



Midwest Wind Power Development

Transmission Planning in the Midwest IV
February 11, 2004
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Midwest Wind Power

	Wind Power, MW			
	Existing ¹	Total Potential ²	% of State Consumption in 2010 ³	
			5%	10%
Illinois	50	6,980	2,668	5,336
Iowa	471	62,900	827	1,654
Minnesota	563	75,000	1,250	2,499
Nebraska	14	99,100	559	1,118
North Dakota	66	138,400	220	440
South Dakota	44	117,200	187	374
Wisconsin	53	6,440	1,363	2,726
Total	1,261	506,020	7,073	14,147

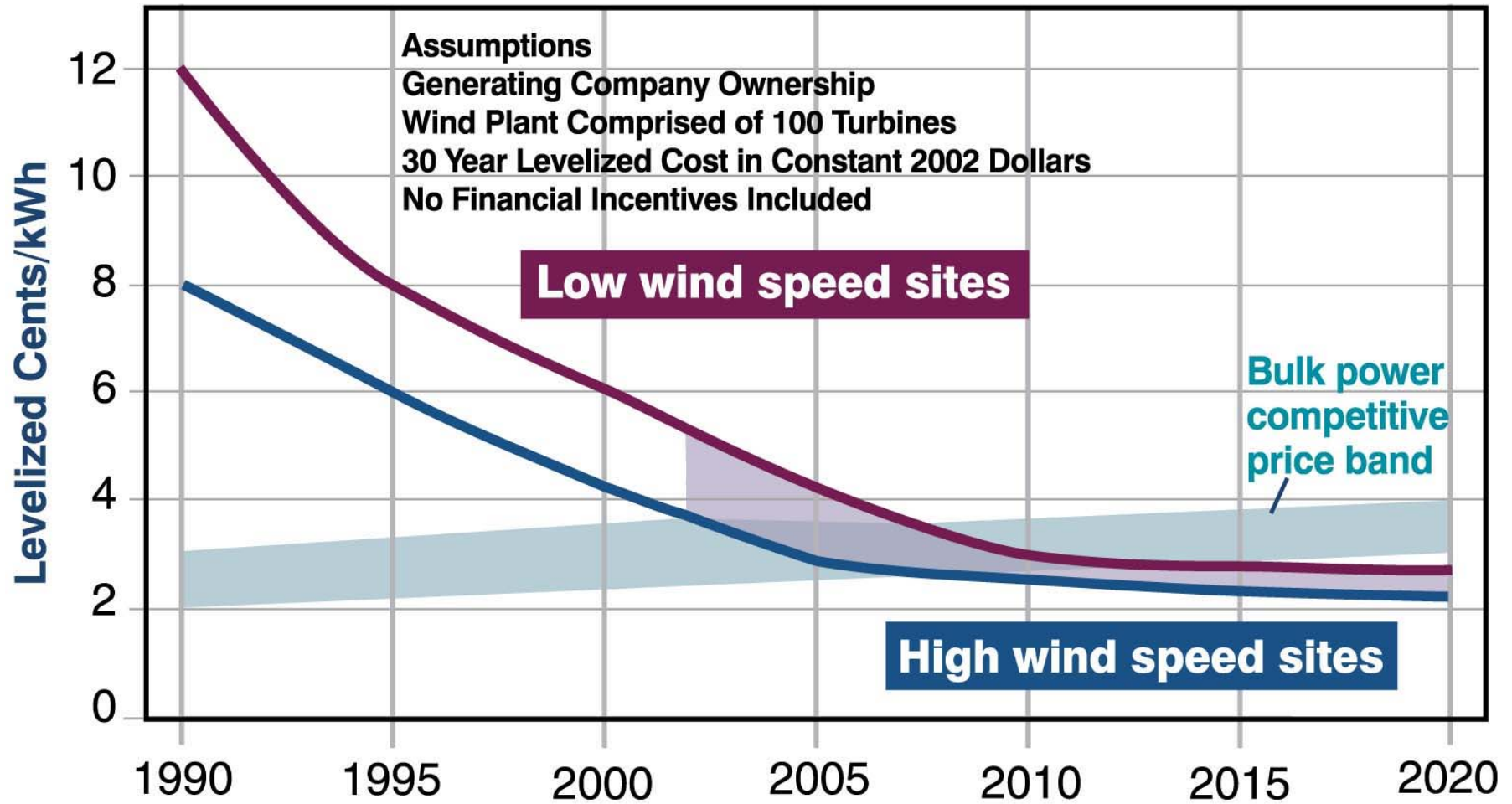
Notes:

1. American Wind Energy Association, January 2004, <http://www.awea.org/>
2. Avg MW, *An Assessment of Windy Land Area and Wind Energy Potential*, Pacific Northwest Lab, 1991.
3. Wind power capacity equivalent; % consumption based on energy.
Energy Information Administration, 2001, http://www.eia.doe.gov/cneaf/electricity/st_profiles/profiles.pdf

Planning for New Wind Power

- ❖ Rapidly growing markets for new wind power development
- ❖ Wind power is site dependent, rapid construction time, developed in relatively small increments
- ❖ Wind power needs to be included in comprehensive, forward looking, integrated transmission planning

Cost of Wind Energy



Source: DOE/NREL, 2002

Midwest Market Drivers

- ❖ Cost of Wind Energy
- ❖ State Policies
- ❖ High and Volatile Natural Gas Prices
- ❖ Future Federal Policies



➔ Policy criteria for transmission expansion are needed in addition to reliability & economic criteria.

