

Prepared by the Bureau of Business Research
 College of Business Administration

ELECTRICITY CONSUMPTION IN NEBRASKA: 1960-1980

When it comes to the production and distribution of electricity in Nebraska, this state is unique. Nebraska is the only state in the nation which supplies its citizens with electrical power entirely from public and cooperatively owned utility firms. The origin of public power dates back to the 1930s. Today, urban as well as rural consumer electric rates in Nebraska are among the lowest in the nation.

TOTAL ELECTRICAL CONSUMPTION

During 1960, sales of electricity to ultimate consumers in Nebraska amounted to approximately 4,065 million kilowatt-hours (KWHs) (see Table 1). By the end of 1970 this consumption had increased to 9,757 million KWHs per year. The increase for the ten-year period was 140 percent. Compounded on an annual basis, this results in a 9.15 percent growth rate from 1960 to 1970.

By 1980, total consumption of electricity in Nebraska had increased to about 14,002 million KWHs. The increase from 1970

to 1980 was 44 percent. Compounded on an annual basis, this indicates a 3.68 percent growth rate from 1970 to 1980 (see Figure 1, p. 2). For the entire historical period from 1960 to 1980, the annual compounded growth rate of electrical consumption was 6.38 percent (see Figure 2, p. 3).

These data show a large reduction in the annual growth rate in the 1970s compared to the 1960s. The energy "crisis" is frequently cited as the major cause for this reduction. Electricity prices during the 1970s have been increasing more rapidly than the general price level. When we disaggregate the 1970s, however, the data indicate a growth rate of 3.44 percent from 1970 to 1975. From 1975 to 1980 the growth rate was 3.92 percent. This indicates that during the 1975 to 1980 time period, consumption of electricity has, once again, been increasing more rapidly than during the first half of the decade.

Beginning in 1973, higher prices for electricity appear to have effectively curbed demand by (continued on page 2)

Table 1
 ELECTRICAL CONSUMPTION
 (millions of kilowatt-hours)

Year	Total I	Residential II	Commercial III	Industrial IV	Irrigation V
1960	4,065	1,907	1,247	866	45
1961	4,427	2,082	1,384	902	59
1962	4,789	2,221	1,560	969	39
1963	5,221	2,442	1,710	985	84
1964	5,534	2,607	1,839	1,004	84
1965	6,023	2,816	1,997	1,139	71
1966	6,098	2,850	1,975	1,175	98
1967	6,101	2,816	2,017	1,158	110
1968	7,391	3,099	2,517	1,641	134
1969	8,916	3,682	3,194	1,890	150
1970	9,757	4,107	3,469	1,946	235
1971	10,271	4,308	3,734	1,971	258
1972	9,936	4,081	3,712	1,900	243
1973	10,703	4,436	3,924	2,065	278
1974	10,951	4,512	3,797	2,240	402
1975	11,552	4,693	3,641	2,776	442
1976	12,081	4,722	3,797	2,993	569
1977	12,414	4,859	3,937	3,211	407
1978	13,339	5,326	4,079	3,420	514
1979	13,604	5,241	4,120	3,834	409
1980	14,002	5,497	4,182	3,713	610

Source: Columns II through IV: Department of Energy, *State Energy Report and Monthly Energy Data Report*.
 Column V: USDA - Rural Electric Association, *Annual Statistical Report*.

(continued from page 1) commercial consumers and, to a lesser extent, residential consumers. Higher prices had little impact, however, upon industrial and irrigation consumers of electricity. Annual growth rates in demand for electricity were:

	1960-1973	1973-1980
Residential	6.72%	3.11%
Commercial	9.22	0.91
Industrial	7.00	8.93
Irrigation	14.95	11.92

The commercial sector's electrical growth rate decreased dramatically between 1973 and 1980. Also, during this time frame, the residential sector's electrical growth rate declined to about one-half the rate it was from 1960 to 1973. Irrigation's growth rate of electricity remained relatively high and shows a moderate decline for 1973-1980 compared to 1960-1973. The industrial sector's growth rate, on the other hand, indicates a sizable increase.

