



Wind Energy for Rural Economic Development



Larry Flowers

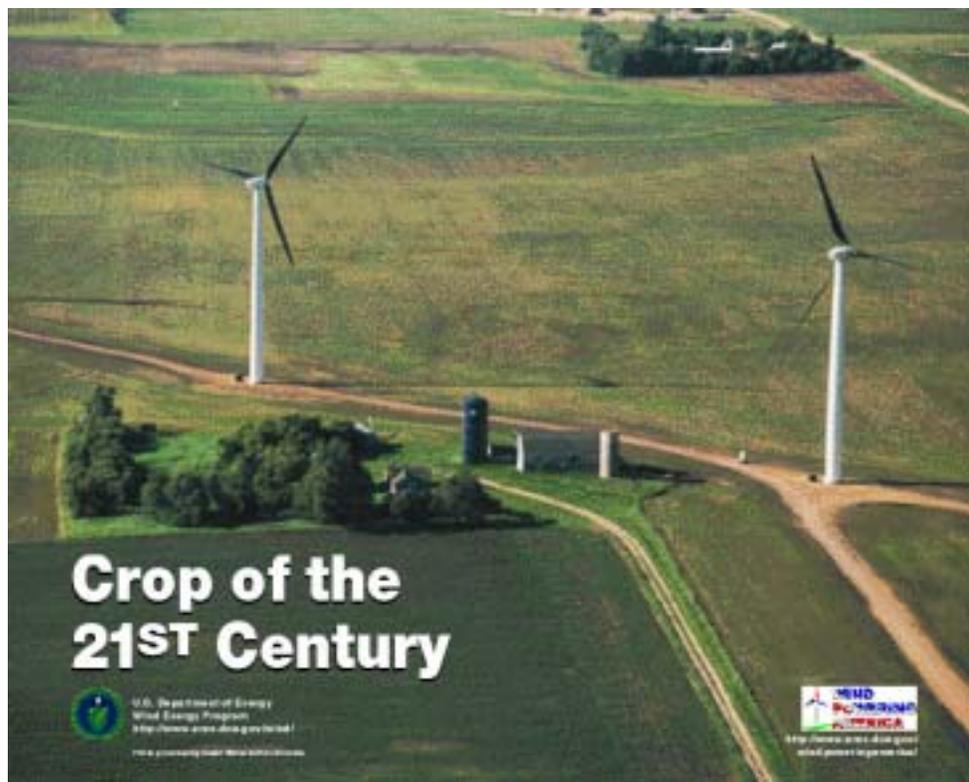
Harvesting Clean Energy

Jan 20-21, 2005

Great Falls, MT

The Opportunity

***Economic security
and prosperity for
rural America
through local
production of energy***

