

ENERGY USE PATTERNS IN NEBRASKA MANUFACTURING

Like most Americans, people of Nebraska are accustomed to energy-intensive life-styles. According to a major oil company executive:

We in the United States, more than any other nation on earth, have learned to let machinery do our hard work. Pure muscle power accounts for less than one percent of the energy used in turning out the products of the nation's factories, mills, and other industrial plants. Energy produces our raw materials, powers our manufacturing, cooks our food and heats our homes. Except for walking, all of our transportation is provided by energy-fuels—including the manufacture of our bicycles. Adequate supplies of energy have become fundamental to our society: to our standard of living, to our national security, and to the nation's ability to support the population.¹

While resource scarcity is a recurring theme in the history of civilization, most Nebraskans, until very recently, were largely unaware of the contribution made by abundant low-cost energy sources to their rising living standards. Events of the 1970s, how-

¹B. R. Dorsey, commencement address delivered at the University of Pittsburgh in August, 1973, and published in the *Pittsburgh Business Review*, September-October, 1973, p. 1.

ever, reaffirmed our dependence upon these energy resources. The oil boycott and OPEC pricing policies awakened us to our increasing reliance on imported fossil fuels. Issues raised by environmentalists concerning the quality of life forced us to consider possible environment/economic growth tradeoffs. And, the harshness of this past winter revealed acute problems in the supply and distribution of natural gas in the United States.

The State of Nebraska possesses relatively small quantities of resources which are used to generate energy. As a consequence, most of the state's energy needs must be met by importing these resources from energy-rich neighboring states. A sizable portion of these resources is used to generate energy for the manufacturing sector of the Nebraska economy. While manufacturing activity in the state is small in comparison to many states, this sector absorbs approximately one-fourth of the energy consumed in Nebraska. This study examines the energy use patterns of the manufacturing sector of the Nebraska economy.

ENERGY CONSUMPTION IN MANUFACTURING

Manufacturers use about one-third of the energy consumed in the United States. Numerous factors influence fuel consumption patterns within this sector of the economy: differences in the composition of final demand, (Continued on page 2)

Table 1
ENERGY CONSUMPTION IN MANUFACTURING, 1974
(billions of kilowatt-hour equivalents: KWHEs)

| | Nebraska | | United States | |
|-----------------------------------|----------|---------|---------------|---------|
| | KWHEs | Percent | KWHEs | Percent |
| Coal | 1.95 | 12.0 | 366.9 | 9.3 |
| Coke | .08 | 0.5 | 111.9 | 2.9 |
| Distillate fuel oil | .40 | 2.5 | 212.3 | 5.4 |
| Residual fuel oil | .08 | 0.5 | 296.1 | 7.5 |
| Natural gas | 9.95 | 61.0 | 1923.0 | 49.0 |
| Purchased electricity | 2.07 | 12.7 | 616.8 | 15.7 |
| Other fuels | .46 | 2.8 | 119.7 | 3.0 |
| Fuels not specified by kind | 1.31 | 8.0 | 278.0 | 7.1 |
| Total | 16.30 | 100.0 | 3924.7 | 100.0* |

*Due to rounding, column sum does not equal column total.

Source: U.S. Bureau of the Census, *Annual Survey of Manufactures 1974: Fuels and Electric Energy Consumed - States, by Industry Group, and United States, by Industry (Revised)*.

Note: Kilowatt-hour equivalents are an internationally recognized unit of energy measure. The following conversion factors to kilowatt-hour equivalents were used by the Bureau of the Census in its *Annual Survey of Manufactures, 1974* series.

| Kind of fuel | Unit of measure | Kilowatt-hour equivalent per unit of measure |
|--------------|---------------------------|----------------------------------------------|
| Coal | Short ton | 7,677.0 |
| Coke | Short ton | 7,618.0 |
| Fuel oil: | | |
| Distillate | Barrel (42 gal.) | 1,707.0 |
| Residual | Barrel (42 gal.) | 1,842.0 |
| Natural gas | MCF (thousand cubic feet) | 303.3 |
| Other fuels | Dollar | 168.3 |

(Continued from page 1) differences in environmental impacts and regulations, relative prices for fuels, and expectations of future fuel prices and availability. In the 1960s, the manufacturing sector significantly increased its use of natural gas and distillate fuel oils. More recently, sharp price increases and growing concern over the future availability of natural gas and petroleum products resulted in greater reliance by the manufacturing sector on electricity as a source of energy.

