



UNITED STATES WIND POWER MARKET

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June 26, 2008



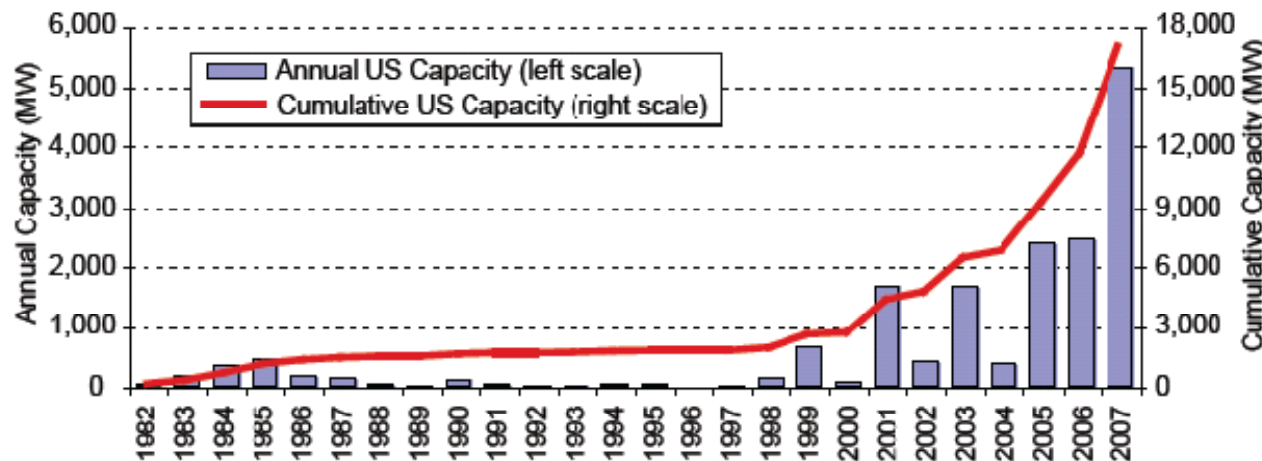
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Offices in Minneapolis, Bismarck, Des Moines,
London, England, Monterrey, Mexico and Shanghai, China

- Chair of Energy Department
- Renewable Wind Energy
- Developed over 2,000 MW of Wind Energy
- Developing over 10,000 MW of Wind Energy
- Projects located in Minnesota, North Dakota, South Dakota, Iowa, Wisconsin, Illinois, Nebraska and New Mexico

United States Wind Power Market 2007: Capacity

- U.S. wind power market added 5,329 MW of new capacity in 2007
 - Approximately \$9 billion invested in wind project installations
- The cumulative total of U.S. wind capacity is now 16,904 MW
 - Nearly \$28 billion has been invested in the U.S. wind market since the 1980s
- U.S. wind power has grown an average of 27% per year
- Wind power generated 35% of all new U.S. electric generating capacity in 2007
- U.S. cumulative wind capacity installed at end of 2007 would supply approximately 1.2% of U.S. electricity consumption



Source: AWEA.

Growth Potential of U.S. Wind Market

- 360,000 MW of projected new capacity required to achieve DOE/AWEA policy goal of 20% of nation's energy supplied by wind power
- 2008 expected to achieve capacity growth of over 5,000 MW
- Local manufacturing of turbines and components anticipated to grow
- 225 GW of wind power capacity within the U.S. eleven interconnection queues represent about ½ of all generating capacity within these queues
 - Capacity planned for:
 - Midwest ISO (66 GW)
 - ERCOT (41 GW)
 - PJM (35 GW)
 - WAPA (10 GW)

Growth Potential of U.S. Wind Market

- Key Drivers
 - Federal Production Tax Credit (2 cents/kwh)
 - Rising cost of carbon based fuels
 - Increasing carbon regulation (States take the lead)
 - 26 states have a Renewable Portfolio Standard (RPS)
 - Federal RPS likely
 - Price for wind power competitive with wholesale market
 - Industry, government, and utility participation in growth (consumer driven demand; i.e. “green power”)
 - State and federal financial incentives (DOE \$18 Million grants)
 - Financing: Clean renewable Energy Bonds (CREBs) \$400 Million

Growth Potential of U.S. Wind Market

- Key Constraints to Growth:
 - Transmission, but solutions are being developed
 - Turbine supply and component price
 - Turbine prices increased approximately 65% since 2004
 - Weakness in U.S. Dollar (drop of 15% to Euro over one year)
 - Rising material costs
 - Increased manufacturing profitability
 - Shortage of components and turbines
 - Transportation costs
 - PTC credit (expires 12/31/2008)
 - Supply and labor constraints
 - Pressure on wind developer operating margins
 - Increased project costs (average \$1.7 Million per MW up 9% from 2006)
 - Wholesale wind power prices have not grown as fast as supply prices

Key Trends in the Wind Industry

The Europeans Are Coming!!!

