

Important Certifications when Considering Small and Medium Wind Turbines

Summary

- There are several designs of commercialized small- and medium-scale wind turbines available on the market, with more under development.
- Along with understanding the applicable standards for these small and medium wind turbine models, certifying these turbines according to these standards sets performance comparison metrics and establishes durability requirements.
- This advisory briefly explains the importance of using certified wind turbines from the industry-accepted certification entities.

Background

This advisory is a resource of the *Rural Area Distributed Wind Integration Network Development* (RADWIND) project,¹ which aims to understand, address, and reduce the technical risks and market barriers to distributed wind adoption by electric cooperatives and other rural utilities.

Medium- and small-size wind turbines² are often used in behind-the-meter (BTM) applications at homes, small farms, and commercial businesses. Although there are a number of small wind turbines currently on the market, the availability of turbines certified to industry standards can be limited.³ This advisory briefly explains the importance of using certified wind turbines and the references to determine whether turbines are certified.

What is the impact on cooperatives and what they need to know?

Cooperatives might be interested in exploring the use of small or medium wind turbines after coming across publicity for newly designed or manufactured turbines, either directly or in their role as Trusted Energy Advisor for their consumer-members. It is important to check whether these turbines have been certified⁴ to industry standards that provide assurance that the models meet performance, duration, and durability requirements and are comparable to similar models developed by different manufacturers.

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² When considering certification, small wind turbines have a swept area < 200 m² and medium turbines have a swept area 200-1000 m² and power up to 300 kW.

³ *Distributed Wind Market Report-2022 Edition*, August 2022. This report is [published annually](#) by the Pacific Northwest National Laboratory, a partner in the RADWIND Project.

⁴ There is an exception, of course, if the turbine manufacturer is explicitly looking to work with a cooperative or one of their consumer members on a pilot-project. Here, due diligence should still be applied to ensure that the technology is taking the proper steps towards certification and meeting applicable standards, for example by working with the Department of Energy's Competitiveness Improvement Project, discussed in [an earlier advisory](#).

Given recent changes in federal policies that support renewable deployment, there is likely to be accelerated growth in the behind-the-meter market for small and medium wind turbines. This will make advising interested consumer-members in performing due diligence even more important, as there will likely be a large number of new manufacturers entering this market with new designs.

Standards and Certification for Small and Medium Wind Turbines

Since 2015, to be eligible to receive the Business Energy Investment Tax Credit (IRS 2015),⁵ small wind turbines have needed to comply with one of two main standards for performance and safety:

- The **AWEA Small Wind Turbine Performance and Safety Standard 9.1-2009**, and
- The **International Electrotechnical Commission (IEC) 61400-(2,11, and 12) Standards**.

Note: The American Clean Power Association (ACP), the successor to AWEA, has recently published an updated certification standard, ACP 101-1-2021, for wind turbines peaking at 150 kW or less. This new standard will be replacing AWEA 9.1-2009 going forward.

These standards and other distributed energy resources (DER) interconnection and safety standards, such as IEEE 1547 and UL 1741, were briefly explained in our earlier advisory on industry standards applicable to these smaller-scale wind technologies.⁶ The certifications of small and medium wind turbines are issued by independent trusted entities, such as the International Code Council – Small Wind Certification Council (ICC-SWCC), Underwriters Laboratories (UL), and Société Générale de Surveillance (SGS).

ICC-SWCC certifies small wind turbines (swept area < 200 m²) that meet the requirements of AWEA 9.1-2009 and medium wind turbines (producing electricity with a swept area between 200-1000 m² and power up to 300 kW) that meet the requirements of IEC 61400-12 (wind turbine power performance testing) and 61400-11 (acoustic noise measurement techniques).

The ICC-SWCC certification process starts with the manufacturer submitting an **application**. When the application's questions are satisfied, the applicant submits a **preliminary review** form. When the review is completed, the **certification agreement** is produced to detail the specific requirements and the detailed testing and evaluations required. Then, **testing and evaluation** is coordinated between the applicant and the testing organization⁷, and generates analyses and a final report. Finally, **final review and decision** is made by ICC-SWCC.⁸

Certification Process



⁵ IRS (U.S. Internal Revenue Service). 2015. [Property Qualifying for the Energy Credit under Section 48, Notice 2015-4](#). Washington, DC

⁶ [Distributed Wind Market Report-2022 Edition](#), August 2022.

⁷ ICC-SWCC Directory of Testing Organizations

⁸ [ICC-SWCC Overview of Certification Process](#)

How to Identify Whether Turbines Meet Standards and Are Certified

Certification can be a lengthy and expensive process, including annual renewal, and not every small and medium wind turbine is certified. The resources below can help cooperative staff identify certified small- and medium-scale turbines when researching potential technologies or advising consumer-members:

- ICC-SWCC Directory of Certified Turbines, available [here](#).
- An updated list of certified turbines is available in PNNL's annual Distributed Wind Market Report. See Table 2, page 19 in the most recent 2022 edition, available [here](#).

Contacts for Questions

Fathalla Eldali

Sr. Distribution Optimization Engineer

Fathalla.Eldali@nreca.coop

703-907-6549

Michael Leitman (RADWIND Project Manager)

Director, System Optimization

Michael.Leitman@nreca.coop

703-907-5864