Natural gas remains the principal source of energy for this sector. Table 1 (page 1) shows fuel consumption patterns for the manufacturing sector in the United States and in Nebraska. To facilitate comparability, quantities of all fuels consumed were converted to kilowatt-hour equivalents.² Taking into account those fuels which were consumed in the manufacturing sector but not reported by fuel type, natural gas accounted for more than one-half of the fuel used by U.S. manufacturers in 1974.³ Consumption of electricity was distant second.

The Nebraska manufacturing sector is also a heavy user of natural gas. In fact, Nebraska industrialists rely more heavily on this energy source than do their U.S. counterparts. In 1974, natural gas provided more than 60 percent of the energy used by manufacturers in the state. In comparison to U.S. firms, Nebraska industrialists also rely more heavily on coal as a source of energy. Electricity, on the other hand, accounted for a smaller portion of

²Conversion factors to kilowatt-hour equivalents are presented in the note to Table 1.

³Some distortion in fuel consumption patterns for the United States may exist, since 1974 was a year of recession. This observation is less applicable to consumption patterns in Nebraska. Evidence indicates that manufacturing activity increased in the state that year.

Table 2
ENERGY CONSUMPTION BY MANUFACTURING INDUSTRY
IN NEBRASKA, 1974

(billions of kilowatt-hour equivalents: KWHEs)

| | KWHEs | % of Total Manufacturing Consumption in Nebraska |
|----------------------------------------|-------|-----------------------------------------------------------|
| Food and Kindred Products | 6.5 | 39.9 |
| Paper and Allied Products | .1 | 0.6 |
| Printing and Publishing | .1 | 0.6 |
| Chemicals and Allied Products | 4.4 | 27.0 |
| Petroleum and Coal Products | .1 | 0.6 |
| Rubber and Plastics Products | .3 | 1.8 |
| Stone, Clay, and Glass Products | 2.6 | 16.0 |
| Primary Metal Industries | .8 | 4.9 |
| Fabricated Metal Products | .1 | 0.6 |
| Machinery, except Electrical | .6 | 3.7 |
| Electrical Equipment and Supplies | .2 | 1.2 |
| Instruments and Related Products | .1 | 0.6 |
| Miscellaneous Manufacturing Industries | .1 | 0.6 |
| Total | 16.3* | 100.0* |

*Column sums do not equal column totals due to rounding and due to the removal of industries which consumed very small quantities of fuel in Nebraska in 1974.

Source: U.S. Bureau of the Census, *Annual Survey of Manufactures 1974: Fuels and Electric Energy Consumed - States, by Industry Group, and United States, by Industry (Revised)*.

energy consumption in Nebraska manufacturing than it did for U.S. producers. Fuel oil and coke provided only a small fraction of the energy consumed by manufacturers in the state.

Aside from revealing differences in fuel consumption patterns between Nebraska and U.S. manufacturers, the data also indicate that Nebraska manufacturers are not major consumers of the nation's energy resources. Of the 3924.7 billion kilowatt-hour

Table 3
ENERGY INTENSIVENESS OF MANUFACTURING INDUSTRIES
AND THE DISTRIBUTION OF NEBRASKA MANUFACTURING
EMPLOYMENT IN THESE INDUSTRIES
1974

| | KWHEs per Employee in U.S. Manufacturing Industries (millions) | Nebraska Manufacturing Employment | Percent of Nebraska Manufacturing Employment |
|----------------------------------------|----------------------------------------------------------------------------|-----------------------------------------|-------------------------------------------------------|
| Petroleum and Coal Products | 2.3132 | 224 | 0.2 |
| Chemicals and Allied Products | .8121 | 2,454 | 2.6 |
| Primary Metal Industries | .5761 | 2,942 | 3.1 |
| Stone, Clay, and Glass Products | .5672 | 2,648 | 2.8 |
| Paper and Allied Products | .5557 | 1,130 | 1.2 |
| Food and Kindred Products | .1636 | 26,097 | 27.8 |
| Lumber and Wood Products | .1271 | 2,366 | 2.5 |
| Rubber and Plastics Products | .1105 | 4,402 | 4.7 |
| Textile Mill Products | .0956 | 321 | 0.3 |
| Fabricated Metal Products | .0802 | 7,014 | 7.5 |
| Tobacco Products | .0742 | --- | --- |
| Transportation Equipment | .0603 | 3,649 | 3.9 |
| Machinery, except Electrical | .0486 | 12,126 | 12.9 |
| Instruments and Related Products | .0400 | 3,239 | 3.4 |
| Electrical Equipment and Supplies | .0362 | 10,966 | 11.7 |
| Miscellaneous Manufacturing Industries | .0335 | 1,523 | 1.6 |
| Furniture and Fixtures | .0331 | 2,045 | 2.2 |
| Leather and Leather Products | .0241 | (a) | --- |
| Printing and Publishing | .0238 | 6,477 | 6.9 |
| Apparel and Other Textile Products | .0141 | 2,087 | 2.2 |
| U.S. - Total Manufacturing | .1958 | --- | --- |

(a) 100-249 employees.

