

SWCC Webinar for Funding Agencies

Larry Sherwood
Executive Director
Small Wind Certification Council

Brent Summerville PE
Technical Director
Small Wind Certification Council

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Agenda

- Presentation (30 min)
- Discussion (30 min)



Problem

- ❑ Small turbine performance specifications are not standardized
- ❑ Agencies and utilities providing financial assistance are asking for performance assurance to increase support for incentives
- ❑ Consumers need greater certainty of function, performance, and durability
- ❑ Less than half of turbines have been tested



SWCC: Small Wind Certification Council

- ❑ Independent, third-party certification body
- ❑ Certify that small wind turbines (SWTs) meet the requirements of the AWEA *Small Wind Turbine Performance and Safety Standard*
- ❑ Rules that **level the playing field** for all turbines



SWCC Funders to Date

- ❑ U.S. Department of Energy
- ❑ NYSERDA

- ❑ Nevada State Office of Energy
- ❑ Energy Trust of Oregon
- ❑ Wisconsin Division of Energy
- ❑ CanWEA (funds from NRCan)
- ❑ Casper College (Wyoming)
- ❑ Iowa Energy Center
- ❑ National Renewable Energy Laboratory (NREL)
- ❑ Interstate Renewable Energy Council (IREC) has facilitated the development of the SWCC



What is the AWEA Standard?

- AWEA *Small Wind Turbine Performance and Safety Standard* (AWEA Standard 9.1 – 2009)
- Incorporates, **with modifications**, existing International Electrotechnical Commission (IEC) standards for small wind turbines
- Written to **ensure the quality** of the wind turbine can be assessed while imposing only **reasonable costs and difficulty** on the manufacturer who chooses to voluntarily certify their product



What Certification....

Is:

- An independent confirmation that the Small Wind Turbine has been tested and designed per the requirements of the AWEA Standard

Is not:

- An assertion that the Small Wind Turbine is durable, reliable, quiet, loud, safe, efficient, good, bad, failure-proof or perfect
- Provided **by** AWEA



SWCC Certification based on...

- an evaluation of:
 - Wind turbine design
(Structural Analysis)
 - Field testing



Applicant Eligibility

- ❑ Persons or entities that design and/or manufacture the SWT or their authorized designee (with written proof)
- ❑ The applicant must own the rights to manufacture and/or distribute the SWT



Equipment Eligibility

- Per the AWEA standard
 - Newly manufactured, electricity-producing wind turbines with a swept area up to 200 m²
- 200m² ~ 16m diameter rotor ~ 65 kW
- Horizontal and vertical axis turbines are eligible



Equipment Eligibility

- ❑ Except as required by the AWEA standard, **towers and foundations** are not part of the scope of SWCC certification



Field Testing

- Power Performance
 - Power Curve
 - Energy Curve
 - Rated Annual Energy
 - Rated Power
- Acoustics
 - Sound pressure levels
 - Rated Sound Level
- Safety and Function
 - Pass/Fail
- Duration
 - Pass/Fail



Qualified Testing Organizations

1. Accredited Test Organization
2. Non-Accredited Test Organization
 - **On-site audits**
3. Manufacturer Testing
 - On-site audits plus **further scrutiny**



Certification Process Summary

1. *Notice of Intent to Submit an Application*
2. Field Testing and design analysis performed
(~ **one year to complete**)
3. Test reports submitted with Certification Application
4. Technical review
5. Certification Decision
6. Info added to website



SWCC Certification Label

- Rated Annual Energy (kWh)
 - @ annual average wind speed of 11.2 mph - 5 m/s

- Rated Sound Level (dBA)
 - Sound pressure level not exceeded 95% of time with average wind speed of 11.2 mph - 5 m/s at 60 meters from rotor

- Rated Power (kW)
 - @ 24.6 mph - 11 m/s

- Duration and Safety & Function Tests = Pass





SWCC Accreditation

- ❑ SWCC pursuing **ANSI Accreditation for Product Certification Bodies**
- ❑ Used **ISO/IEC Guide 65** as a guide for policies



Multiple Certifications

- What if the mfg intends to pursue:
 - Type certification to IEC 61400 Standards;
 - Certification to BWEA Standard for MCS in UK; **and**
 - SWCC certification for North America ?

