

THE ATMOSPHERIC RESERVOIR

Examining the Atmosphere and Atmospheric Resource Management

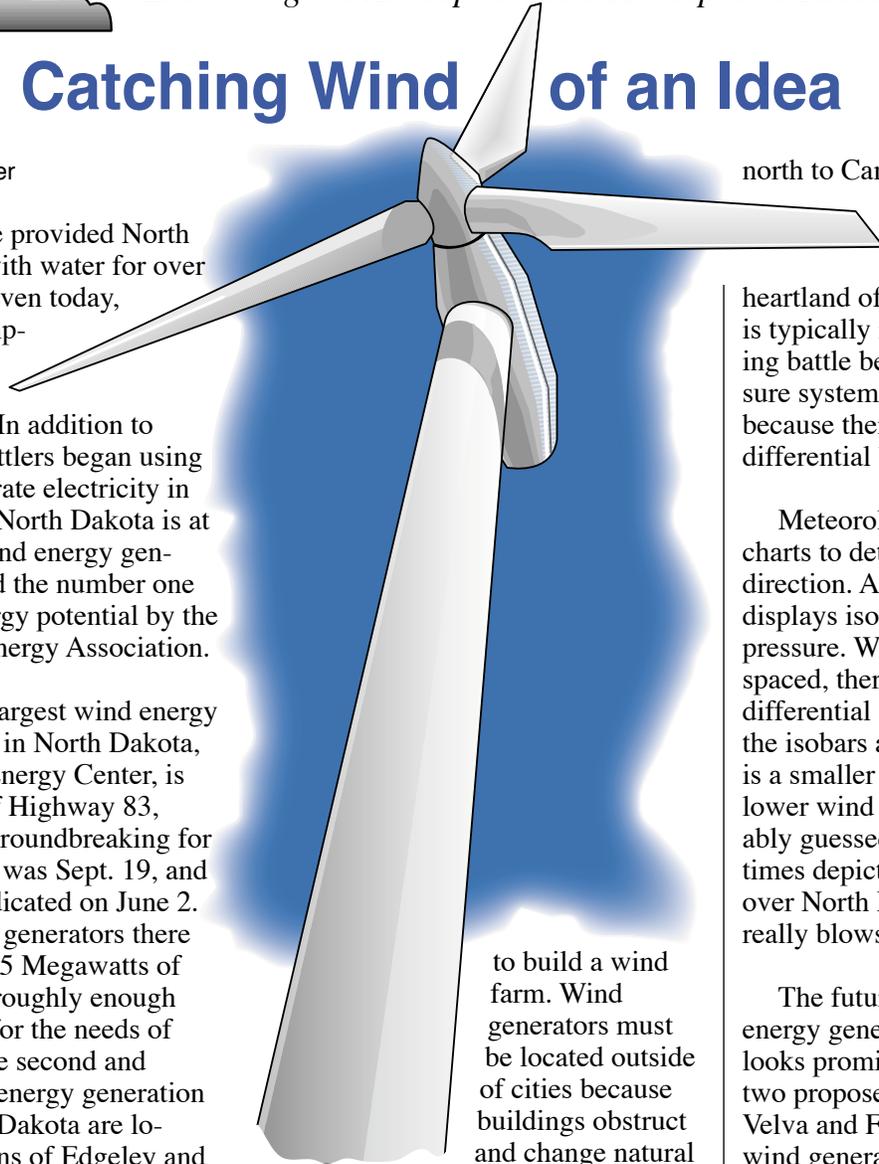
Catching Wind of an Idea

By Mark D. Schneider

Windmills have provided North Dakota ranchers with water for over a hundred years. Even today, windmills are pumping water to feed livestock in rural areas of our state. In addition to pumping water, settlers began using windmills to generate electricity in the 1930s. Today, North Dakota is at the forefront of wind energy generation and is rated the number one state for wind energy potential by the American Wind Energy Association.

The latest and largest wind energy generation facility in North Dakota, the Wilton Wind Energy Center, is located just east of Highway 83, south of Wilton. Groundbreaking for the Wilton facility was Sept. 19, and it was recently dedicated on June 2. There are 33 wind generators there which produce 49.5 Megawatts of electricity. That's roughly enough power to provide for the needs of 15,000 homes! The second and third largest wind energy generation facilities in North Dakota are located near the towns of Edgeley and Kulm. There are 41 wind generators between these two closely located farms. All three wind farms are owned by Florida Power and Light Energy Company. Basin Electric and Otter Tail Power Company purchase and use the generated electricity from FPL Energy. Other locations in North Dakota where wind generators are in use include the Valley City/Oriska Hills, Petersburg, and Prairie Winds (near Minot) sites.

Many factors must be taken into account when choosing a location



to build a wind farm. Wind generators must be located outside of cities because buildings obstruct and change natural airflow patterns. Areas of raised topography such as hilltops and plateaus are often ideal for wind farms because they aren't obstructed and typically receive the greatest wind velocities.

North Dakota's abundant supply of wind is primarily due to the geographic position of the state relative to the development and track of weather systems in North America. In the spring and summer, gusty southerly winds bring moisture all the way from the Gulf of Mexico

north to Canada. During the fall and winter, cold northerly winds from Canada race southward into the heartland of America. North Dakota is typically in the middle of the ongoing battle between high and low pressure systems. We receive brisk winds because there is a significant pressure differential between these systems.

Meteorologists look at weather charts to determine wind speed and direction. A pressure analysis chart displays isobars; or lines of equal pressure. When isobars are closely spaced, there is a greater pressure differential and higher wind speed. If the isobars are spread out, then there is a smaller pressure differential and lower wind speed. As you've probably guessed, weather charts oftentimes depict closely spaced isobars over North Dakota and the wind really blows here.

The future for additional wind energy generation in North Dakota looks promising. There are already two proposed wind projects near Velva and Forbes which could add 31 wind generators to North Dakota's fleet. The facility near Velva is under construction and scheduled to be online by the end of 2006. We have an unending supply of wind available to us here in North Dakota and the progressive mindset necessary to use it productively.

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