Sources: Bureau of the Census, *Annual Survey of Manufactures 1974: Fuels and Electric Energy Consumed - States, by Industry Group, and United States, by Industry (Revised)*, and *County Business Patterns 1974: Nebraska*.

equivalents of energy consumed by U.S. manufacturing activity in 1974, only 16.3 billion were consumed by Nebraska firms. This amounted to less than one-half of one percent of manufacturing energy consumed in the United States.

Patterns of fuel use in Nebraska manufacturing also confirm the importance of agricultural activities in the state's economy. Table 2 (page 2) shows the distribution of energy consumption by Nebraska manufacturers in 1974. Industries are categorized by the Standard Industrial Classification (SIC). Nearly 40 percent of the energy was consumed by firms engaged in the production of food and food-related products. The second major consumer of energy by Nebraska manufacturers was the chemical industry (27 percent of the energy used in Nebraska manufacturing). Approximately 90 percent of the energy absorbed by firms in this classification was used in the production of agricultural chemical products (primarily fertilizers). The production of farm and garden machinery also accounted for a significant portion of the energy used in machinery (except electrical) production in the state. Energy consumed in the combined production of food products, *agricultural chemicals*, and *agricultural machinery* accounted for about two-thirds of the total energy consumed by manufacturing activities in the state.

MANUFACTURING EMPLOYMENT IN ENERGY-INTENSIVE INDUSTRIES

Energy-intensive industries use large quantities of energy relative to other inputs in the production process. Given the uncertainty surrounding future energy prices and supply sources, it is important to identify those industries which are particularly energy-intensive. Such industries are more vulnerable to energy-induced cost pressures and possible supply shortages.

As a measure of the energy intensiveness of the various manufacturing industries, a ratio of energy inputs (kilowatt-hour equivalents) to labor inputs was calculated for each industry in the U.S. manufacturing sector. These energy-intensiveness indices, which were derived from 1974 manufacturing data, are presented in Table 3 (page 2). The ratio for the entire U.S. manufacturing sector for 1974 was .1958 million kilowatt-hour equivalents per employee.

Producers of petroleum and coal products were by far the most energy-intensive producers in the manufacturing sector of the U.S. economy. These firms, on the average, employed 2.31 million kilowatt-hour equivalents per employee in 1974. Kilowatt-hour equivalents per employee for other heavy fuel-consuming industries in manufacturing were: chemicals, .8121 million; primary metal products, .5761 million; stone, clay, and glass products, .5672 million; and paper products, .5557 million. Other manufacturing industries used relatively small amounts of energy per employee, ranging from .1636 million KWHEs in the production of food and kindred products to .0141 million KWHEs in the apparel (and other textile products) industry.

Manufacturing activity in Nebraska was significantly less energy-intensive than U.S. manufacturing. The .1735 million KWHEs of energy consumed per manufacturing employee in the state was nearly 13 percent below the comparable figure for U.S. manufacturing. The major reason for this phenomenon is that the state's manufacturing activity is concentrated in industries which are relatively light consumers of energy.

Employment data for Nebraska manufacturing indicate that only a small percentage of the state's manufacturing employees

work in energy-intensive industries. Only 10 percent were employed in the five SIC industries which used more than one-half million energy units (kilowatt-hour equivalents) per employee in 1974. These industries were: petroleum and coal products; chemicals and allied products; primary metal industries; stone, clay, and glass products; and paper and allied products.

Two-thirds of the state's manufacturing employment is concentrated in five industries: food and kindred products; machinery, except electrical; electrical equipment and supplies; fabricated metal products; and printing and publishing. Nebraska manufacturing data for 1974 were used to construct energy-intensiveness coefficients for these industries. All of these industries had significantly lower coefficients than the five most energy-intensive industries in the U.S. manufacturing sector.

Nearly 28 percent of Nebraska manufacturing workers are employed in the production of food and kindred products. While energy consumption per employee in this industry (.2491 million KWHEs) exceeded the average for both U.S. and Nebraska manufacturing, it was small in comparison to that of the five manufacturing industries identified as heavy energy users. Producers of food and kindred products in Nebraska used only about 11 percent as much energy per employee as was used in the production of coal and petroleum products; 31 percent of that used in producing chemicals and allied products; and approximately 44 percent of that used in producing primary metals, paper products, and stone, clay, and glass products.

