

A Statistical Analysis of the North Dakota Lignite Industry's Contribution to the State Economy for 1988 and Projected 1989

Randal C. Coon and F. Larry Leistriz

The economic contribution the lignite industry makes to the North Dakota economy has been assessed on an annual basis since 1982. Funding for the prior analyses has been provided by the North Dakota Lignite Council; funding for this research project, however, was provided by the North Dakota Industrial Commission. Economic contributions the lignite industry (i.e., firms involved in the mining and conversion of the state's lignite) has made to the state's economy have been previously determined on an annual basis for the period 1982 to 1987 (Coon et al. 1983; Coon and Leistriz 1985; Coon and Leistriz 1986; Coon and Leistriz 1987; Coon and Leistriz 1988). This report will provide an assessment of the lignite industry's contribution to the state economy for 1988 based on actual expenditures and preliminary estimates for 1989. Key economic indicators (e.g., retail trade activity, personal income, total business activity, employment, and tax revenues) will be addressed in this analysis.

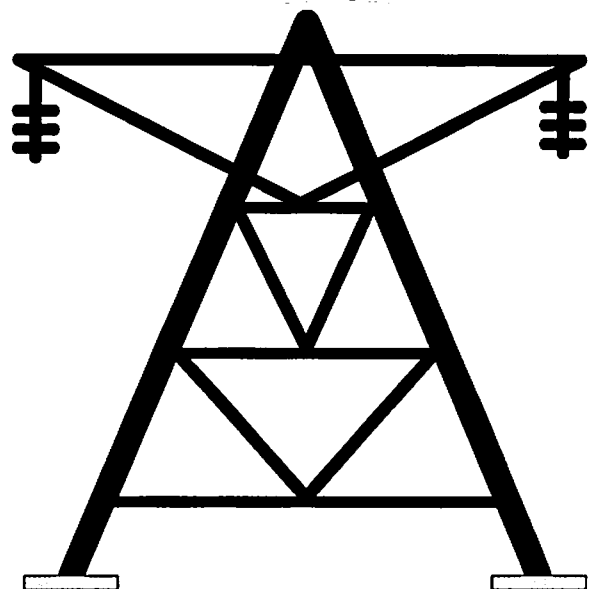
Methodology for this analysis is similar to that used previously (for a complete description, see Coon et al. 1983 and Coon and Leistriz 1986). Expenditures in North Dakota as reported by companies involved in lignite-related activities were collected by means of a survey, and the North Dakota Input-Output model was used to analyze these data. The interdependence coefficients or multipliers (that measure the number of times each expenditure dollar "turns over" before it leaves the state) of the input-output model were applied to these expenditures. 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 Coon et al. 1988. Resulting levels of business activity were used to estimate such economic indicators as tax revenues and indirect and induced employment based on historic relationships (Coon et al. 1984).

It is assumed that the expenditures made by firms involved in lignite-related activities work

their way through the local economy in much the same way as expenditures made by firms in other sectors of the North Dakota economy. The estimated ratio of secondary employment (that is, jobs generated in other sectors of the North Dakota economy) to direct employment (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. This is to be expected because of the capital-intensive nature of the industry. That is, firms in the lignite industry have much higher levels of expenditures per employee than do most other economic sectors in the state so that the indirect and induced employment per worker in the lignite and lignite conversion industries is higher than for other basic economic sectors.

Results

The North Dakota lignite industry is an important component of the state's economy. The industry's in-state expenditures totaled \$343.9 million in 1988 and were estimated to amount to



\$356.4 million for 1989 (Table 1). Actual expenditures for 1988 were somewhat higher than the projected level for that year (Coon and Leistriz 1988) and reflect the increased usage of electrical energy in 1988 primarily due to the extreme summer heat (additional electricity was needed for air conditioning, etc.). Expenditures for the period 1988-1989 are slightly larger than those for 1987 (Coon and Leistriz 1988). These increases in expenditures tend to indicate that the period of stable coal production and conversion activities in North Dakota has given way to a modest growth trend in recent years. The abundant supplies of lower-priced petroleum that

Table 1. Estimated North Dakota Expenditures by Economic Sector for Companies Involved in Lignite-Related Activities, 1988 and Preliminary 1989.

