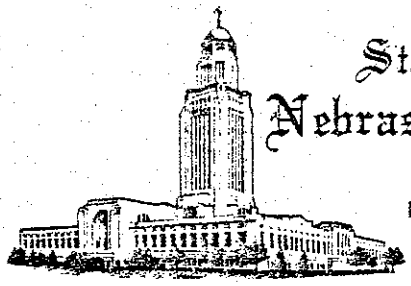
nebraska energy office

third quarter report
november 15, 1982

Help Conserve the Good Life of Nebraska

CHARLES THONE
GOVERNOR



State of Nebraska
Nebraska Energy Office
Box 95085
Lincoln, Nebraska 68509
(402) 471-2867

V.B. BALOK
DIRECTOR

November 15, 1982

The Honorable Charles Thone
Governor of Nebraska
State House
Lincoln, Nebraska 68509

Patrick J. O'Donnell
Clerk of the Legislature
Room 2018 State Capitol
Lincoln, Nebraska 68509

Dear Governor Thone and Clerk O'Donnell:

This Quarterly Report from the Nebraska Energy Office, for the period of July - September, 1982, is submitted in accordance with provisions of Section 81-1606 RSN (1980).

If you have any questions, please contact this office.

Sincerely,

NEBRASKA ENERGY OFFICE

V. B. Balok
Director

VBB:peg

Enc.

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EXECUTIVE SUMMARY

The third quarter of 1982 brought to fruition various significant events that had been in the preparation stages at the Nebraska Energy Office (NEO) throughout the year, including the Nebraska Independence Day Alternate Fuels Classic road rally. This executive summary provides an overview of these various state-level activities, as well as a synopsis of national, regional and state energy matters during the July-September time frame.

The NEO is required by law to provide the Governor and Legislature with quarterly and annual reports. In complying with this statutory directive, the NEO provides as extensive an analysis as possible of programs, policies and data that will provide lawmakers and the Governor with insight into the status of Nebraska's energy position and progress.

During the July-September quarter, world oil prices stabilized at approximately $33 per barrel, which contrasts with the fluctuating situation that had followed the sharp growth in prices which began in 1979. Most forecasters see this period of stabilized prices continuing unless there are major political interruptions or shortages stemming from conflict that sparks war in the Mideast. The Reagan administration free market philosophy seemed partly responsible for the forecasters' view that stability in pricing would continue into the forseeable future.

Regionally, oil stocks were viewed as in the normal range. The stocks as of July 31 were down 11 percent from the same date a year ago, but that was still viewed as within the acceptable level for the Petroleum Allocation for Defense District in which Nebraska is located. Motor gasoline stocks in the region were down only five percent.

Nebraskans during the third quarter continued their impressive 1982 record in motor fuels of using less gasoline and more gasohol. During the July-September period, Nebraska motorists used nearly 182 million gallons of gasoline, compared with almost 205 million gallons during the same three-month period in 1981. Meanwhile, gasohol sales during the third quarter of 1982 soared to nearly 27 million gallons, compared with the 7.5 million gallons recorded during the same period of 1981.

State building audits, low income weatherization assistance and school weatherization all continued in the anticipated fashion during the third quarter. School weatherization took the spotlight among these programs as $1.3 million in State Oil and Gas Severance tax funding was distributed during the quarter for energy efficiency projects at 73 public school buildings in 46 local districts. This third grant cycle distribution marked the completion of the initial year of the State School Weatherization Program, during which almost $4 million in State funding was targeted for energy efficiency in districts

throughout Nebraska.

Use of nuclear energy to generate electricity in Nebraska continued to increase throughout 1982, as disclosed in data covering the first three quarters of the year. Use of natural gas and coal to generate electricity declined and nuclear power made up the difference as overall electricity generation increased during the first nine months of the year by nearly 12 percent.

The showcase event of the third quarter was the Alternate Fuels Classic, which drew 31 entries from across the nation to compete in an event designed to promote alcohol and other alternate fuels. The Classic road rally covered a 150-mile course from Lincoln to Aurora and back on July 4. The winner of the spark ignition class was Dan Kunau of Simla, Colorado, whose 1966 station wagon covered the course running on 200 proof ethanol, which is grain alcohol. The compression ignition (diesel-type) class was won by a 1982 automobile engineered by Robert Strassburger of the University of Michigan. It ran on a fuel combination of ethanol, soybean oil and castor oil. Winners were determined on the basis of energy efficiency.

The NEO's third quarter activities also included an August 4-5 meeting of energy officials from seven states and the federal government to discuss emergency planning and other matters in Omaha. The NEO hosted the two-day gathering at which U.S. Department of Energy representatives described for energy office directors and planners from the Midlands region the implications of free market petroleum policies and operation of the Strategic Petroleum Reserve system. Representatives of Nebraska, Iowa, Missouri, Kansas, Colorado, Wyoming and South Dakota were on hand for the ad hoc planning group sessions. Greater regional cooperation and communication, along with enhanced communication with federal DOE personnel, resulted from the meeting.

During the quarter, planning began on the NEO Community Energy Management Program. This program was being devised to provide interested Nebraska cities and towns an opportunity to join with the state-level NEO in a joint effort at identifying local energy programs and challenges. The program is designed to encourage formation of local energy management committees to identify those problems and challenges, and to provide coordinated solutions. The full range of technical assistance available from the NEO is to be made available for communities which participate.

WORLD AND U.S. OIL PRICES

The price of internationally traded oil was constant, at $33.11 per barrel during the third quarter in contrast to the sharp growth and frequent changes it registered from the beginning of 1979. Most forecasters agree that barring major political or war interruptions, the price will remain stable to the end of this year, with a moderate increase along the average inflation rate in the following years.

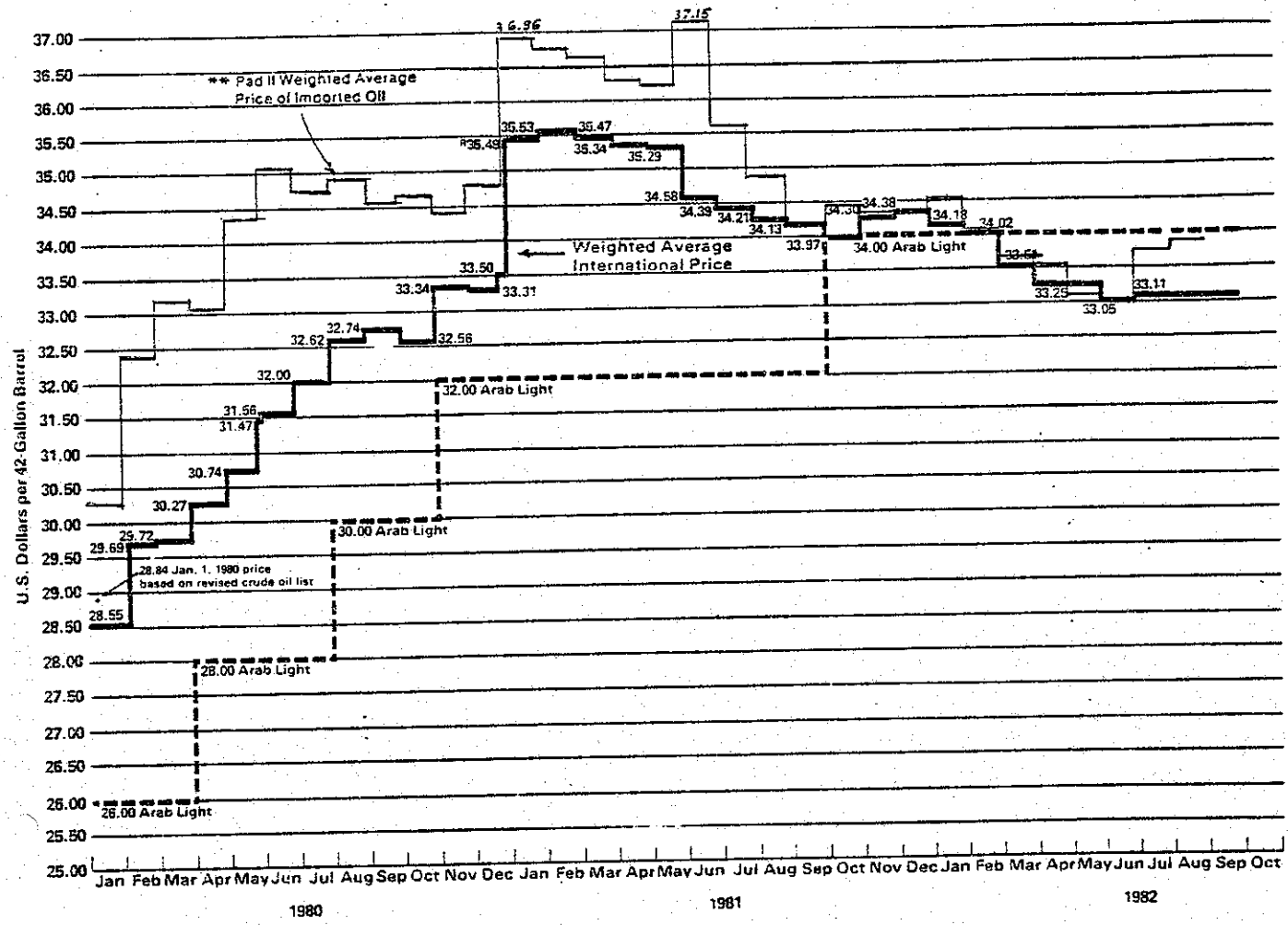
In order to maintain the crude oil price, the Organization of Petroleum Exporting Countries (OPEC) decreased production of oil from 31.3 million barrels per day in 1979 to an estimated 21.1 million barrels per day in 1982. Further production cuts are unlikely because this year OPEC countries face a $9.5 billion deficit.

The U.S. average refinery acquisition cost of crude oil from domestic sources was $30.79 per barrel in July and $33.44 per barrel from import sources, correspondingly 8.4 and 8.6 percent lower than in July 1981 ($31.74 per barrel and 8.5 percent for all sources).

The stabilized and soft oil prices caused a decrease in exploration and drilling activity. A national drilling rig count was 31.3 percent lower, and the number of crews engaged in seismic exploration was 21.2 percent lower, compared with July 1981. The record year in U.S. rotary rig activity was 1981. A sharp decrease in well drilling also was recorded in the state.

Table 1

World Crude Oil Prices[1]
(Dollars per Barrel)



1/ Internationally traded oil only. Average price (FOB) weighted by estimated export volume.

Note: Beginning with the May 1, 1981 issue of the Weekly Petroleum Status Report, the world crude oil price is based on a revised crude list.
Additions: Saudi Arabia's Arabian Heavy, Dubai's Fateh, Egypt's Suez Blend, and Mexico's Maya.
Omissions: Canadian Heavy.
Replacements: Iraq's Kirkuk Blend for Iraq's Basrah Light.
The above graph shows an estimated world crude oil price based on this revised list beginning January 1, 1981. An asterisk shows the January 1, 1980 price based on the revised list. All other 1980 prices represent the old crude list before revisions.

