Small Wind Turbine Certification and Labeling

Brent Summerville
Technical Director
SWCC

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SWCC

Small Wind Turbines (≤ 200 m^2)

- Certified to the AWEA Standard 9.1 – 2009: *Small Wind Turbine Performance and Safety Standard*

ACCREDITED

Certificate number 3299.01

Dakota DT30 under test in Kansas

Medium Wind Turbines

> 200 m^2 < 1000 m^2

Brief History, SWT Certification

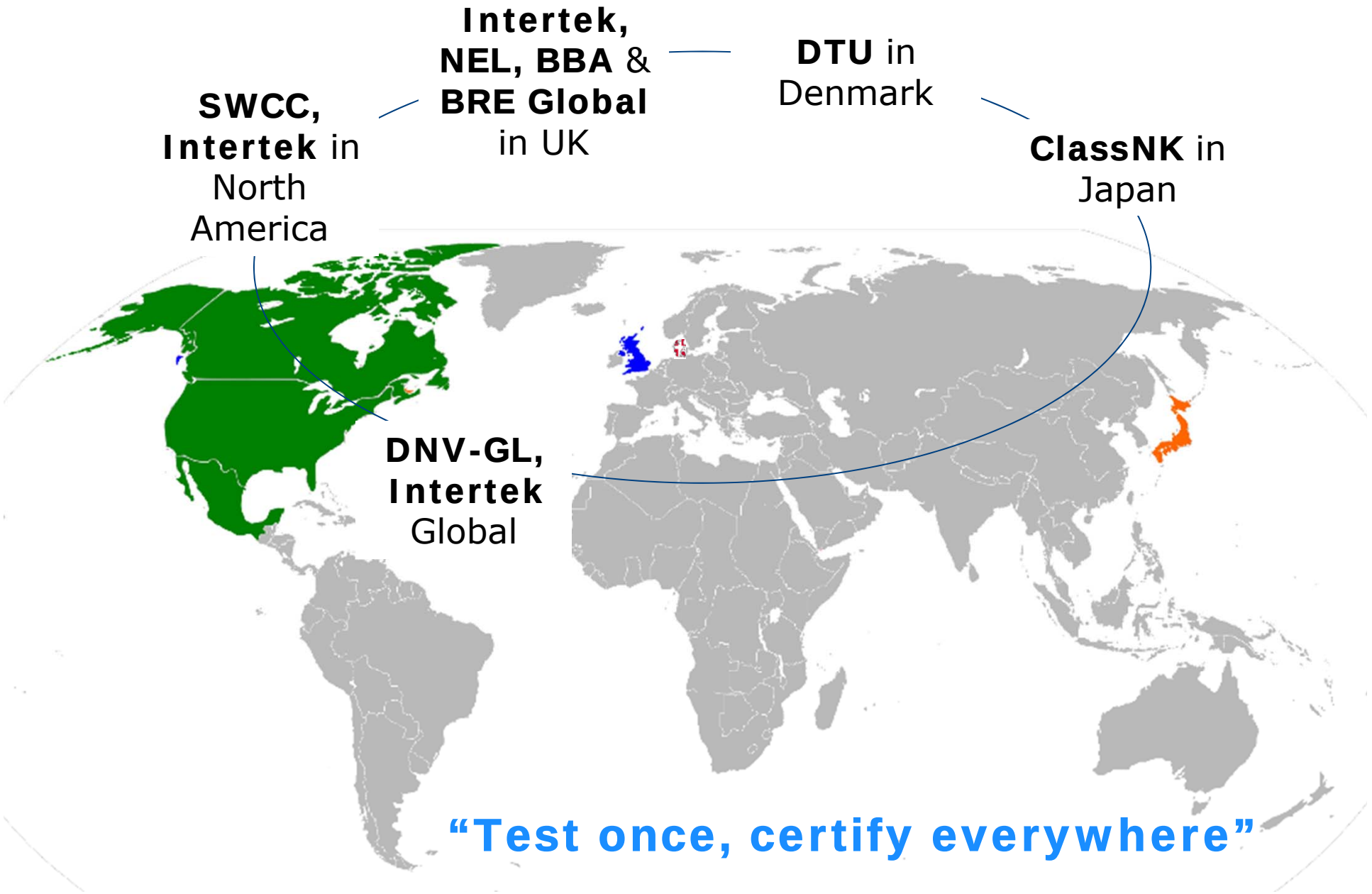
- Pre-2009
  - Time consuming, expensive, not required
  - Evolution of the IEC Standards
- 2009
  - BWEA Standard (UK) and AWEA Standard (US)
- 2010
  - MCS FIT in UK; States require certification in US
- 2012
  - Japan FIT, JSWTA0001 Standard
- 2013
  - Danish Energy Agency's Executive Order
- 2014
  - Following IEC-CAC, IECRE established, working toward globally harmonized scheme

