

North Dakota Lignite Energy Industry's Contribution to the State Economy for 2002 and Projected for 2003

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This report provides estimates of the lignite industry's contribution to the North Dakota economy, using key economic indicators such as retail trade activity, personal income, total business activity, employment, and tax revenues. The estimates are based on actual industry expenditures for 2002 and projected expenditures for 2003. This analysis contains several measures of the relative importance of the lignite energy industry in North Dakota. First, the industry's share of the state's total sales to final demand (or exports) is evaluated. Second, the business volume generated by the industry is compared to the total gross business volume for the state. Expenditures were obtained from a survey of firms involved in lignite-related activities (mining or conversion) in North Dakota. Third, annual wages paid by lignite energy related industries will be compared to all industry wages in the state.

The methods used for this analysis are similar to those described in Coon et al. (1983) and Coon and Leistritz (1986). Expenditures of companies involved in lignite-related activities in North Dakota constitute the basic data for the study. The North Dakota Input-Output Model was used to analyze these data. The model uses interdependence coefficients, or multipliers, that measure the level of total gross business volume generated in each sector from an additional dollar of sales to final demand in a given sector. The input-output model applies the industry's expenditures to these interdependence coefficients. For a complete description of the input-output model, a listing of the coefficients, and how the model can be used to perform an economic contribution study, see Coon et al. (1985 and 1989). Resulting levels of business activity were used to estimate tax revenues and indirect and induced employment, based on historic relationships (Coon et al. 1992). Lignite industry sales for final demand for 2001 and the resulting level of business activity were compared to 2001 state values (the most recent data available) to indicate the industry's role in the economy. All values in this analysis are expressed in current year dollars (i.e., nominal dollars).

The expenditures of firms involved in lignite-related activities are assumed to work their way through the local economy the same as expenditures of firms in other sectors of the North Dakota economy. The estimated ratio of secondary employment (jobs generated in other sectors of the North Dakota economy) to direct employment (jobs in the mines and plants using lignite in the state) is higher for the lignite industry than for some other sectors of the state's economy. Firms in the lignite industry have higher levels of expenditures per employee than do most other economic sectors in the state, making the indirect employment per worker in the lignite and lignite conversion industries higher.

Results

The North Dakota lignite industry's in-state expenditures totaled \$514.0 million in 2002 and were projected at \$555.7 million for 2003 (Table 1), based on a survey of firms in the industry. Actual expenditures for 2002 were slightly lower than the level projected for that year--\$527.7 million (Coon and Leistritz 2002). [Overall, expenditures during the 1987-2002 period were higher than those for earlier years. In fact, 2002 expenditures were 48 percent higher than those for 1986, which were \$346.2 million (Coon and Leistritz 1987). It should be noted, however, that inflation was about 62 percent, nationwide, over this period.]

Actual 2002 outlays were lower than previous projections resulting primarily because retail trade sector expenditures were less than projected. Rising oil prices worldwide since 2000 may also have contributed to growth in the lignite energy industries. Since mid-1999, oil prices have risen rather dramatically which could lead to increased demand for lignite energy products. In fact, electric energy shortages in the United States in 2000 have stimulated discussions for building a new coal-fired plant in western North Dakota. Construction expenditures were lower than in 1996, the principal construction year for an anhydrous ammonia plant and an ammonium sulfate plant at the Dakota Gasification

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Sector	2002	2003
	-million dollars-	
Construction	21.9	34.4
Transportation	19.8	21.5
Communications and public utilities	40.8	43.2
Wholesale trade and misc. manufacturing	52.6	59.3
Retail trade	105.5	114.2
Finance, insurance, and real estate	40.8	44.1
Business and personal services	38.3	41.1
Professional and social services	22.9	23.0
Households	<u>171.4</u>	<u>174.9</u>
Total	514.0	555.7

facility near Beulah. Construction expenditures are projected to increase considerably in 2003, but this could be a sector with even larger increases in the future with the possible addition of a power plant.

Expenditures from firms involved in lignite-related activities generated total business activity of nearly \$1.5 billion for each year (Table 2). Expenditures by lignite-related firms resulted in \$391.8 million of retail sales activity in the state in 2002 and are projected at \$420.2 million for 2003. Also, the industry's activities generated \$511.7 million in personal income in 2002, with the 2003 level projected to be \$542.8 million.

Lignite industry companies contribute substantially to state tax revenues. Total taxes attributable to the industry were estimated to be \$72.1 million in 2002 and \$74.4 million in 2003 (Table 3). Coal severance and energy conversion taxes constituted 17 percent and 37 percent of the total, respectively, in 2002. In addition to the 3,763 workers directly employed in 2002 and the projected 3,803 workers for 2003, the industry supported jobs for over 16,000 indirect workers (secondary employment) from business activity attributable to the lignite industry in each of these years (Table 4).