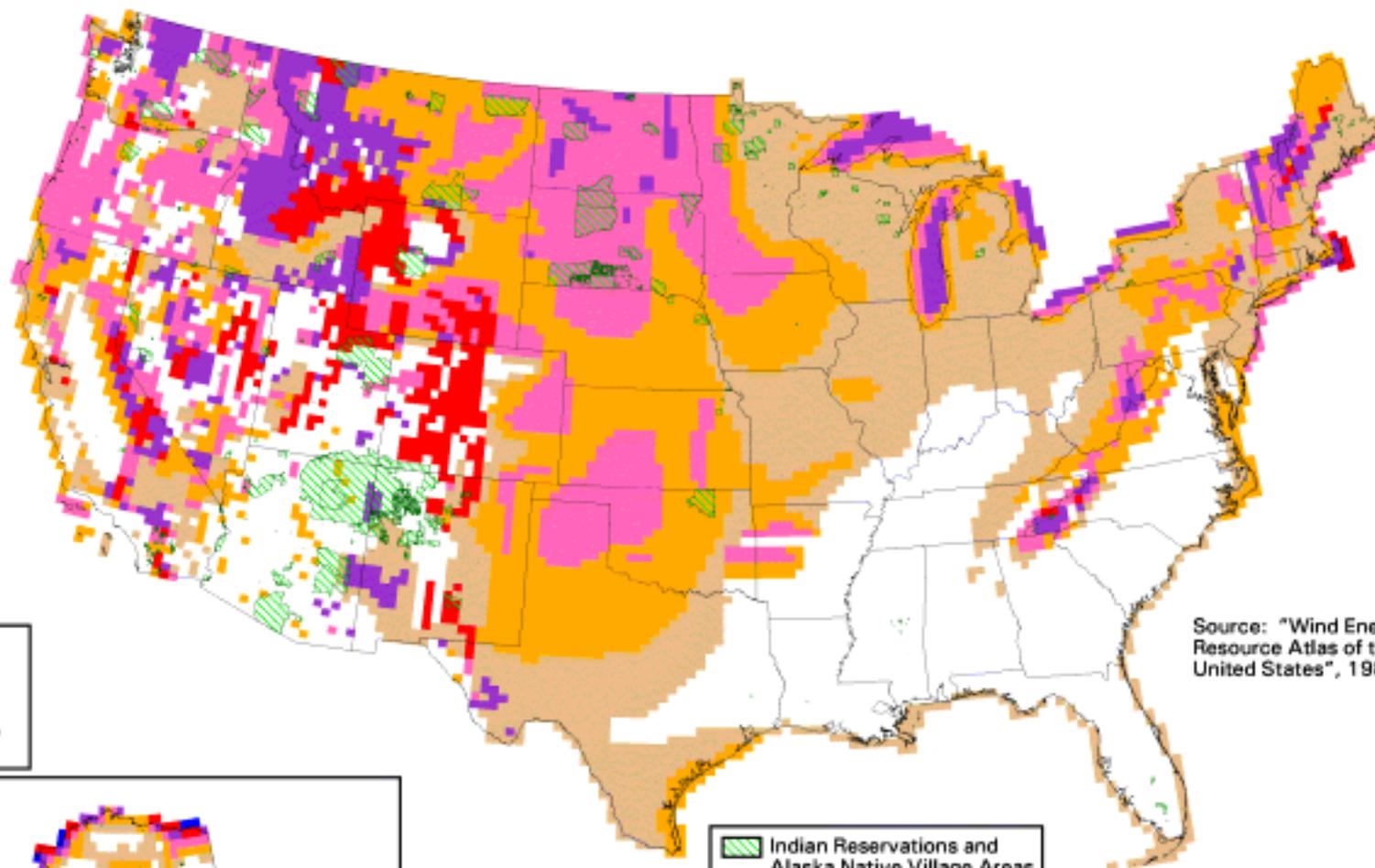


Rural Economic Challenges

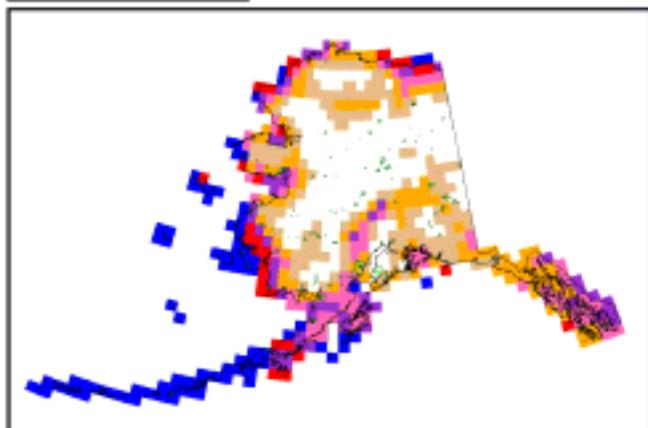
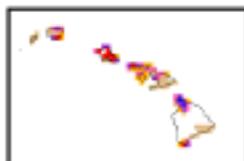
- Low commodity prices
- Fuel price uncertainty
- High fertilizer prices
- Migration to cities
- Eroding local tax bases
- Water shortages



