
North Dakota Lignite Energy Industry's Contribution to the State Economy for 2000 and Projected for 2001

Randal C. Coon and F. Larry Leistritz*

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 2000 and projected expenditures for 2001. 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 1999 and the resulting level of business activity were compared to 1999 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 \$462.2 million in 2000 and were projected at \$517.4 million for 2001 (Table 1), based on a survey of firms in the industry. Actual expenditures for 2000 were slightly lower than the level projected for that year--486.3 million (Coon and Leistritz 2000). [Overall, expenditures during the 1987-2000 period were higher than those for earlier years. In fact, 2000 expenditures were 34 percent higher than those for 1986, which were \$346.2 million (Coon and Leistritz 1987). It should be noted, however, that inflation was about 51 percent, nationwide, over this period.]

*Research specialist and professor, Department of Agricultural Economics, North Dakota State University, Fargo.

Table 1. Estimated North Dakota Direct Expenditures by Economic Sector for Companies Involved in Lignite-related Activities, 2000 and Preliminary 2001

Sector	2000	2001
	-million dollars-	
Construction	34.3	46.8
Transportation	16.1	14.1
Communications and public utilities	43.9	52.8
Wholesale trade and misc. manufacturing	36.9	37.3
Retail trade	93.2	105.2
Finance, insurance, and real estate	52.6	53.0
Business and personal services	17.3	30.8
Professional and social services	22.0	19.4
Households	<u>145.9</u>	<u>158.0</u>
Total	462.2	517.4

Table 2. Estimated Direct Plus Indirect Personal Income, Retail Sales Activity, Business Activity for All Business Sectors, and Total Business Activity for Companies Involved in Lignite-related Activities, 2000 and Preliminary 2001

Item	2000	2001
	-million dollars-	
Personal income	460.1	504.6
Retail sales	349.4	386.8
Business activity for all business sectors ^a	<u>808.2</u>	<u>898.2</u>
Total business activity	1,378.7	1521.3

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

Actual 2000 outlays were less than previous projections resulting primarily because construction, finance-insurance-real estate, and household sector expenditures were not as large as projected. Low oil prices worldwide in early 1999 may also have contributed to less than expected growth in the lignite energy industries. However, since mid-1999 oil prices have risen rather dramatically and could lead to increased demand for lignite energy products. 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 facility near Beulah. Construction expenditures are projected to increase slightly in 2001 but could be a sector with large increases in the future with the possible addition of a power plant due to shortages of electricity within the United States.

Expenditures from firms involved in lignite-related activities generated total business activity of nearly \$1.4 billion for each year (Table 2). Expenditures by lignite-related firms resulted in \$349.8 million of retail sales activity in the state in 2000 and are projected at \$386.8 million for 2001. Also, the industry's activities generated 460.1 million in personal income in 2000, with the 2001 level projected to be \$504.6 million.

Lignite industry companies contribute substantially to state tax revenues. Total taxes attributable to the industry were estimated to be \$61.4 million in 2000 and \$64.8 million in 2001 (Table 3). Coal severance and energy conversion taxes constituted 29 percent and 25 percent of the total, respectively, in 2000. In addition to the 2,894 workers directly employed in 2000 and the projected 2,927 workers for 2001, the industry supported jobs for over 15,000 indirect workers (secondary employment) from business activity attributable to the lignite industry in each of these years (Table 4).

Table 3. Estimated State Tax Revenue Resulting from Activities of Companies Involved in Lignite-related Activities, 1999 and Preliminary 2001		
Tax Revenue	2000	2001
	-million dollars-	
Coal severance	18.0	17.9
Energy conversion	15.3	16.1
Sales and use	16.2	17.9
Personal and corporate income	8.5	9.4
Other	<u>3.4</u>	<u>3.5</u>
Total	61.4	64.8

Table 4. Estimated Direct and Secondary Employment for Companies Involved in Lignite-related Activities, 2000 and Preliminary 2001		
Employment	2000	2001
Direct	2,894	2,927
Secondary	15,295	16,825

Table 5. North Dakota Covered Annual Average Wages By Industry, 1998 and 1999		
Industry	1998	1999
Agriculture	20,740	20,991
Mining	40,770	42,981
Coal Mining	60,444	64,642
Construction	28,808	31,446
Manufacturing	28,992	29,711
Trans,Comm,Utilities	33,115	32,995
Electrical Production	49,551	50,126
Gas Production	55,629	55,306
Wholesale Trade	29,872	30,591
Retail Trade	12,849	13,298
FIRE	28,132	28,740
Services	20,782	21,702
Government	<u>24,965</u>	<u>25,404</u>
TOTAL	22,992	23,750

Source: Job Service North Dakota, 1999 and 2000.

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 1999 (\$891.3 million) were compared with the total economic base (sales for final demand or exports) for North Dakota for 1999, the last year the data were available (\$13,462.3 million), they comprised 6.6 percent of the state's total (Coon and Leistriz 2001). When petroleum exploration, extraction, and refining were included, the energy sectors accounted for 10.4 percent of the state's total economic base in 1999. Business activity generated by the lignite industry's sales for final demand (\$2,022.1 million) was 4.8 percent of the 1999 state total gross business volume (\$42,433.8 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 (\$60,444 in 1998 and \$64,642 in 1999)(Table 5). These salaries were more than 2.6 times that of all covered wages in North Dakota in 1998 and 1999, 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.

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 1998 (\$57,781) and 1998 (\$60,939). 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 1998 and 1999. 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.

Table 6. Covered Annual Average Wages For Mining and All Industries, For State Planning Regions Involved in Mining, 1998 and 1999

Region	1998		1999	
	Mining	Total	Mining	Total
	-----\$-----			
Region 1	35,686	20,851	36,397	20,912
Region 2	31,391	20,437	33,069	21,005
Region 7	57,781	24,741	60,939	25,293
Region 8	36,445	19,632	37,648	19,957

Source: Job Service North Dakota, 2000.

Table 7. Covered Annual Average Wages For Mining and All Industries, For Counties Involved in Mining, 1997 and 1998

Region	1998		1999	
	Mining	Total	Mining	Total
Bowman	31,719	17,523	26,579	17,351
McLean	51,212 ^a	24,886	52,970 ^a	25,999
Mercer	59,243	33,905	62,997	34,567
Oliver	50,831 ^b	40,576	54,092	40,618
Williams	36,952	21,403	37,563	21,212
North Dakota	40,770	22,992	42,981	23,750

^a Includes agriculture, mining, and construction industries to avoid disclosure.
^b Includes agriculture, mining, construction, and manufacturing industries to avoid disclosure.

Source: Job Service North Dakota, 1999 and 2000.

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 Leistriz

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