- **Coordinate** with Cert. Bodies and Test Organization to understand requirements when developing test plans

- **Conditional Temporary Certification** may be an SWCC option if turbine is tested to IEC or BWEA standards



SWCC Certification to AWEA vs. Type Certification to IEC

Type Certification to IEC

Required

- Full Design Evaluation including
 - Structural Analysis
 - Static Blade Test
 - Design Basis Evaluation
 - Test for Design Data
 - and plenty more...
- Manufacturing Evaluation
- Power Performance
- Safety and Function
- Duration

Optional

- Acoustic Noise
- Power Quality
- Foundation Design Evaluation

SWCC Certification to AWEA

Required

- Limited Design Evaluation
 - Structural Analysis
 - Tower dynamics analysis (single/dual speed turbines)
 - Tower design requirements
- Power Performance
- Safety and Function
- Duration
- Acoustic Noise



MCS Transition Lesson

UK Microgeneration Certification Scheme



The Certification Mark for Onsite Sustainable Energy Technologies

- Transition from
 - From the old **Clear Skies** list
 - to the new **MCS list**

- Turbine must be on list to receive Feed-in-Tariff

- 31 December 2009** – end of Clear Skies, **no turbines** had completed testing and certification (*oops*; lesson learned = it takes considerable time to test/certify wind turbines)



MCS Transition Lesson

UK Microgeneration Certification Scheme



The Certification Mark for Onsite Sustainable Energy Technologies

- A **Transitional Arrangement** was then developed (January through June 2010)
 - The transition scheme becomes more rigorous during the course of the year
 - Commercial liabilities for the manufacturer are higher during the transition scheme

- “the industry is confident that they can provide a good volume in the market given a transition period to September 2010.”
 - MCS Transitional Arrangements



SWCC certifies **Mechanical** Strength, Durability, Function & **Performance** of turbine system to new AWEA standard

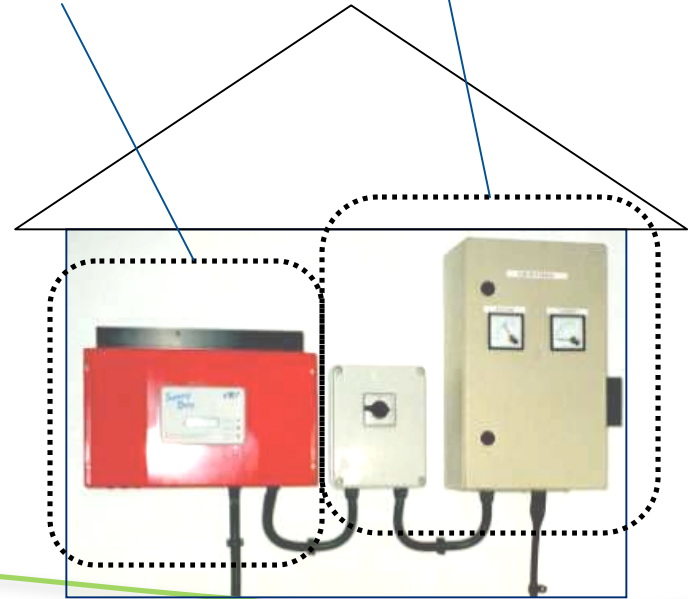
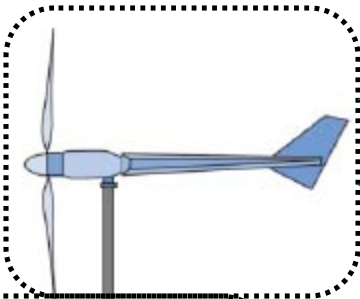
NRTLs certify **Electrical Safety of Turbine & Controller** (*new UL Standards in development*)