Global Alignment

- AWEA Std ~ RUK Std ~ Japan Std ~ DK order

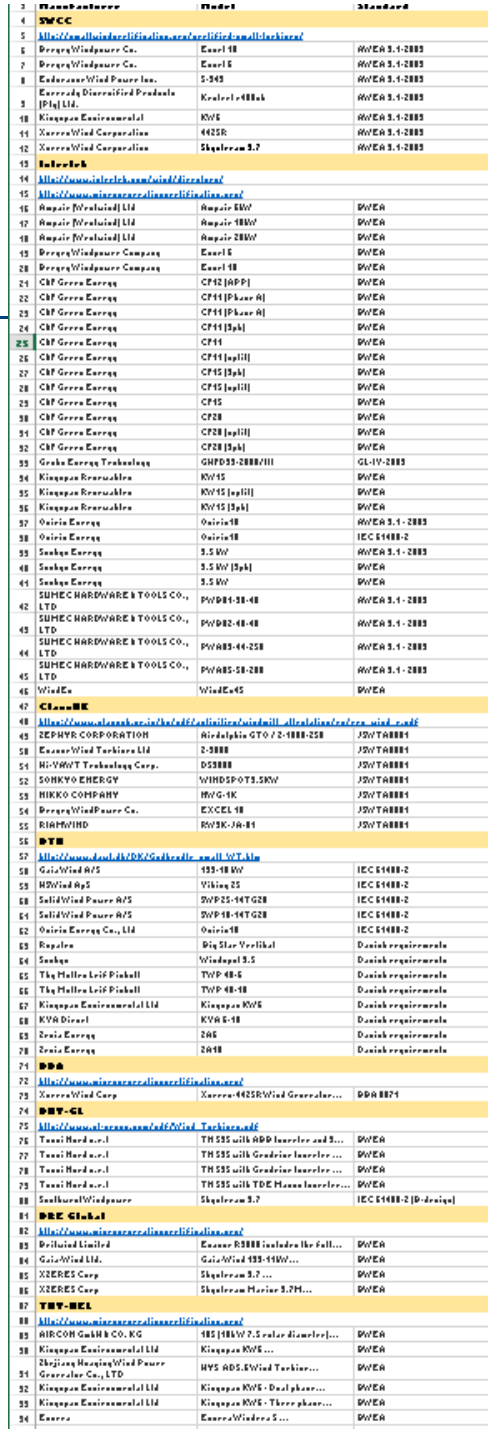
- IEC 61400, foundation for all
- Requirements are similar, not same
- Loads modeling and structural analysis
  - IEC 61400-2
- Safety and Function Test
  - IEC 61400-2
- Duration Test
  - IEC 61400-2
- Static Blade test
  - IEC 61400-2
- Power Performance
  - IEC 61400-12-1
- Acoustic Test
  - IEC 61400-11