Sector	1988	1989
<i>---million dollars---</i>		
Construction	49.6	43.5
Transportation	13.7	8.0
Communications and public utilities	43.7	42.7
Wholesale trade and misc. manufacturing	24.7	26.7
Retail trade	24.3	25.5
Finance, insurance, real estate	29.8	32.4
Business and personal services	13.4	24.7
Professional and social services	2.6	2.9
Households	142.1	150.0
TOTAL	343.9	356.4

existed several years ago have disappeared resulting in renewed growth in demand for North Dakota's lignite and lignite products (i.e., particularly electricity).

Expenditures from firms involved in lignite-related activities generated total business activity in excess of \$1 billion for each year (Table 2). Lignite industry companies contribute heavily to state tax revenues; total taxes attributable to the industry were estimated to be \$60.1 million in 1988 and \$58.7 million in 1989 (Table 3). Coal severance and energy conversion taxes constituted the major portion of the total. In addition to the 3,668 workers directly employed in 1988 and the projected 3,740 workers for 1989, the industry provided jobs for nearly 14,000 indirect and in-

duced workers in each of these years as a result of the levels of business activity attributable to the lignite industry (Table 4).

Table 2. Estimated Personal Income, Retail Sales Activity, Total Business Activity of All Business Sectors, and Total Business Activity For Companies Involved in Lignite-Related Activities, 1988 and Preliminary 1989.

Item	1988	1989
<i>---million dollars---</i>		
Personal income	373.6	390.6
Retail sales	226.6	236.2
Total business activity for all business sectors*	584.5	606.4
Total business activity	1,037.8	1,079.8

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

Table 3. Estimated State Tax Revenues Resulting From Activities of Companies Involved in Lignite-Related Activities, 1988 and Preliminary 1989.

Tax Revenue	1988	1989
<i>---million dollars---</i>		
Coal severance	22.4	22.7
Energy conversion	12.3	10.3
Sales and use	9.2	9.6
Personal and corporate income	9.7	10.1
Other	6.5	6.0
TOTAL	60.1	58.7

Table 4. Estimated Direct and Secondary Employment For Companies Involved In Lignite-Related Activities, 1988 and Preliminary 1989.

Employment	1988	1989
Direct	3,668	3,740
Secondary	13,649	14,102

References

- Coon, Randal C. and F. Larry Leistritz. 1985. *The Contribution of North Dakota's Lignite Industry To The State Economy, 1984 and 1985: A Statistical Analysis*. AE 85016. Fargo: North Dakota State University, Dept. of Agr. Econ..
- Coon, Randal C. and F. Larry Leistritz. 1986. *North Dakota Lignite Industry's Contribution To The State Economy*. Agr. Econ. Misc. Rpt. No. 99. Fargo: North Dakota State University, Dept. of Agr. Econ..
- Coon, Randal C. and F. Larry Leistritz. 1987. *The Contribution of North Dakota's Lignite Industry To The State Economy, 1986 and 1987: A Statistical Analysis*. AE 87003. Fargo: North Dakota State University, Dept. of Agr. Econ..
- Coon, Randal C., John F. Mittleider, and F. Larry Leistritz. 1983. *Economic Analysis Of The North Dakota Lignite Industry*. Agr. Econ. Misc. Rpt. No. 67. Fargo: North Dakota State University, Dept. of Agr. Econ..
- Coon, Randal C., Carlene F. Vocke, William Ransom-Nelson, and F. Larry Leistritz. 1984. *North Dakota Economic-Demographic Assessment Model (NEDAM): Technical Description Of Update And Enhancement*. Agr. Econ. Misc. Rpt. No. 75. Fargo: North Dakota State University, Dept. of Agr. Econ..
- Coon, Randal C., F. Larry Leistritz, Thor A. Hertsgaard, and Arlen G. Leholm. 1985. *The North Dakota Input-Output Model: A Tool For Analyzing Economic Linkages*. Agr. Econ. Rpt. No. 187. Fargo: North Dakota State University, Dept. of Agr. Econ..
- Coon, Randal C., F. Larry Leistritz. 1988. *A Statistical Analysis of the North Dakota Lignite Industry's Contribution to the State Economy for 1987 and Projected 1988*. AE88002. Fargo: North Dakota State University, Dept. of Agr. Econ..
- Coon, Randal C., F. Larry Leistritz, and Thor A. Hertsgaard. 1988. *North Dakota Input-Output Economic Projection Model (NDIOIEPM): Software and Documentation*. Agr. Econ. Software Series No. 1. Fargo: North Dakota State University, Dept. of Agr. Econ..

Coon is research specialist and Leistritz is professor, Department of Agricultural Economics, North Dakota State University, Fargo.