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

2022 Small Turbine Certification Awardee: Eocycle America Corporation

Project dates: May 26, 2023–Jan. 15, 2025

Project Overview

Small Wind Turbine Certification To Validate Maximum Reliability, Minimum Maintenance Needs

Small wind turbines, which generate less than 100 kilowatts (kW), typically supply electricity for homes, farms, and businesses in remote locations. Unfortunately, unless sufficiently tested, some small turbines might experience reliability issues that result in diminished consumer confidence.

Eocycle's Competitiveness Improvement Project (CIP) award will fund certification testing of the company's EOX S-16 25-kW turbine to make sure it meets UL electrical safety standards. In addition to validating the turbine's reliability and anticipated reduced maintenance requirements, UL certification will also boost consumer confidence in the technology, with the potential to increase the market for the entire small-wind industry.

Eocycle has received four CIP awards and was also awarded funding for another 2022 project to commercialize and market distributed wind systems. The company received previous rounds of funding for turbine and wind system foundation research and development.

Project Outcomes and Deliverable

Certification will confirm that Eocycle's EOX S-16 model will be a consistent and compliant power source. The CIP project's final deliverable will be UL documentation and publication of the certification. UL6142 listing will streamline approval requirements for each EOX S-16 installation, making it possible for Eocycle to more widely deploy the small wind turbine with a leaner process and at a lower cost compared to the current requirement, which calls for electrical safety engineering validation for each turbine installation. The EOX S-16 has already been certified by the International Electrotechnical Commission (IEC) and the American Clean Power Association as meeting design, installation, maintenance, and operational electrical safety requirements.

> "Comprehensive certification is key for our company to demonstrate that we're delivering safe and robust renewable energy systems. This CIP award represents an important step toward the highest quality standards."
>
> — *David Grenier-Lévesque, Director of Engineering, Eocycle America Corporation*

The EOX S-16 wind turbine, shown here on a farm in Kansas, features few moving parts. This results in high reliability and low maintenance costs. *Photo from Eocycle*

> "Pairing the low cost of EOX wind turbine installation with its dependable operation makes it easier and more affordable for households and small businesses to deploy in remote locations. This certification will confirm system reliability and help jump-start more widespread commercialization of the entire small-wind industry."
>
> — *Scott Dana, National Renewable Energy Laboratory (NREL) technical monitor*

Project Approach

To prove the electrical safety of the EOX S-16, Eocycle and UL Solutions will perform multiple evaluations. After reviewing the alternator design, all electrical components, and construction, the team will implement any changes needed to comply with standards. Subsequent tests will be conducted on the controls and turbine systems.

Project Collaborator

Eocycle is partnering directly with a recognized certification body on the certification testing.

Project Financial Information

Award Amount: $79,772

Awardee Share: $62,678

Total: $142,450

Small Turbine Certification

One of nine types of CIP awards, Small Turbine Certification projects apply to turbines up to 150-kW peak power that are seeking certification to ANSI/ACP 101-1-2021, *The Small Wind Turbine Standard*. The effort may also include work to list the turbine assembly or component(s) to applicable electrical safety standards.

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.

Eocycle's Competitiveness Improvement Project (CIP) award will fund certification testing of the company's EOX S-16 25-kW turbine, shown operating on a Minnesota farm during winter, to ensure the turbine meets UL electrical safety standards *Photo from Eocycle*

More Information

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

Eocycle America Corporation SUB-2023-10223

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