

Distributed Wind Generation: We're at a Turning Point



Jeff Ehlers, President, Renewegy

Jeff Ehlers is the President for Renewegy and is responsible for overall company leadership; customer interface; innovation consulting; sales and marketing; and strategic planning. Jeff has over 20 years experience as a passionate technologist and a business leader. He has held numerous leadership positions within both large and small technology companies. Jeff holds two engineering degrees and has been awarded 15 patents.



Dave Klostermann, Manager of Renewables, Van Meter Inc.

Dave Klostermann is the Renewable Energy Manager at Van Meter, Inc. He has worked at Van Meter for 17 years in a variety of sales roles. Dave currently does business development in the wind and solar power markets for Van Meter. Dave is married to Natalie and lives near Lisbon, Iowa. They have five children and two dogs and enjoy spending time outdoors.

Distributed Wind Generation: We're at a Turning Point



What is distributed wind?

- Most energy today is produced at large, central generation plants, which have to transmit the power to the end user
- Distributed wind means small scale power generation for use in a local area

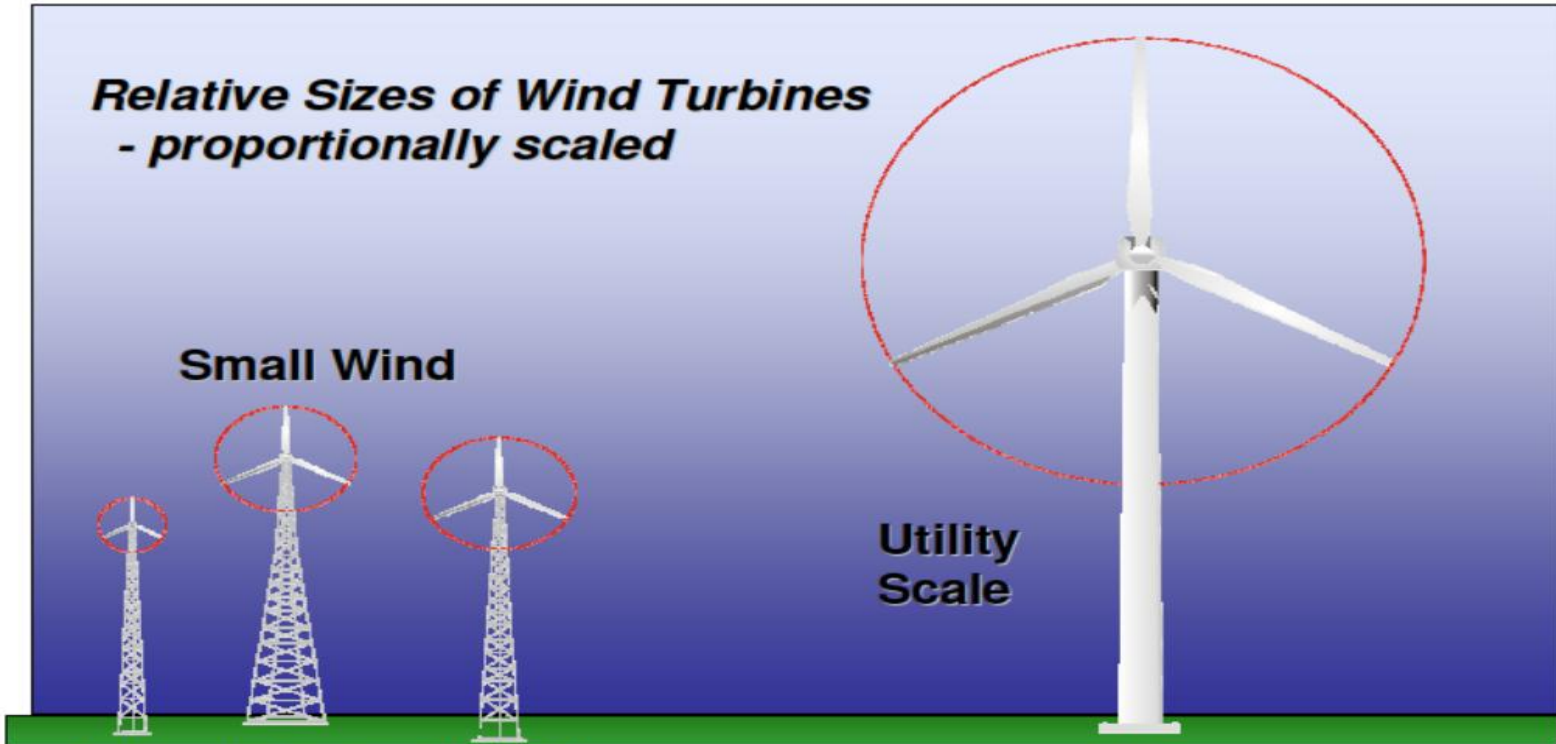
Why Distributed Wind?