RESIDENTIAL SECTOR

The residential sector consists of the aggregate of all types of housing units. Sales of electricity to ultimate consumers in the residential sector in Nebraska during 1960 was 1,907 million KWHs (see Table 1). By the end of 1970, consumption had increased to 4,107 million KWHs. The 115 percent increase results in an annual compounded growth rate of 7.97 percent during this ten-year period.

At the end of 1980, electrical consumption in the residential sector had increased to 5,497 million KWHs. From 1970 to 1980, consumption had increased 34 percent. Compounded on an annual basis, this indicates a 2.96 percent growth rate of electrical consumption.

The electrical consumption growth rate from 1970 to 1975

was 2.70 percent and from 1975 to 1980 it was 3.21 percent. In the residential sector, the growth rate of electrical consumption is about 0.5 percent higher from 1975 to 1980 than it was from 1970 to 1975.

When retail electricity prices in the residential sector are weighted by customers served, the average price per KWH paid by Nebraskans in 1980 was about 4.50 cents. This price is for residences consuming 1,000 KWHs per month. The average price per KWH for actual consumption in the residential sector of the entire United States and the District of Columbia was 5.36 cents per KWH. The average price per KWH for Nebraska in 1980 was approximately 16 percent less than the national average.

In terms of distribution of total electricity consumption over the years, the residential sector has shrunk in size. In 1960 this sector accounted for 46.9 percent of the total usage (see Figure 3, p. 6). By 1980, the residential sector consumed 39.3 percent of the total.

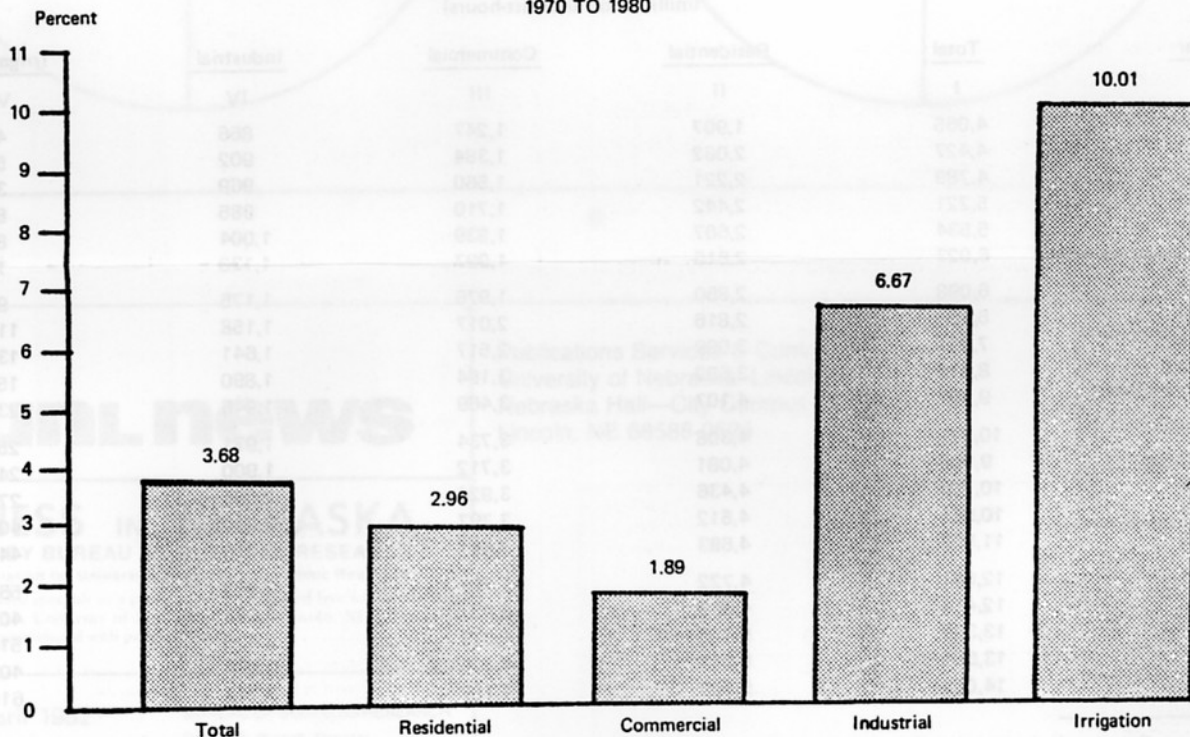
COMMERCIAL SECTOR

The commercial sector includes the aggregate of retail and wholesale trade; finance, insurance, real estate; service; transportation, communication, and utilities; and government.