Item	2002	2003
	-million dollars-	
Personal income	511.7	542.8
Retail sales	391.8	420.2
Business activity for all business sectors ^a	898.2	976.8
Total business activity	1,541.8	1,663.1

^a Includes all sectors except agriculture (livestock and crops), households, and government.

Tax Revenue	2002	2003
	-million dollars-	
Coal severance	12.2	12.2
Energy conversion	26.8	26.8
Sales and use	18.1	19.5
Personal and corporate income	10.5	11.2
Other	<u>4.5</u>	<u>4.7</u>
Total	72.1	74.4

Employment	2002	2003
Direct	3,763	3,803
Secondary	16,223	17,404

Two additional measures can be used to show the importance of the lignite industry to the North Dakota economy: sales for final demand and business activity. When lignite energy industry sales for final demand for 2001 (\$1,070.5 million) were compared with the total economic base (sales for final demand or exports) for North Dakota for 2001, the last year the data were available (\$15,359.0 million), they comprised 7.0 percent of the state's total (Coon and Leistritz 2003). When petroleum exploration, extraction, and refining were included, the energy

sectors accounted for 11.0 percent of the state's total economic base in 2001. Business activity generated by the lignite industry's sales for final demand (\$2,417.7 million) was 5.0 percent of the 2001 state total gross business volume (\$47,928.7 million). These measures show that the lignite energy industry plays an important role in the North Dakota economy.

Wages paid annually in the state's coal mining sector were the highest of any in North Dakota (\$62,975 in 2000 and \$66,177 in 2001) (Table 5). These salaries were more than 2.6 times that of all covered wages in North Dakota in 2000 and 2001, the latest years data were available. Following closely behind coal mining wages were gas production and electrical production salaries. The lignite energy industry (coal production and conversion) provides the highest average wages of any industry in North Dakota.

Industry	2000	2001
Agriculture	21,561	22,093
Mining	44,305	48,296
Coal Mining	62,975	66,177
Construction	31,214	31,849
Manufacturing	30,570	31,494
Trans, Comm, Utilities	34,465	35,547
Electrical Production	52,622	56,777
Gas Production	58,389	60,226
Wholesale Trade	31,994	32,657
Retail Trade	13,867	14,491
FIRE	30,364	31,729
Services	22,817	23,994
Government	<u>26,361</u>	<u>27,283</u>
TOTAL	24,683	25,707

Source: Job Service North Dakota, 2001 and 2002.

Table 6 presents data that shows mining wages are much higher than all wages for state regions that have lignite energy activities. State Region 7 had the highest mining industry wages per employee in 2000 (\$60,766) and 2001 (\$63,402). County mining and all industry wages are presented in Table 7 for those with mining activities. These data were consolidated to avoid disclosure problems but still provide a good indication of the extent mining wages were above those for all industries. Mercer County had the highest

mining wages of all counties in 2000 and 2001. Wage data presented helps to show the benefits the lignite energy industry provides in North Dakota. It contributes to the state's economy through business activity, tax revenues, and employment. On a local and regional basis, the lignite energy industry provides good paying jobs that help keep people in North Dakota.

Region	2000		2001	
	Mining	Total	Mining	Total
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Region 1	38,353	22,194	44,309	24,264
Region 2	34,611	21,842	38,880	22,746
Region 7	60,766	26,308	63,402	27,686
Region 8	39,357	20,651	43,468	21,893

Source: Job Service North Dakota, 2002.

Region	2000		2001	
	Mining	Total	Mining	Total
-----\$-----				
Adams	N/A	19,407	N/A	21,302
Bowman	31,640	18,126	39,475	20,101
McLean	53,206 ^a	25,880	48,642 ^a	27,140
Mercer	61,514	36,122	64,281	38,045
Oliver	55,083 ^b	42,407	61,144 ^b	46,464
Williams	39,212	22,521	45,332	24,810
N. Dakota	44,305	24,683	48,296	25,707

^aIncludes mining and construction industries to avoid disclosure
^bIncludes agriculture, mining, construction, and manufacturing industries to avoid disclosure.
Source: Job Service North Dakota, 2001 and 2002.

The lignite energy industry's economic contribution to the North Dakota economy has been assessed annually since 1982. The North Dakota Lignite Council, the North Dakota Industrial Commission, and recently the Lignite Energy Council have funded these studies. For a discussion of the annual economic contributions the lignite energy industry (that is, those firms involved in the mining or conversion of the state's lignite) has made from 1982 through 1996, see Coon et al. (1983) and Coon and Leistritz (annually 1985-2002).

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