

September 2003

WIND ENERGY DEVELOPMENT STUDY - BACKGROUND MEMORANDUM

Senate Bill No. 2310 (2003) (attached as an appendix) provides that the Legislative Council shall consider studying, during the 2003-04 interim, issues related to wind energy development in this state, including wind turbine siting requirements, wind energy development contract provisions, the potential economic benefits of wind energy development for farmers and ranchers, the potential adverse impacts of wind energy development on landowners, and the impact of wind energy development on organized labor, especially in the energy industry. The Legislative Council, however, has revised this study by directive. At its May 16, 2003, meeting to prioritize resolutions and bills for study, the Legislative Council removed the language relating to wind turbine siting requirements and the impact of wind energy development on organized labor, removed the words "for farmers and ranchers" and "on landowners," and directed that the study include consideration of transmission of electrical energy and the impact on the electric energy industry of wind energy development.

As revised by the Legislative Council, Senate Bill No. 2310 (2003) provides for a study of issues related to wind energy development in this state, including wind energy development contract provisions, the potential economic benefits of wind energy development, the potential adverse impacts of wind energy development, consideration of transmission of electrical energy, and the impact on the electric industry of wind energy development.

The National Wind Coordinating Committee estimates the United States could meet 10 to 40 percent of its electricity demand with wind power. Areas of the United States identified as having significant wind energy potential include areas near the coasts, along ridges of mountain ranges, and in a wide belt that stretches across the Great Plains, including North Dakota. The Great Plains is an especially attractive area for wind energy development because many coastal areas and mountain ridges are unsuitable for wind energy development because of rocky terrain, inaccessibility, environmental protection, or population density. Wind energy can be converted to electricity by using wind turbines. The amount of electricity created depends on the amount of energy contained in wind that passes through a turbine in a unit of time. This energy flow is referred to as wind power density. Wind power density depends on wind speed and air density, with air density being dependent on air temperature, barometric pressure, and altitude. Wind speed, wind shear, and turbine costs determine a site's wind energy potential.

According to the American Wind Energy Association, installed wind energy generating capacity totals 4,685 megawatts, and generated approximately 11.2 billion kilowatts of electricity, less than 1 percent of electricity generation in the United States. By contrast,

the American Wind Energy Association estimates the total amount of electricity that could potentially be generated from wind in the United States at 10,777 billion kilowatts annually, three times the electricity generated in the United States today. North Dakota ranks first among the top 20 states for wind energy potential, as measured by annual energy potential in billions of kilowatt hours, factoring in environmental and land use exclusions for wind class of three and higher. The top 20 states are listed in the following table:

1	North Dakota	1,210
2	Texas	1,190
3	Kansas	1,070
4	South Dakota	1,030
5	Montana	1,020
6	Nebraska	868
7	Wyoming	747
8	Oklahoma	725
9	Minnesota	657
10	Iowa	551
11	Colorado	481
12	New Mexico	435
13	Idaho	73
14	Michigan	65
15	New York	62
16	Illinois	61
17	California	59
18	Wisconsin	58
19	Maine	56
20	Missouri	52

Source: An Assessment of the Available Windy Land Area and Wind Energy Potential in the Contiguous United States, Pacific Northwest Laboratory, 1991.

Similarly, the Department of Energy's National Renewable Energy Laboratory has identified North Dakota as having the greatest wind resource of any of the lower 48 states. North Dakota also has few environmental restraints regarding land availability. However, the Division of Community Services within the Department of Commerce has identified a number of issues that must be addressed before significant wind energy development in North Dakota. The single biggest obstacle identified by the Division of Community Services is constraints on the state's existing transmission grid. North Dakota currently exports nearly 60 percent of the power generated within the state, and it is likely that most wind generated electricity will also be exported. Thus, utility experts agree that additions to the current transmission grid will be necessary for a significant generation expansion in the state, regardless of fuel source. Other issues related to the development of wind energy noted by the Division of Community Services include identification of the market for wind energy and possible avian issues related to raptors and nesting waterfowl.

A continued interest in wind energy development in the United States and worldwide has produced steady improvements in technology and performance of wind power plants. In addition to being cost-competitive, wind power projects may offer additional benefits to the economy and the environment. The National Wind Coordinating Committee has indicated that wind energy development carries the economic benefits of job and business creation while supporting local economies and reducing reliance on imported energy. Wind energy may also protect utilities and energy consumers from the economic risks associated with changing fuel prices, new environmental regulations, uncertain load growth, and other cost uncertainties. In addition, the National Wind Coordinating Committee has found the environmental benefits of wind energy development to be substantial by reducing a utility's pollutant emissions, thus easing regulatory pressure and meeting the public's desire for clean power sources. The National Wind Coordinating Committee summarizes the benefits of wind energy as being cost-competitive, creating no air pollution, and benefiting the public health, environment, and the economy. In addition, wind power does not require fuel, create pollution, or consume scarce resources.