Consumption of electricity to ultimate consumers in the commercial sector in Nebraska during 1960 was 1,247 million KWHs (see Table 1). By the end of 1970, sales had increased to 3,469 million KWHs. The 178 percent increase indicates an annual compounded growth rate of 10.77 percent for this ten-year period.

By 1980, electrical usage in the commercial sector had increased to 4,182 million KWHs. From 1970 to 1980, usage had increased 21 percent. Compounded on an annual basis, this results in a 1.89 percent growth rate of electrical usage for the 1970s.

Figure 1
ANNUAL GROWTH RATE OF ELECTRICAL CONSUMPTION
1970 TO 1980



Between 1970 and 1975, usage of electricity in this sector decreased dramatically. For this five-year period the growth rate had decreased to 0.97 percent. From 1975 to 1980, the KWH usage growth rate was 2.81 percent. The rate of increase for electricity in the commercial sector was 1.84 percent larger for the last half of the 1970s than for the first half of the decade.

The commercial sector did not change very much in terms of percentage of total consumption of electricity in Nebraska. In 1960 this sector accounted for 30.7 percent of total KWH consumption, and in 1980 it accounted for 29.9 percent (see Figure 3).

INDUSTRIAL SECTOR

The U.S. Department of Energy defines the industrial sector as the aggregate of construction, manufacturing, mining, and agriculture. Irrigation is relatively important in Nebraska, and farmers use electricity as energy for running water pumps and irrigation systems. Therefore, the portion of electricity used for irrigation is subtracted from the industrial sector and is reported as a separate sector.

Sales of electricity in the industrial sector (with KWHs consumed by irrigation subtracted out) in Nebraska during 1960 was 866 million KWHs (see Table 1). By the end of 1970, consumption had increased to 1,946 million KWHs. This 125 percent increase results in an annual compounded growth rate of 8.43 percent for this ten-year period.

By the end of 1980, electrical consumption in this sector had grown to 3,713 million KWHs. From 1970 to 1980, consumption had increased 91 percent. Compounded on an annual basis, this in-

dicates a 6.67 percent growth rate of electrical usage for industry. The electrical consumption growth rate from 1970 to 1975 was 7.36 percent and from 1975 to 1980 was 5.99 percent. The industrial sector differed from the residential or commercial sector in that its annual growth rate from 1975 to 1980 was lower than for the period from 1970 to 1975. The growth rate was 1.37 percent less for the last half of the 1970s than for the first half.

The industrial sector consumed a larger proportion of total KWH usage in Nebraska in 1980 than it did in 1960. During 1960 this sector consumed 21.3 percent of all KWHs consumed in the state (see Figure 3). By 1980, the industrial sector's proportion had increased to 26.4 percent.

