Renewable Energy Opportunities for American Farmers: *Farming Wind Energy*

Lisa M. Daniels
Windustry

Agricultural Outlook Forum

February 20, 2004

Arlington, Virginia

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Windustry

- Creating an understanding of wind energy opportunities for rural economic benefit.
- Non-profit based in Minneapolis, Minnesota
- Outreach and technical support for rural landowners and communities throughout the Midwest and US.
- www.Windustry.org
- Coming: Wind Energy Network for Landowners and Communities

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Windustry Collaborations

- Minnesota SEED Coalition (Sustainable Energy for Economic Development - 18 member organizations)
- MN Rural Energy Task Force - 17 Counties
- Midwest State Agencies
- National Wind Coordinating Committee (NWCC)
- Wind Powering America (U.S. Department of Energy)

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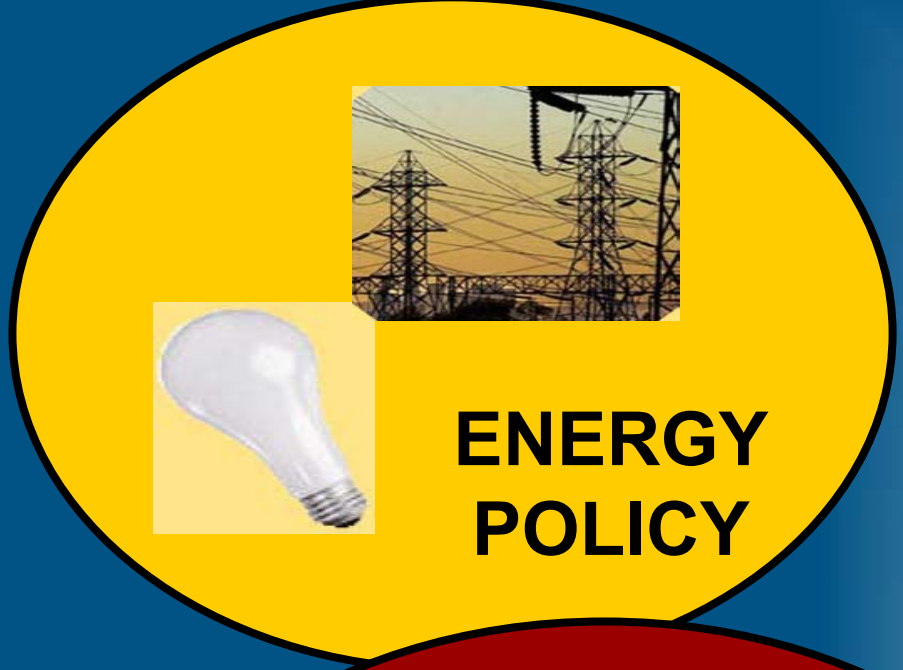
Wind Energy Status