United States - Wind Resource Map



Source: "Wind Energy Resource Atlas of the United States", 1987



 Indian Reservations and Alaska Native Village Areas

Wind Power Classification

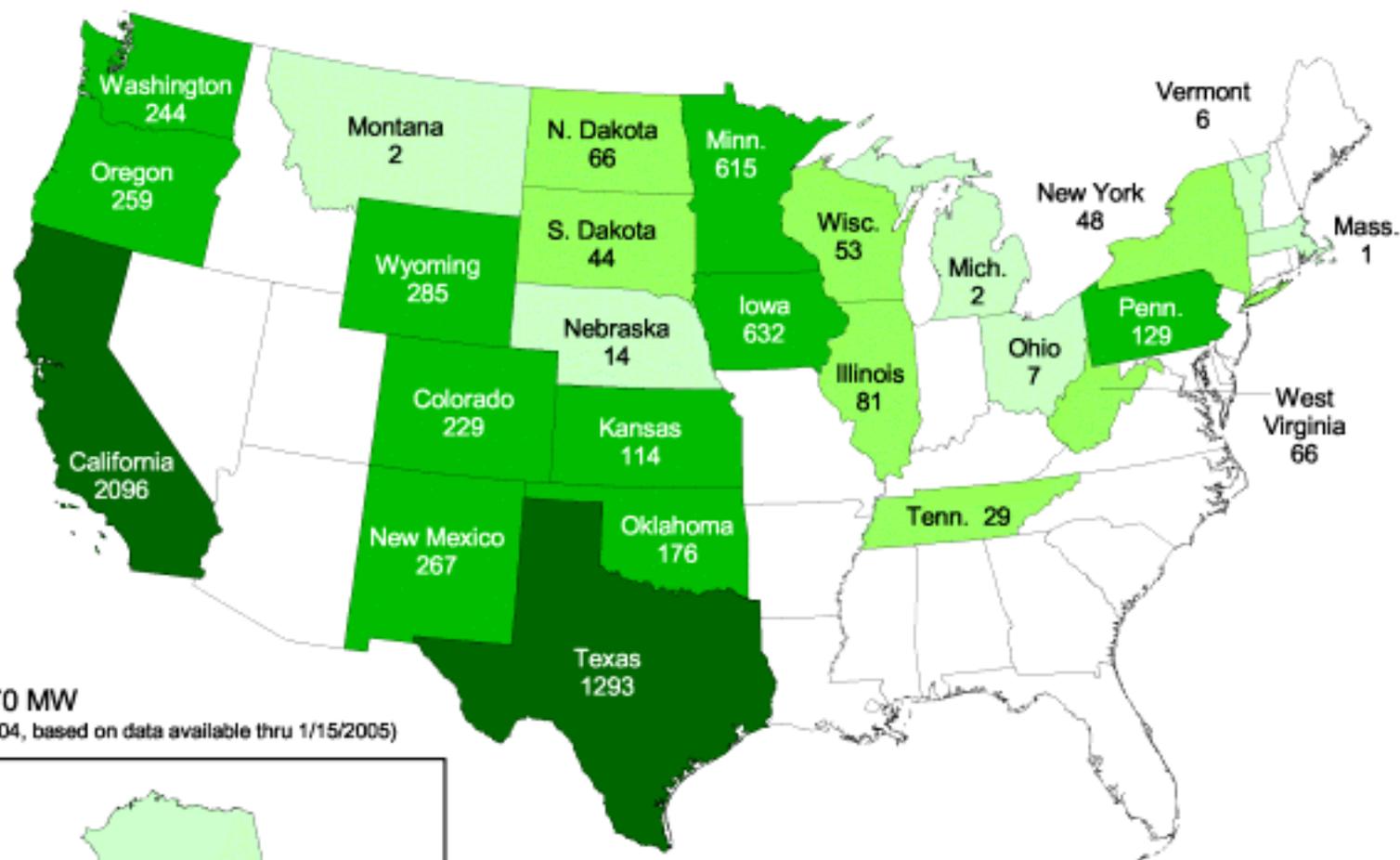
Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m^2	Wind Speed ^a at 50 m m/s	Wind Speed ^a at 50 m mph
	2 Marginal	200 - 300	5.6 - 6.4	12.5 - 14.3
	3 Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
	4 Good	400 - 500	7.0 - 7.5	15.7 - 16.8
	5 Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
	6 Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
	7 Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

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

U.S. Department of Energy
National Renewable Energy Laboratory

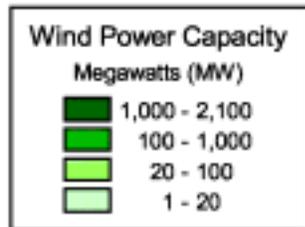


United States - 2004 Year End Wind Power Capacity (MW)



Total: 6,770 MW

(As of 12/31/2004, based on data available thru 1/15/2005)



U.S. Department of Energy
National Renewable Energy Laboratory



Wind Energy Benefits (EIEIO)

- **E**conomic development (revenue, increased local tax base, jobs)
- **I**ndigenous resource
- **E**nvironmental benefits (emission free, water-free generation)
- **I**nexhaustible supply
- **O**n the farm



Different Sizes for Different Applications



Small (≤ 10 kW)