Midwest Wind Development Plan

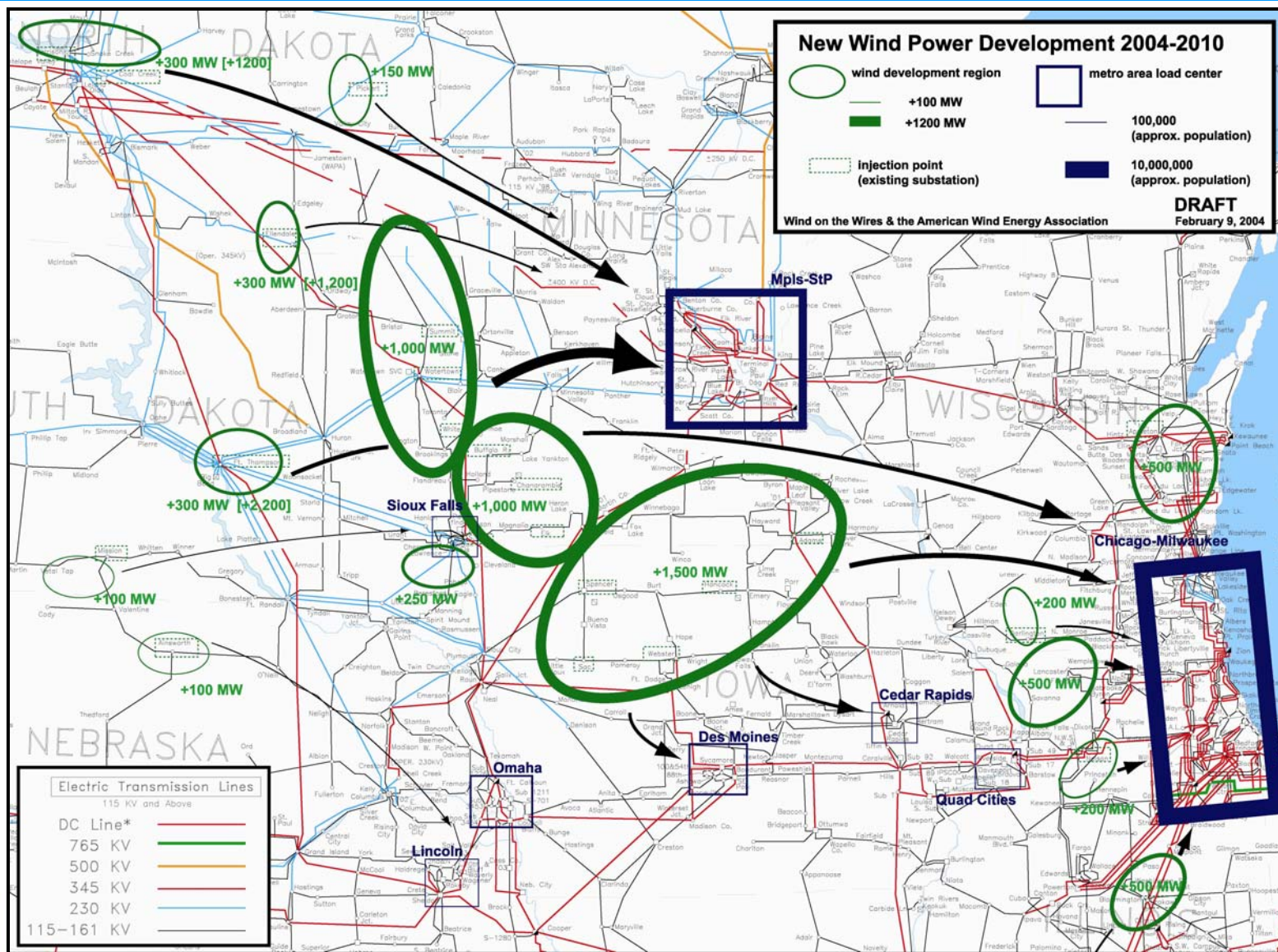
- ❖ Originated at the NWCC Transmission workshop in March 2002 as a joint project of Wind on the Wires and the American Wind Energy Association
 - ❖ Participants included developers, consultants, & stakeholders
 - ❖ Aggregated projected development into representative groups
- ❖ Plan included projected injection points, markets, and costs
- ❖ Projections result in 10,000 MW of new wind power in nine upper Midwest states
- ❖ Wind Development Plan was submitted to MISO in June 2002 for use in MTEP-03



Related Developments Include:

- ❖ Recently approved SW MN transmission upgrades (operational 2007) for 825 MW of wind are already over subscribed
- ❖ Advancing wind turbine technology is improving the economics of lower wind speed sites and overall capacity factors
- ❖ Parallel development models of small (2-20 MW) & large wind farms
- ❖ MISO group interconnection studies & exploratory studies
- ❖ WAPA appropriation to study transmission for Dakota wind; DOE wind program comprehensive transmission assessment
- ❖ Development of economic & policy driven transmission expansion criteria
- ❖ Potential development of regional credit trading

Draft Update to Midwest Wind Development Plan:



Summary

- ❖ Midwest wind power continues to grow rapidly.
 - ❖ Successful transmission planning for wind needs to be comprehensive, integrated, & forward looking.
 - ❖ Transmission expansion planning needs to include reliability, economic, and policy criteria.
- ➔ Key challenge for new transmission is achieving regional consensus early in the process