



# **The Need for Product Qualifications for the Federal Investment Tax Credit (ITC)**

# Modern Small Wind Turbines:

## High Tech, High Reliability, Low Maintenance

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- ❖ Products from 2 – 100 kW
- ❖ Technically Advanced (Sophisticated & Simple)
- ❖ Low - Very Low Maintenance Requirements
- ❖ Track records up to 30 years
- ❖ North American Companies Lead



2 kW



10 kW

(Not to scale)



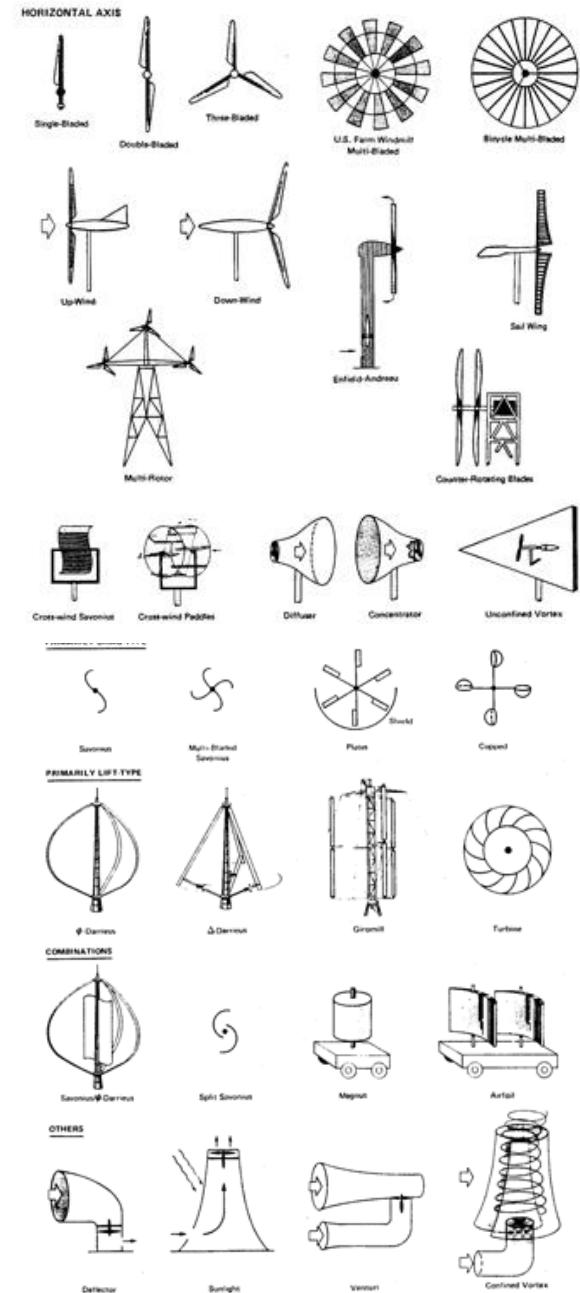
50 kW



100 kW

# Turbine Configurations

- ❖ Hundreds of Possible Configurations ... **Most can't Compete**
- ❖ Non-Competitive Configurations Keep Showing-up and Attracting Naive Investors:
  - ❖ “Funneling” Flow Concentrators
  - ❖ Diffuser-type Flow Concentrators
  - ❖ Savonius Vertical-Axis Rotors with Electrical Generator
  - ❖ Helical Darrieus Vertical-Axis Rotors
  - ❖ Cloth-Blade, Sail Wings Rotors
  - ❖ Windmill Rotor with Electrical Generator



# Endless Supply of “Snake Oil” Products

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- ❖ Clueless inventors and unethical opportunists bring dozens of new small wind turbines to market annually
- ❖ General public wants to believe that there’s been a performance and cost breakthrough; but lack the experience or tools to sort wheat from chaff
- ❖ For numerous articles and citations, see subcategories at <http://www.wind-works.org/cms/index.php?id=17>
- ❖ U.S. Green Building Council LEED, with no wind turbine standards, nurtures fringe products for green buildings



