National Renewable Energy Marketing Conference

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Liz Salerno, Manager of Policy Analysis
American Wind Energy Association

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Overview

- Current Status of the Wind Industry
- Future Growth Opportunities
- Current Challenges for Growth

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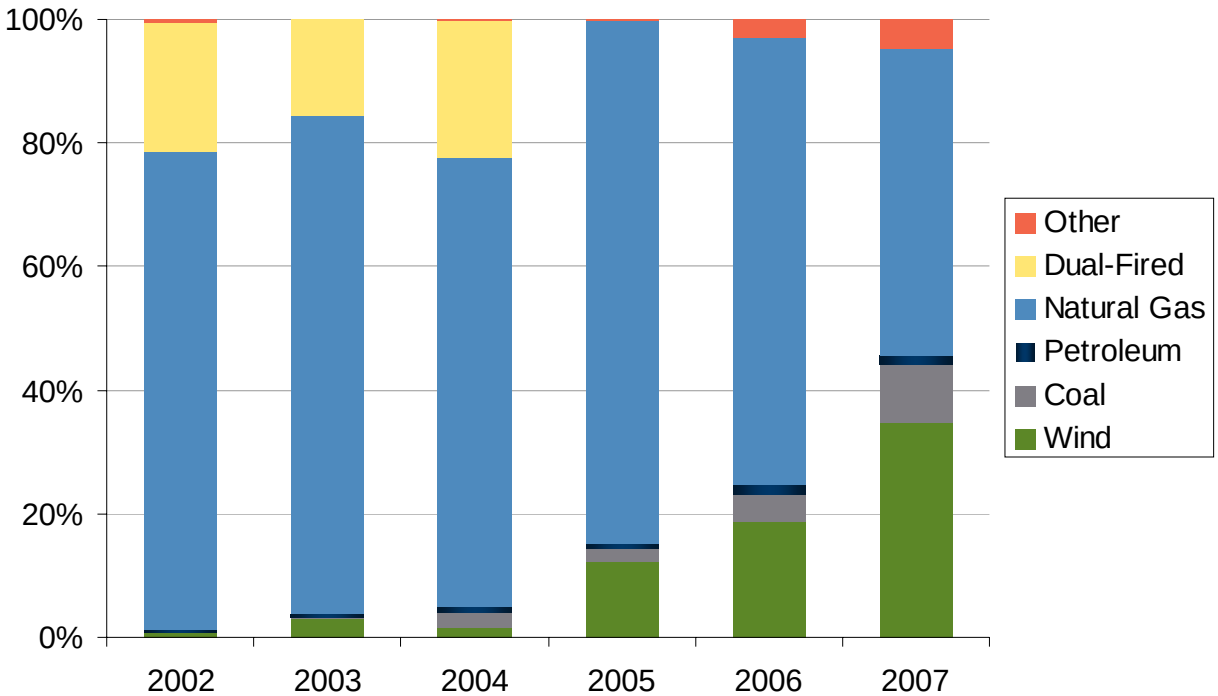
Wind Growth Statistics

- Over 5,200 MW in 2007
- **Expect 7,500 MW** in 2008
- Wind market has grown at a **29% average annual growth** over the past 5 years



- **35%** of all new energy capacity in 2007 was from wind.