IRRIGATION SECTOR

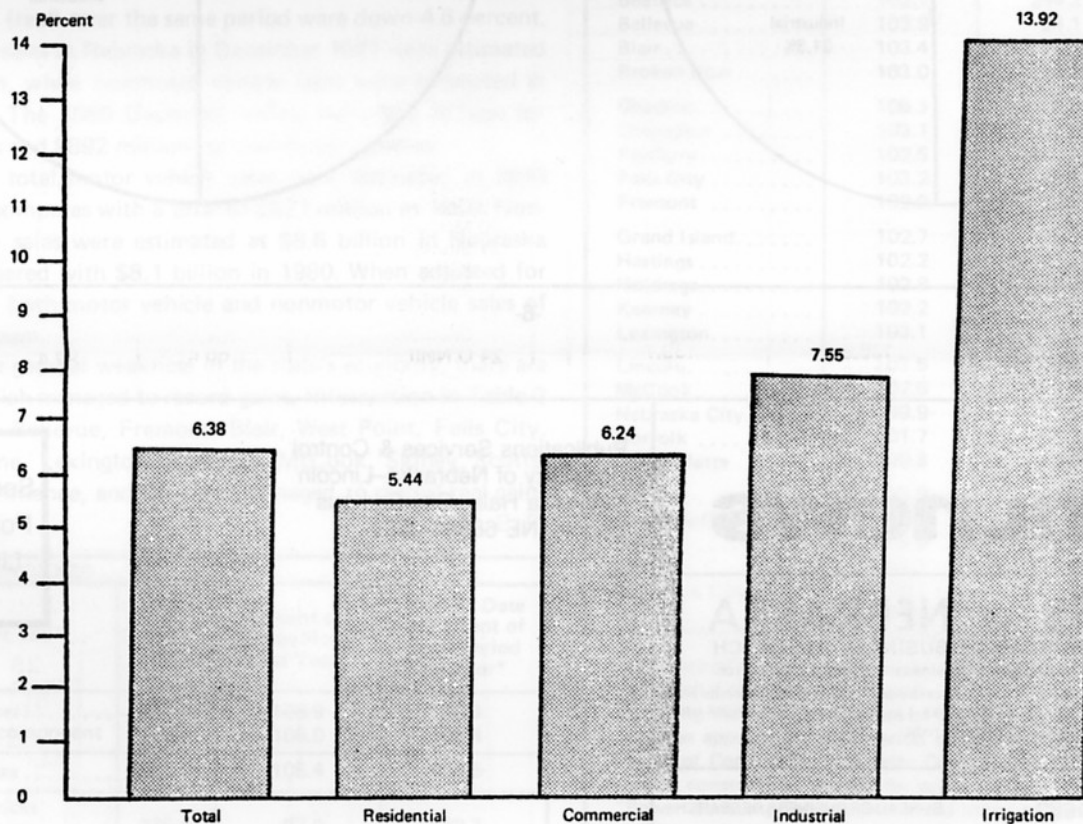
Electrical energy consumption by irrigation has grown relatively rapidly in Nebraska over the past two decades. Sales of electricity to farmers for irrigation purposes in 1960 were only 45 million KWHs (see Table 1). By the end of 1970, consumption in this sector had increased to 235 million KWHs. This 422 percent increase indicates an annual compounded growth rate of 17.97 percent for the ten-year period.

By the end of 1980, electrical consumption for irrigation had increased to 610 million KWHs. From 1970 to 1980, consumption had increased 160 percent. Compounded on an annual basis, this indicates a compounded growth rate of about 10 percent.

The electrical consumption growth rate by irrigation from 1970 to 1975 was 13.47 percent, and from 1975 to 1980 it was 6.66 percent. This shows that the

(continued on page 6)

Figure 2
ANNUAL GROWTH RATE OF ELECTRICAL CONSUMPTION
1960 TO 1980



Review and Outlook

The Nebraska economy recorded an increase of 1.3 percent in December 1981, according to the net physical volume index. The December 1981 results are somewhat misleading, since the index was boosted by substantial marketing of agriculture commodities. Despite the depressed prices, the volume of marketings was large and resulted in boosting the agriculture component of the physical volume index.

The agriculture component of the index was up 12.8 percent November-December 1981. On a year-to-year basis, cash farm marketings were up \$19.8 billion, or 2.8 percent above the December 1980 level. For December 1981, cash farm marketings in Nebraska totaled \$732 million.

Agriculture prices continued to decline in Nebraska and nationally. On a seasonally adjusted basis November-December 1981, agriculture prices received in Nebraska were down 4.4 percent, compared with 3.7 percent nationally. Taking a longer view, prices were down 12.9 percent December 1980-December 1981 in Nebraska and down 13 percent in the United States.