Concerning the effect of wind energy development on state and local economies, the National Wind Coordinating Committee has identified several direct economic effects on the economy. Direct effects include increased revenues to local governments and landowners, creation of jobs and demand for local goods and services during construction and operation, and additional property tax revenues to local governments. Secondary or indirect effects identified by the National Wind Coordinating Committee include increased consumer spending power, economic diversification, and use of indigenous resources. For example, an article in the August 24, 2003, edition of the *Bismarck Tribune* noted that the 41 wind turbines being constructed east of Kulm will each generate \$5,000 annually in local tax revenue. The wind farm is located in the Kulm School District, which will receive 60 percent of the tax revenue--approximately \$120,000 per year.

Rural landowners can reap substantial economic rewards from wind energy development. Rent to landowners is paid because land rights for a wind energy project must be secured in advance by purchase or lease. The National Wind Coordinating Committee estimates that rural landowners may receive \$50 to \$100 per acre from wind energy development projects. In addition, in most cases, farming operations may continue undisturbed. Thus, a landowner is recognizing significant increased income while retaining use of that landowner's land.

Wind power plants generally can be constructed in less than a year. The National Wind Coordinating Committee estimates that for a 50-megawatt wind project, 40 full-time jobs may be created. Operation and maintenance of wind power plants generally require between two and five skilled employees for each 100 turbines. In addition, construction and operation of a

wind project creates demand for local goods and services such as construction materials and equipment, maintenance tools, supplies and equipment, and accounting, banking, and legal assistance. These economic benefits are not weakened by heavy demands on state and local infrastructure, and wind projects require little support from public services such as water and sewer systems, transportation networks, and emergency services. Wind energy projects also contribute to economic diversification in a local economy, thus ensuring greater stability by minimizing high and low points of business cycles. The National Wind Coordinating Committee indicates this effect may be particularly important in rural areas that generally have one-dimensional economies.

2003 WIND ENERGY LEGISLATION

The 58th Legislative Assembly considered several bills and resolutions relating to wind energy. Senate Bill No. 2310, as introduced, would have provided for wind turbine siting requirements and wind energy development contract provisions. This bill was amended to provide for a Legislative Council study of wind energy development.

House Bill No. 1340 would have provided for the release and surrender of terminated wind energy development leases, and notwithstanding any other provision of law, a lease for a wind energy development project or wind turbine terminates five years after the date of the lease unless at least 100 kilowatts of electricity was produced from a wind turbine located on the leasehold. This bill failed to pass the House.

House Bill No. 1378 requires the State Board of Higher Education to urge an institution under the board's jurisdiction to conduct a study of the feasibility and desirability of generating electricity from the state's wind energy resource for the purpose of producing hydrogen for fuel.

House Bill No. 1412 would have established renewable energy goals for state agencies, departments, and institutions. This bill failed to pass the House.

House Bill No. 1435 would have established a renewable energy production incentive program. This bill failed to pass the Senate.

Senate Bill No. 2244 would have provided for the development and operation of wind turbines by public school districts. This bill failed to pass the House.

Senate Concurrent Resolution No. 4012 would have established an official state wind power development objective of 10,000 megawatts of installed turbine capacity to be achieved by the year 2020 and directed all state departments, agencies, and commissions to adopt this official objective for planning and policy development purposes. This resolution failed to pass the Senate.

Senate Concurrent Resolution No. 4025 urges Congress to promote development of North Dakota's wind energy resource by appropriating funds to develop a two and one-half cents per kilowatt-hour wind energy production tax credit.

2001 WIND ENERGY LEGISLATION

The 57th Legislative Assembly enacted three bills concerning wind energy. House Bill No. 1223 allows installations on property leased by the taxpayer to qualify for long-form income tax credit for installation of geothermal, solar, or wind energy devices. To qualify for the credit, the device must be installed before January 1, 2011. For a device installed before January 1, 2001, the credit is equal to 5 percent per year for three years, or for a device installed after December 31, 2000, the credit is equal to 3 percent per year for five years, of the actual cost of acquisition and installation of the device.

House Bill No. 1221 provides a sales and use tax exemption for production equipment and tangible personal property used in construction of a wind-powered electrical generating facility before January 1, 2011, if a facility has an electrical energy generation unit with a nameplate capacity of 100 kilowatts or more.

House Bill No. 1222 reduces the taxable valuation of centrally assessed wind turbine electric generators from 10 percent of assessed value to 3 percent of assessed value if the generation unit has a nameplate generation capacity of 100 kilowatts or more and construction is completed before January 1, 2011.

POSSIBLE STUDY APPROACH

In conducting its study of issues related to wind energy development in this state, the committee could solicit testimony from a number of sources. These include the Public Service Commission and its staff, the Division of Community Services of the Department of Commerce, local economic development officials and wind energy proponents, and Wind Interests of North Dakota.

ATTACH:1