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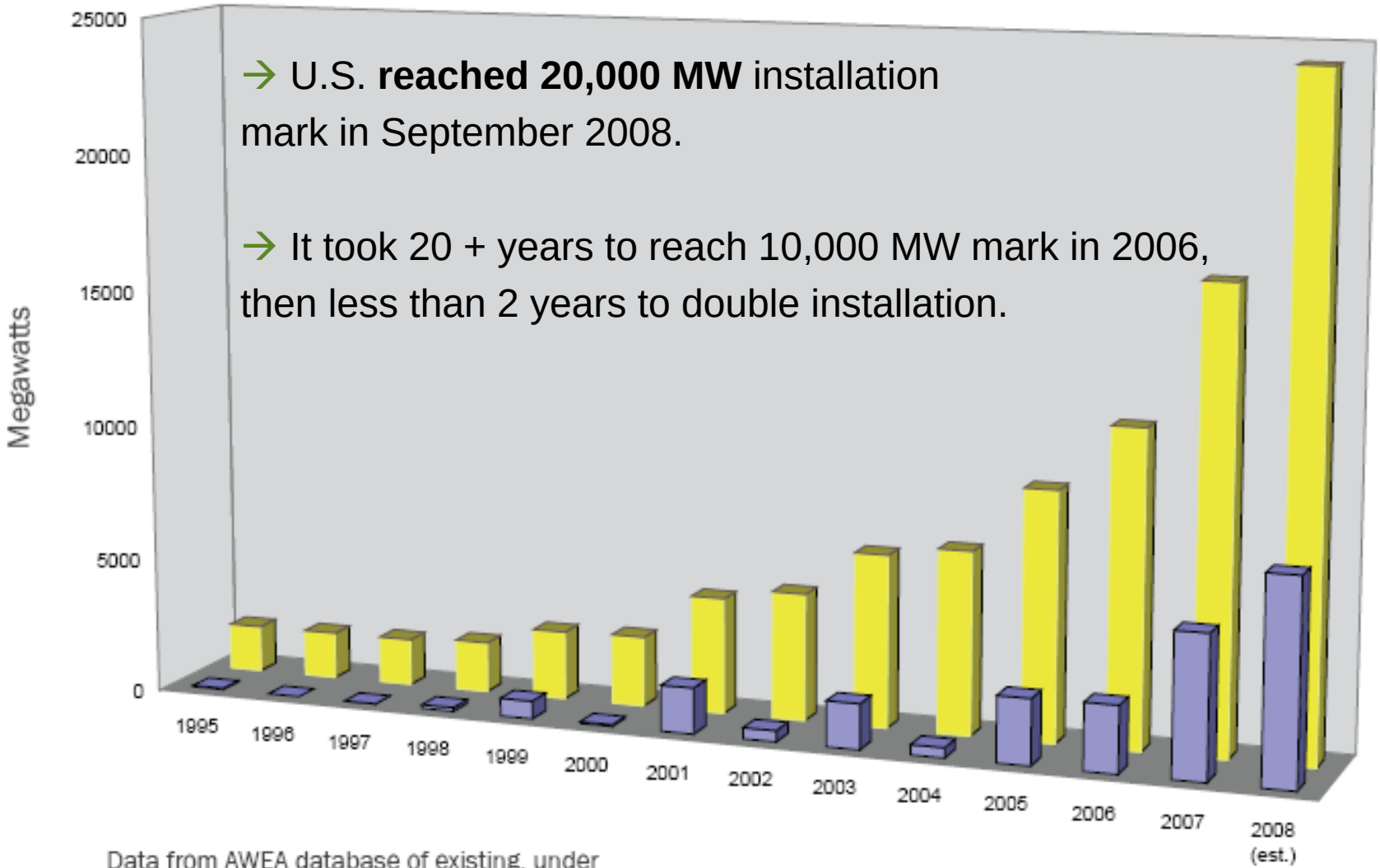
Surpassed 20,000 MW

→ U.S. **reached 20,000 MW** installation mark in September 2008.

→ It took 20 + years to reach 10,000 MW mark in 2006, then less than 2 years to double installation.



Data from AWEA database of existing, under construction and proposed wind power facilities