PE certifies **Tower & Foundation**

NRTLs certify **Inverter** to IEEE 1547/UL 1741

NABCEP will certify the **Installer** (*in development*)

Grid-tie Small Wind Turbine in the US



Wired per National Electrical Code (**NEC**) (*new article in 2011*)

SWCC Development

- ✓ Phase 1: Develop Organization Plan
- ✓ Phase 2: Incorporate
- ✓ Phase 3: Hire Staff and Develop Policies & Procedures
- ✓ Phase 4: Begin Operations
 - **SWCC began to accept *Notices of Intent to Submit and Application* on February 4, 2010**
 - *Notices of Intent* have been received



How States & Utilities Might Handle Certification

- Appreciate the time required and to populate the list of certified turbines – testing & reviews just now beginning
- More turbines will be certified more rapidly if manufacturers have clear signal from states on future requirements
- In the short-term, can offer certification as one path to eligibility or qualification (e.g. Massachusetts, New York, Wisconsin)
 - Can also document certification as preferred method for qualifying wind turbines and estimating annual energy output (e.g. Oregon)



Funding Agencies

- SWCC believes 13 funding agencies **plan to require certification** or evidence of intent to achieve certification for small wind turbines to be eligible for funding
 - MA, NY, CA, OR, MN, WI, MD, NE, OH, AZ, NV, MT, IA, several others considering

- Majority of states and utilities with existing small wind requirements indicated they expect **certification to supplement or replace procedures**
 - MA, NY, CA, NV, OR, OH, AZ, NC, MT, VT, PSE

- Numerous incentive program managers have indicated that certification **could help expand their programs** to include small wind turbines



Benefits of Certification

- ❑ Certification labels ease **consumer comparison** of products
- ❑ Funding agencies and utilities will gain greater confidence that small turbines installed with public assistance **have been tested** for safety, function, performance and durability and **meet requirements of consensus standards**
- ❑ Certification can help prevent unethical marketing and false claims, thereby ensuring **consumer protection** and **industry credibility**



Examples

- Massachusetts
- Wisconsin
- Oregon
- Minnesota



Eligibility Pathway Example



All technologies (manufacturer and model) must demonstrate compliance with at least one of the four minimum standards, outlined below, in order to be eligible for funding through the Commonwealth Wind Incentive Program: Micro Scale. In addition, all systems must meet the minimum rated capacity of 1 kW at 11 m/s in order to be eligible for funding.

- (1) Earn approval by the Small Wind Certification Council, outlined at: <http://www.irecusa.org/index.php?id=107>
- (2) Earn approval by the American Wind Energy Association as commercially proven, as outlined on the AWEA website at: <http://awea.org/smallwind/smsyslst.html>
- (3) Have been previously installed in Massachusetts using Small Renewables Initiative or Commonwealth Wind Incentive Program funding
- (4) Be tested and verified to a professional standard. The following must be submitted to demonstrate significant testing and verification:
 - Written and visual description of test site and equipment setup
 - Include a minimum of 12 months of production data
 - Include site topographic/satellite map, locations of all test turbines and equipment, site wind rose, and calculated turbulence intensity (10 m/s at hub height)
 - Field tested power curve, stamped by a Professional Engineer in any state (or equivalent for international systems)
 - Written duration and acoustic test results
 - 3 existing customer references
 - Full specification sheets and copy of the warranty
 - Description of dealer/installer training process

Documentation for Option 4, outlined above, should be submitted prior to any project's application to the following address. Within 45 days of submission, a representative from MRET will notify the submitter, in writing, regarding the eligibility of the proposed equipment for funding.

MRET may, at its own discretion, make exceptions to these eligibility requirements for specific projects.