- The goal is to reduce or eliminate grid power usage to save money
- Some types of small wind systems provide backup during blackouts

**Relative Sizes of Wind Turbines
 - proportionally scaled**

Small Wind

**Utility
 Scale**



Jacobs
 31-20
 15.5 ft
 100 ft
 116 ft

Endurance
 3120
 31.5ft
 140 ft
 172 ft

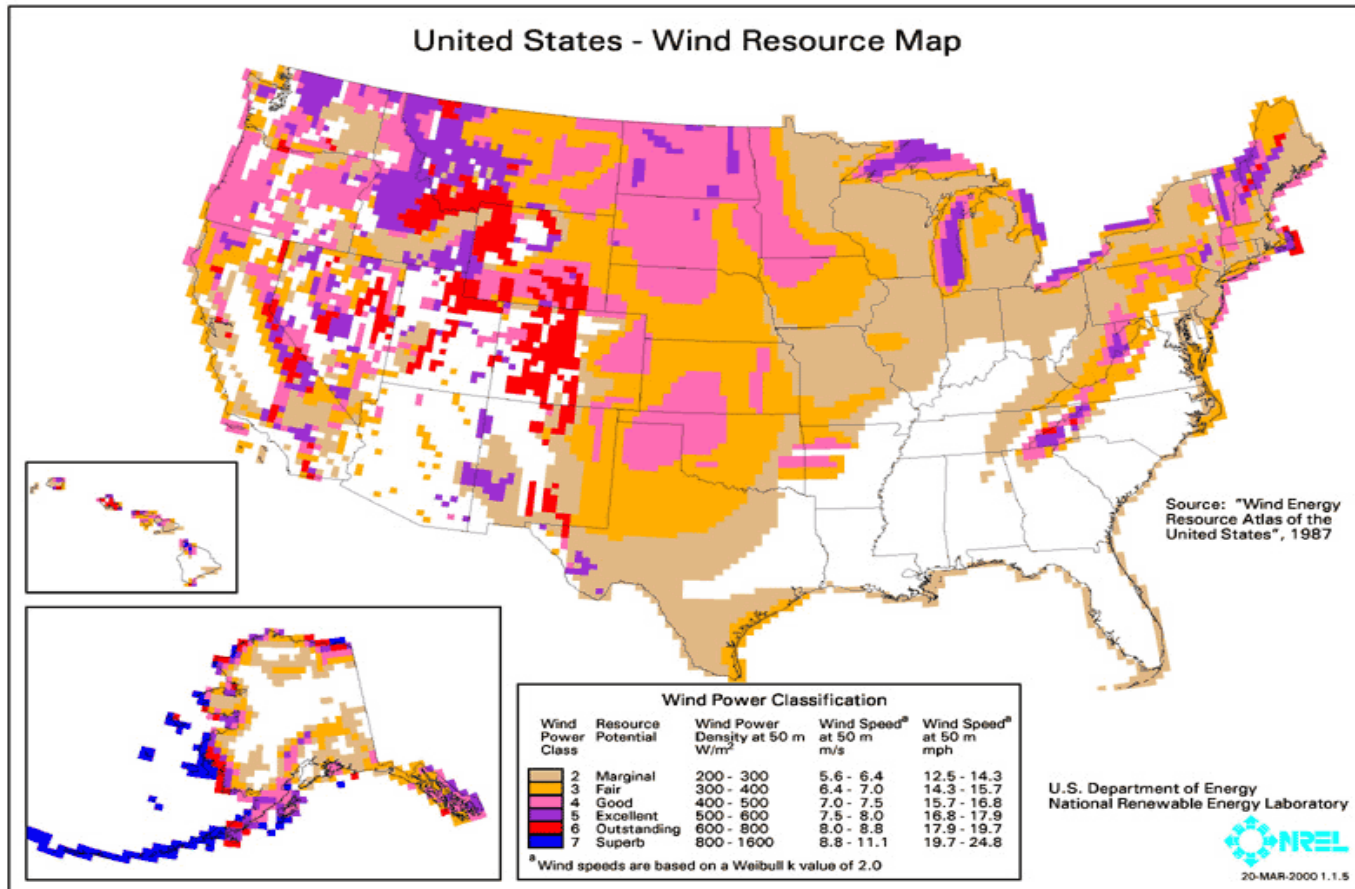
Northwind
 NW 100
 34.5 ft
 120 ft
 155 ft