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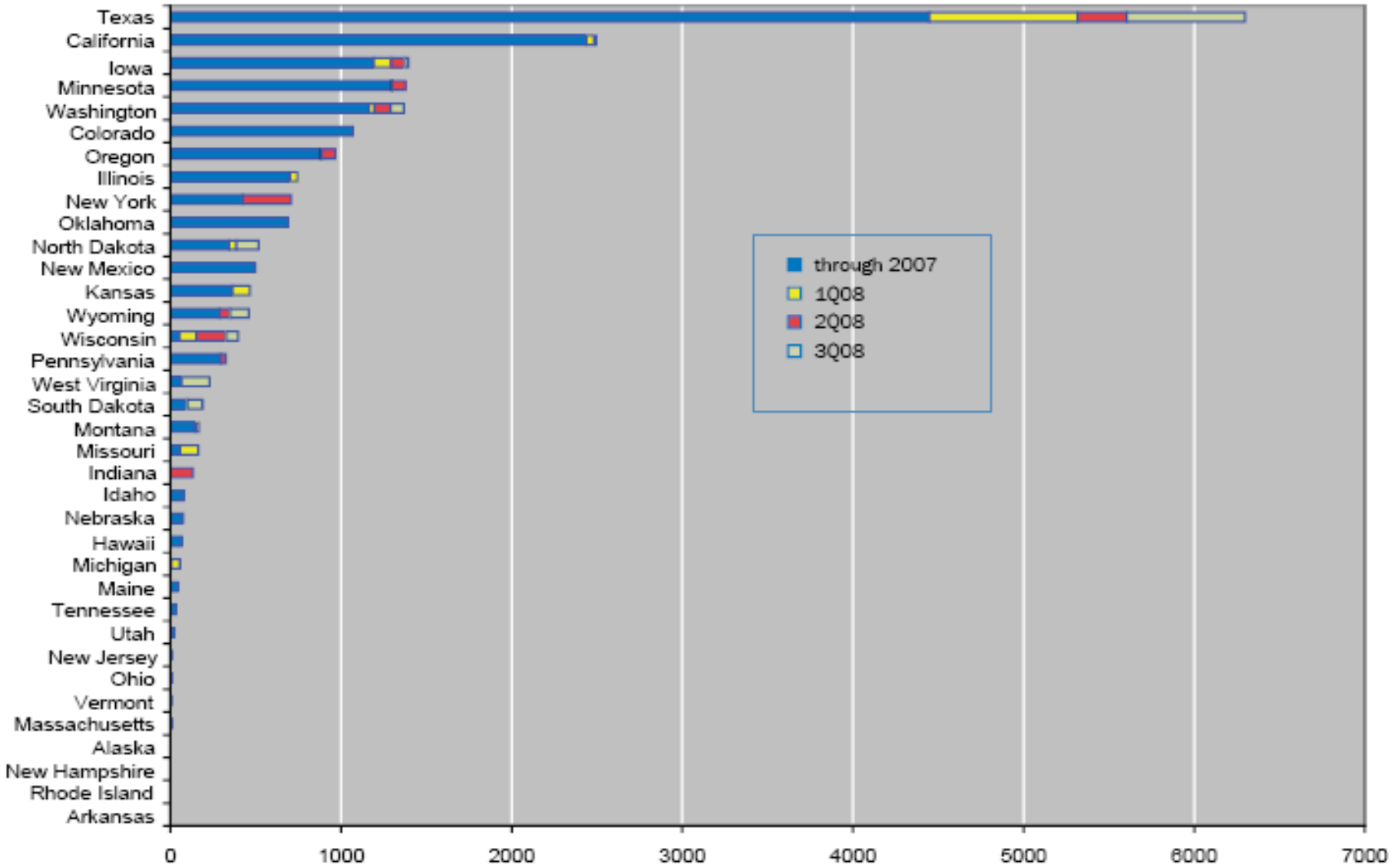
Location of 2008 Wind Installation



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3rd Quarter Project Highlights

- Texas moved into the 6 GW category. Only Germany, India and Spain had more wind energy capacity installed at the end of last year.
- The state with the fastest wind power capacity growth was West Virginia, which more than tripled its existing capacity with the addition of a 164-MW project; another 100-MW project is scheduled to come online this year.
- Utah added its first multi-turbine project, the 9-turbine Spanish Fork project.
- The Dakotas: Acciona Energy, a wind turbine manufacturer, brought its first U.S. turbines online at a 120-turbine project straddling the North Dakota/South Dakota border.

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The 20% Wind Energy Scenario

- In May 2008, U.S. DOE released

  20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply

- Primary Findings:
  - 20% wind electricity requires about 300,000 MW of wind
  - Annual Installation would have to reach 16,000 MW
  - Affordable, accessible wind resources available across the nation
  - Cost to integrate wind modest
  - Raw materials available
  - Transmission a challenge