Certification Bodies



Global Certification of SWT

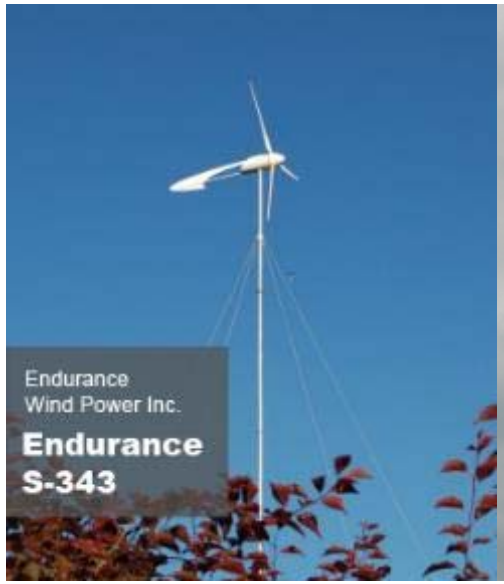
- SWCC (7)
  http://smallwindcertification.org/certified-small-turbines/
- Intertek (22; or 31 on MCS list)
  http://www.intertek.com/wind/directory/
  http://www.microgenerationcertification.org
- ClassNK (7)
  https://www.classnk.or.jp/hp/pdf/activities/windmill_attestation/en/reg_wind_e.pdf
- DTU (13)
  http://www.dawt.dk/DK/Godkendte_small_WT.htm
- BBA (1)
  http://www.microgenerationcertification.org
- DNV-GL (5)
  http://www.gl-group.com/pdf/Wind_Turbines.pdf
- BRE Global (4)
  http://www.microgenerationcertification.org/
- TUV-NEL (6)
  http://www.microgenerationcertification.org/



Global Certification of SWT

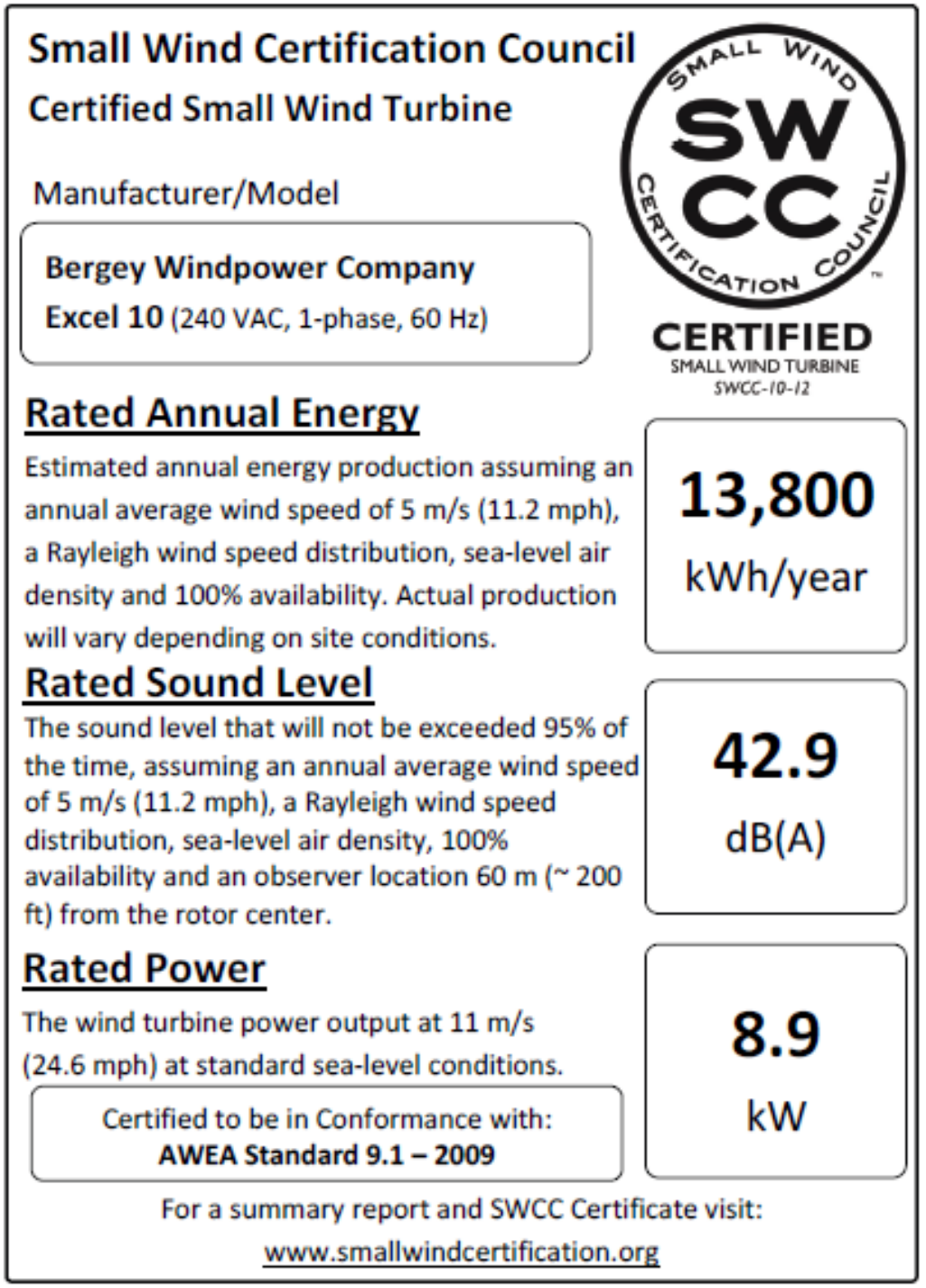
- Certificates issued (74)
  - BWEA Std (38)
  - AWEA Std (13)
  - Danish Req (8)
  - IEC 61400-2 (7)
  - JSWTA0001 (7)
  - GL Guidelines (1)
- Unique turbine models (59)
  - Several are variants (e.g. power form)
  - Some turbines have multiple certs (e.g. Sonkyo Windspot has AWEA, BWEA, Japan, Danish…*and* is on the Austrian list)