Farm Bill 2002 with the Energy Title

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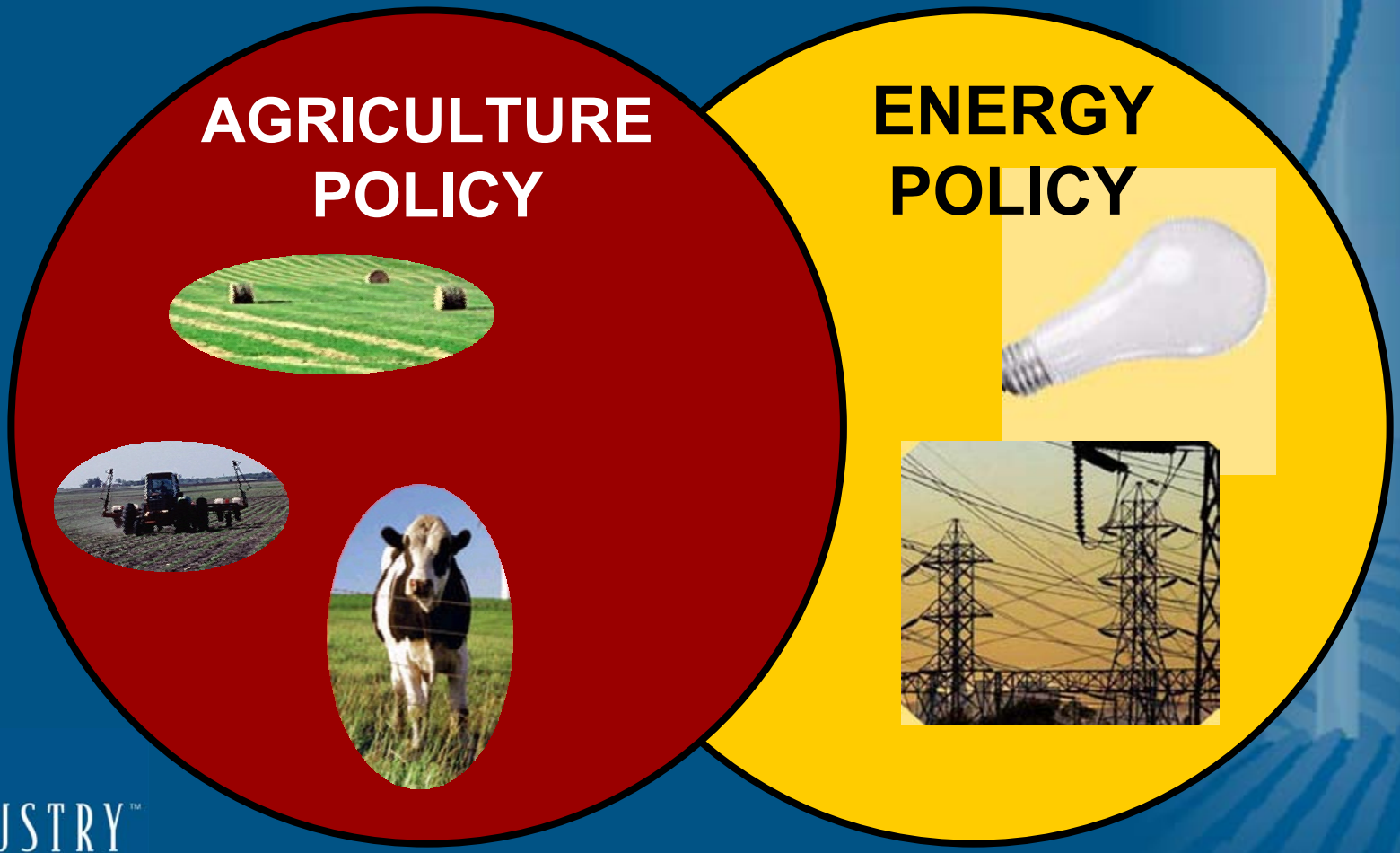
Activities in rural communities today.



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World Growth Market

Total Installed Wind Capacity

1. Germany: 14000 MW
2. United States: 6374 MW
3. Spain: 5780 MW
4. Denmark: 3094 MW
5. India: 1900 MW

World total 2003: 37220 MW

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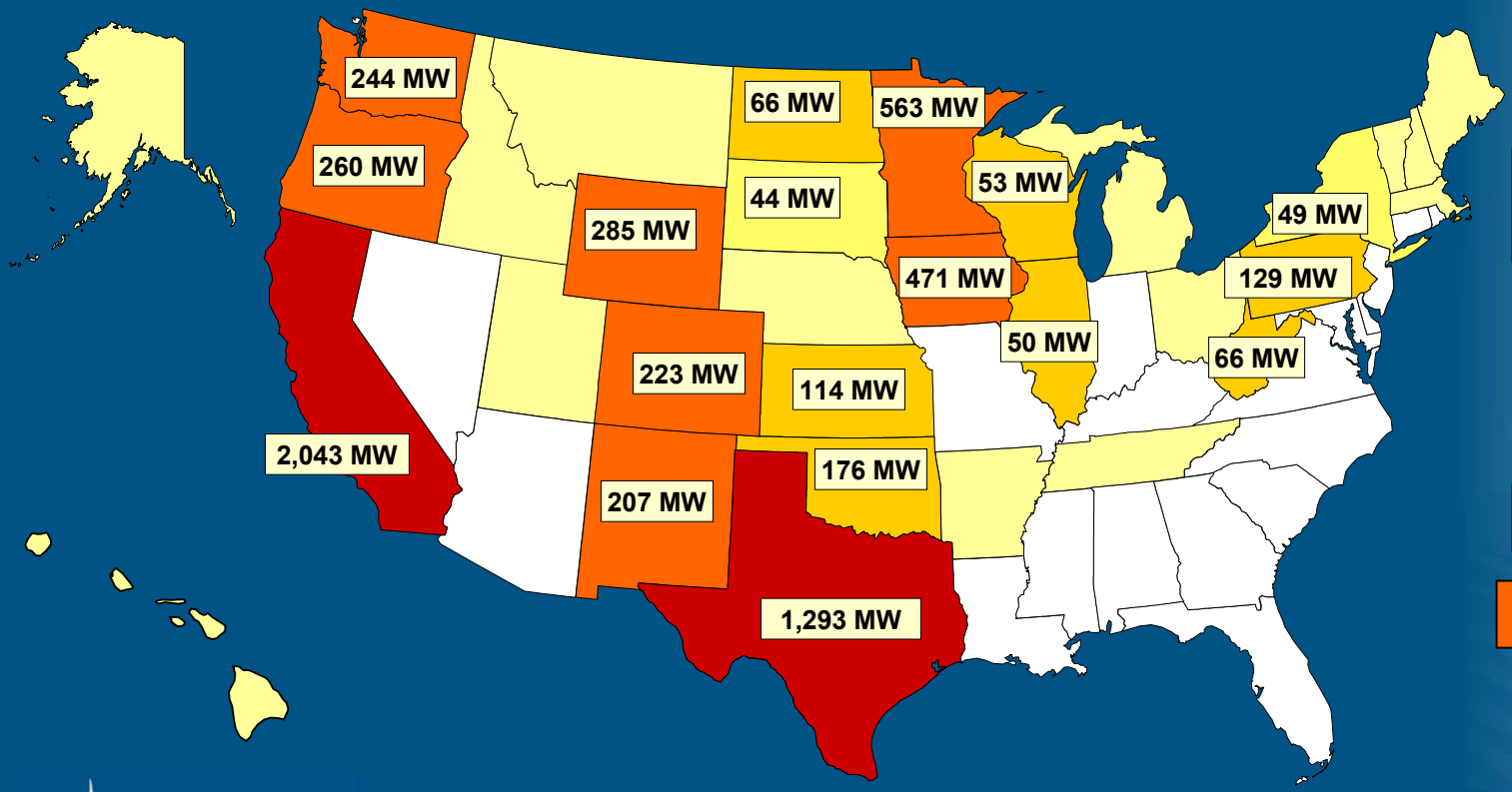
Source: WindPower Monthly