The nonagriculture sector declined 0.7 percent, and is probably more reflective of conditions in the state than those increased by the agriculture component of the index. The construction component declined 1.1 percent November-December 1981. Construction activity as measured by the net physical volume index declined since March 1981. The index recovered from the June 1980 lows through March 1981, but

(continued on page 5)

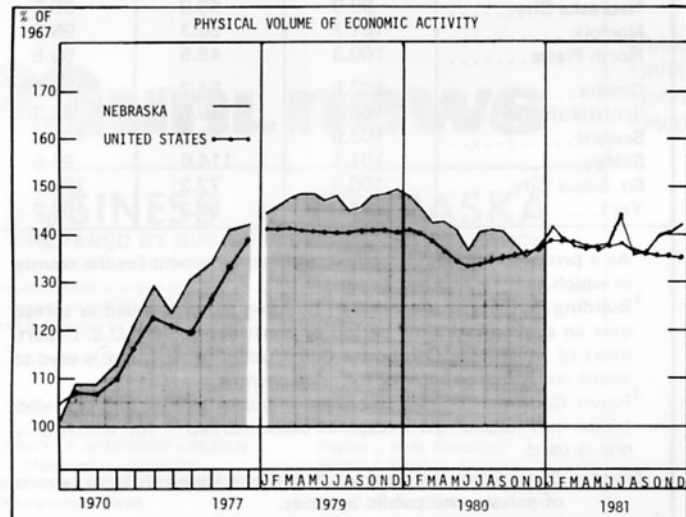
Notes for Tables 1 and 2: (1) The "distributive" indicator represents a composite of wholesale and retail trade; transportation, communication and utilities; finance, insurance, and real estate; and selected services. (2) The "physical volume" indicator and its components represent the dollar volume 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				
December 1981	Current Month as Percent of Same Month Previous Year		1981 Year to Date as Percent of 1980 Year to Date	
	Nebraska	U.S.	Nebraska	U.S.
Indicator	Nebraska	U.S.	Nebraska	U.S.
Dollar Volume	105.8	106.0	106.9	109.8
Agricultural	124.6	99.8	100.5	104.0
Nonagricultural	103.2	106.2	107.8	110.0
Construction	82.3	95.5	117.3	103.1
Manufacturing	98.6	102.2	107.4	109.4
Distributive	105.2	108.6	107.6	111.2
Government	107.2	107.6	106.9	108.4
Physical Volume	101.6	98.5	98.8	100.2
Agricultural	143.0	114.7	99.6	101.1
Nonagricultural	96.2	98.0	98.7	100.2
Construction	77.1	89.5	110.2	96.6
Manufacturing	94.5	95.9	99.4	100.1
Distributive	96.6	99.7	97.5	100.7
Government	101.9	98.3	100.2	99.0

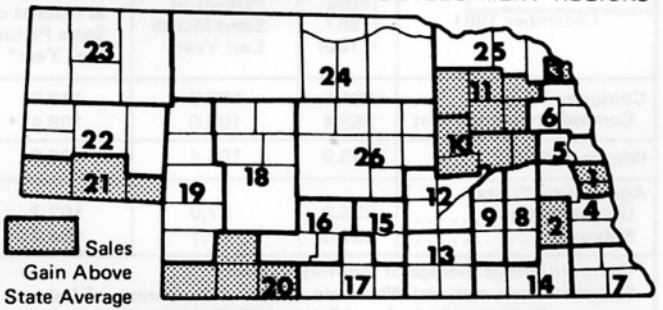
2. CHANGE FROM 1967		
Indicator	Percent of 1967 Average	
	Nebraska	U.S.
Dollar Volume	375.5	358.1
Agricultural	414.6	354.9
Nonagricultural	369.4	358.2
Construction	224.0	312.1
Manufacturing	363.8	306.9
Distributive	384.5	393.4
Government	387.5	349.0
Physical Volume	142.1	135.1
Agricultural	175.0	151.0
Nonagricultural	137.0	134.6
Construction	66.9	93.2
Manufacturing	154.2	126.2
Distributive	136.6	139.7
Government	149.8	148.6