- Homes
- Farms
- Remote Applications

(e.g. water pumping, telecom sites, icemaking)



Intermediate (10-250 kW)

- Village Power
- Hybrid Systems
- Distributed Power



Large (660 kW - 2+MW)

- Central Station Wind Farms
- Distributed Power

Proven Economic Development Impact

- Land lease payments: 2%-3% of gross revenue; \$2500-\$4000/MW/year
- Local property tax revenue: 100 MW creates \$500,000 - \$1 million/year
- 1-2 jobs/MW during construction
- 2-5 permanent O&M jobs per 50-100 MW
- Local construction and service industry: concrete, towers usually contracted to locals
- Investment as equity owners: production tax credit, accelerated depreciation



Economic Development Impacts

- Construction
- Manufacturing
- Operations and Maintenance
- Property Tax Revenues
- Landowner Revenues
- Multiplier Effect
- Net Impacts of Wind vs. Fossil Fuels



Local Share of Expenditures

- Construction: 10-25% of total capital cost
- Manufacturing: 0-40% of total capital cost
- O&M: 50-100% of total
- Property Taxes and Landowner Revenues = 100%
- Depends on geographic focus and regional economy



240-MW Iowa wind project

- \$640,000/yr in lease payments to farmers (\$2,000/turbine/yr)
- \$2 million/yr in property taxes
- \$5.5 million/yr in O&M income
- 40 long-term O&M jobs
- 200 short-term construction jobs
- Doesn't include multiplier effect



107-MW Minnesota wind project

- \$500,000/yr in lease payments to farmers
- \$611,000 in property taxes in 2000 = 13% of total county taxes
- 31 long-term local jobs and \$909,000 in income from O&M (includes multiplier effect)



Case Study: Hyde County, South Dakota

- 40 MW wind project in South Dakota creates \$400,000 - \$450,000/yr for Hyde County, including:
 - More than \$100,000/yr in annual lease payments to farmers (\$3,000 - \$4,000/turbine/yr)
 - \$250,000/yr in property taxes (25% of Highmore's education budget)
 - 75 -100 construction jobs for 6 months
 - 5 permanent O&M jobs
 - Sales taxes up more than 40%
 - Doesn't include multiplier effect



Case Study: Prowers County, Colorado



162-MW Colorado Green Wind Farm boosts the local economy

- Mortensen employed 87 people to pour 35,000 yards of concrete
- Christensen employed 46 people to install 20 miles of underground cable
- Ridge Crane devoted two cranes to the project for three months
- All-Rite Paving supplied concrete for 32 miles of poles
- Country Acres Motel and RV Park was booked solid for months
- Hay Stack Steak House experienced a 30% increase in business
- Property tax revenues increase \$2 million

Case Study: Wind for Schools

Spirit Lake, Iowa

Two turbines (250 kW and 750kW)

When loans are paid off, the revenue (estimated to be \$120K/year) will be used to enhance school programs



Case Study: Texas RPS



Utilities and wind companies invested \$1 billion in 2001 to build 912 MW of new wind power, resulting in:

- 2,500 quality jobs with a payroll of \$75 million
- \$13.3 million in tax revenues for schools and counties
- \$2.5 million in 2002 royalty income to landowners
- Another 2,900 indirect jobs as a result of the multiplier effect
- \$4.6 million increase in Pecos County property tax revenue in 2002.



Taxes Paid to School Districts by Texas Wind Projects



County	Installed Wind (MW)	Assessed Value (\$million)	Tax Rate (%)	Tax Due in 2002
Pecos	412.7	297.1	1.62	\$4,809,472
Upton	292.3	191.0	1.44	\$2,750,400
Taylor	100.5	82.0	1.38	\$1,131,324
Carson	80	57.5	1.49	\$856,750
Crockett	61	47.5	1.33	\$631,750
Nolan	49.5	37.6	1.58	\$594,080
Culberson	65	34.9	1.55	\$470,028
Howard	34.3	24.7	1.50	\$370,656
Jeff Davis	6	4.3	1.50	\$64,800
Hudspeth	1.3	1.0	1.50	\$14,256
Total	1,103	777.49	1.49	\$11,693,516

Source: Virtus Energy Research Associates, 2002.