Blade length
 Hub Height
 Total Height

G. E.
 1.5 MW
 126 ft
 263 ft
 389 ft

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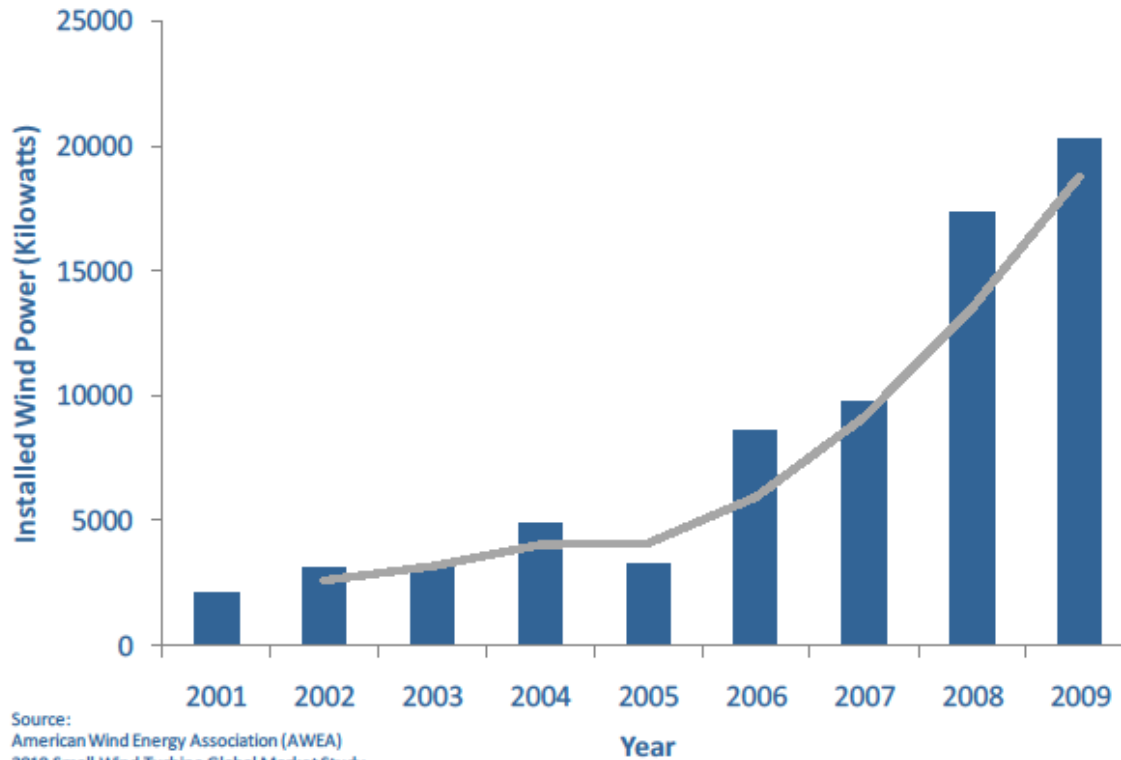
United States Wind Resource



Historical Market Growth (<100 kW)