Wind Energy Development in the United States

(as of the end of 2003)



Installed MW by state

- **0.1-20 MW**
- **20-50 MW**
- **50-200 MW**
- **200-1,000 MW**
- **>1,000 MW**

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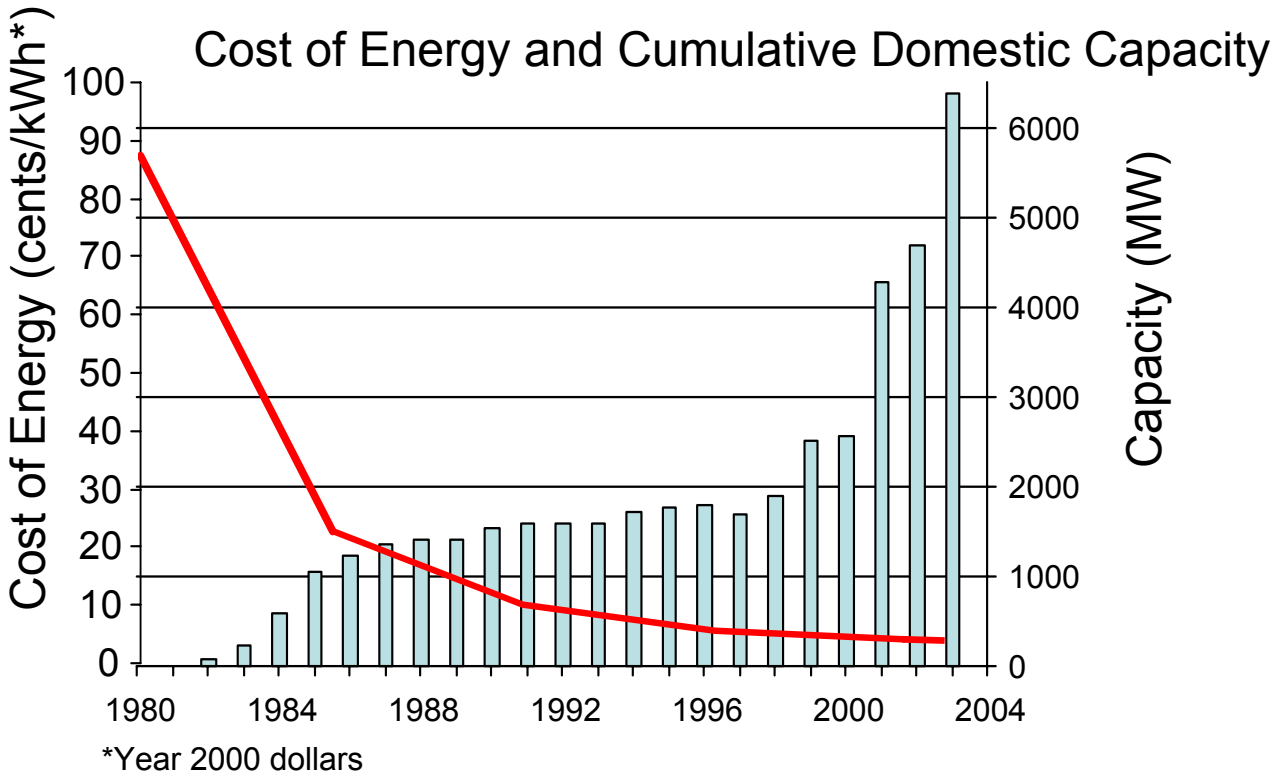
U.S. Total: 6,374 MW at the end of 2003.