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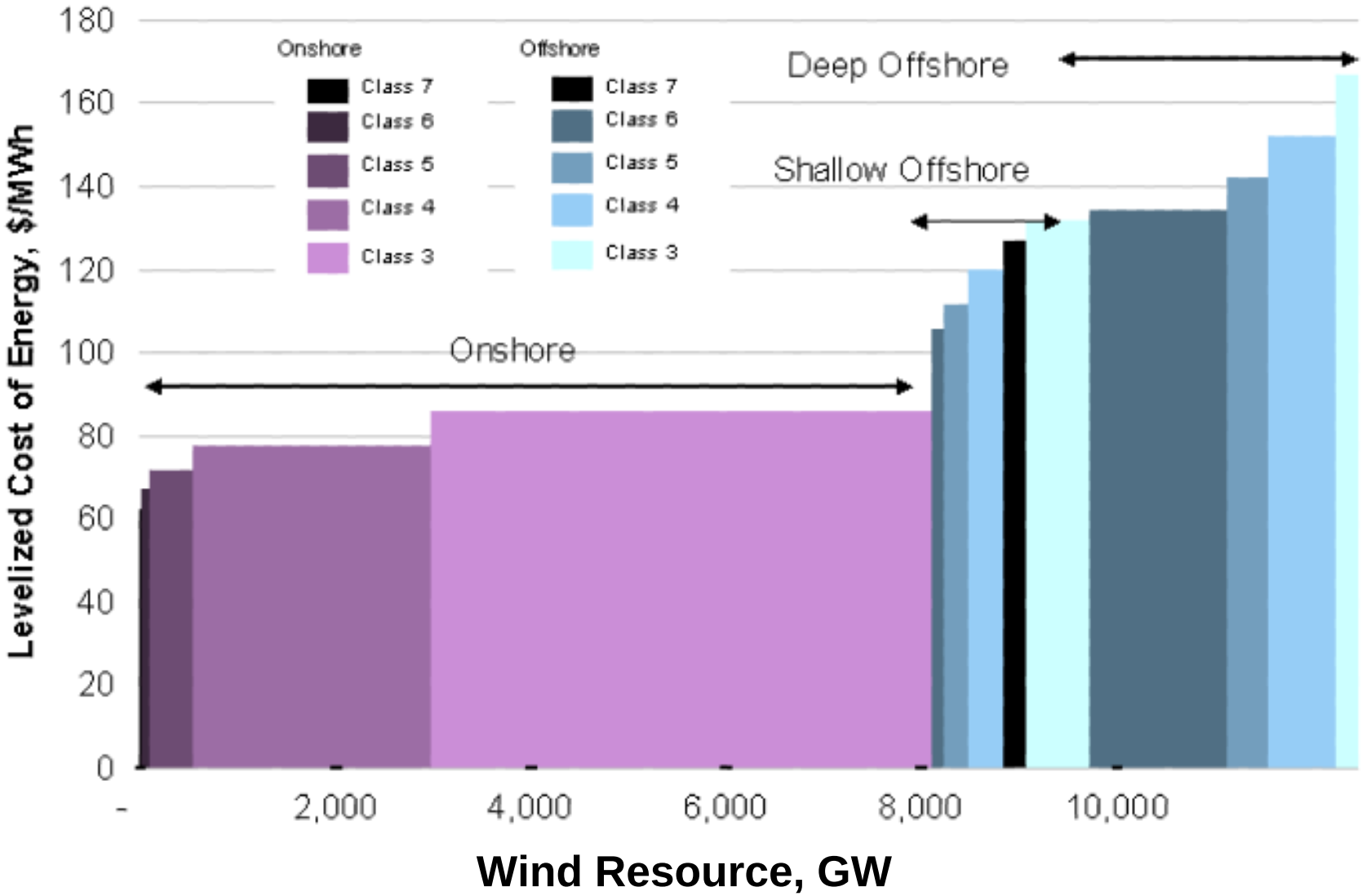
Significant Wind Resource