REGIONAL STOCK AND IMPORTS

Nebraska is in a fifteen state Petroleum Allocation for Defense District known as PAD 2, which ranges from Nebraska to Ohio. As of July 31, 1982, stocks of crude oil in PAD 2 were down 11 percent from the level of July, 1981. This year's stock is still viewed as in the normal range.

Motor gasoline stocks in PAD 2 were 5 percent lower than last year, distillate fuel oil stocks were down 14.5 percent and residual fuel stocks were 26 percent lower. In the four state district of Oklahoma, Kansas, Missouri and Nebraska, motor gasoline stocks were down 7 percent in July.

In 1980, there were 416,660,000 barrels of foreign crude oil imported into PAD 2. Six countries accounted for 79 percent: Nigeria, 16.5 percent; Mexico, 13.9 percent; Canada, 12.2 percent; Algeria, 11.4 percent, and Saudi Arabia, 7.7 percent.

The percentages changed in 1981. There were 264,838,000 barrels of foreign crude oil imported into PAD 2 from the six countries, which is a decrease of 36 percent. Canada led with 39.9 percent; Nigeria, 16.1 percent; Saudi Arabia, 13.7 percent; Mexico, 13.0 percent; Libya, 8.9 percent; and Algeria, 8.4 percent.

During the first seven months of 1982, imports of foreign oil into PAD 2 were down over 27% from 1981 with nearly 59% coming from Canada; 15% from Mexico; 13.5% from Nigeria, 7% from Saudi Arabia. There have been no imports from Libya since February.

Sources: Weekly Petroleum Status Report, Monthly Petroleum Statement and Petroleum Supply Monthly.

NEBRASKA OIL PRODUCTION AND EXPLORATION

The following table and graphs present data on oil production and exploration in the State from reports of the Nebraska Oil and Gas Conservation Commission. A trend of moderate increase in oil production in the State is clear. During eight months of this year, oil production was 105 percent compared with the corresponding period of the last year. It is not certain, however, how long this trend will sustain because drilling activity is dropping substantially.

As shown in the table, the number of development well permits went down to 48 percent of the corresponding period of 1981. A development well is a well drilled within the presently known or proved production area. The number of exploratory well permits went down to 69 percent of the same period of 1981. An exploratory well is a well drilled to find and produce oil or gas in an unproved area. A similar trend is taking place at the national level.

NEBRASKA OIL PRODUCTION AND EXPLORATION

TABLE 2

Month	Oil Production in Barrels				Drilling Permits							
					Exploratory				Development			
	1980	1981	1982	**	1980	1981	1982	**	1980	1981	1982	**
January	502,703	554,180	560,334	101	45	27	26	96	21	27	23	85
February	480,512	503,868	532,073	106	21	22	22	100	27	29	15	52
March	516,836	565,799	605,026	107	20	16	27	169	25	22	17	77
April	486,000	559,925	591,723	106	19	23	18	78	30	56	7	13
May	540,000	553,556	594,224	107	27	15	15	100	28	40	13	33
June	509,397	548,195	568,019	104	17	50	13	26	32	30	20	67
July	504,840	547,937	586,941	107	14	27	13	48	33	44	22	50
August	547,833	578,214	580,348	100	13	39	15	38	16	20	12	60
September	534,617	559,887			34	23	18	78	22	24	11	46
October	539,889	580,388			41	34			32	24		
November	502,264	541,312			34	41			30	26		
December	529,079	571,699			24	37			27	32		
TOTALS	6,193,970	6,664,930	4,618,688	105	309	354	167	69	323	374	140	48
*Annual Summary	6,239,652	6,671,313			309	354			311	374		

Notes: *Annual summary data is compiled after corrections and is considered more reliable.

**Percent for corresponding period of previous year.

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Table 3

Average Retail Price of Gasoline in Nebraska

(Dollars per Gallon)

	1978	1979	1980	1981	1982	Percent of Previous Year
January	$ .63	$ .67	$1.09*	$1.21	$1.27	105.0
February	.63	.68	1.15	1.28	1.26	98.4
March	.63	.71	1.18	1.35	1.22	90.4
April	.63	.74	1.21	1.35	1.12	83.0
May	.63	.79	1.22	1.32	1.14	86.4
June	.63	.87	1.22	1.31	1.23	93.9
July	.64	.90	1.20	1.29	1.26	97.6
August	.65	.94	1.18	1.29	1.24	96.1
September	.66	.97	1.17	1.28	1.21	94.5
October	.66	.97	1.16	1.28		
November	.66	1.00	1.19	1.28		
December	.67	1.02	1.19	1.28		
						93.8%

Average first nine months of 1981: $1.30
Average first nine months of 1982: $1.22

Source: Cornhusker Motor Club
*Source: Weekly Petroleum Status Report

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NEBRASKA PETROLEUM STATUS REPORT

Increasing gasohol consumption and declining gasoline use continued during the third quarter, following a trend in 1982 that is shattering gasohol records and conserving gasoline for future use.

Gasoline available for sale in Nebraska is defined as total gasoline (excluding Gasohol) imported into Nebraska, minus the total exported. Since 1978, consumption has gradually decreased, and is now levelling off. The consumption of gasohol and gasoline combined is within one half of one percent of the same period in 1981.

Gasohol available for sale in Nebraska has shown definite growth over the last two years and even more significant gains in recent months. In the first nine months of 1982, consumption of gasohol was 248.6 percent of the same period in 1981. Gasohol comprised 9.4 percent of Nebraska gasoline sales thus far in 1982.

January-September middle distillate imports were 103 percent of the corresponding period of 1981 and 83 percent of the same period in 1979. Gasoline sold to federal agencies in the first nine months of 1982 was 185.1 percent of the 1981 level during the same period.

Special fuels, which are any fuels other than gasoline that may be used in a motor vehicle fuel tank (diesel, propane, natural gas), are recorded in two categories. Special fuels for highway use are fairly constant, reflecting the stability of the commercial transportation system. Consumption this year is following the regular seasonal pattern. Special fuels for non-highway use include agricultural, industrial, railroad and any other model vehicle use not on Nebraska roads. The non-highway use is quite dependent upon the Nebraska economy and the weather. It is more volatile than highway use.

Tables and graphs on the following pages reflect Nebraska's petroleum experience for the third quarter, along with the historic usage patterns for gasoline and other fuels.

Table 4

Gasoline Available for Sale in Nebraska* (Metered Thousands of Gallons)

	1977	1978	1979	1980	1981	1982	Percent of Previous Year
January	69,334	69,166	69,602	63,763	60,917	53,344	87.6%
February	62,501	63,227	69,367	59,381	51,123	48,611	95.1
March	70,780	75,162	73,397	63,151	56,183	55,705	99.1
April	77,085	74,597	72,399	65,318	61,489	66,295	107.8
May	79,039	84,422	77,631	72,440	65,221	63,380	97.2
June	86,543	86,165	75,955	65,801	67,532	62,470	92.5
July	92,844	88,253	80,054	73,498	71,593	67,004	93.6
August	82,343	89,733	82,473	72,201	68,404	60,347	88.2
September	79,853	79,202	72,609	79,754	65,057	54,516	83.8
October	82,107	86,061	78,565	65,140	70,371		
November	76,506	78,351	76,555	60,261	61,220		
December	75,453	76,887	74,824	68,169	62,200		
TOTAL	934,388	951,226	903,431	808,877	761,310	531,672	93.7%

The last three months are preliminary.
*Gross imports into the state minus exports out of the state, excluding Gasohol.
Source: Department of Revenue Tax Form 81

November 2, 1982
NEBRASKA ENERGY OFFICE

Table 5

NEBRASKA ENERGY OFFICE
GASOLINE AVAILABLE FOR SALE

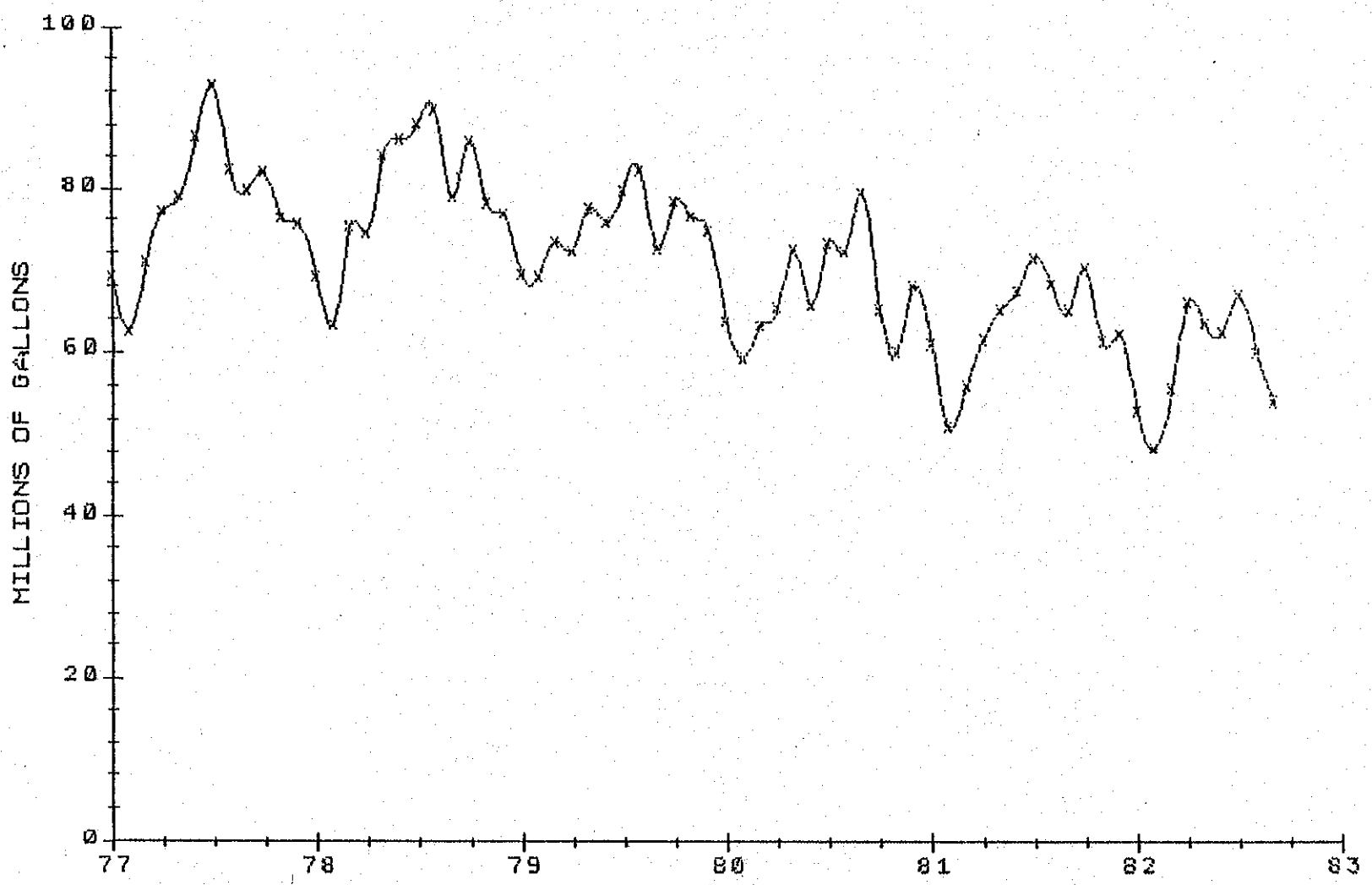


Table 6

Gasohol Available for Consumption in Nebraska* (Thousands of Gallons)