Capacity & Cost Trends



Increased Turbine Size - R&D Advances - Manufacturing Improvements

Key Drivers for Wind Power

- Cost of wind energy
- Volatile Natural Gas Prices
- State policies
- Future Federal Policies
  - Carbon Emmisions Policy

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Wind Energy Key Challenges

- Lack of firm policy support or commitments
- Transmission constraints
- Transmission rules and regulations inhibit investment

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PTC Helps Grow the Industry

- 24.5% annual growth over five years
- BUT, instability of PTC causes a boom and bust cycle:
  - 2000 = 67 MW
  - 2001 = 1,696 MW
  - 2002 = 410 MW
  - 2003 = 1,100-1,400 MW
  - 2004 = ???

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Energy Policy Innovations at the State/Local level

- Truly innovative energy policies for wind at the state level
  - State Renewable Energy Standards/Goals and Incentives
  - Supported by Local/State groups organized on clean energy, agriculture and economic development

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Economic Development for Communities- Tax Revenue

- Largest benefit to whole communities from large wind farms is tax revenue
- For example:
  - Lincoln County, Minnesota 2002 (Pop. 6,232): $757,634 from 156 MW (25% of total county tax revenue).
  - Pipestone County, Minnesota 2002 (Pop. 9,761): $389,789 from 113 MW (10% of total county revenue).
  - Worth County, Iowa - the new 80 MW project will add an estimated 9% to the county tax base.

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Landowner Payments

- More options for landowners are emerging, but leasing land remains the most common.
- Landowners are becoming savvier about:
  - The value of windy land
  - Their wind resource
  - Options beyond leasing land
- Turbines are bigger and competition for good sites has increased.

Farmer hosts of an early wind project in Iowa.

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Prepared by Virtus Energy Research for Public Citizen and the SEED Coalition

Commercial-scale Wind Projects- Public Utilities

- Municipal Utilities

  Examples: Moorhead, MN
  • Waverly, IA •Algona, IA,
  • Hull. MA

- Examples: Kotzebue Electric Association, Alaska
  • Last Mile Electric Cooperative, Oregon.

Moorhead, Minnesota

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Commercial-Scale Community Wind Projects

- School districts

  Examples: Spirit Lake, IA • Eldora, IA • Pipestone, MN- integrated into school curriculum

- Tribal Communities

  Example: Rosebud, SD- first Native American-owned large-scale wind turbine in the U.S.

- Local Landowners

  Examples: Kas Brothers, Woodstock MN • Minwind I & II, Luverne, MN

Spirit Lake, Iowa

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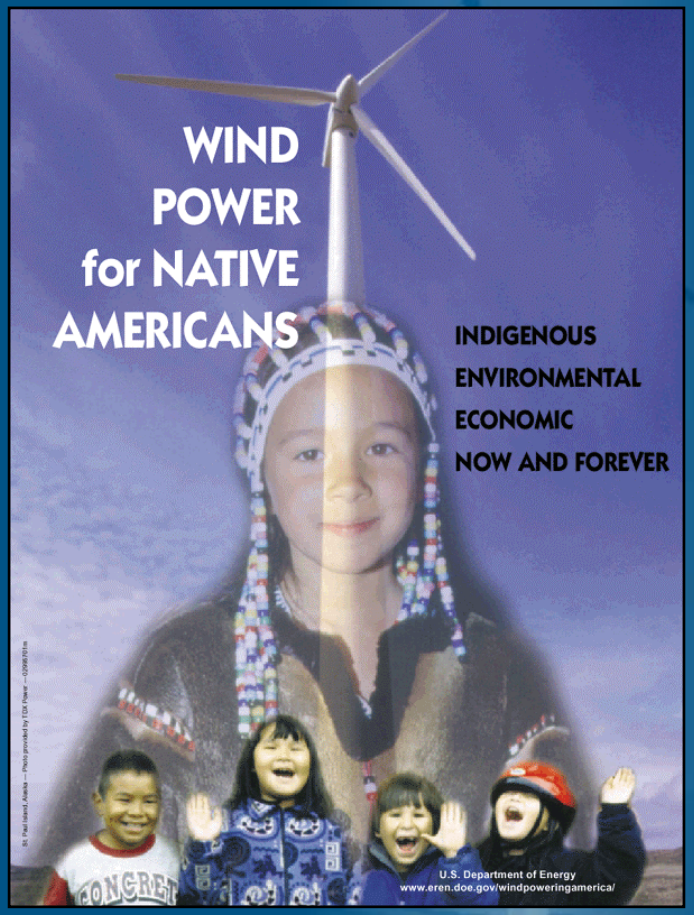
Native American Wind Projects