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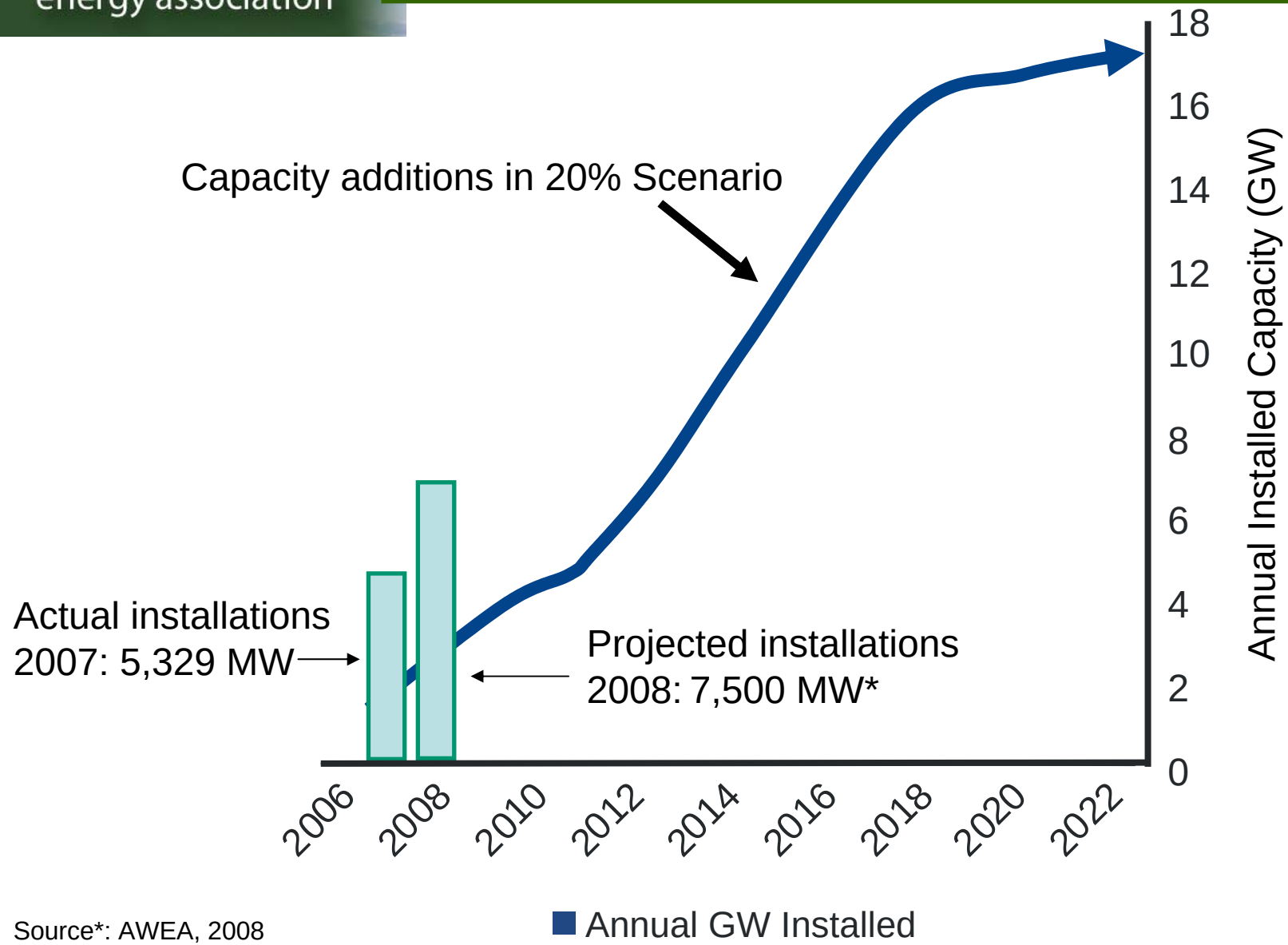
Growth Path for Wind in 20% Scenario



