



# THE ATMOSPHERIC RESERVOIR

*Examining the Atmosphere and Atmospheric Resource Management*

## "Exporting" North Dakota's Winds

Photo: American Wind Energy Association

By Mark D. Schneider

North Dakota has an abundant supply of wind energy potential. It's important to understand why our state is near the top in national rankings. Evaluations of wind energy potential show that geographic regions with steady, moderate winds are more desirable than areas prone to sporadic, gusty winds. Also, air density is an important factor because cold, dense winds produce more energy than warmer breezes. North Dakota often receives a consistent flow of moderate, dense winds from Canada and this assures us a high ranking nationally.

Wind energy production in North Dakota will triple in the next few years largely because of the proposed 2,000 megawatt Hartland Wind Farm in Burke, Mountrail, and Ward Counties. The 1,333-wind tower project could provide 600,000 homes with power, and would make our state the number one wind energy exporter in the country. According to the American Wind Energy Association (AWEA), North Dakota ranks tenth in the nation for wind energy production, up from a ranking of 13th nationally for the last several years.

"The wind sector has grown extensively in North Dakota in the past decade. More than 750 turbines are producing approximately 1,200 megawatts of wind energy across the state," said Patrice Lahlum, chair of the North Dakota Alliance for Renewable Energy. "North Dakota stands to benefit from additional wind energy development; however, we will need to work to address areas including transmission, storage, and landowner issues."

There are factors that limit the extent to which wind power can be utilized. In North Dakota, our state's electrical transmission line capacity cannot currently handle the proposed Hartland Wind Farm output. However, American Electric Power has proposed "building the first 765-kilovolt (kV) extra-high voltage transmission lines to connect major wind developments in the Dakotas and surrounding states to the existing 765-kV network that ends near Chicago." This is precisely what North Dakota will need to utilize more of its wind energy potential.

Another factor that limits the extent of wind energy production is the initial start-up cost. Each wind tower

costs between two to three million dollars to purchase and install and that adds up quickly when you consider the proposed four billion-dollar Hartland Wind Farm. Once initial start-up costs are rendered, however, the wind towers typically pay for themselves in only three to eight months of operation.

There is currently no cost-effective way to store wind energy once it's produced. This means that it must be used instantly or it will be lost. For the U.S. and its tremendous energy demands storage shouldn't be necessary, as long as there are sufficient transmission lines to carry the energy directly to its customers. North Dakota's cooperation with energy companies to increase our transmission line capacity is an essential step to securing our role in energy exportation in the future.

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