	1979	1980	1981	1982	Percent of Previous Year
January	280	1,729	2,514	3,637	144.7%
February	280	1,926	2,308	4,016	174.0
March	296	2,878	2,413	4,817	199.6
April	291	2,687	2,311	4,772	206.5
May	313	2,915	2,397	4,723	197.0
June	306	2,579	2,587	6,188	239.2
July	320	2,749	2,616	7,279	278.2
August	1,413	2,320	2,478	9,254	373.4
September	823	2,761	2,547	10,436	409.7
October	922	2,485	2,631		
November	802	2,284	2,713		
December	844	2,825	3,666		
TOTAL	6,890	30,138	31,181	55,122	248.6%

The last three months are preliminary
*Gross imports into the state minus exports out of the state
Source: Department of Revenue Tax Form 81-1

November 2, 1982
NEBRASKA ENERGY OFFICE

Table 7

NEBRASKA ENERGY OFFICE
GASOHOL AVAILABLE FOR SALE

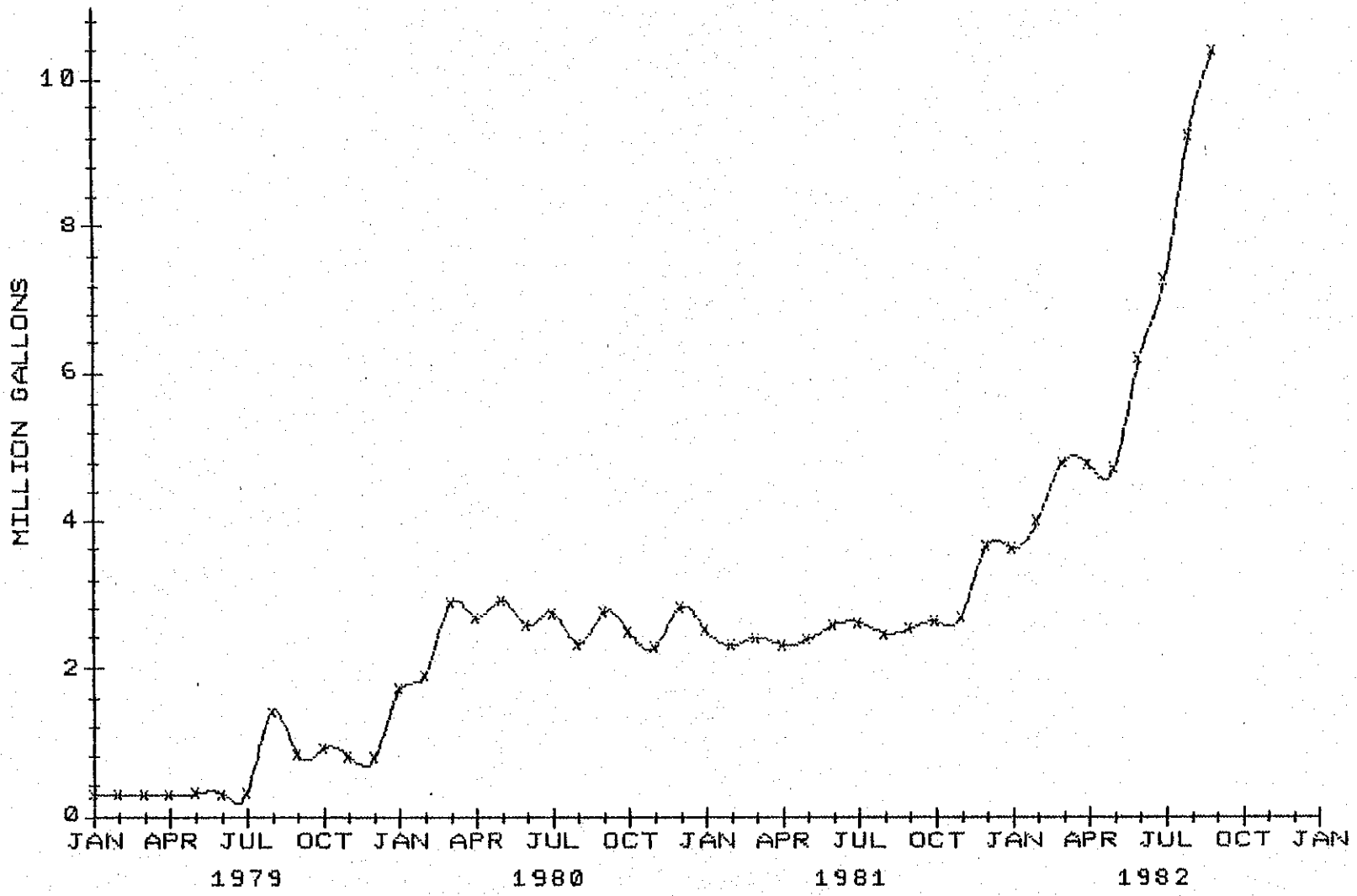


Table 8

*Middle Distillates Imported Into Nebraska (Thousands of Gallons)

	1976	1977	1978	1979	1980	1981	1982	Percent of Previous Year
January	16,408	28,165	34,298	40,244	25,381	24,891	26,926	108.2%
February	14,081	18,169	29,735	34,600	26,157	59,280	19,013	32.1
March	19,222	24,028	37,886	48,150	23,102	29,450	22,130	75.1
April	23,495	24,833	32,942	40,745	32,255	24,922	49,480	198.5
May	26,239	27,521	43,673	50,992	36,486	28,494	40,283	141.4
June	28,744	28,267	42,739	38,258	31,247	36,640	36,516	99.7
July	32,022	36,250	50,051	46,443	59,339	42,389	44,655	105.3
August	29,857	36,183	46,934	43,635	35,548	28,808	40,065	139.1
September	24,475	32,160	39,245	34,495	29,905	30,595	35,444	115.8
October	24,160	32,295	34,802	38,383	31,691	31,896		
November	26,464	28,073	34,156	38,326	28,840	28,695		
December	24,461	29,294	34,524	31,200	27,060	25,464		
TOTALS	289,628	345,238	460,985	485,471	392,619	391,524	314,512	103.0%

*Diesel, home heating oil, kerosene and other middle distillates
The last three months are preliminary
Source: Unaudited Figures from Department of Revenue Tax Forms 81

November 2, 1982
NEBRASKA ENERGY OFFICE

Table 9

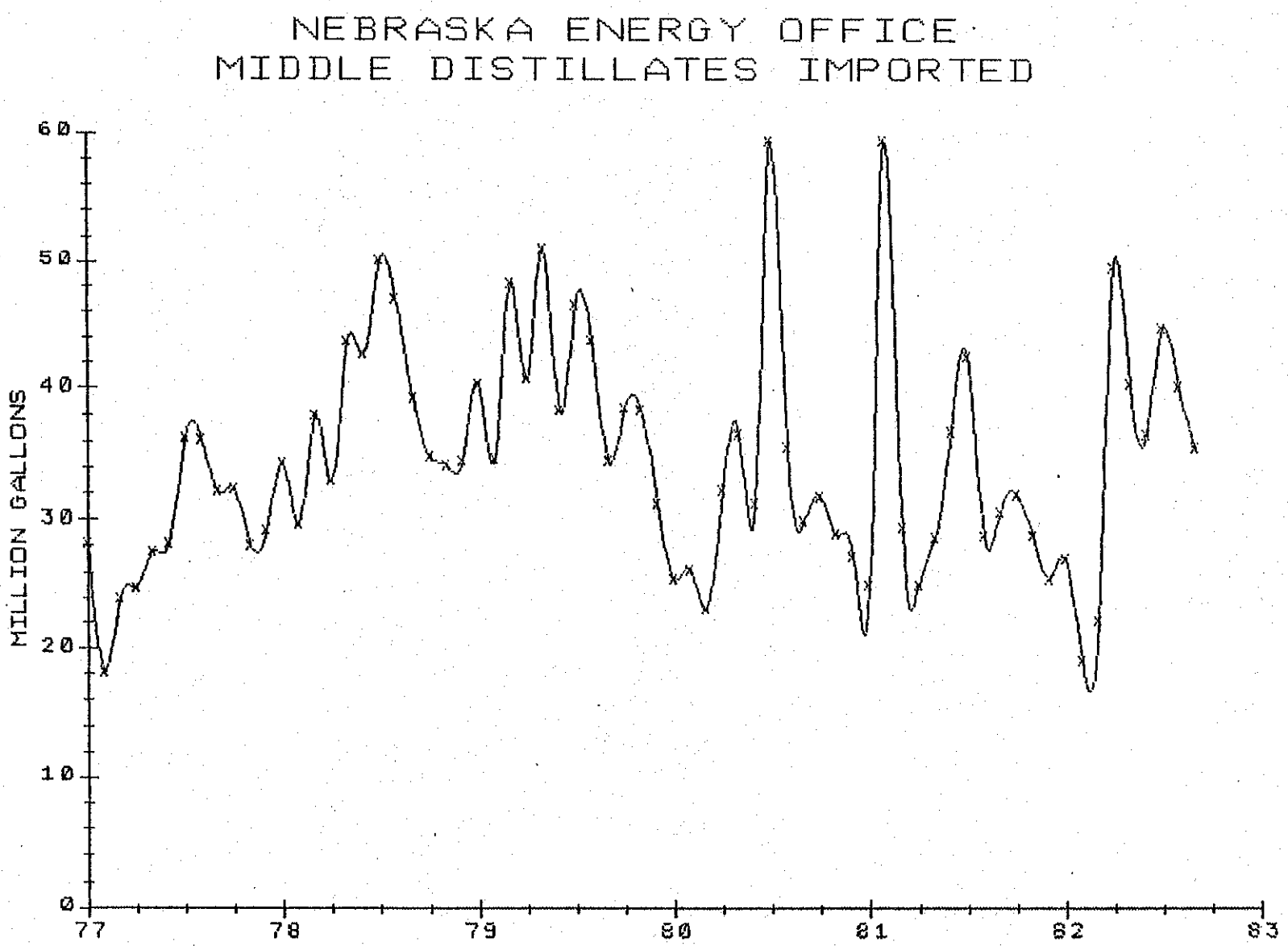

NEBRASKA ENERGY OFFICE
MIDDLE DISTILLATES IMPORTED
MILLION GALLONS
60
50
40
30
20
10
0
77
78
79
80
81
82
83

Table 10

Gasoline Sold in Nebraska to Federal Agencies* (Thousands of Gallons)