SWCC:
7 SWT certified, 1 LPP (Pika T701)
1 MWT Power & Acoustics



SWCC Deliverables

- **Consumer Label**
  - Single-number ratings
- **Certificate**
  - Available online to confirm validity
- **Summary Report**
  - Summary of testing
  - Power curve
  - Annual energy curve
  - Acoustic Data



Small Wind Certification Council

Certified Small Wind Turbine

SMALL WIND CERTIFICATION COUNCIL — SWCC

CERTIFIED
SMALL WIND TURBINE
SWCC-10-12

Manufacturer/Model

Bergey Windpower Company
Excel 10 (240 VAC, 1-phase, 60 Hz)

Rated Annual Energy

Estimated annual energy production assuming an annual average wind speed of 5 m/s (11.2 mph), a Rayleigh wind speed distribution, sea-level air density and 100% availability. Actual production will vary depending on site conditions.

13,800 kWh/year

Rated Sound Level

The sound level that will not be exceeded 95% of the time, assuming an annual average wind speed of 5 m/s (11.2 mph), a Rayleigh wind speed distribution, sea-level air density, 100% availability and an observer location 60 m (~ 200 ft) from the rotor center.

42.9 dB(A)

Rated Power

The wind turbine power output at 11 m/s (24.6 mph) at standard sea-level conditions.