# Example: DyoCore

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- ❖ 6.5 ft diameter roof-mounted wind turbine built in Southern California
- ❖ Claimed Rated Power of 1.6 kW at 18 mph – which is 4.5 times the maximum theoretical efficiency
- ❖ \$2,000 product “qualified” for \$4,800 California rebate; plus they qualified for the federal ITC ... Turbines were sold for \$1
- ❖ CEC shut down their program after receiving > \$50M in rebate application in 3 months in 2010
- ❖ CEC investigation revealed the fraud and they rejected pending applications
- ❖ Legitimate California industry still hasn't recovered





# Example: WindTronics

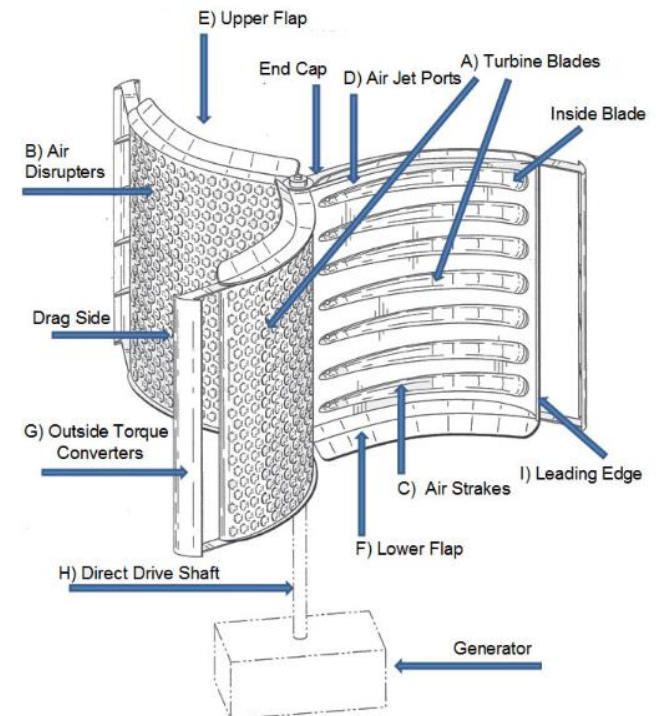
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- ❖ 5.7 ft diameter roof-mounted wind turbine built in Michigan and then Ontario
- ❖ Licensed Honeywell name; 2009 “Breakthrough Product” award from Popular Mechanics magazine
- ❖ Claimed Rated Power of 1.5 kW at 31 mph – power curve hits 160% efficiency, see [http://www.wind-power-program.com/small\\_turbines.htm](http://www.wind-power-program.com/small_turbines.htm)
- ❖ 15 month test by Consumers Report produced 4 kWh, 0.3% of projection
- ❖ Raised >\$15M from investors and >\$3M from governments
- ❖ Bankrupt in 2013, leaving thousands of customers orphaned



# Example: Sauer Energy

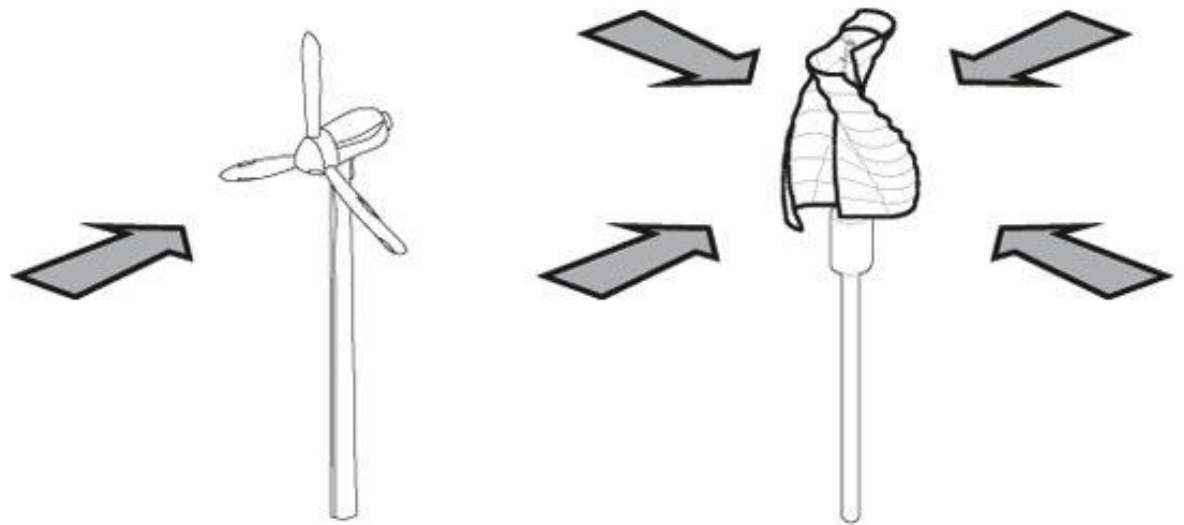
- ❖ 3.6' x 4' roof-mounted VAWT wind turbine built in California
- ❖ Current penny stock on OTC BB: SENY.US; sold 92M shares; market cap of \$33M with \$0 revenues and annual loss of ~\$1.4M
- ❖ Claimed Rated Power of 1.5 kW at 25 mph – which at 69% total efficiency is above the theoretical limit
- ❖ No independent test data available
- ❖ Bought assets of Helix, another penny stock VAWT that went bankrupt after raising ~\$30M on hyped performance claims