Other major manufacturing industries in Nebraska which employed sizable quantities of labor but used only small quantities of energy per unit of labor, were the machinery (electrical and nonelectrical), fabricated metal products, and printing and publishing industries. Per employee consumption in these industries ranged from .0495 million KWHEs per employee in the production of nonelectrical machinery to .0154 million KWHEs in the printing and publishing industry.

NATURAL GAS CONSUMPTION IN NEBRASKA MANUFACTURING

Events of the past winter point to serious supply and distribution problems in the natural gas industry. Natural gas is the major source of energy for the nation's manufacturers. Nebraska firms are especially heavy users. In 1974, nearly two-thirds of the energy consumed by manufacturing activity in the state was provided by natural gas.

Heavy reliance upon this energy source by manufacturing concerns in the state has important implications for Nebraskans. First, while productive activities in the state were not seriously interrupted by the events of last winter, the potential for future disruption does exist. Second, manufacturing concerns in the state which rely heavily on natural gas are likely to experience cost pressures in the future. If these additional costs are passed on in the form of higher prices, product demand and resource employment in these industries may be adversely affected. Third, substitution away from natural gas as a source of energy will receive serious consideration by producers. Manufacturers have, in the past, demonstrated a willingness to undertake fuel substitution when faced with significant changes in relative fuel prices and concern over sources of supply. Recent evidence indicates that such energy substitution is presently under way in Nebraska. A draft of the Energy Conservation Plan for the State of Nebraska reveals a sizable drop in natural gas (Continued on page 6)

Review and Outlook

Nebraska's total real output for the month of January was 4.4 percent higher than in the previous January, but down 0.4 percent from December after adjustment for that month's normal seasonal peak. All sectors of the state's economy declined from their month-earlier levels except for manufacturing, where a small gain was noted. The Bureau's index of total real output for the national economy showed the same 4.4 percent gain for January over the previous year as was observed in the Nebraska index, but the national economy declined a bit less from December than was the case for Nebraska. Declines occurred in the indexes of real output for all sectors of the national economy except manufacturing and agriculture, but the national agricultural index showed

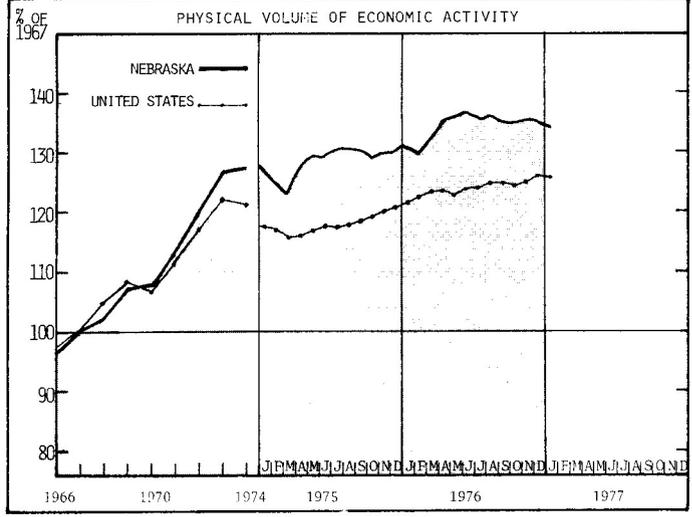
strong improvement. The Nebraska agricultural index continued to decline, but at a much slower rate than occurred in November and December. The seasonally adjusted index of Nebraska farm prices was 7 percent below its January, 1976, level, causing the dollar volume index for agriculture to drop 6.4 percent below the previous January even though the physical volume index was virtually the same for both periods.

Government employment in Nebraska dipped rather sharply in January, principally at the state government level, but preliminary February figures indicate that the decline was of only a month's duration. Real output in the construction, manufacturing, and distributive sectors rose above the previous January by 43.8 percent, 7.8 percent, and 3.4 percent, (Continued on page 5)