Rosebud Sioux Tribe

- Rosebud, South Dakota
- Dedicated a 750 kW turbine in May
- "Breaking Trail"
  - First step for the ambitious wind power plans of Great Plains tribes.



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Designing state policies for community wind energy

MN Renewable Energy Incentive Payment

- Renewable energy systems, defined as wind, small hydro, and methane digesters.
- Wind energy projects under 2 MW
- Minnesota offers 1.5-cents/kWh, for 10 years, for power sold to a third party
- Owned by a farmer, non-profit, small business, or tribe
- Incentive was good for up to 200 MW installed capacity
  - From 1997 to April 2003- 100 MW
  - April to November 2003- another 100 MW enrolled

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Kas Brothers Plant 25-Year Cash Crop

- First farmer owned commercial-scale project in U.S.
- Two 750 kW Micon turbines installed in summer of 2001.
- Financed with local banks
- Dozens of farmers in MN now following this model.

Richard and Roger Kas- Woodstock, MN

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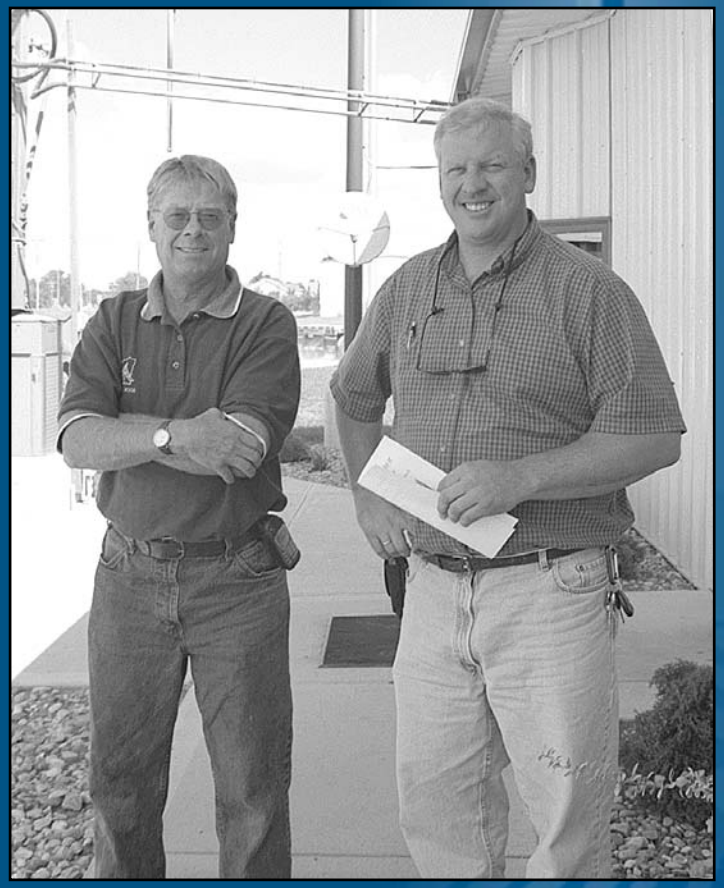
Minwind I and II "Farmer Cooperative"

- Structured to use PTC, but rules are similar to a cooperative.
- Sold membership stock to 66 individuals (33 in each group, required 85% of shares to be owned by farmers)
- Developed two 1.9 MW projects (to use MN incentive)
- Built the project (installed late 2002)



Tom Arends and Mark Willers, Presidents of Minwind I and II

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Minwind I and Minwind II

- Goals included:
  - Local ownership
  - Maximize return on investment
  - Create local economic development
  - Research and utilize available incentives
  - Develop a “cookie-cutter” model
  - Maintain cooperative principles

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Agriculture Policy

Innovations for Renewable Energy at the national level

- U.S. 2002 Farm Bill Energy Title
  - Championed by farm state Congressional members
  - Supported by regional/national farm and environment organizations
  - First round of grants awarded in August 2003
  - Funding for local/farmer owned wind projects
  - Becoming an important driver for community wind projects

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Minwind III - IX

- Seven more Minwind projects received $178,201 grants from USDA.
  - Essentially, using funds to build interconnection substation to get all 7 projects on the grid.
  - Minwind III-IX will have 147 owners.
- Signed power purchase contracts with a utility in November.
- Result will be approximately another 14 MW of locally owned wind in Rock County, Minnesota.