# Common False Claims – Caveat Emptor

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- ❖ “50% more efficient than conventional wind turbines”
- ❖ “Superior because it accepts wind from all directions”
- ❖ “Works well in turbulence”
- ❖ “Our technology eliminates the need for tall towers”
- ❖ “Bird friendly”





# AWEA Certification Standard

- ❖ Sets Rated Power at 11 m/s (25 mph)
- ❖ Introduces “AWEA Estimated Annual Energy” modeled after EPA Estimated Mileage for cars
- ❖ 6 month duration test; 90% availability requirement
- ❖ Detailed structural analyses (based on IEC 61400-2)
- ❖ Certifications issued by SWCC ([smallwindcertification.org](http://smallwindcertification.org)) and Intertek ([intertek.com/wind/small/](http://intertek.com/wind/small/))
- ❖ Standard adopted in UK and Japan

<b>Small Wind Certification Council</b> <b>Certified Small Wind Turbine</b>		
Manufacturer/Model		
Bergey Windpower Company Excel 10 (240 VAC, 1-phase, 60 Hz)		
<b><u>Rated Annual Energy</u></b> 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.		<b>13,800</b> kWh/year
<b><u>Rated Sound Level</u></b> 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.		<b>42.9</b> dB(A)
<b><u>Rated Power</u></b> The wind turbine power output at 11 m/s (24.6 mph) at standard sea-level conditions.		<b>8.9</b> kW
Certified to be in Conformance with: <b>AWEA Standard 9.1 – 2009</b>		
For a summary report and SWCC Certificate visit: <a href="http://www.smallwindcertification.org">www.smallwindcertification.org</a>		

# Certification Requirements

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- ❖ New York, Massachusetts, Nevada, and Oregon now require certification to AWEA 9.1. Several other states are in the process of instituting this requirement
- ❖ The U.K. and Japan require certification to qualify for their feed-in-tariff national incentives
- ❖ DWEA has developed a set of complementary requirements for turbine above the 200m<sup>2</sup> scope of AWEA 9.1; which are also being adopted by states
- ❖ As of 6/2013 there are 11 models certified in the U.S. 22 models are in the process of certification. Over 20 models are certified in the UK.

# Rebuilt Small Turbines

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- ❖ Over 4,000 1980's era turbines up to 100 kW are being removed from California windfarms
- ❖ Several companies, with varying expertise, offer rebuilt turbines and towers for sale, claiming ITC eligibility
- ❖ These systems previously received federal and state tax credits and depreciation
- ❖ Need clarification on what is eligible and what is not





## **DWEA Request:**

### **Phase I: Require Certifications to Qualify for Wind Turbine ITC**

- $\leq 200\text{m}^2$ : AWEA 9.1-2009 by accredited certification agency
- $> 200\text{m}^2$ : Certified power performance and acoustic test reports by accredited body, plus either certified design evaluation or significant operational experience (e.g.,  $>500\text{K}$  fleet hours & 25 installs & 2+ years on at least 5 units); plus standardized performance reporting
- On rebuilt turbines, only new components and re-installation expenses qualify for the ITC



## **DWEA Request:**

### **Phase II: Extend Small Wind Certification Requirements to Other Federal Incentive / Procurement Programs**

- USDA REAP (DWEA pursuing)
- Misc. federal facilities and procurements
- Military facilities and procurements
- Foreign assistance