- Iberdrola – Spain
- Gamesa – Spain
- Acciona – Spain
- E.ON AG – Germany
- Siemens - Germany



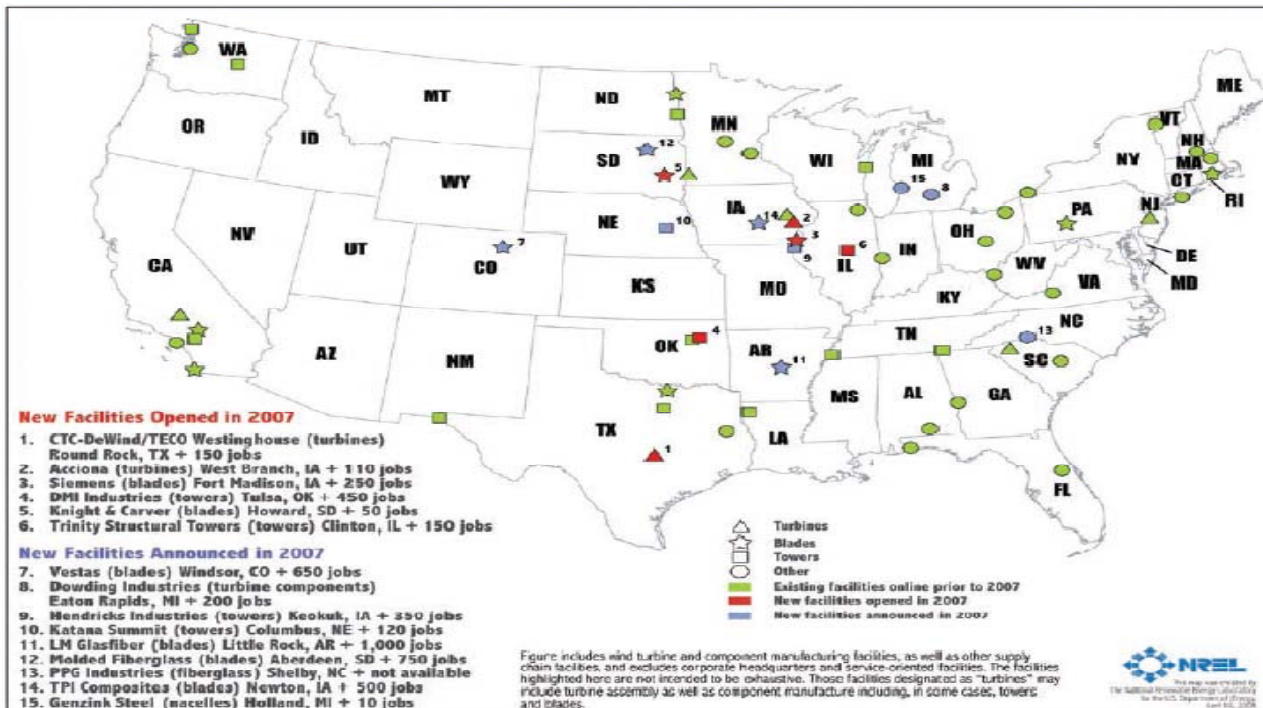
Key Trends in the Wind Industry

U.S. growth potential and constraints provide opportunities for foreign and U.S. developers, turbine manufacturers and supply chain

- U.S. manufacturing of turbines and supply chain
- Acquisition of development capacity
- Vertical integration of supply chain to control production and costs
- U.S. Investment in turbine components

Manufacturing

- Manufacturing of wind turbines and components in U.S. is growing:
 - Growing number of turbine manufacturers localizing operations in U.S. (Clipper-Iowa; Gamesa-Pennsylvania; Acciona-Iowa; Fuhrlander-Butte, Montana; DeWind, Texas; Nordic, Idaho)
 - Blade manufacturing (Siemens – Iowa, Knight & Carver - South Dakota, Vestas – Colorado, LM Glassfiber – Arkansas, TPI Composites – Iowa)
 - Tower Manufacturing (Broadwind – Wisconsin, South Dakota and Texas, DMI Industries – Oklahoma, Trinity Structural Tower – Illinois)



Acquisitions of Development Capacity

- 2007 – 11 transactions, roughly 37,000 MW
- 2006 – 12 transactions, roughly 34,000 MW
- Key acquisitions (many by foreign investors)
 - E. ON AG (Germany) acquisition of Airtricity North America
 - Acciona (Spain) acquisition of EcoEnergy, LLC
 - Iberdrola (Spain) acquisition of PPM (Scottish Power)
 - Energias de Portugal acquisition of Horizon Wind
 - BP investment in Clipper Windpower and acquisition of Greenlight Energy

Vertical Integration of Supply Chain

Turbine vendors control capacity and costs

Examples:

	<u>Rotar / Blade</u>	<u>Gearbox</u>	<u>Controls</u>	<u>Generator</u>	<u>Coatings</u>	<u>Tower</u>
Vestas	X -	-	X	X -	X -	X -
Mitsubishi	X	-	X	X	-	X -
GE Wind	-	X -	X	-	-	-
Suzlon	X -	X -	X	X -	-	X -
Inhouse (X)						
Outsource (-)						

U.S. Investment in Turbine Components

- Rotor blades
- Gearbox
- Generator
- Bearing (Pitch, Yaw)
- Tower
- Power converter

Broadwind Energy, Inc. (Case Study)

- Key component supplier and service provider
- Originally manufactured towers in Wisconsin
- Investment by Tontine Partners
- Acquisition of Brad Foote Gear Works, Inc.
- Acquisition of Energy Maintenance Service, LLC
- Acquisition of Badger Transport, Inc.
- Additional \$100 Million investment
- Expansion of tower manufacturing in South Dakota and Texas

Future

- Increased investment in U.S. supply chain including turbines, towers, blades and components improves capacity
- Supply and demand move closer as new transmission is finally added
- Power prices paid by wholesale power purchasers increases to meet state RPS objective and cost of new transmission
- Carbon Cap and Trade system within 2 years
- Federal Production Tax Credit extended