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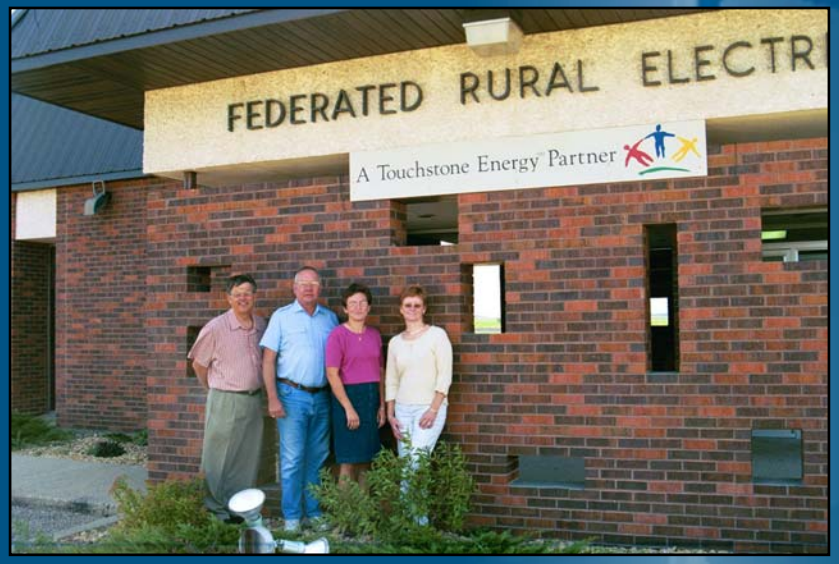
Rural Electric Cooperatives

- Three Rural Electric Cooperatives received USDA funds to develop wind projects:
  - Federated Rural Electric Association (MN) $500,000
  - Nobles Cooperative Electric (MN) $500,000
  - Illinois Rural Electric Cooperative (IL) $438,544



