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# North Dakota Lignite Energy Industry's Contribution to the State Economy for 2001 and Projected for 2002

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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 2001 and projected expenditures for 2002. 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 2000 and the resulting level of business activity were compared to 2000 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 $536.4 million in 2001 and were projected at $527.7 million for 2002 (Table 1), based on a survey of firms in the industry. Actual expenditures for 2001 were slightly higher than the level projected for that year--$517.4 million (Coon and Leistritz 2001). [Overall, expenditures during the 1987-2001 period were higher than those for earlier years. In fact, 2001 expenditures were 55 percent higher than those for 1986, which were $346.2 million (Coon and Leistritz 1987). It should be noted, however, that inflation was about 61 percent, nationwide, over this period.]

Actual 2001 outlays were higher than previous projections resulting primarily because the construction and household sector expenditures were larger than projected. Rising oil prices worldwide in 2000 may also have contributed to growth in the lignite energy industries. Since mid-1999, oil prices have risen rather dramatically and 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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Table 1. Estimated North Dakota Direct Expenditures by Economic Sector for Companies Involved in Lignite-related Activities, 2001 and Preliminary 2002

| Sector | 2001 | 2002 |
|---|---|---|
| | -million dollars- | |
| Construction | 47.1 | 19.6 |
| Transportation | 16.3 | 18.7 |
| Communications and public utilities | 46.6 | 46.2 |
| Wholesale trade and misc. manufacturing | 55.2 | 52.2 |
| Retail trade | 109.1 | 121.8 |
| Finance, insurance, and real estate | 41.2 | 40.7 |
| Business and personal services | 33.1 | 31.3 |
| Professional and social services | 21.2 | 21.7 |
| Households | 166.6 | 175.5 |
| Total | 536.4 | 527.7 |

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, 2001 and Preliminary 2002

| Item | 2001 | 2002 |
|---|---|---|
| | -million dollars- | |
| Personal income | 519.9 | 520.0 |
| Retail sales | 402.1 | 412.1 |
| Business activity for all business sectors [a] | 939.5 | 915.2 |
| Total business activity | 1,594.7 | 1,569.3 |

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

Table 3. Estimated State Tax Revenue Resulting from Activities of Companies Involved in Lignite-related Activities, 2001 and Preliminary 2002

| Tax Revenue | 2001 | 2002 |
|---|---|---|
| | -million dollars- | |
| Coal severance | 15.6 | 10.8 |
| Energy conversion | 21.6 | 23.9 |
| Sales and use | 18.6 | 19.1 |
| Personal and corporate income | 10.7 | 10.6 |
| Other | 3.9 | 3.8 |
| Total | 70.4 | 68.2 |

Table 4. Estimated Direct and Secondary Employment for Companies Involved in Lignite-related Activities, 2001 and Preliminary 2002

| Employment | 2001 | 2002 |
|---|---|---|
| Direct | 3,094 | 3,106 |
| Secondary | 16,826 | 16,464 |

facility near Beulah. Construction expenditures are projected to decrease slightly in 2002 but could be a sector with large 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 $1.6 billion for each year (Table 2). Expenditures by lignite-related firms resulted in $402.1 million of retail sales activity in the state in 2001 and are projected at $412.1 million for 2002. Also, the industry's activities generated 519.9 million in personal income in 2001, with the 2002 level projected to be $520.0 million.

Lignite industry companies contribute substantially to state tax revenues. Total taxes attributable to the industry were estimated to be $70.4 million in 2001 and $68.2 million in 2002 (Table 3). Coal severance and energy conversion taxes constituted 22 percent and 31 percent of the total, respectively, in 2001. In addition to the 3,094 workers directly employed in 2001 and the projected 3,106 workers for 2002, 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).

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 2000 ($1,023.8 million) were compared with the total economic base (sales for final demand or exports) for North Dakota for 2000, the last year the data were available ($14,290.3 million), they comprised 7.2 percent of the state's total (Coon and Leistritz 2002). When petroleum exploration, extraction, and refining were included, the energy sectors accounted for 12.5 percent of the state's total

economic base in 2000. Business activity generated by the lignite industry's sales for final demand ($2,314.2 million) was 5.2 percent of the 2000 state total gross business volume ($44,180.1 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 ($64,642 in 1999 and $62,975 in 2000) (Table 5). These salaries were more than 2.6 times that of all covered wages in North Dakota in 1999 and 2000, 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 5. North Dakota Covered Annual Average Wages By Industry, 1999 and 2000

| Industry | 1999 | 2000 |
|---|---|---|
| Agriculture | 20,991 | 21,561 |
| Mining | 42,981 | 44,305 |
| Coal Mining | 64,642 | 62,975 |
| Construction | 31,446 | 31,214 |
| Manufacturing | 29,711 | 30,570 |
| Trans, Comm, Utilities | 32,995 | 34,465 |
| Electrical Production | 50,126 | 52,622 |
| Gas Production | 55,306 | 58,389 |
| Wholesale Trade | 30,591 | 31,994 |
| Retail Trade | 13,298 | 13,867 |
| FIRE | 28,740 | 30,364 |
| Services | 21,702 | 22,817 |
| Government | 25,404 | 26,361 |
| TOTAL | 23,750 | 24,683 |

Source: Job Service North Dakota, 2000 and 2001.

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 1999 ($60,939) and 2000 ($60,766). 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 1999 and 2000. 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, 1999 and 2000

| | 1999 | | 2000 | |
|---|---|---|---|---|
| Region | Mining | Total | Mining | Total |
| | ----------$---------- | | | |
| Region 1 | 36,397 | 20,912 | 38,353 | 22,194 |
| Region 2 | 33,069 | 21,005 | 34,611 | 21,842 |
| Region 7 | 60,939 | 25,293 | 60,766 | 26,308 |
| Region 8 | 37,648 | 19,957 | 39,357 | 20,651 |

Source: Job Service North Dakota, 2001.

Table 7. Covered Annual Average Wages For Mining and All Industries, For Counties Involved in Mining, 1999 and 2000

| | 1999 | | 2000 | |
|---|---|---|---|---|
| Region | Mining | Total | Mining | Total |
| | ----------$---------- | | | |
| Adams | N/A | 19,359 | N/A | 19,407 |
| Bowman | 26,579 | 17,351 | 31,640 | 18,126 |
| McLean | 52,970[a] | 25,999 | 53,206[b] | 25,880 |
| Mercer | 62,997 | 34,567 | 61,514 | 36,122 |
| Oliver | 54,092 | 40,618 | 55,083[c] | 42,407 |
| Williams | 37,563 | 21,212 | 39,212 | 22,521 |
| N. Dakota | 42,981 | 23,750 | 44,305 | 24,683 |

[a] Includes agriculture, mining, and construction industries to avoid disclosure.
[b] Includes mining and construction industries to avoid disclosure.
[c] Includes agriculture, mining, construction, and manufacturing industries to avoid disclosure.
Source: Job Service North Dakota, 2000 and 2001.

*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 1985-2001).*

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