	1977	1978	1979	1980	1981	1982	Percent of Previous Year
January	250	225	293	198	194	322	166.0%
February	207	229	510	223	155	246	158.7
March	208	241	354	259	205	394	192.2
April	355	254	244	218	228	505	221.5
May	563	289	433	197	203	710	349.8
June	202	223	201	217	336	194	57.7
July	381	170	242	211	288	1,194	414.6
August	234	192	234	187	227	169	74.4
September	272	191	162	298	298	215	72.1
October	154	154	288	151	214		
November	214	165	292	126	288		
December	229	180	203	175	388		
TOTAL	3,269	2,513	3,456	2,363	3,024	3,949	185.1%

The last three months are preliminary.
*Unaudited data, expected revision has not been done.
Source: Department of Revenue Tax Form 81

November 2, 1982
NEBRASKA ENERGY OFFICE

Table 11

NEBRASKA ENERGY OFFICE
GASOLINE SOLD TO FEDERAL AGENCIES

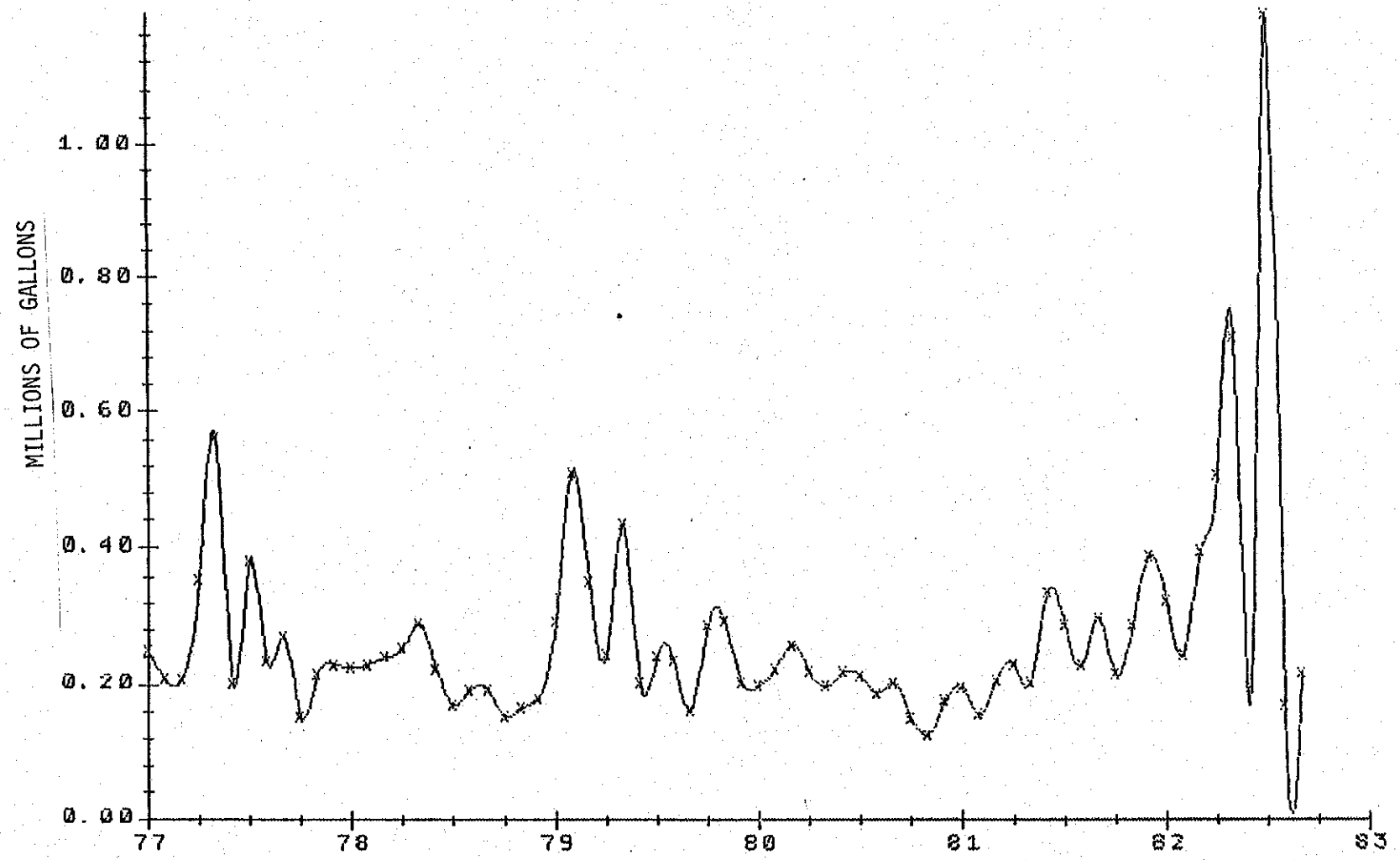


Table 12

Special Fuels for Highway Use Delivered in Nebraska (Thousands of gallons)

	1976	1977	1978	1979	1980	1981	1982	Percent of Previous Year
January	8,828	10,123	10,200	11,482	11,840	10,598	10,861	102.5%
February	8,889	9,654	10,104	11,256	11,067	10,022	10,871	108.5
March	10,363	12,092	11,615	12,944	12,068	12,041	12,564	104.3
April	10,306	11,180	11,906	12,415	12,324	12,072	12,649	104.8
May	10,059	10,901	12,114	13,035	11,895	11,706	11,711	100.0
June	10,372	10,938	11,971	11,019	11,884	11,849	11,872	100.2
July	9,698	10,336	11,121	11,637	11,714	11,544	11,973	103.7
August	10,243	10,915	12,454	12,570	12,349	11,483	12,446	108.4
September	10,491	10,937	12,476	12,686	13,439	12,180	12,892	105.8
October	10,849	12,198	13,996	14,310	13,592	13,367		
November	10,660	10,774	11,894	12,412	11,823	11,664		
December	10,027	10,116	11,114	12,047	11,224	11,101		.
TOTAL	121,785	130,161	140,965	147,813	145,219	139,627	107,839	104.2%

*Any fuels other than gasoline that are put in a motor vehicle fuel tank. These include diesel, propane and natural gas.
The last three months are preliminary.
Source: Department of Revenue Form 91

November 2, 1982
NEBRASKA ENERGY OFFICE

Table 13

NEBRASKA ENERGY OFFICE
HIGHWAY FUEL

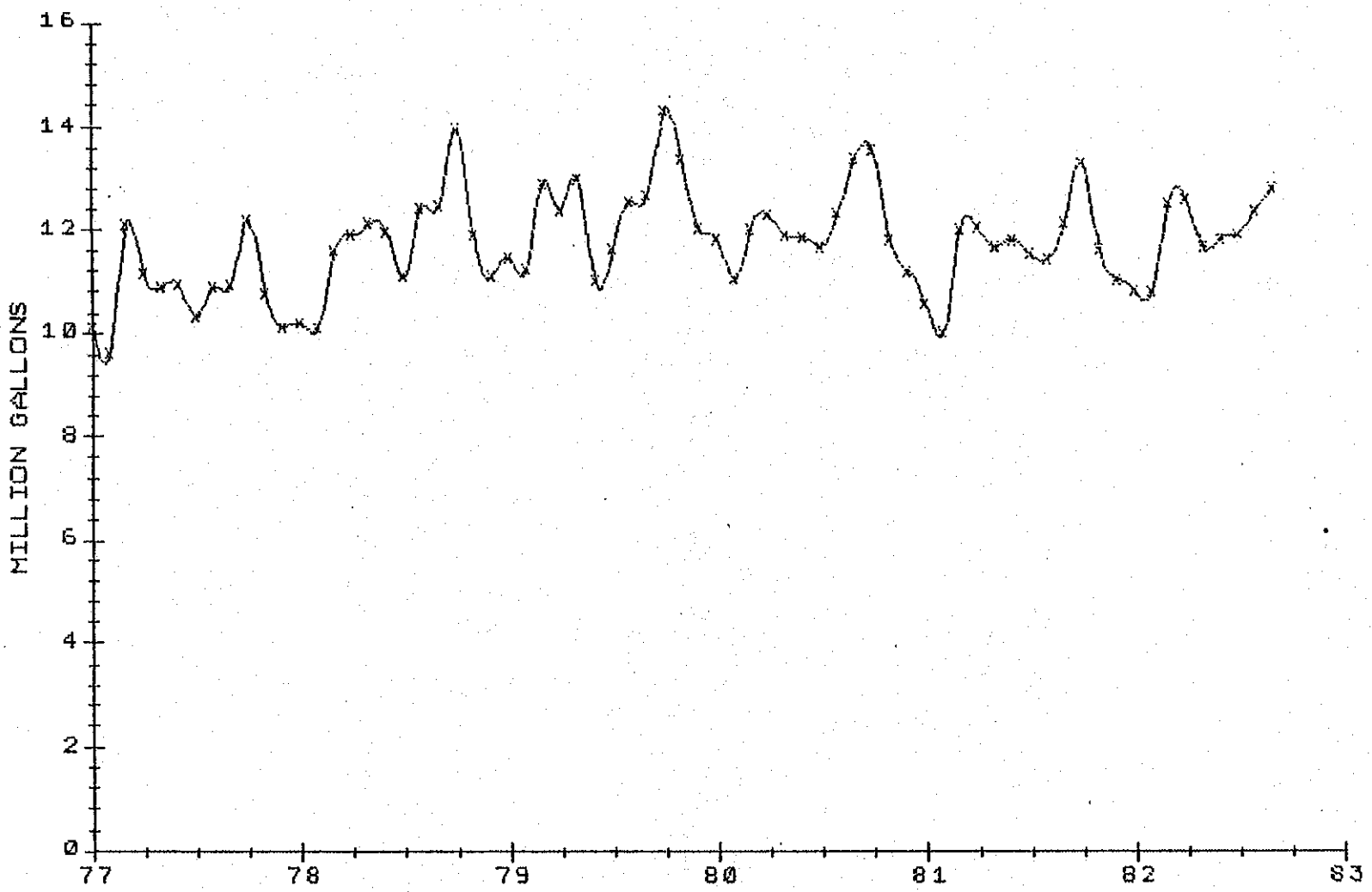


Table 14

*Special Fuel (Non-Highway Use) Delivered in Nebraska (Thousands of Gallons)