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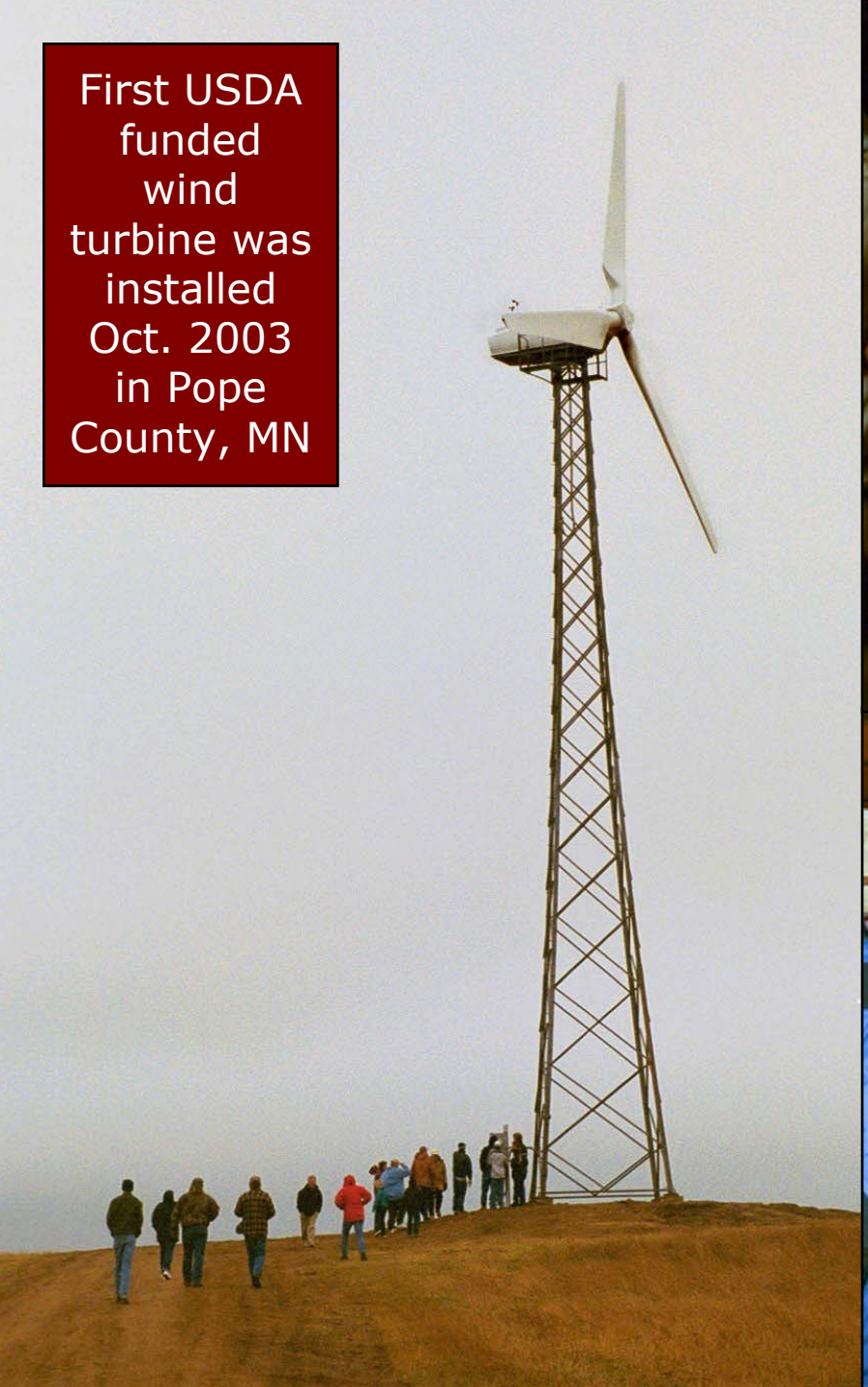
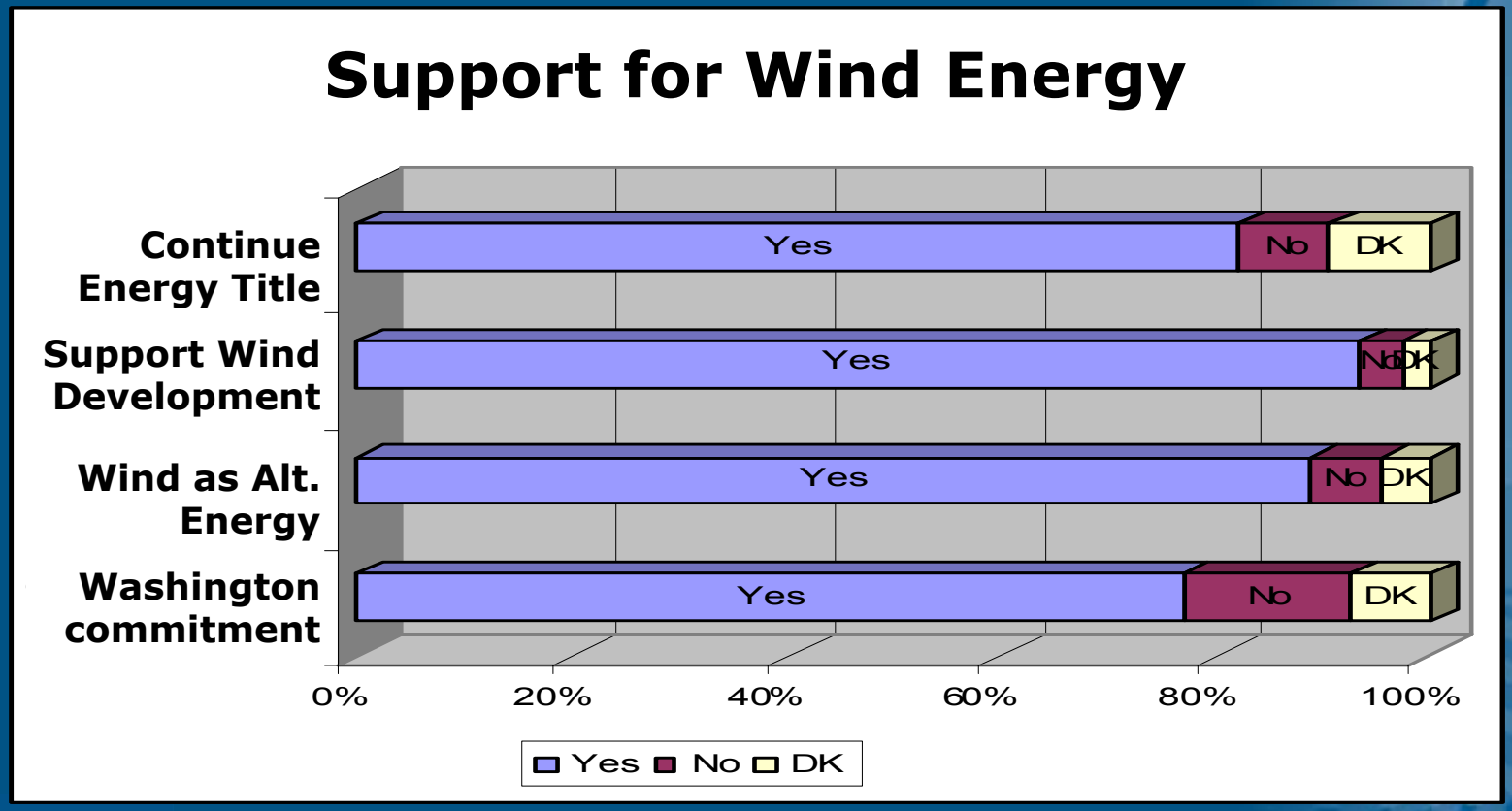
First USDA funded wind turbine was installed Oct. 2003 in Pope County, MN