Project Manager, Small Renewables Initiative
smallrenewables@masstech.org

[www.masstech.org/
wind/micro_wind.
html](http://www.masstech.org/wind/micro_wind.html)

Focus on Energy Small Wind Turbine Listing and Financial Incentive Policies

Purpose

The purpose of this policy is to describe the conditions under which a given wind turbine model may be listed as prequalified for a Cash-Back Reward or Implementation Grant. This policy is meant to protect consumers, Wisconsin ratepayers, the long term viability of the small wind turbine industry and enable good quality installations of small turbines in Wisconsin.

Guiding Principles

The small wind turbine industry exhibits substantial opportunities to provide a larger share of Wisconsin's renewable electricity. The emerging Small Wind Certification Council (SWCC) certification of the AWEA small wind standard will provide consumers, installers, dealers, and manufacturers with a common set of metrics and protocols to label turbines for the purpose of understanding turbine performance. The SWCC standard exists in draft form. It is the goal of these policies to align with the intent of the SWCC standards. At such a time, when finalized standards exist and turbines begin to receive SWCC labels, the policies may be revised. The Focus on Energy program reserves the right to change the listings or financial incentives for a given turbine model at any time.

Eligible Turbine Listing Policy

The Cash-Back Reward and Implementation Grant applications list turbines that have been prequalified for Focus on Energy incentives. The basis for the current list is a historical track record of quality and performance. For a turbine to be added to the list of Eligible Turbines, the following conditions must be met:

- 1) The turbine model must be able to be assessed for estimated annual kWh performance per the site Focus on Energy site assessment policy; AND
- 2) The turbine model must meet performance and quality standards through one of five methods:
 - a. Provide test data that complies with all aspects of the AWEA small wind turbine test standards. (http://www.awea.org/smallwind/standard/Small_Turbine_Standard_Draft_Document.pdf), OR
 - b. Provide technical information and specifications of the turbine and provide acceptable evidence to Focus on Energy demonstrating at least 12 months of reliable turbine operation at a location experiencing at least 12 mph average annual wind speeds during the operating period. Only information for the current model will be considered by Focus on Energy. Minor changes to designs will be reviewed on a case by case basis.
 - c. Provide three or more verifiable references made up of independent stakeholders in the small wind turbine industry who can attest to the durability and power curve performance of the turbine model in question, and in alignment with the issues associated with AWEA test standards, OR
 - d. Have an established history of three or more durable installations in Wisconsin of 5 years or more. Documentation may be provided by manufacturers or installers. Past funding by Focus on Energy is not a guarantee of ongoing listing, OR
 - e. Receive SWCC labeling, OR

Listing Policies Example

[www.focusonenergy.com/
Renewable/loose_pages/
wind_policy.aspx](http://www.focusonenergy.com/Renewable/loose_pages/wind_policy.aspx)

Preferred Method Example

Energy Trust of Oregon Small Wind System Installation Requirements

2.5 Eligible Wind Turbines

Turbines must be on the Energy Trust eligible turbine list in order to be eligible for an incentive. To qualify for the list, the following criteria shall be used by Energy Trust, (1) certification by a nationally recognized testing laboratory or organization as meeting the safety and performance requirements of a nationally or internationally recognized testing institution, or (2) providing technical information and specifications of the wind generator for Energy Trust review and providing acceptable evidence demonstrating one year of reliable operation of that model of equipment at a site with average annual wind speeds of at least 12 mph.

Energy Trust may add also wind turbines that have been approved by other jurisdictions with similar eligibility criteria to the list of eligible wind turbines.

Energy Trust is currently participating in the Small Wind Certification Corporation's efforts to create a national certification program and will become the preferred method for qualifying wind turbines and estimating annual energy output.

The list of eligible wind turbines can be found on the small wind pages of the Energy Trust website.

[http://energytrust.org/
library/forms/SMW_RQ_SystemRequirements.pdf](http://energytrust.org/library/forms/SMW_RQ_SystemRequirements.pdf)

Thanks

Brent Summerville PE
Technical Director

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www.smallwindcertification.org



Discussion



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