	1980	1981	1982	Percent of Previous Year
January	13,800	12,943	11,917	92.1%
February	15,164	10,669	9,630	90.3
March	12,336	8,384	7,723	92.1
April	12,201	8,558	14,627	170.9
May	13,619	10,705	12,642	118.1
June	14,332	13,473	12,241	90.9
July	24,485	18,163	16,659	91.7
August	16,920	10,187	14,535	142.1
September	14,990	10,418	13,098	125.7
October	15,457	17,026		
November	12,488	13,919		
December	13,913	11,020		
TOTAL	179,695	145,465	113,072	109.2%

*Any fuels other than gasoline that are put in a motor vehicle fuel tank. These include diesel, propane and natural gas.
*Includes agricultural, industrial, railroad and any other motor vehicle use not on Nebraska roads.
The last three months are preliminary
Source: Department of Revenue Form 91

November 2, 1982
NEBRASKA ENERGY OFFICE

Table 15

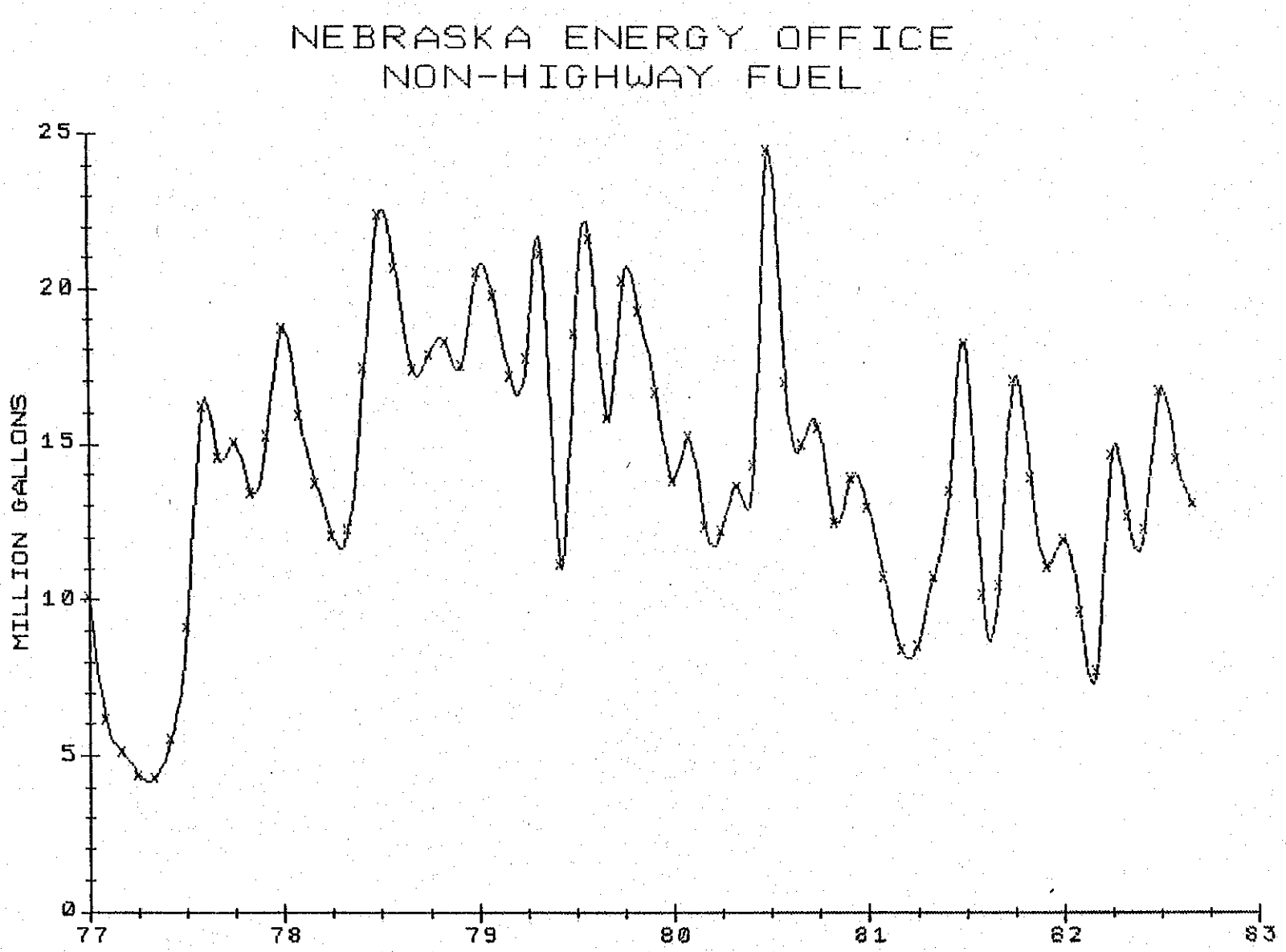

NEBRASKA ENERGY OFFICE
NON-HIGHWAY FUEL
MILLION GALLONS
25
20
15
10
5
0
77
78
79
80
81
82
83

Table 16

Aviation Fuel (all types) Available for Sale* In Nebraska (Thousands of Gallons)

	1980	1981	1982	Percent of Previous Year
January	3,523	2,997	2,444	81.5%
February	2,883	2,591	2,368	91.4
March	3,011	2,997	2,588	86.4
April	3,099	2,710	2,446	90.3
May	3,371	2,974	2,429	81.7
June	3,220	3,220	2,735	84.9
July	3,431	3,208	3,005	93.7
August	3,746	2,700	2,845	105.4
September	4,190	3,131	2,579	82.4
October	4,444	2,727		
November	2,972	2,371		
December	3,209	2,663		
TOTAL	41,099	34,289	23,439	88.4%

The last three months are preliminary

*Gross Gallons imported into Nebraska minus gallons exported out of state.

Source: Department of Revenue Form 85

November 2, 1982

NEBRASKA ENERGY OFFICE

Table 17

NEBRASKA ENERGY OFFICE
AVIATION FUEL

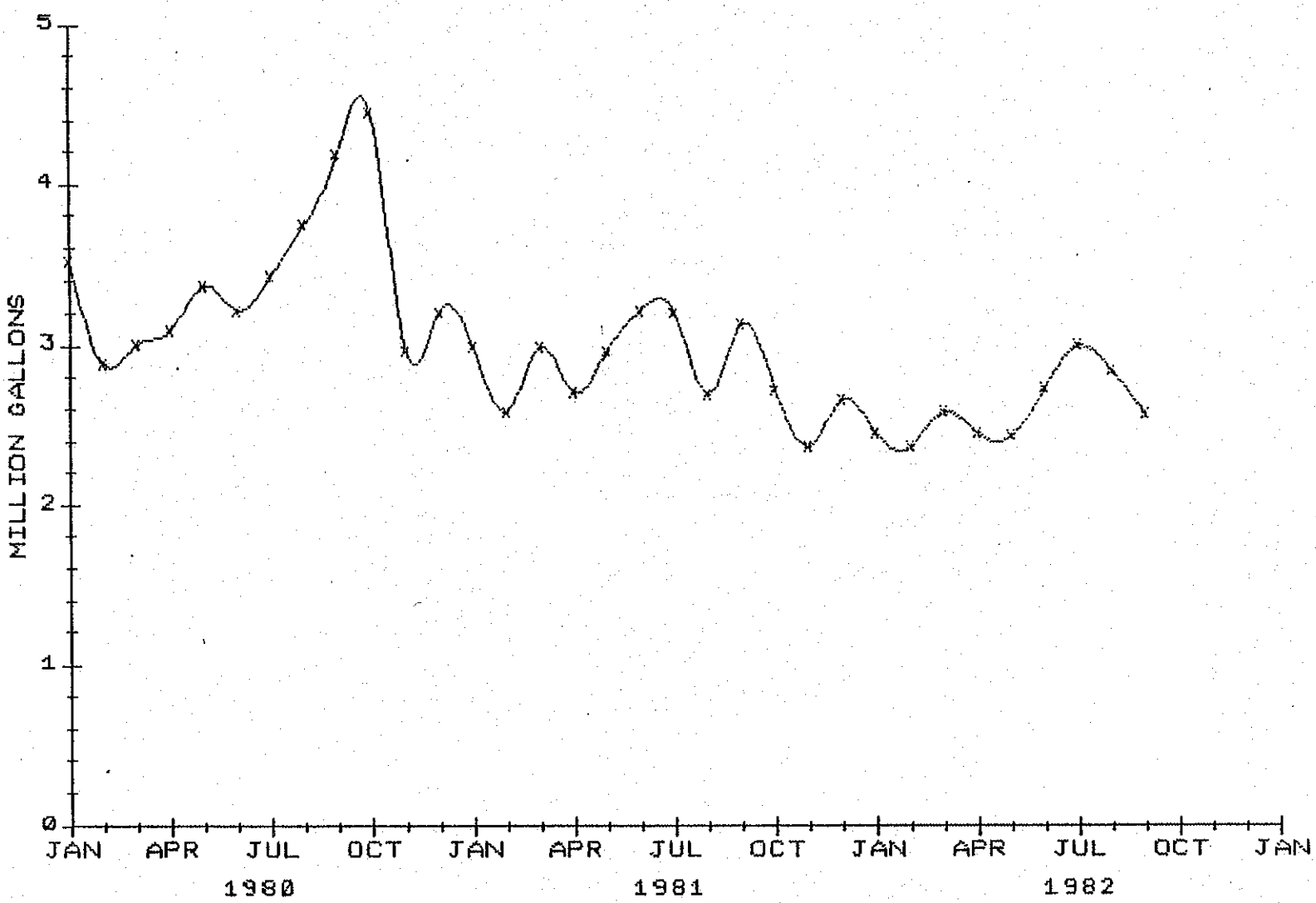


Table 18

Propane Delivered in Nebraska (Thousands of Gallons)