3. NET TAXABLE RETAIL SALES OF NEBRASKA REGIONS AND CITIES (Adjusted for Price Changes)			
Region Number and City	City Sales*	Sales in Region*	
	Dec. 1981 as percent of Dec. 1980	Dec. 1981 as percent of Dec. 1980	Year to date '81 as percent of Year to date '80
<i>The State</i>	95.4	94.9	97.9
1 Omaha	94.3	95.6	100.5
Bellevue	110.4		
2 Lincoln	92.0	91.6	98.3
3 So. Sioux City	109.4	102.7	97.6
4 Nebraska City	95.4	90.6	94.8
5 Fremont	102.5	98.7	96.0
Blair	106.6		
6 West Point	102.3	93.4	91.7
7 Falls City	105.8	99.6	95.8
8 Seward	92.1	95.6	93.2
9 York	94.3	90.1	92.0
10 Columbus	80.2	81.7	97.6
11 Norfolk	100.5	96.5	98.3
Wayne	101.1		
12 Grand Island	96.9	94.5	93.6
13 Hastings	88.1	90.0	95.4
14 Beatrice	96.3	94.2	96.4
Fairbury	98.2		
15 Kearney	95.5	94.5	96.5
16 Lexington	101.2	94.8	94.6
17 Holdrege	110.4	99.1	96.5
18 North Platte	93.2	91.5	93.7
19 Ogallala	105.0	101.2	96.4
20 McCook	110.3	100.7	97.9
21 Sidney	117.1	105.0	100.5
Kimball	96.5		
22 Scottsbluff/Gering	107.6	95.5	96.0
23 Alliance	109.8	100.5	97.2
Chadron	104.1		
24 O'Neill	99.5	87.4	94.4
25 Hartington	83.2	81.9	92.5
26 Broken Bow	95.7	91.7	92.3

*State totals include sales not allocated to cities or regions. The year-to-year ratios for city and region sales may be misleading because of changes in the portion of unallocated sales. Region totals include, and city totals exclude, motor vehicle sales. Sales are those on which sales taxes are collected by retailers located in the state. Compiled from data provided by Nebraska Department of Revenue.



1981 YEAR TO DATE AS PERCENT OF 1980 YEAR TO DATE IN NEBRASKA'S PLANNING AND DEVELOPMENT REGIONS



(continued from page 4) has declined since the March peak.

The manufacturing component of the index recorded a 4.5 percent decrease November-December 1981. This is the largest percentage decrease in the index during the past three years. In December 1981 the index was about 5 percent below the corresponding level in 1980 and approximately 10 percent below the December 1979 level. Most of the deterioration in the Nebraska manufacturing economy occurred during the third and fourth quarters of 1981.

The distributive trade component and government component of the index recorded increases. The distributive trade recorded a 0.2 percent increase November-December 1981, while government recorded an increase of 1.4 percent. The index for distributive trade in December 1981 was well below the 1980 and 1979 levels. The index for the government component is sometimes difficult to interpret in Nebraska because electricity is included in the public sector.

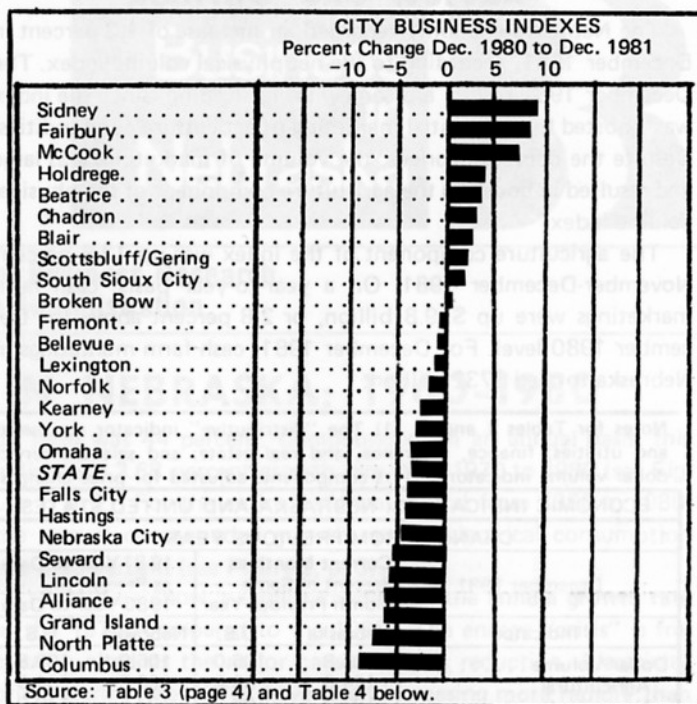
Nebraska retail sales in December 1980 recorded a slight gain—0.6 percent—above the December 1980 level. Nationally, retail sales were up 4.9 percent during the same period. When retail sales are adjusted for price changes, Nebraska retail sales were down 5.1 percent in real terms, while sales were down 1 percent in real terms nationally. The commodity component of the Consumer Price Index continues to record lower rates of price increases. December 1981 compared with one year previous indicates a price increase of 6.0 percent.