Source*: AWEA, 2008

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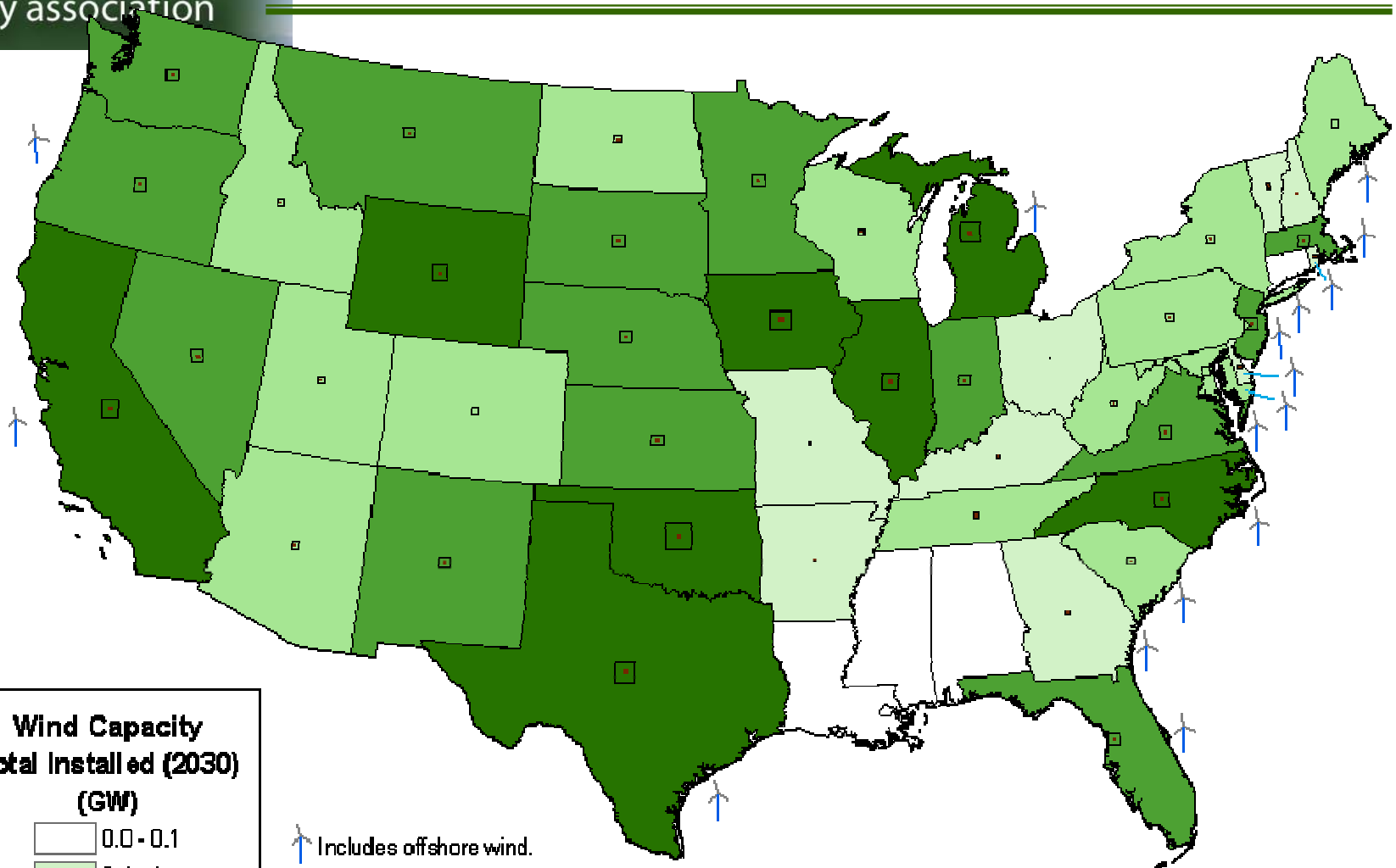
Development in 46 States Under The 20% Wind Scenario



The black open square in the center of a state represents the land area needed for a single wind farm to produce the projected installed capacity in that state. The brown square represents the actual land area that would be dedicated to the wind turbines (2% of the black open square).

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Summary: Costs & Benefits

Incremental direct cost to society	$43 billion 50 cents/month/ household
Reduction in emissions of greenhouse gasses and avoided carbon regulation costs	825 million tons of CO_2 $50 to $145 billion
Reduction in water consumption	8% through 2030 17% in 2030
Jobs supported and other economic benefits	500,000 total with 150,000 direct jobs $2 billion in local annual revenues
Reduction in nationwide natural gas use and likely savings for all gas consumers	11% $86-214 billion