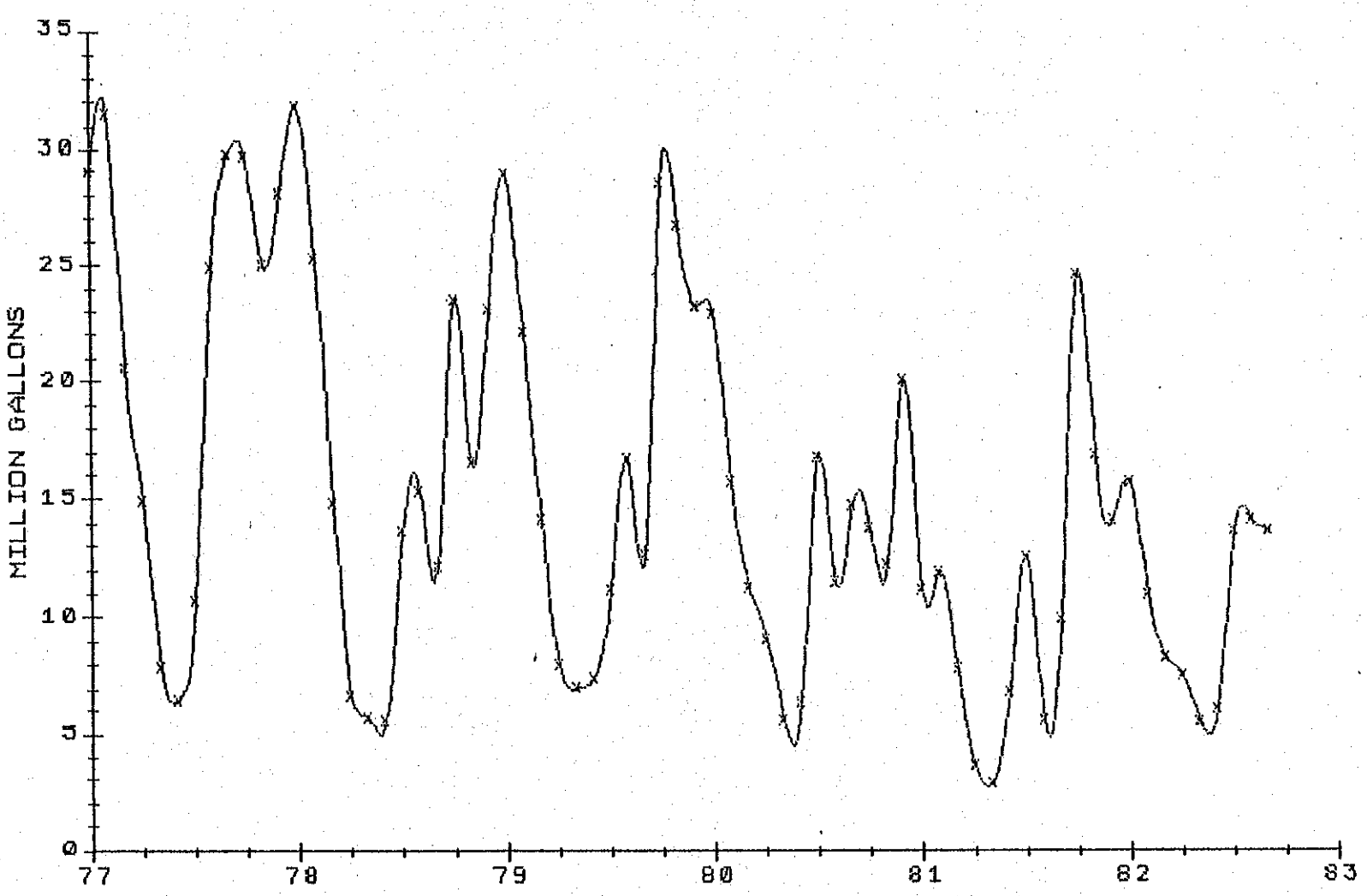
	1976	1977	1978	1979	1980	1981	1982	Percent of Previous Year
January	26,437	29,017	31,848	28,908	22,902	11,186	15,739	140.7%
February	25,163	31,505	25,331	22,164	15,673	11,841	11,045	93.3
March	16,844	20,609	14,839	14,142	11,331	7,822	8,318	106.3
April	16,500	14,952	6,717	8,008	9,115	3,731	7,524	201.7
May	7,348	7,958	5,754	7,035	5,669	2,947	5,556	188.5
June	6,456	6,494	5,611	7,447	6,402	6,864	6,142	89.5
July	11,845	10,676	13,654	11,217	16,772	12,502	13,649	109.2
August	24,855	24,895	15,328	16,671	11,447	5,631	14,185	251.9
September	24,054	29,767	12,137	12,611	14,727	9,906	13,679	138.1
October	16,624	29,735	23,492	28,577	13,767	24,673		
November	27,439	25,027	16,558	26,709	12,237	16,877		
December	24,227	28,123	23,138	23,181	19,977	14,173		
TOTAL	227,792	258,758	194,407	206,670	160,019	128,153	95,837	132.3%

The last month is preliminary
Source: EIA-25 Reporting Forms

November 2, 1982
NEBRASKA ENERGY OFFICE

Table 19

NEBRASKA ENERGY OFFICE
PROPANE DELIVERED



ENERGY DEMAND MODEL

The Nebraska Energy Office (NEO) has been involved in the creation of an energy demand model for the state in response to passage of Legislative Bill 954 of 1980. The model is used to identify emerging trends relating to energy supply, demand and conservation in the following sectors: agricultural, commercial, residential, industrial, and transportation. It is a useful tool in evaluating policies on Nebraska's economy and energy status.

Over the past year, the NEO has highlighted the model's capabilities in quarterly reports. In previous reports, all the sectors except commercial were analyzed by using the model. In this third quarterly report for 1982, the commercial sector is being analyzed.

COMMERCIAL MODEL

The commercial model is part of the Nebraska Energy Office plan to create a comprehensive energy model for the state. The primary goal is to find existing trends in the use of different fuels in the commercial sector and forecast to 1990.

The commercial sector consists of all enterprises with Standard Industrial Classification (SIC) Codes from SIC 50 and up. This includes sales, trade, finance and services. Four end uses (space heating, water heating, space cooling and all other uses) are disaggregated in the model. Four major fuel types accounted for in the model are natural gas, electricity, propane (LPG) and distillates. Gasoline and other fuels used in commercial transportation were included in the transportation model.

The commercial model can presently answer the following questions about energy use in the Nebraska commercial sector:

A. How much energy in British thermal units (Btu's) and physical units for four types of fuel will be used and the expected cost any year from 1980 to 1990, assuming that the previous trend in fuel use will continue?

B. The same as above, but with the assumed rate of fuel switching from fossil fuels to electricity and/or from petroleum products to natural gas?

C. What amount of energy will be used in the commercial sector depending on the Nebraska disposable personal income in constant 1972 dollars? This variable has a high influence on commercial energy use

D. What changes in energy use and cost can be expected with any changes in separate fuel prices?

The primary source of data for the commercial model is the U.S. Department of Energy (DOE). The State Energy Data Report (SEDR), State Energy Fuel Prices (DOE printout) and Chase Econometric Data Base give State specific data of the past. The future fuel prices (specific for DOE region 7) are taken as forecasted by Energy Economic Research, Inc. (EER). Future disposable personal income for Nebraska is taken from the Chase Econometric Data Base. Data forecasted by the residential model were also used. The ratios of end uses for energy fuel type were taken from different sources and need updating. The ratios can be treated as constant or variable (fuel switching) depending on assumptions for each calculation.

Separate linear regression equations were developed for each type of fuel and tested for statistical validity, including the table of residuals. Printouts of the tests on statistical validity are kept on file.

The amount of natural gas used in the commercial sector is correlated with national consumption and disposable personal income in constant dollars. Both correlations are positive. Electricity consumption is positively correlated with disposable personal income (the higher the income, the higher the electricity consumption) and negatively correlated with the ratio of electricity price to natural gas price (the higher the ratio, the lower the electricity consumption). Distillate consumption is positively correlated to the national supply and negatively correlated to the price ratio of propane to distillate. Propane consumption is negatively correlated to the ratio of its price to natural gas price and positively correlated to propane usage in the Nebraska residential sector.

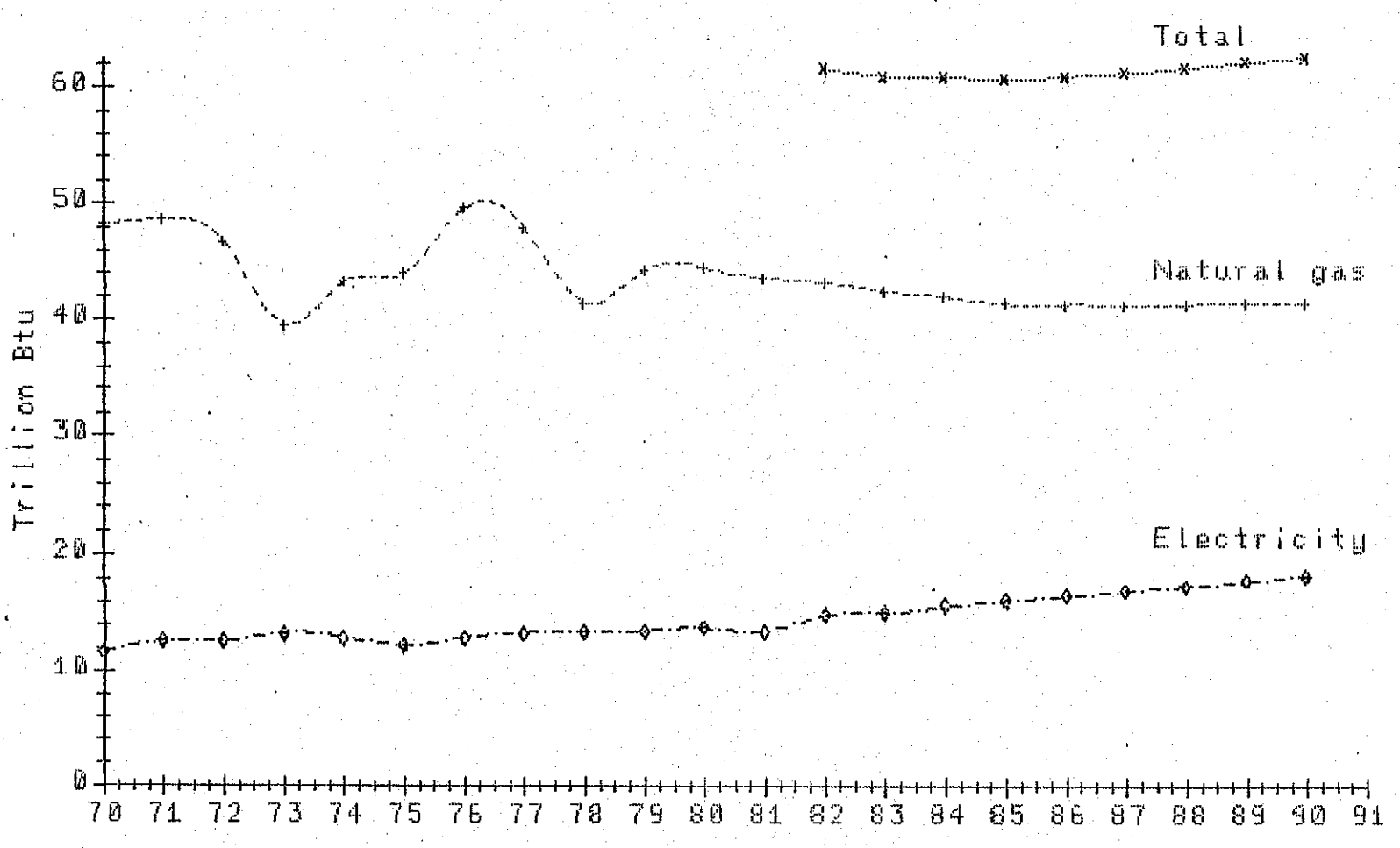
Assuming that existing trends in commercial fuel use will continue in the current decade, natural gas will remain a dominant type of fuel for the commercial sector of Nebraska without significant changes in total volume. Electricity use is expected to have sustained growth while distillate oil and propane decrease at the same time. Total energy consumption in the commercial sector is expected to decrease slightly until 1985 and then register a small increase to the end of the decade.