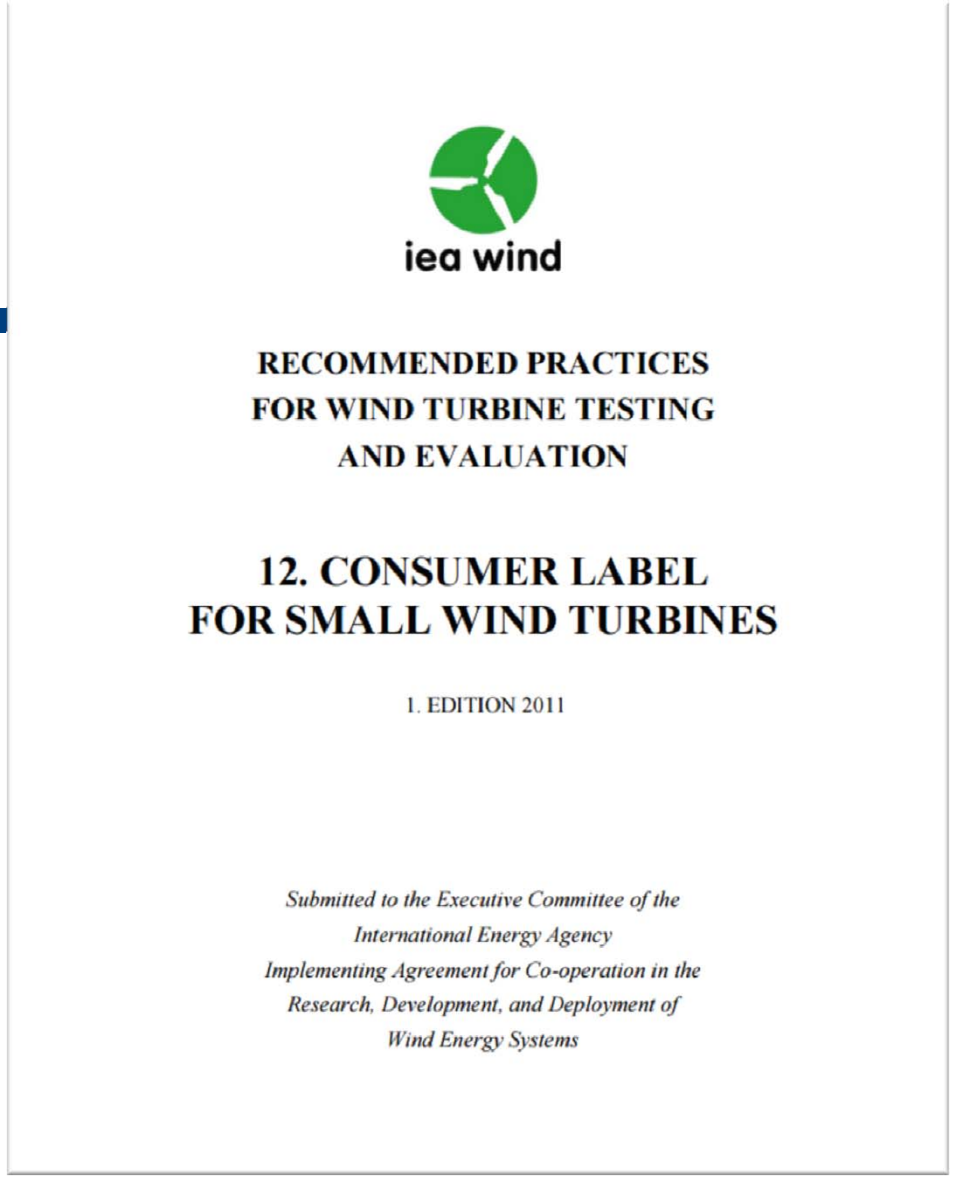
8.9 kW

Certified to be in Conformance with:
AWEA Standard 9.1 – 2009

For a summary report and SWCC Certificate visit:
www.smallwindcertification.org

IEA Task 27

- ✓ Developed the consumer label
- ✓ Coordinating testing orgs (SWAT)
- ■ VAWT design tools
- ■ Small wind turbines in the built environment



iea wind

RECOMMENDED PRACTICES
FOR WIND TURBINE TESTING
AND EVALUATION

12. CONSUMER LABEL
FOR SMALL WIND TURBINES

1. EDITION 2011

Submitted to the Executive Committee of the International Energy Agency Implementing Agreement for Co-operation in the Research, Development, and Deployment of Wind Energy Systems

11.3 Consumer label

It is recommended that a consumer label be provided in accordance with Annex M. If this is done the measurement reports used to complete the consumer label shall meet the requirements of ISO/IEC 17025 and relevant standards used to define the test requirements (e.g. IEC 61400-12-1).

Consumer Label in IEC 61400-2 ed.3

Tests for label

- Duration test per IEC 61400-2
- Power performance per IEC 61400-12-1
- Acoustic noise test per IEC 61400-11

Test Results

Manufacturer	**Manufacturer**
Model	**Model**
Reference Annual Energy at 5 m/s average wind speed, actual production will vary depending on site conditions	**### kWh/yr**
Declared Sound Power Level at 8 m/s	**## dB(A)**
Turbine Test Class (I-IV or S for Special)	**II**
Tested by	**Test Organisation**
Published Date (Year-Month-Day)	**2011-03-04**

For more information, see www.ieawind.org

Conclusions and questions

- SWT certification has matured
  - ~59 turbines certified
- "Test once, certify everywhere"
  - Portable test results
  - Meeting national differences can be significant
- IECRE
  - Can global harmonization be realized?
- What will "new" markets do?
  - China? Brazil? Others?
- How is labeling vs certification perceived?

Thank you

Brent Summerville
Technical Director
Small Wind Certification Council
Brent@smallwindcertification.org
www.smallwindcertification.org