Motor vehicle sales were more adversely affected by the economy than nonmotor vehicle sales. Comparing December 1981 with December 1980, motor vehicle sales on a price-adjusted basis (real) were down 12.3 percent. Nonmotor vehicle sales on a price-adjusted basis (real) over the same period were down 4.6 percent. Motor vehicle sales in Nebraska in December 1981 were estimated at \$55 million, while nonmotor vehicle sales were estimated at \$902 million. The 1980 December values were \$60 million for motor vehicles and \$892 million for nonmotor vehicles.

For 1981, total motor vehicle sales were estimated at \$844 million. This compares with a total of \$821 million in 1980. Nonmotor vehicle sales were estimated at \$8.6 billion in Nebraska in 1981 compared with \$8.1 billion in 1980. When adjusted for price changes, both motor vehicle and nonmotor vehicle sales of course were down.

Despite the general weakness in the state's economy, there are some areas which managed to record gains. Information in Table 3 indicates that Bellevue, Fremont, Blair, West Point, Falls City, Norfolk, Wayne, Lexington, Holdrege, McCook, Sidney, Scottsbluff-Gering, Alliance, and Chadron managed to record real gains in retail sales.

D. E. P.



Source: Table 3 (page 4) and Table 4 below.

The State and Its Trading Centers	Percent of Same Month a Year Ago		
	Employment ¹	Building Activity ²	Power Consumption ³
<i>The State</i>	102.6	55.5	99.7
Alliance	83.9	54.0	90.3
Beatrice	102.7	244.3	103.7
Bellevue	103.9	24.1	96.6
Blair	103.4	73.5	100.9
Broken Bow	103.0	116.8	97.6
Chadron	106.3	76.0	94.2
Columbus	103.1	77.8	102.6
Fairbury	102.5	467.6	101.3
Falls City	103.2	18.9	93.9
Fremont	102.9	58.6	122.3*
Grand Island	102.7	30.8	98.7
Hastings	102.2	97.3	120.5
Holdrege	102.8	69.9	97.6
Kearney	102.2	71.0	100.2
Lexington	103.1	48.7	99.0
Lincoln	103.5	49.8	100.2
McCook	102.6	133.5	93.0
Nebraska City	99.9	59.9	95.6
Norfolk	101.7	56.3	96.8
North Platte	100.3	45.5	96.8
Omaha	103.9	54.7	100.0
Scottsbluff/Gering ..	106.3	49.8	88.7
Seward	103.9	48.3	103.0
Sidney	101.1	114.6	94.8
So. Sioux City	100.3	72.2	102.5
York	104.0	55.2	100.2

¹ As a proxy for city employment, total employment for the county in which a city is located is used.

² Building Activity is the value of building permits issued as spread over an appropriate time period of construction. The U.S. Department of Commerce Composite Construction Cost Index is used to adjust construction activity for price changes.

³ Power Consumption is a combined index of consumption of electricity and natural gas except in cases marked * for which only one is used.

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

December 1981	Index (1967 = 100)	Percent of Same Month Last Year	Year to Date as Percent of Same Period Last Year*
Consumer Prices	281.5	108.9	110.3
Commodity component	258.4	106.0	108.4
Wholesale Prices	295.9	105.4	108.5
Agricultural Prices			
United States	235.0	87.0	102.7
Nebraska	237.0	87.1	101.4

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

(continued from page 3) annual growth rate of electrical usage for irrigation has dropped off dramatically from 1975 to 1980 compared to the previous five years. The decrease in the growth rate was 6.81 percent annually. However, during 1975 to 1980, the irrigation sector continued to lead all other sectors in the annual growth rate of electrical consumption.