With all limitations in available data and assumptions, the commercial model properly performs intended calculations giving reasonable results. All results need to be analyzed and interpreted. The model can be a useful tool for the management of energy in the state of Nebraska.

The following tables provide information from the commercial model.

Table 20

Nebraska Commercial Energy Use

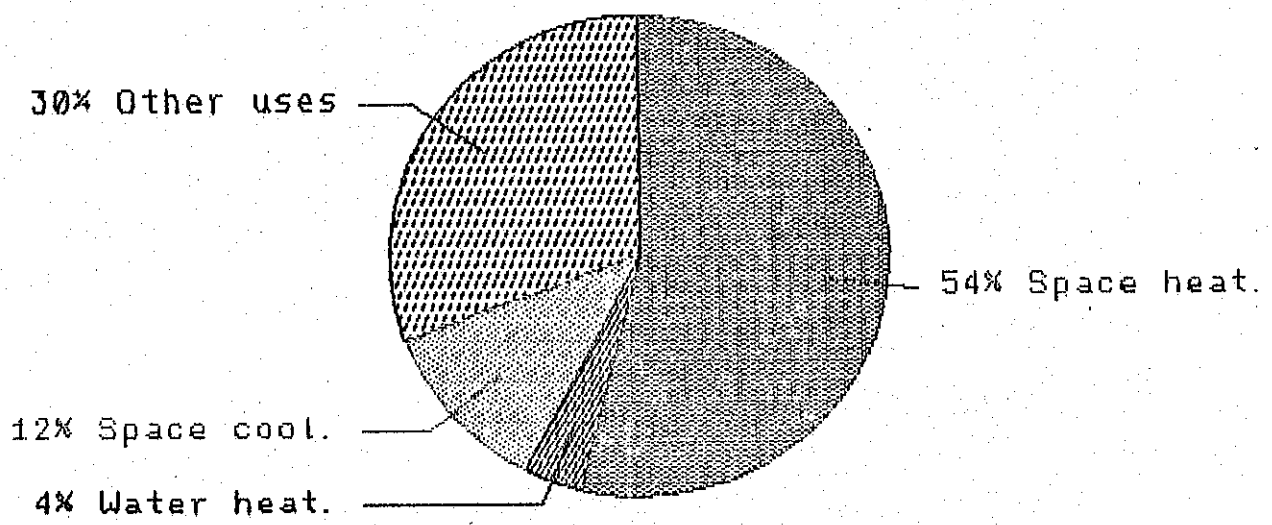


Actual up to 1981; projection - 1982 and up.

NEO, Sept. 1982

Table 21

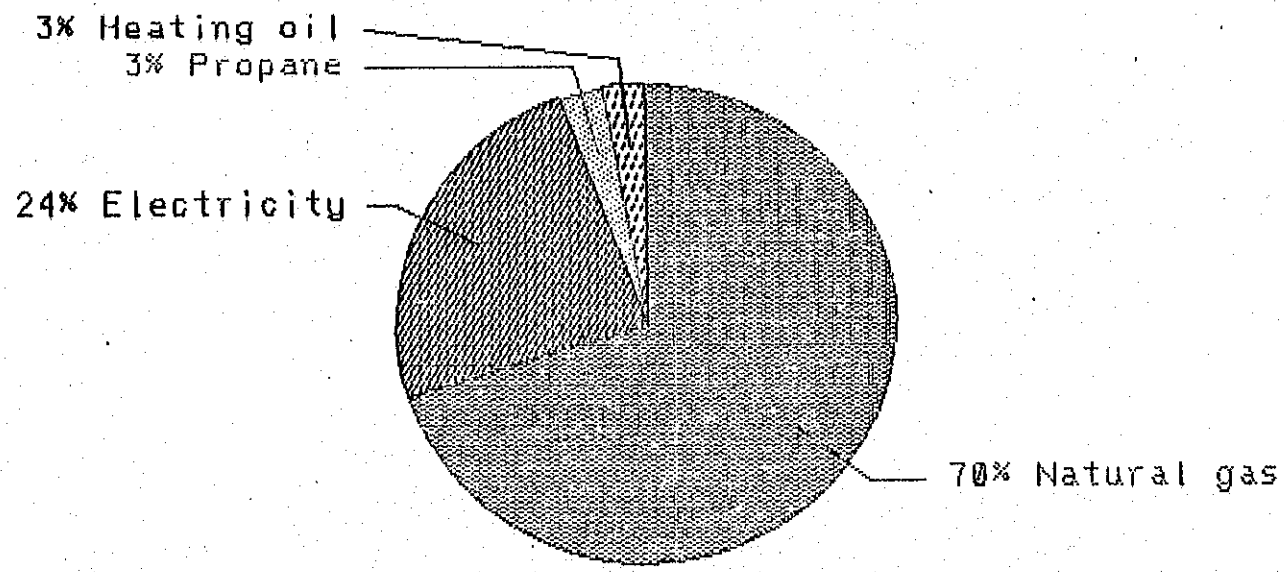
Commercial Energy End Use



NEO Commercial model estimation for 1982

Table 22

Nebraska Commercial Fuel Use



NEO Model calculation for 1982

ELECTRIC SALES TO ULTIMATE CONSUMERS

The total electric sales as reported by the three largest electric utilities for the first nine months of this year were up a meager four-tenths of one percent compared with the corresponding period of 1981. The weak electric sales during last summer were expected because of the economic recession and prevailing weather conditions. Cooling degree days were 12 percent lower than normal and precipitation from April 1 through September 24 was 7 percent higher than normal.

As in the previous reporting period, a substantial difference remains among sectors of the state economy. The electricity sales to industrial consumers were down 11.5 percent, while residential and commercial sales were up 4.3 and 3.3 percent, respectively.

Forecasts for the forthcoming winter are for cooler than normal temperatures and a moderate improvement in the economy. This likely will result in a substantial increase in electric sales in the near future.

Table 23

NEBRASKA ENERGY OFFICE
ELECTRIC SALES TO ULTIMATE CONSUMERS
GIGAWATTHOURS (GWH) SOLD
(NPPD, OPPD & LES)

DATE	RESIDENTIAL		COMMERCIAL		INDUSTRIAL		PUBLIC USE		TOTAL SALES		PERCENT
	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	
January	297	336	238	265	196	185	30	32	762	817	107.1
February	274	309	234	239	188	185	29	30	717	763	106.4
March	234	255	200	224	188	183	27	29	651	691	106.5
April	199	231	197	214	197	176	27	29	620	709	114.4
May	190	203	202	202	197	163	26	27	614	595	96.9
June	239	190	229	205	220	172	27	26	714	593	83.1
July	360	302	273	254	227	180	31	28	892	764	85.7
August	319	360	257	273	209	189	30	31	817	852	104.4
September	245	272	234	258	215	192	31	32	724	753	104.0
October	198		210		200		31		639		
November	211		213		193		29		647		
December	269		234		172		30		704		
TOTAL	3,034	2,458	2,722	2,133	2,402	1,625	349	264	8,501	6,537	100.4%

NOTE: Sum of components may not equal the total due to independent rounding

FUEL USED FOR ELECTRICITY GENERATION

Reported figures for the first nine months of 1982 show a sharp drop in the use of natural gas for electricity generation. Major Nebraska electric utilities used only 21 percent of the natural gas used during the corresponding period of 1981. During the same period, coal use for electricity generation decreased 1.4 percent even though new coal power units went into commercial operation.

Despite the decreases in the use of natural gas and coal, electricity generation in the state increased 11.8 percent. That was because of the increased use of nuclear energy. Nuclear power stations produced one third more electricity for the same period of time.

Though the use of oil increased slightly during the first nine months of 1982, it consisted of less than one half of one percent (0.4%) of the total energy for the generation of electricity. A substantial portion was start up fuel.

Heating degree days of six major cities for the beginning of this season through October 17 were estimated 30 percent higher in comparison with the same period last year. Although winter is expected to be colder than normal, there is no reason to expect any shortages of energy in the upcoming season.

Table 24

NEBRASKA ENERGY OFFICE

FUEL USED FOR ELECTRICITY GENERATION BY NEBRASKA MAJOR ELECTRIC UTILITIES

(NPPD, OPPD, LES, GRAND ISLAND, FREMONT AND HASTINGS)

MONTH	COAL THOUSAND SHORT TON		NATURAL GAS MILLION CUBIC FEET		OIL THOUSAND BARREL		HYDRO TRILLION BTU		NUCLEAR TRILLION BTU		TOT ENERGY TRILLION BTU		PERCENT
	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	
January	441	571	186	12	4	15	0.2	0.2	7.4	9.5	17.7	22.6	127.5
February	352	463	136	17	11	24	0.2	0.2	7.6	8.3	15.9	19.0	119.9
March	398	291	156	15	2	8	0.2	0.2	7.1	9.0	16.5	15.8	96.1
April	462	231	164	33	7	10	0.2	0.2	4.3	9.0	15.1	14.4	95.0
May	439	293	243	21	5	10	0.2	0.2	1.7	7.1	12.0	14.0	116.4
June	387	382	338	13	6	7	0.2	0.2	5.1	3.6	14.4	12.5	86.8
July	477	734	501	163	8	13	0.2	0.2	8.3	7.3	19.8	24.2	122.4
August	365	520	265	115	6	6	0.3	0.2	8.2	8.7	16.9	20.8	123.0
September	438	329	165	59	2	3	0.2	0.2	3.5	8.4	13.8	16.0	116.6
October	440		22		1		0.2		0.0		10.1		
November	364		16		8		0.2		4.1		12.6		
December	433		25		12		0.2		6.8		16.9		
Total	4,995	3,814	2,217	448	72	97	2.5	2.0	64.2	71.0	181.6	159.5	112.3

NOTE: Sum of components may not equal the total due to independent rounding.

NUCLEAR POWER GENERATION

Two nuclear electric stations produced 51 percent of all electricity generated in the State by the five largest electric utilities during the first nine months of 1982, as shown in the following table.

The electricity generation from nuclear stations this year was 33.3 percent higher than the corresponding period of last year. The State's total generation increased by only 11.8 percent at the same time.