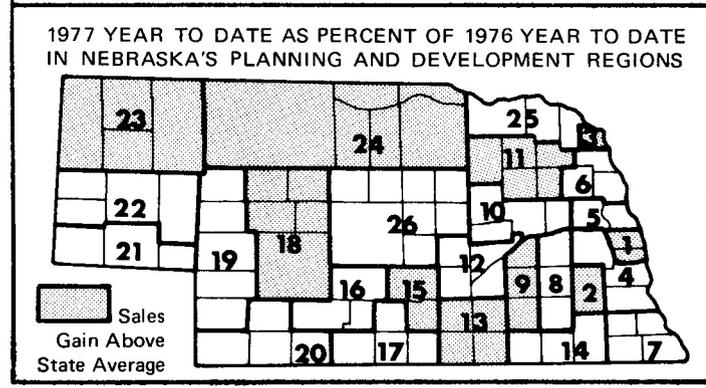
Notes for Tables 1 and 2: (1) The "distributive" indicator represents a composite of wholesale and retail trade; transportation, communication and utilities; finance, insurance, and real estate; and selected services. (2) The "physical volume" indicator and its components represent the dollar volume indicator and its components adjusted for price changes using appropriate price indexes—see Table 5, page 5.

| ECONOMIC INDICATORS: NEBRASKA AND UNITED STATES | | | | |
|-------------------------------------------------|------------------------------------------------------|-------|---------------------------------------------------|-------|
| 1. CHANGE FROM PREVIOUS YEAR | | | | |
| January, 1977 | Current Month as Percent of Same Month Previous Year | | 1977 Year to Date as Percent of 1976 Year to Date | |
| | Nebraska | U.S. | Nebraska | U.S. |
| Indicator | | | | |
| Dollar Volume | 108.1 | 109.7 | 108.1 | 109.7 |
| Agricultural | 93.6 | 107.9 | 93.6 | 107.9 |
| Nonagricultural | 110.4 | 109.7 | 110.4 | 109.7 |
| Construction | 151.2 | 99.3 | 151.2 | 99.3 |
| Manufacturing | 112.0 | 110.8 | 112.0 | 110.8 |
| Distributive | 108.7 | 110.4 | 108.7 | 110.4 |
| Government | 103.0 | 108.1 | 103.0 | 108.1 |
| Physical Volume | 104.4 | 104.4 | 104.4 | 104.4 |
| Agricultural | 100.6 | 110.3 | 100.6 | 110.3 |
| Nonagricultural | 104.9 | 104.2 | 104.9 | 104.2 |
| Construction | 143.8 | 94.4 | 143.8 | 94.4 |
| Manufacturing | 107.8 | 105.5 | 107.8 | 105.5 |
| Distributive | 103.4 | 105.0 | 103.4 | 105.0 |
| Government | 97.1 | 101.1 | 97.1 | 101.1 |
| 2. CHANGE FROM 1967 | | | | |
| Indicator | Percent of 1967 Average | | | |
| | Nebraska | U.S. | | |
| Dollar Volume | 241.9 | 225.1 | | |
| Agricultural | 194.6 | 240.1 | | |
| Nonagricultural | 250.1 | 224.6 | | |
| Construction | 269.0 | 169.2 | | |
| Manufacturing | 268.6 | 211.4 | | |
| Distributive | 244.3 | 233.6 | | |
| Government | 241.4 | 239.0 | | |
| Physical Volume | 134.6 | 125.9 | | |
| Agricultural | 111.8 | 131.9 | | |
| Nonagricultural | 138.5 | 125.7 | | |
| Construction | 132.5 | 83.3 | | |
| Manufacturing | 145.1 | 114.8 | | |
| Distributive | 139.4 | 133.3 | | |
| Government | 127.7 | 135.9 | | |

