Prepared by the North Dakota Legislative Council staff for the Agriculture and Natural Resources Committee

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ENERGY RESOURCE UTILIZATION STUDY - BACKGROUND MEMORANDUM

House Concurrent Resolution No. 3028 (attached as Appendix A) directs the Legislative Council to study utilization of the state's abundant energy resources to attract energy-intensive economic development projects to the state. The resolution notes that the state possesses abundant energy resources, including both fossil fuels such as coal and oil and gas and renewable resources such as wind; that the state's energy producers have encountered significant obstacles in transmitting energy generated in this state to markets located outside the borders of this state; that one method to utilize the state's abundant energy resources would be to locate energy-intensive industries in this state; and that location of energy-intensive industries in this state would not only allow the state to utilize its abundant sources of energy but would create much-needed jobs and population growth in the state.

Proponents of the resolution testified that North Dakota has an abundance of energy resources in this state but that the state has encountered problems transmitting energy produced from these resources outside the state. One solution to this problem identified by the sponsors of the resolution would be to encourage businesses to relocate to North Dakota and utilize this energy in state.

OIL AND GAS PRODUCTION

Crude oil production totaled 97,168 barrels per day for July 2005, ranking North Dakota 10th out of the 31 oil- and gas-producing states and federal offshore areas. The state had 3,172 producing oil wells in July 2005, averaging 31 barrels of oil per day. The state produced 5,660,754 million cubic feet (mcf) of gas in March 2004, the most recent month for which statistics are available, and sold 4,528,795 mcf of gas in that month. The state has a single refinery, the Tesoro West Coast Refinery, located at Mandan, with a distillation capacity of 58,000 barrels per day.

The federal Department of Energy estimates that North Dakota has 353 million barrels of crude oil proved reserves, ranking the state eighth in the nation. The state has seven major crude oil pipelines, three major product pipelines, and two major liquefied petroleum gas pipelines.

COAL PRODUCTION

North Dakota's coal resources are in the form of lignite--a low-grade, low-sulfur coal. North Dakota mines produced 30.1 million tons of lignite coal in 2004, marking the sixth year in a row that over 30 million tons have been produced. Since 1988 the state's lignite production has consistently been near the 30 million ton range, making it one of 16 major coal-producing states, as measured by the Energy Information Administration. North Dakota ranked 11th among the 26 coal-producing states in 2003.

There are six active coal mines in North Dakota. There are four large mines and two small mines that produce leonardite. The large mines are BNI Coal, Ltd.'s Center Mine, Dakota Westmorland Corporation's Beulah Mine, Coteau Properties Company's Freedom Mine, and Falkirk Mining Company's Falkirk Mine. The Coteau Properties Company and Falkirk Mining Company are subsidiaries of the North American Coal Corporation. In addition to these mines, there are five other mines that have closed and remain permitted and bonded for reclamation purposes. These are the Gascoyne, Glenharold, Indian Head, Larson, and Royal Oak Mines. In 2004 the Freedom Mine, the state's largest lignite producer, sold over 15 million tons of lignite, which was used by four customers. These were Dakota Gasification Company's Great Plains Synfuels Plant, Basin Electric Cooperative's Antelope Valley and Leland Olds Stations, and Great River Energy's Stanton Station. The Falkirk Mine, the state's second largest lignite producer, sold 7.6 million tons of lignite in 1984. The primary customer of this mine is Great River Energy's Coal Creek Station, the largest of the state's power plants. The Center Mine, owned by BNI Coal, a subsidiary of Minnesota Power, produced 4.1 million tons of lignite, which was primarily sold to Minnkota Power Cooperative's Milton R. Young Station. The Beulah Mine produced three million tons of lignite. Otter Tail Power Company's Coyote Station and Montana-Dakota Utilities Company's Heskett Station purchased coal from the Beulah Mine.

The North Dakota Geological Survey estimates that western North Dakota contains an estimated 351 billion tons of lignite, the single largest deposit of lignite known in the world. The survey estimates that North Dakota also contains an estimated 25 billion tons of economically minable coal, enough to last for over 800 years at the present extraction rate of 32 million tons per year.

WIND ENERGY

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 due to 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.

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.

PRIMARY SECTOR ECONOMIC INCENTIVES

The Department of Commerce has compiled a schedule of incentive programs available to businesses in the state. These incentive programs are primarily finance tools and tax advantages which benefit primary sector businesses and corporations. The Department of Commerce has responsibility for certifying primary sector businesses, defined as an individual, corporation, partnership, or association which, through the employment of knowledge or labor, adds value to a product, process, or service that results in the creation of new wealth. These incentive programs are divided into income tax incentives, renaissance zones, property tax exemptions, sales tax exemptions, finance programs, training funds, and additional programs. These economic incentives are summarized in Appendix B.

POSSIBLE STUDY APPROACH

In conducting its study of utilization of these state's abundant energy resources to attract energy-intensive development projects to this state, the committee could solicit testimony from a number of sources. These include the Department of Commerce, Tax Commissioner, and the Greater North Dakota Chamber of Commerce.

ATTACH:2