Nuclear stations provide a possibility to hold the electricity price in the State on a level substantially lower than the national average.

Table 25

NET ELECTRICITY GENERATED BY NUCLEAR AND ALL POWER STATIONS

GIGAWATTHOURS (GWH) GENERATED BY FORT CALHOUN AND COOPER STATIONS

MONTH	Cooper		Fort Calhoun		Total Nuclear		Grand Total Generation		Nuclear Percent of Grand Total	
	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982
January	449	539	246	355	695	893	1,491	1,854	46.6	48.2
February	449	500	264	283	713	783	1,340	1,575	53.2	49.7
March	436	489	228	356	664	844	1,359	1,377	48.8	61.3
April	268	508	139	338	407	846	1,210	1,283	33.6	65.9
May	0	312	156	355	156	668	943	1,184	16.5	56.4
June	256	0	226	340	482	340	1,193	975	40.4	34.9
July	457	340	324	340	781	680	1,627	1,645	48.0	41.4
August	448	475	319	344	767	820	1,412	1,728	54.3	47.4
September	164	487	167	300	331	786	1,097	1,426	30.2	55.1
October	0		-3		-3		769		-0.4	
November	389		-2		386		1,040		37.1	
December	566		75		642		1,371		46.8	
Total	3,883	3,651	2,137	3,011	6,020	6,662	14,854	13,048	40.5	51.1

NOTE: Sum of components may not equal the total due to independent rounding

INSTITUTIONAL CONSERVATION PROGRAM

The Nebraska Energy Office (NEO) completed a fourth grant cycle of the Institutional Conservation Program (ICP) during the third quarter of 1982.

Based on recommendations made to the U.S. Department of Energy by the NEO, grants of $488,690 were awarded for energy conservation construction projects at seven schools and five hospitals in Nebraska.

The federal grant funds will be used to implement such cost effective capital improvements as insulation of buildings, installation of automatic temperature setback controls, replacement of window glass with insulated panels, installation of blowdown heat recovery systems and replacement of incandescent fixtures with more efficient fluorescent lighting.

The estimated total cost of these energy conservation projects is $921,197 with matching funds included. Grant recipients are required in most cases to match the federal funds dollar-for-dollar (50/50). However, one school and one hospital were allowed hardship grants, so they will have to provide matching funds of just 10 percent.

Energy conservation projects funded in grant cycle four of the ICP program will save Nebraska institutions more than $180,000 annually and will pay for themselves in approximately five years. These projects also will save approximately 43,000 million British thermal units (Btus) of energy per year.

In grant cycle four the NEO received applications from 61 schools and eight hospitals requesting more than $1,839,000. The NEO reviewed all applications to determine eligibility for funding and then ranked each application using criteria mandated by the federal government. Final grant recommendations were made by the Application Review Committee.

STATE BUILDING AUDITS

State building audits conducted by the Nebraska Energy Office (NEO) during the third quarter of 1982 covered 130 structures and would cut energy use in the buildings by an estimated 29 percent if all audit recommendations were followed.

The total British thermal units (Btus) consumed annually in the buildings audited in the July-September period amounted to an estimated 120,883 million Btus. Energy savings from following the audit recommendations would be an estimated 35,185 million Btus a year.

Those projected energy savings represent the equivalent of 254,964 gallons of fuel oil or 34,160 MCF (thousands of cubic feet) of natural gas. Projected annual monetary savings from implementation of the audit recommendations would be $154,660.

The State Building Audits Program is administered by the NEO's Institutions Division and is being carried out under the mandate in Legislative Bill 158 of 1981.

Cost effective changes are recommended by NEO energy auditors in two forms: low cost or no cost items that require little or no capital outlay; and energy conservation measures, which require funding.

To measure the effectiveness of this program, the NEO's Institutions Division conducted a written survey of all agencies that have had energy audits done through the third quarter. Survey results indicated that almost all agencies felt the auditors identified potential trouble areas unique to the buildings involved and offered realistic corrective suggestions. These same agencies agreed the program was worthwhile.

LOW INCOME WEATHERIZATION

During the third quarter, progress on low income weatherization assistance was excellent as 1,291 homes were completed. The Nebraska Energy Office (NEO) administers low income weatherization, in which Community Action Agencies or other contractors at the local level weatherize homes for low income, elderly and handicapped Nebraskans.

The 1,291 homes completed during the third quarter of 1982 compared with 825 homes done during the same quarter of 1981. However, this year's third quarter figures involved homes completed from two federal funding sources rather than the single source during the same quarter in 1981.

The NEO secured additional federal funds by utilizing money from the Low Income Energy Assistance Program (LIEAP), which originally goes to the Nebraska Department of Public Welfare. The bulk of the LIEAP funding is for aid in paying utility bills of low income Nebraskans, but a percentage was made available to the NEO for weatherization assistance.

The NEO during the third quarter also began the process of securing more LIEAP funding for weatherization during calendar 1983. Prospects for success in that effort were viewed as good.

SCHOOL WEATHERIZATION

The third quarter of 1982 brought to a successful completion the first full year of Nebraska's School Weatherization Program as the third grant cycle ended and $1.3 million was distributed.

The $1,360,984 in State Oil and Gas Severance Tax funds available for the third cycle were distributed to 46 local school districts for energy efficiency projects at 73 public school buildings.

Estimated monetary savings upon completion of the energy efficiency projects involved is $439,928 annually. Estimated annual energy savings upon completion of the third grant cycle projects is the equivalent of 15,477 barrels of oil or 94,468 MCF (thousands of cubic feet) of natural gas. The financial payback period was figured at 3.8 years on average.

The program, originally established under Legislative Bill 257 of 1981, is administered by the Nebraska Energy Office. The program provides 80 percent of the funding for projects which are determined to have good energy and cost saving potential. Local districts provide 20 percent of the project funding as match.

During the initial year, a total of $3,969,258 in Oil and Gas Severance Tax money was distributed from the State level to local districts in the three grant cycles completed. That means with local matching money, nearly $5 million has been allocated for energy efficiency projects at schools across Nebraska.

Projects involve such techniques as adding insulation, lighting retrofit, caulking and weatherstripping, window modification, temperature setback and energy management.

LEGISLATIVE COMPLIANCE

Legislative Bill 799 became law on July 16. It provides for income tax credits to individuals and corporations who install renewable energy systems, a geothermal grant program for political subdivisions, and the repeal of sales tax refund and property tax exemption incentives.

The Nebraska Energy Office (NEO) drafted preliminary rules and regulations for the renewable energy income tax credits, and guidelines for the geothermal energy utilization grant program. Public hearings were held on the geothermal guidelines in Scottsbluff on August 17 and in Lincoln on August 19. A public hearing was also held on August 19 on the rules and regulations for the renewable energy income tax credits.

The rules and regulations were revised and taken to the Attorney General for approval. The NEO then began taking applications for geothermal energy utilization grants.

The NEO also has processed over 200 applications for sales tax refunds during the months of July, August, and September.

INDEPENDENCE DAY ALTERNATE FUELS CLASSIC

The 1982 Independence Day Alternate Fuels Classic road rally sponsored by the Nebraska Energy Office (NEO) drew 31 entries from 16 states. Participants came to Nebraska for the July 4 event from as far away as New York, New Jersey and Virginia on the east, and Washington and California to the west. The deep south provided an entry from Arkansas and from the northern tier of states came participants representing North Dakota and Minnesota. Nebraska and Iowa were among the states represented from the Midwest.

There were 22 entries in the spark ignition class, two of them designated "pace" cars because they were sponsored by the NEO and the Nebraska Gasohol Committee. Those two were ineligible to win. There were seven entries in the compression ignition class. All vehicles entered were required to cover a 150-mile rally course from Lincoln to Aurora and back. Winners were selected based on energy efficiency.

The spark ignition (gasoline-type) engine class was won by Dan Kunau of Simla, Colorado, driving a vehicle powered by ethanol (grain alcohol). Ernie Tuff of Rushford, Minnesota took second in a vehicle that also ran on ethanol. Thid place went to Dick Rhodes of Winthrop Harbor, Illinois, in a vehicle running on methanol. Fourth went to Jerry Lee of Houston, Minnesota, in another ethanol-powered vehicle and fifth was captured by the Illinois Department of Transportation entry, which also was run on ethanol.

The compression ignition (diesel-type) engine class was won by a vehicle engineered by a University of Michigan team headed by Robert Strassburger. The vehicle, which ran on a combination of ethanol, soybean oil and castor oil, was driven by Dan Cleary. Second place in compression ignition was won by Frank Polowy of Kewanee, Illinois, driving a vehicle powered by a blend of ethanol and turpentine. Third place was shared by Walter "Bob" Kruse of New Kensington, Pennsylvania, in a car using ethanol and vegetable oil, and Robert Keucher of Palos Hills, Illinois, with a vehicle running on lard.

The event was planned and carried out as a showcase for persons working with alternate fuels and was viewed by the NEO as a successful application of technology because of the heavy use of alcohol fuels such as ethanol. The NEO is following up on the Classic by publishing data on the conversion of vehicles entered so the general public will have access to information on using alcohol and other alternate fuels.

EMERGENCY PLANNING SESSION

A two-day meeting in Omaha August 4-5 drew energy office directors and emergency preparedness planners from Nebraska and the six contiguous states. Also on hand for the sessions at the Peter Kiewit Conference Center were two representatives of the U.S. Department of Energy.

Discussions with the federal officials centered on the effects of the Reagan administration free market philosophy in the field of energy and on how the Strategic Petroleum Reserve (SPR) would be used in an energy emergency. Among the various states' representatives, details of regional emergency planning coordination were discussed.

Participants agreed the meeting produced open and frank analysis from the federal officials regarding the Reagan administration energy policy and the SPR. Participants also were able to set up an informal system for regional communication and cooperation in the event of an energy emergency in the Midwest.

The states represented were Nebraska, Iowa, Missouri, Kansas, Colorado, Wyoming and South Dakota.

NEBRASKA COMMUNITY ENERGY MANAGEMENT PROGRAM

Planning began during the third quarter for a Nebraska Community Energy Management Program to promote cooperation between the Nebraska Energy Office (NEO) and communities throughout the State.

Focus of the program is formation of local energy management committees to lead local efforts to curb energy use and costs. The full range of technical assistance available from the NEO would be at the disposal of such local energy management committees.

The first phase of the program is working with communities which express an interest in participating in the program. The NEO was preparing a slide presentation on services available from the NEO and reasons for forming local energy management committees.

The next step would be creation of the committees in the various communities where interest is significant. Members of such panels could be members of the Chamber of Commerce, local community government officials, representatives of consumer or civic organizations, financial institution personnel, representatives of local utilities, general citizens and others interested in energy-saving programs.

The committee in each participating community next would determine energy use and problems and develop plans to reach energy-saving goals through activities initiated locally in cooperation with the NEO.