National Survey of Corn Producers - April 2003



Full survey results: www.acga.org/news/2003

Wind Power is in the news…

The New York Times ON THE WEB

SCIENCE DESK | November 4, 2003, Tuesday

As Earth Warms, The Hottest Issue Is Energy

By KENNETH CHANG (NYT) 2413 words
Late Edition - Final , Section F , Page 1 , Column 4

DISPLAYING FIRST 50 OF 2413 WORDS - Suppose that over the ncx
the forecasts of global warming start to come true. Color has drai
England's autumns as maple trees die, and the Baltimore oriole ca

Daily Globe

$26 million wind field will spur the local economy

Tuesday, June 17, 2003

By Juan Montoya, jmontoya1@

STOCK — The principal c
Ridge area says such who

SUCCESSFUL FARMING® ONLINE PRODUCTION

Harvest the wind

The Midwest could be the Saudi Arabia of wind-powered energy

By Chester Peterson Jr.

How would you like to harvest a crop that is relatively
untroubled by inclement weather, prices, or the actions of
politicians? Believe it or not, there is such a crop. And that
crop is wind power. A small but growing number of

FILLMORE COUNTY JOURNAL online

Inherit the wind

Harnessing wind power is a new rural

Friday, December 06, 2002

By Mary T. Bell

Over the past few months I have at
meetings in Preston dealing with th
Energy and Recycling project that,
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SCIENCE NEWS ONLINE®

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Power Harvests

The salvation of many U.S. farmers may be blowing in the wind

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Star Tribune

Tiny county benefits from wind, seeks more tax revenue

Robert Franklin
Star Tribune

Published Mar 24, 2002

LAKE BENTON, MINN. -- At 7:30 on a frigid March morning, Jim Nichols' four-wheel-drive pickup truck plows through drifts and bounces across a snowy farm field to one of 33 wind generators that he's supposed to keep running.

But five of the 33 have stopped. As the wind machines poke their blades up through a blanket of ground fog, Nichols unlocks the door at the base of one's pedestal, steps inside, looks at gauges and punches buttons to reset the machinery.

"I don't know why he went crazy on us," says Nichols, who had climbed 175 feet inside the machine the day before, looking for ice that might have disabled the mechanism and finding none. "These things are very reliable. They just run."

Nichols the machine minder is also Nichols the Lincoln County

CATCH the WIND

Michael Petersen

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A New "Cash Crop" for the Rural Economy

"The Energy Title establishes energy policy as an integral part of agriculture policy, which will create and grow the market for farm-based energy that will benefit rural communities." *David Benson, farmer and Nobles County Commissioner, Minnesota*

"Wind Energy has provided jobs so that our young people could come back home to live and raise their families" *Sherry Phillips, Mayor of McCamey, Texas*

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In Closing:

Community wind energy in the larger context

- U.S. policies on energy, climate change, and the environment are not in step with much of the world.
- BUT, people at the grassroots, local, and even state level are moving toward a clean energy future on their own.

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In Closing:

Community Wind Energy: a key driver for wind energy in the U.S.

- **Communities energized by opportunities to:**
  - Harvest clean energy as a "cash crop"
  - Enhance energy security/independence.
  - To have local control over energy resources and keep energy dollars local.
  - Protect the environment.
- **An emerging market force:**
  - Successful projects in the ground.
  - Interest spreading like wildfire.
  - More sectors getting involved, such as bankers, attorneys, and farm organizations.

Photo courtesy of U.S. Department of Energy

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We invite you to Windustry's Community Wind Conference

June 23-24, 2004

Minneapolis, Minnesota USA

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