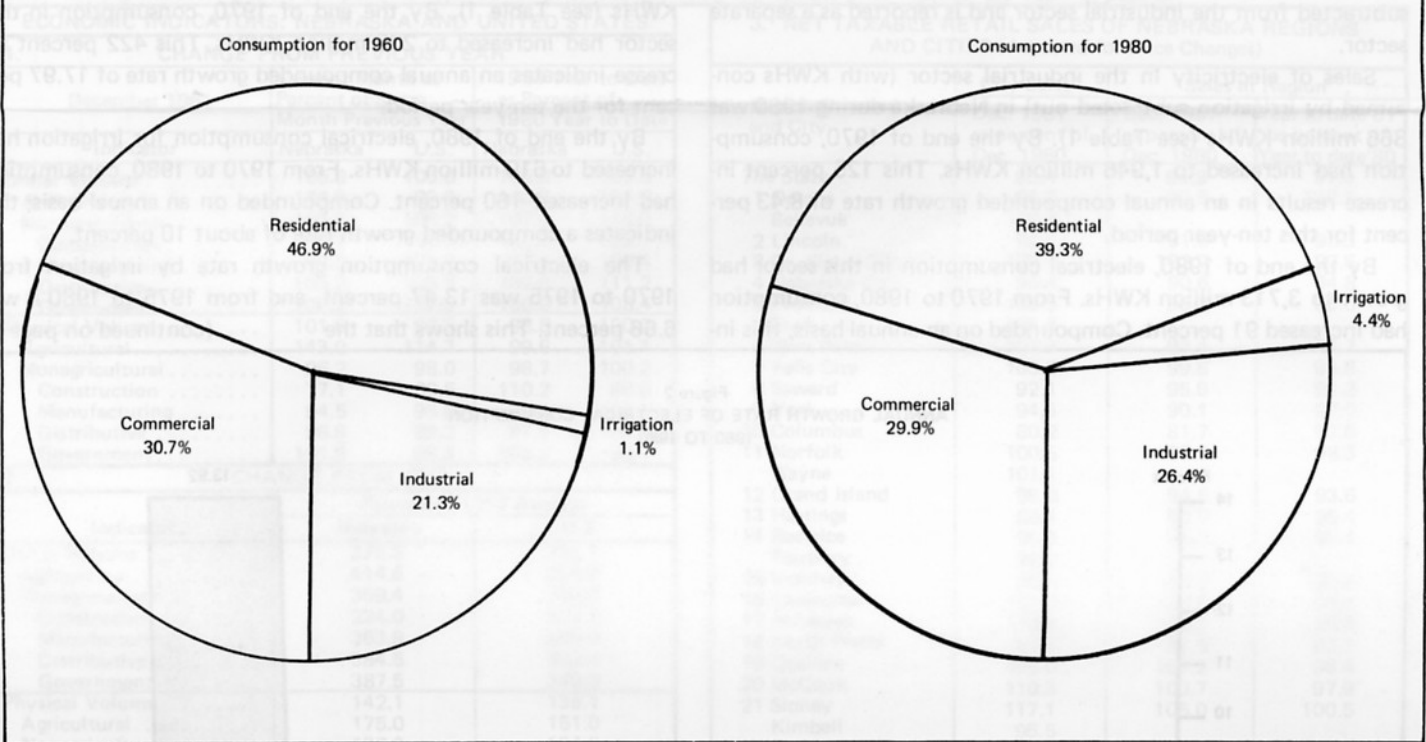
For the past twenty-one years, electrical consumption for irrigation has experienced high growth. Electrical consumption in

1960 was 45 million KWHs. By the end of 1980, electrical consumption for irrigation had increased to 610 million KWHs. This 1,256 percent increase for the twenty-one-year period indicates an annual compounded growth rate of 13.92 percent.

The irrigation sector continues to consume a relatively small proportion of total KWH usage in Nebraska. In 1960, this sector accounted for 1.1 percent of all KWHs consumed in Nebraska. By 1980, the irrigation sector's proportion had increased to 4.4 percent.

C. P. D.

Figure 3
DISTRIBUTION BY SECTOR OF TOTAL KILOWATT-HOUR
CONSUMPTION FOR NEBRASKA



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