Net Benefits of 10% NE Electricity from Wind by 2012

- 360 more jobs, \$8 million more in income, and \$35 million more in GSP than coal and gas
- \$2.2 million in royalty payments to farmers and landowners (\$2,000/turbine/year)
- \$5.2 million in property tax revenues for rural communities
- Net benefits to state economy = \$15 million/year over a 20-year period

Kas Brothers Plant 25-Year Cash Crop

- First farmer-owned commercial-scale project in the United States
- Two 750-kW NEG Micon turbines installed in summer of 2001
- Financed with local banks (equity partner)
- Dozens of farmers in Minnesota now following this model

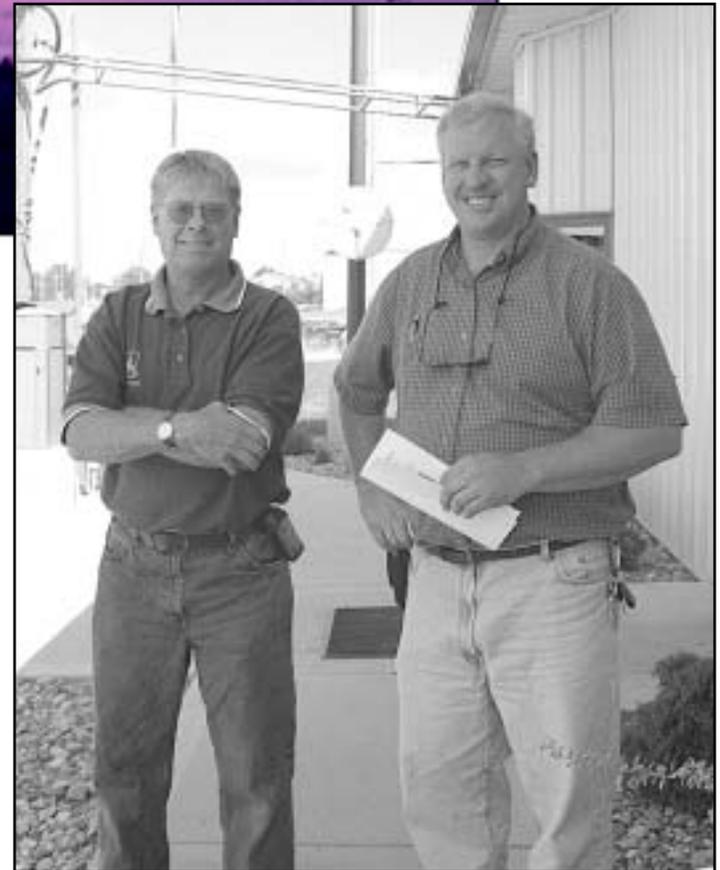


Richard and Roger Kas- Woodstock, MN

Case Study: Minnesota Farmer Cooperative



- Two 900-kW NEG Micons
- Two LLCs formed with cooperative principles
- Sold membership stock to 66 individuals; developed two 1.8-MW projects in late 2002
- Replicated with USDA 9006 Farm Bill grants

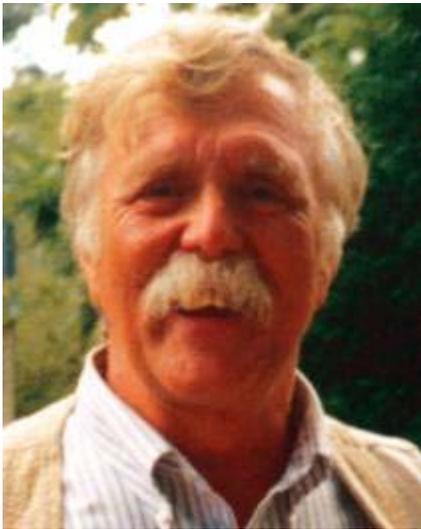


Jess Algers' Ranch, Stanford, Montana



- Fourth-generation Montana farmer
- 1200-acre cattle ranch and wheat farm
- Turbine offsets all electricity used for home and farm operations





“Wind is a homegrown energy that we can harvest right along side our corn or soybeans or other crops. We can use the energy in our local communities or we can export it to other markets. We need to look carefully at wind energy as a source of economic growth for our region.”

David Benson, farmer and county commissioner, Nobles County, Minnesota



“Converting the wind into a much-needed commodity while providing good jobs, the Colorado Green Wind Farm is a boost to our local economy and tax base.”

John Stulp, county commissioner, Prowers County, Colorado



Harvest the Wind

www.windpoweringamerica.gov