Sources: DOE, 2008 and Hand et al., 2008

Note: All dollar values are in NPV

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Challenges Facing Industry

- Transmission
- Manufacturing
- Project Siting

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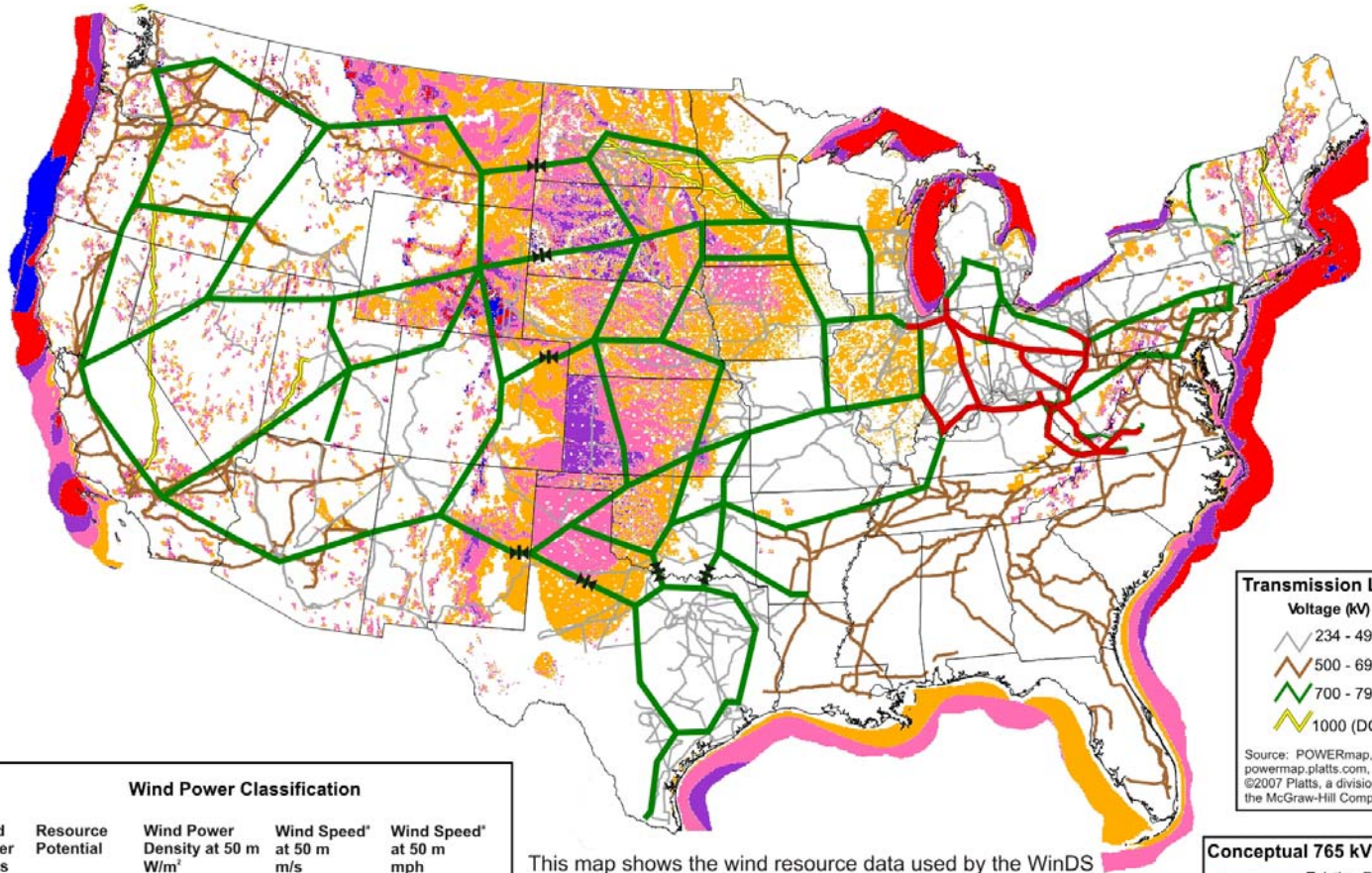
Transmission

AEP's Conceptual Transmission Plan to Accommodate 400 GW of Wind Energy



Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m²	Wind Speed* at 50 m m/s	Wind Speed* at 50 m mph
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

* Wind speeds are based on a Weibull k value of 2.0

Transmission Lines
Voltage (kV)
- 234 - 499
- 500 - 699
- 700 - 799
- 1000 (DC)

Source: POWERmap, powermap.platts.com, ©2007 Platts, a division of the McGraw-Hill Companies

Conceptual 765 kV Network
- Existing 765 kV
- New 765 kV
- AC-DC-AC Link

Source: American Electric Power (AEP)

This map shows the wind resource data used by the WinDS model for the 20% Wind Scenario. It is a combination of high resolution and low resolution datasets produced by NREL and other organizations. The data was screened to eliminate areas unlikely to be developed onshore due to land use or environmental issues. In many states, the wind resource on this map is visually enhanced to better show the distribution on ridge crests and other features.