| 3. NET TAXABLE RETAIL SALES OF NEBRASKA REGIONS AND CITIES (Adjusted for Price Changes) | | | | |
|-----------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|-------------------------------------------------|--|
| Region Number ¹ and City | City Sales ² | | Sales in Region ² | |
| | Jan. 1977 as percent of Jan. 1976 | Jan. 1977 as percent of Jan. 1976 | Year to date '77 as percent of Year to date '76 | |
| <i>The State</i> | 98.5 | 95.7 | 95.7 | |
| 1 Omaha | 100.6 | 97.9 | 97.9 | |
| Bellevue | 96.3 | | | |
| 2 Lincoln | 104.0 | 102.3 | 102.3 | |
| 3 So. Sioux City | 103.6 | 101.4 | 101.4 | |
| 4 Nebraska City | 100.8 | 90.3 | 90.3 | |
| 5 Fremont | 97.0 | 88.3 | 88.3 | |
| Blair | 94.9 | | | |
| 6 West Point | 90.9 | 94.4 | 94.4 | |
| 7 Falls City | 94.6 | 90.7 | 90.7 | |
| 8 Seward | 87.8 | 92.9 | 92.9 | |
| 9 York | 96.6 | 96.8 | 96.8 | |
| 10 Columbus | 103.5 | 88.3 | 88.3 | |
| 11 Norfolk | 112.5 | 96.1 | 96.1 | |
| 12 Grand Island | 89.2 | 86.8 | 86.8 | |
| 13 Hastings | 95.0 | 96.2 | 96.2 | |
| 14 Beatrice | 97.8 | 92.5 | 92.5 | |
| Fairbury | 109.3 | | | |
| 15 Kearney | 105.4 | 113.7 | 113.7 | |
| 16 Lexington | 77.8 | 81.2 | 81.2 | |
| 17 Holdrege | 95.9 | 82.1 | 82.1 | |
| 18 North Platte | 99.6 | 97.6 | 97.6 | |
| 19 Ogallala | 89.8 | 89.3 | 89.3 | |
| 20 McCook | 92.4 | 91.2 | 91.2 | |
| 21 Sidney | 90.6 | 86.0 | 86.0 | |
| Kimball | 97.2 | | | |
| 22 Scottsbluff/Gering | 100.1 | 93.6 | 93.6 | |
| 23 Alliance | 101.7 | 98.9 | 98.9 | |
| Chadron | 106.5 | | | |
| 24 O'Neill | 111.1 | 115.0 | 115.0 | |
| 25 Hartington | 86.2 | 89.7 | 89.7 | |
| 26 Broken Bow | 99.6 | 87.7 | 87.7 | |



¹ See region map below.
² Sales on which sales taxes are collected by retailers located in the state. Region totals include motor vehicle sales; city totals exclude motor vehicle sales.
 Compiled from data provided by Nebraska Department of Revenue.



(Continued from page 4) respectively. Nationally, the distributive and government sectors showed greater increases in output compared with January, 1976, than did the corresponding Nebraska sectors, but the state's construction activity far outpaced the national sector, and manufacturing in the state registered again above the national average.

Gains in the Nebraska distributive and services sector were reduced by the generally sluggish behavior of retail sales. After adjustment for price changes, the state's total retail sales were some 4.3 percent below their January, 1976, level, whereas the nation as a whole recorded a 5.6 percent increase for the same period. Despite the disappointing statewide performance of total sales, several of the state's trading centers posted substantial increases over the previous January. Excluding motor vehicle sales, Norfolk, O'Neill, Chadron, Kearney, and Fairbury had increases in excess of 5 percent. Lincoln did nearly as well with a 4 percent increase, and Alliance, Scottsbluff/Gering, Columbus, Nebraska City, South Sioux City, and Omaha had smaller gains. The very large retail sales gain shown in Table 3 for Region 15 arises from truly astonishing increases for Axtell and Minden, and may well be due to errors in the data. Regions 24 (O'Neill), 15 (Kearney), 2 (Lincoln), and 3 (South Sioux City) are the only ones showing gains in total retail sales compared with January, 1976.

Corrections in motor vehicle sales data just received from the Nebraska Department of Revenue have reduced the state's 1976 retail sales somewhat. It was previously reported that total retail sales, deflated for price changes, were 10 percent above 1975. The revised total is now about 9.5 percent above 1975, still a substantial gain.

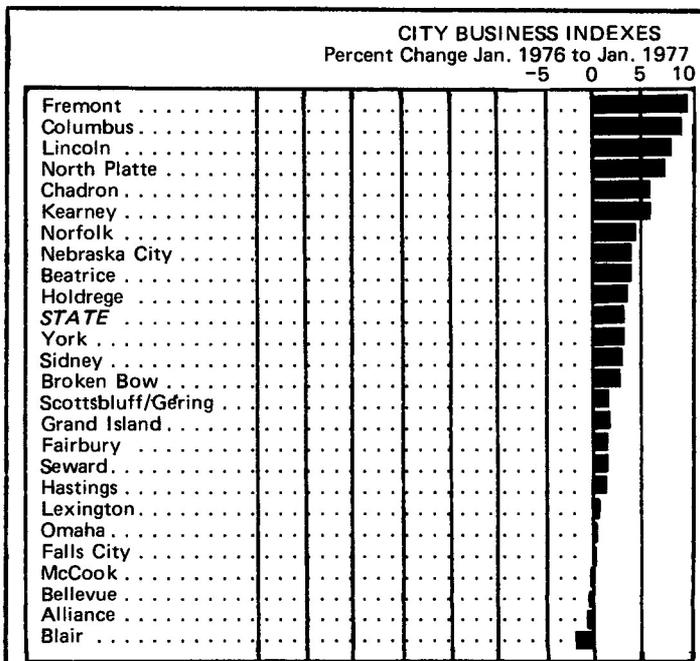
Fremont, Columbus, Lincoln, North Platte, Chadron, and Kearney took top positions in the January city business rankings. Each of the cities except Chadron had increases in banking activity well above the state average of 4.9 percent, compared with January, 1976, and all exceeded the state average for retail sales. North Platte, Fremont, and Chadron have been near the top of the list for several months, while Columbus, Kearney, and Lincoln moved up in January from middle or lower rankings in recent months.