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U.S. Installed Windpower



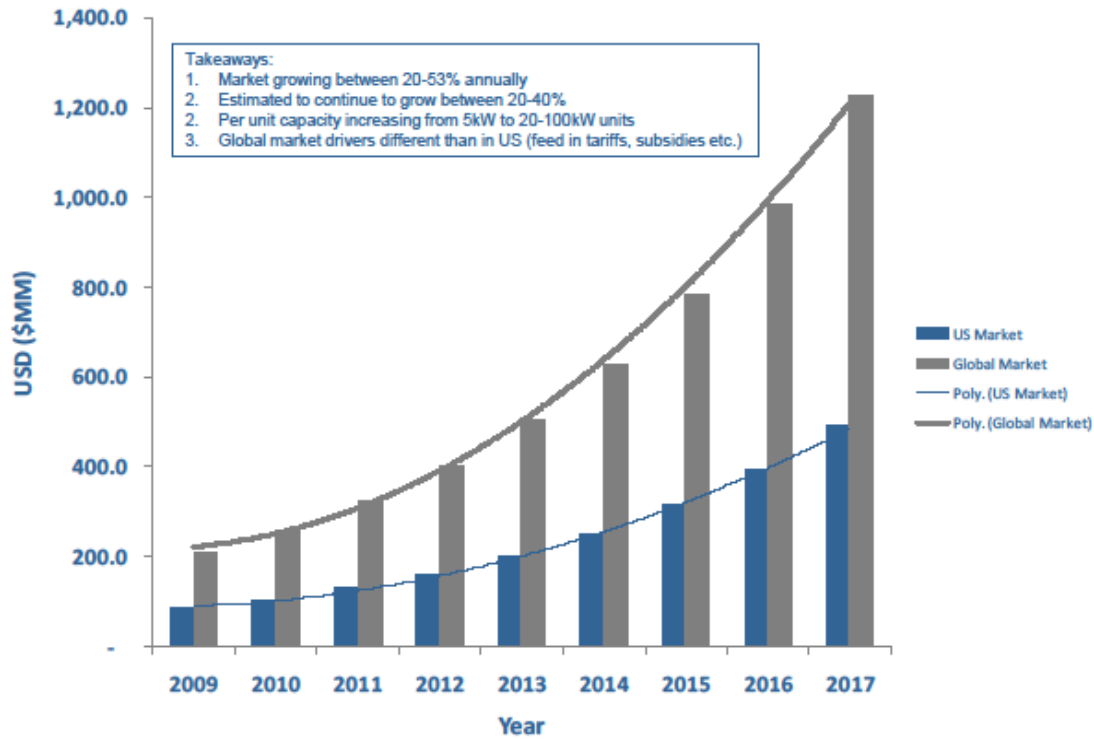
2010 U.S. Small Wind Turbine Market Highlights (year ending 2010)

- Market for small wind systems grew 26% with 25.6 megawatts (MW) of new sales capacity, nearly 8,000 units, and \$139 million in sales.
- Growth in 2010 pushed cumulative sales in the U.S. to an estimated 179 MW of capacity and 144,000 units
- The U.S. market experienced a pronounced shift away from “micro-scale,” off-grid turbines to larger, grid-connected systems.
- The average installed cost of small wind turbines installed in the U.S. in 2010 was \$5,430/kW.

Market Growth

Renewegy

Projected Small Wind (<100kW) Market Growth (~25% CAGR)



Horizontal Axis Wind Turbines

- Horizontal axis wind turbines are generally more efficient



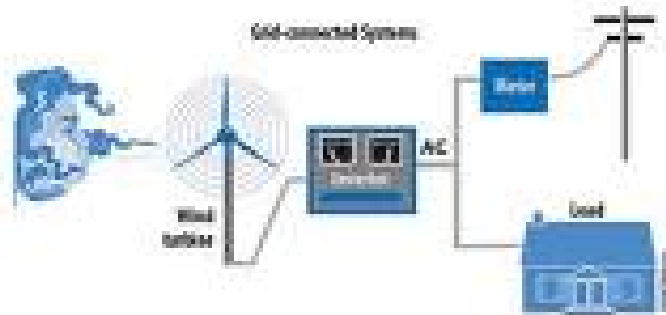
Vertical Axis Turbines

- Vertical axis turbines work with slower winds
- Typically work better with turbulent winds seen above rooftops



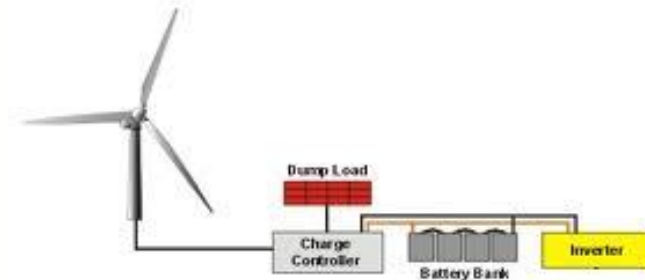
System Types

Grid-Tied Wind System



- Turbine supplies a portion household power
- If excess power is produced it goes back to the grid

Battery charging back-up system



- The turbine charges a battery bank, which can be used as backup power for a building
- The system utilizes power from the batteries

Is Distributed Wind For You?

- Clean energy source
- Create your own power
- Reduce reliance on utility
- Need power in a remote area
- Desire to “lock in” energy prices for decades
- Companies using turbines for image enhancement to draw customers
- Environmental impact

Installation Considerations

- Access to good wind resource
- Zoning and permitting
- Foundation
- Quality tower
- Electrical installation
- Design of system

What will it cost?

- Costs of systems vary with type of turbine and your location
- Paybacks vary with cost of electricity in your area
- Incentives may be available
- No property tax for five years on system
- No sales tax on entire system and installation
- Federal tax incentive: 30% of installed cost of system

Questions... Comments...

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