a viable alternative suitable to more sites.

The Sonsight Wind 3.5-kilowatt (kW) prototype turbine is designed to compete with solar power, meeting energy needs for a wide range of smaller-scale applications, such as powering individual homes and irrigation systems on farms and ranches in remote areas. The technology's innovative high-torque, low-rotations-per-minute generator permits the use of longer blades that, at moderate wind speed sites, generate the energy of a 5-kW turbine with lower thrust forces than similarly rated turbines. The 3.5-kW turbine is projected to offer greater durability at a significantly lower levelized cost of energy. Sonsight Wind advanced the development of the prototype with a previous Competitiveness Improvement Project (CIP) funding award.

> "To be competitive with rooftop solar power, small wind devices need not only a robust turbine system but also an efficient manufacturing process. Previous rounds of CIP funding have helped us design an innovative system. This latest award will help us reach our goal of manufacturing a viable product."
>
> Devon Rocky (D. R.) McIntosh,
> president/CEO, Sonsight Wind

Project Outcomes and Deliverables

The focus of this 2022 CIP award is to upgrade the manufacturing of the permanent-magnet generator, a component critical to the success of the turbine design. Externally sourced, mass-produced, and custom-fabricated components, plus specialized tooling designed in house, will facilitate generator manufacturing that is faster, easier, and more efficient than current prototype fabrication processes.

Project Approach

The Sonsight Wind team will transform the labor-intensive methods currently used to fabricate the turbine into commercial-scale production practices that will make the technology viable in the marketplace. A key part of this effort is to reduce the cost of manufacturing the turbine's generator through a variety of design and fabrication processes.

Project Financial Information

Award Amount: $63,500
Awardee Share: $77,613.45
Total: $141,113.45

Prototype Manufacture and Installation Award

One of nine 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.

"Sonsight Wind's small-scale distributed wind turbine design has the potential to offer low-cost, clean energy to a large market of users who previously had solar as the only affordable option. We're excited to help move this concept closer to the commercial marketplace."

Brent Summerville, technical monitor, National Renewable Energy Laboratory (NREL)

About the Competitiveness Improvement Project

The U.S. Department of Energy's (DOE's) Competitiveness Improvement Project supports U.S. leadership in distributed wind technologies. Managed by NREL on behalf of DOE's Wind Energy Technologies Office, the Competitiveness Improvement Project 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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