January's generally disappointing economic results may well be only temporary. The U.S. Department of Commerce has recently reduced its estimate of the impact of the severe winter upon economic activity in the first quarter, and the state's agricultural outlook has been improved by this spring's rainfall. Finally, recent reports on the state's income tax collections seem to indicate that total income has held up reasonably well. The retail sales decline may reflect consumer caution or may be a reaction to rising prices.

DUANE HACKMANN

| 5. PRICE INDEXES | | | |
|----------------------------|--------------------|---------------------------------|---------------------------------------------------|
| January, 1977 | Index (1967 = 100) | Percent of Same Month Last Year | Year to Date as Percent of Same Period Last Year* |
| Consumer Prices | 175.3 | 105.2 | 105.2 |
| Commodity component | 168.7 | 103.9 | 103.9 |
| Wholesale Prices | 188.0 | 104.9 | 104.9 |
| Agricultural Prices | | | |
| United States | 182.0 | 97.8 | 97.8 |
| Nebraska | 174.0 | 93.0 | 93.0 |

*Using arithmetic average of monthly indexes.
Sources: Consumer and Wholesale Prices: U.S. Bureau of Labor Statistics; Agricultural Prices: U.S. Department of Agriculture.



Source: Table 4 below.

| 4. JANUARY CITY BUSINESS INDICATORS | | | |
|-------------------------------------|----------------------------------------------------------------------------|--------------------------------|--------------------------------|
| The State and Its Trading Centers | Percent of Same Month a Year Ago | | |
| | Banking Activity ¹ (Adjusted for Price Changes) ⁴ | Building Activity ² | Power Consumption ³ |
| <i>The State</i> | 104.9 | 127.0 | 107.9 |
| Alliance | 88.1 | 241.5 | 98.0 |
| Beatrice | 105.7 | 171.6 | 104.2 |
| Bellevue | 98.1 | 120.9 | 110.4* |
| Blair | 100.0 | 100.5 | 107.1 |
| Broken Bow | 92.8 | 349.3 | 103.3 |
| Chadron | 97.6 | 205.8 | 110.0 |
| Columbus | 110.7 | 158.1 | 103.7 |
| Fairbury | 88.0 | 149.6 | 108.3* |
| Falls City | 111.6 | 49.1 | 107.1 |
| Fremont | 108.7 | 153.0 | 156.3* |
| Grand Island | 104.8 | 218.3 | 107.3 |
| Hastings | 110.4 | 68.6 | 106.7 |
| Holdrege | 102.9 | 202.4 | 107.9 |
| Kearney | 109.1 | 83.7 | 107.4 |
| Lexington | 107.2 | 357.6 | 103.9 |
| Lincoln | 115.1 | 94.2 | 102.8 |
| McCook | 95.7 | 231.8 | 110.0 |
| Nebraska City | 106.3 | 98.4 | 114.0 |
| Norfolk | 94.3 | 192.5 | 90.2 |
| North Platte | 106.9 | 300.6 | 99.4 |
| Omaha | 100.0 | 78.3 | 110.3 |
| Scottsbluff/Gering | 105.4 | 59.5 | 117.9 |
| Seward | 114.0 | 111.5 | 102.9 |
| Sidney | 92.9 | 489.9 | 127.3 |
| So. Sioux City | NA | NA | NA |
| York | 103.9 | 151.9 | 111.7 |

¹Banking Activity is the dollar volume of bank debits.
²Building Activity is the value of building permits issued as spread over an appropriate time period of construction.
³Power Consumption is a combined index of consumption of electricity and natural gas except in cases marked * for which only one is used.
⁴Banking Activity is adjusted by a combination of the Wholesale Price Index and the Consumer Price Index, each weighted appropriately for each city.

Source: Compilation by Bureau of Business Research from reports of private and public agencies.

(Continued from page 3) consumption by Nebraska industrialists in the past three years.⁴ Electric utilities appear to be the primary beneficiaries of this interfuel substitution. These adjustments often require additional investment by firms converting to different energy sources. They also point to future capacity expansion for electrical utilities.