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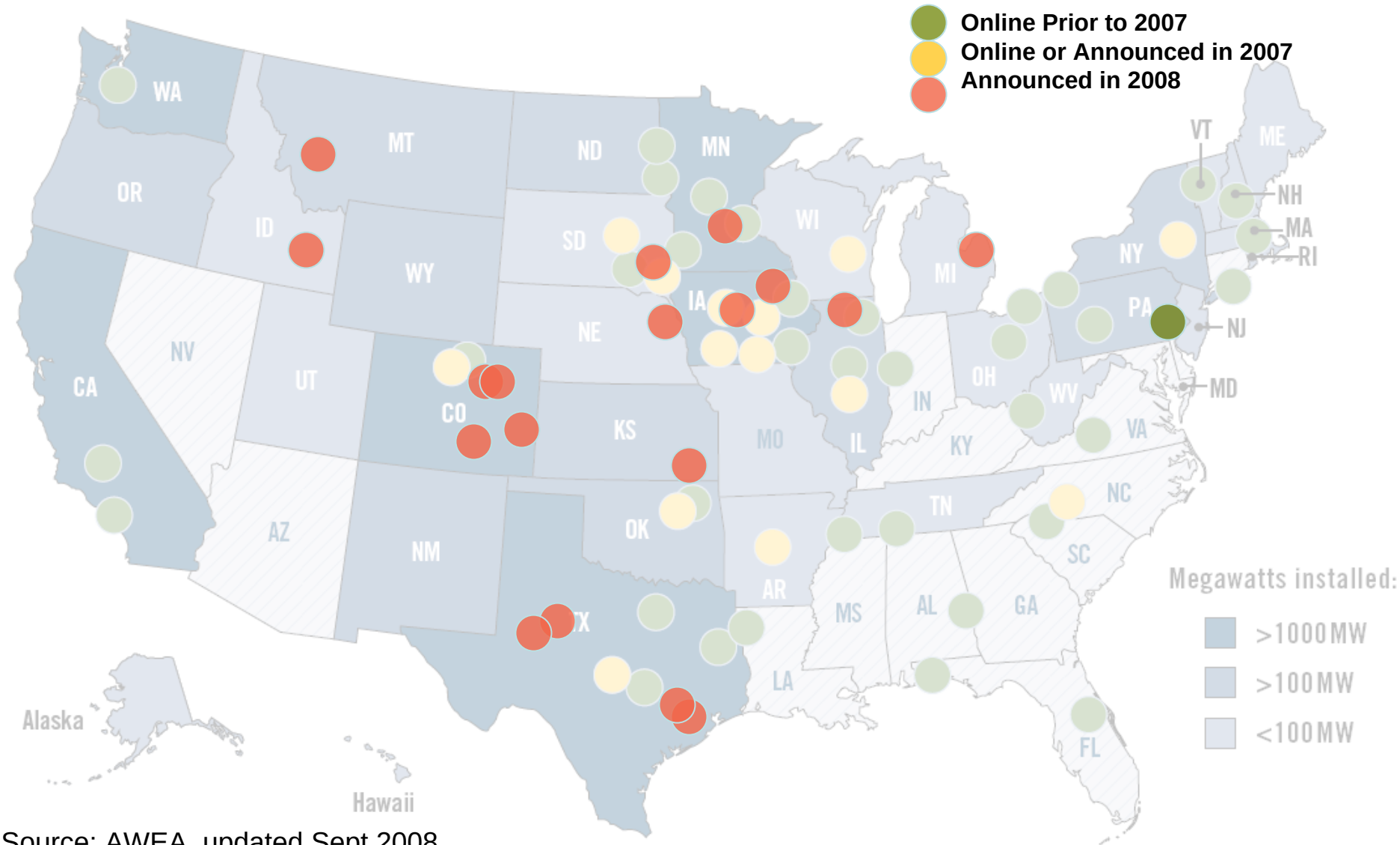
Sample of Manufacturing Facilities



Source: AWEA, updated Sept 2008

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Project Siting

- Project siting often raises local concerns about:
  - Visual impacts
  - Property value impacts
  - Impacts on local wildlife/habitats
  - Turbine or rotor noise
  - Land use

Photo courtesy: US Fish and Wildlife

- Wind generation is responsible for 0.003% of human-caused avian mortality (National Research Council, 2007)
- Bat mortality has been higher than expected

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Federal Policy Timeframe

- Policies with near-term impacts:
  - Stable production tax incentive (PTC)
  - Small wind investment tax incentive (ITC)
  - Fair and efficient siting
- Policies with mid-term impacts:
  - National renewable electricity standard (RES)
  - Policies to promote renewable energy transmission
  - Research and development (R&D) funding
- Policies with long-term impacts:
  - Effective carbon regulation

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Thank You for your Attention

Contact:
Liz Salerno
esalerno@awea.org
202-383-2517
www.awea.org

More on *20% Wind Energy by 2030* Report:
www.20percentwind.org