The source of dependence on natural gas by Nebraska manufacturers is apparent in the data for fuel consumption in manufacturing. The food, chemical, and stone, clay, and glass industries accounted for nearly 83 percent of the energy consumed by Nebraska manufacturers in 1974. Each of these industries was a major consumer of natural gas. The share of energy consumed in each industry which was provided by natural gas exceeded the national average for manufacturing in 1974. A reliance on natural gas was characteristic of the production of agriculturally related products in the state. Producers of agricultural chemicals and meat products (meat packing plants, poultry dressing plants, and producers of sausages and other prepared meats) derived 69 percent of their energy from this source. Sixty-two percent of the energy used in producing grain mill products (flour, cereal breakfast foods, prepared feeds, and wet corn milling) was provided by natural gas. The state's other major manufacturing consumer, the stone, clay, and glass industry, obtained 65 percent of its energy requirements from natural gas.

SUMMARY

Abundant low-cost energy sources have played an important role in the growth of living standards in Nebraska. Since the state possesses relatively small quantities of resources which are currently used to generate energy, most of its needs must be met by importing resources from energy-rich neighboring states. A sizable portion of these resources is used to support manufacturing activity in the state.

While energy used by Nebraska manufacturers represents a significant portion of the state's energy needs, total energy consumption by these firms is small when viewed in the context of the nation's energy requirements. Less than one-half of one percent of the energy resources employed in the production of manufactured goods in the United States are used by Nebraska

⁴ *Easy on Energy: The Draft State Energy Conservation Plan for the State of Nebraska, 1977.* A final draft of this plan is to be submitted to the Federal Energy Administration, Region VII, Kansas City, Missouri.

manufacturing firms. These relatively modest energy requirements are due to two factors: (1) Nebraska is an agricultural state with a relatively small manufacturing sector, and (2) manufacturing activity in the state is not very energy intensive.

The manufacture of foods (and food products), chemicals, and stone, clay, and glass products absorbs much of the energy consumed in the manufacturing sector of the Nebraska economy. Collectively, these three industries account for more than eight-tenths of the energy consumed by manufacturers in the state. Since Nebraska manufacturing is oriented toward the production of agricultural products, it is not surprising to find that a significant portion of the state's manufacturing energy needs support the production of these goods. Nearly two-thirds of the energy consumed by manufacturers in the state results from the production of agricultural products (mainly foods, fertilizers, and agricultural machinery).

Natural gas is the major source of energy for manufacturing activity in the nation. Nebraska producers rely more heavily on this source than do their U.S. counterparts. Each of the state's three principal fuel consuming industries in the manufacturing sector is a heavy user of natural gas. Until recently, this fuel possessed both favorable environmental and economic attributes. It is a clean-burning fuel, and regulated interstate gas prices were low in comparison to competitive fuels. Supply and distribution problems in this industry, however, have encouraged interfuel substitution in manufacturing. Data for the last three years indicate a significant drop in the use of natural gas by Nebraska firms. Although electricity historically has been a relatively high-priced fuel, electrical utilities appear to be the primary beneficiary of energy input substitution by manufacturing concerns in the state.

Data on manufacturing employment for the state indicate that only a small percentage of workers in this sector of the Nebraska economy are employed in energy-intensive industries. Only ten percent are employed in the five manufacturing industries which use large quantities of fuel relative to labor in the production process. The five industries are: petroleum and coal products; chemicals and allied products; primary metal industries; stone, clay, and glass products; and paper and allied products. Heavy manufacturing employment in Nebraska occurs in the less energy-intensive food, machinery, fabricated metal products, and printing and publishing industries.

WILLIAM D. GERDES

-6-

NEWS

BUSINESS IN NEBRASKA

PREPARED BY BUREAU OF BUSINESS RESEARCH

Member, Association for University Business & Economic Research

Business in Nebraska is issued monthly as a public service and mailed free within the State upon request to 200 CBA, University of Nebraska—Lincoln 68588. Material herein may be reproduced with proper credit.

No. 392

May, 1977

UNIVERSITY OF NEBRASKA—LINCOLN
Roy A. Young, *Chancellor*

BUREAU OF BUSINESS RESEARCH
Donald E. Pursell, *Director*

COLLEGE OF BUSINESS ADMINISTRATION
Ronald L. Smith, *Dean*

Charles L. Bare, *Statistical Coordinator*
Duane Hackmann, *Research Associate*
Mrs. Vicki Stepp, *Research Analyst*
Mrs. Jean Keefe, *Editorial Assistant*

Publications Services & Control
University of Nebraska—Lincoln
Nebraska Hall—City Campus 5U
Lincoln, Nebraska 68588