Taking Action

First Quarterly Report
May 15, 1983

Nebraska Energy Office
P.O. Box 95085
Lincoln, Nebraska 68509

TABLE OF CONTENTS

TABLE OF TABLES

TABLE OF CHARTS

I. THE NEBRASKA ENERGY OFFICE

> "In 1973 energy policy and energy went from being a matter of private sector supply and demand to being a matter of public policy. Energy and the supply of it is now intimately intertwined with national security. Therefore, there has been and there will be government intervention in the energy sector."
>
> --Lewellyn King*
> April 19, 1983

In November, 1973, the State of Nebraska created the Petroleum Allocation Office. Since those early days of crisis, the Nebraska Energy Office has developed into a multi-faceted agency whose goal has remained unchanged--energy independence through conservation and the development of renewable sources of energy.

Lewellyn King* recently confirmed the correctness of choosing conservation as Nebraska's major energy thrust by saying,

> "There was one great omission in all of this planning in 1974, and it wasn't very long ago, nine years. There was one great omission--conservation was generally left out. It was not believed that Americans would conserve. It simply wasn't. It was not believed that we would drive smaller automobiles or that we could live with less, and it also didn't really appeal. It sounded sort of like a nag--'turn the light off!' That's conservation. It wasn't attractive, and it was underestimated massively. With all of those things that we were going to do for a very complex set of reasons, we didn't do most of them. What we did do was conserve on a scale far greater than anything ever contemplated."

While an immediate fuel availability crisis has passed from the scene, energy-related problems are still with us today. As we approach the mid-point of 1983, Nebraskans are buffeted by economic factors which are forcing them to make changes in their lives. The increasingly higher cost of energy is just one of those economic factors. We in the Nebraska Energy Office have recommitted ourselves and our resources to helping Nebraskans in every way possible to meet this challenge.

Just as there is a finite limit on the earth's resources, so is there a limit on the resources available to government. That is why the Nebraska Energy Office is taking action by concentrating its energy conservation efforts in six areas which touch the lives of all Nebraskans.

--WEATHERIZING the homes of low-income citizens to conserve energy.

--PLANNING with cities, towns, and villages to determine their energy needs today and plan for tomorrow.

--EDUCATING Nebraskans and their children on ways to curtail their use of energy.

--PREPARING for any interruption in the state's energy sources by maintaining a constant monitoring of those sources.

--INCREASING state government's own energy efficiency.

--DEVELOPING Nebraska's economy in the agricultural, commercial and industrial sectors.

*Lewellyn King is the editor and publisher of the influential Energy Daily. The quotations of Mr. King used throughout this publication were taken from an address he delivered on April 19, 1983 in Lincoln at a successful conference on "Reducing Energy Costs in Food Processing, Meat Processing and Dairy Processing" sponsored by the Nebraska Energy Office.

This Quarterly Report from the Nebraska Energy Office, for the period of January - March, 1983 is submitted in accordance with provisions of Section 81-1606 RSN (1980).

II. WEATHERIZING HOMES TO CONSERVE ENERGY

Even those with the least can help in the effort to "Weatherize America"

Weatherization of homes is a front-line of defense in the war on unwise use of energy in America. While a major effort of the Nebraska Energy Office is to provide information to those who are willing and able to weatherize their own homes, we have joined the United States Department of Energy in its committment to ensure that even the homes of those who cannot afford to conserve are weatherized.

Building on a strong history of cooperation with the community action agencies of the state and with private interests, we are seeking a new committment to bring into the Weatherization program the estimated one-third of all elderly who qualify for the program. We are pleased to join the Department on Aging in this new and important emphasis.

The Weatherization Assistance Program provides a permanent solution to containing energy consumption in the homes of the low-income. With insulation, caulking, weatherstripping, new storm windows and the patching of holes and cracks, homes are made more energy-efficient. Since January of this year, 528 homes across Nebraska have been weatherized at a cost of $541,942.

With additional support from the Low-Income Energy Assistance Program (LIEAP) of the Nebraska Department of Social Services, another 125 homes have been totally weatherized and 127 have been partially completed at a cost of $134,409. The bulk of the LIEAP program provides assistance to eligible persons to help them pay their utility bills during the winter heating season. On April 27th, Governor Kerrey exercised an option which allows unexpended LIEAP funds to be spent to weatherize homes and designated $400,000,of these monies for weatherization. He added an additional $200,000 from oil overcharge settlements to support this program and to increase participation by those over 60 years of age. In cooperation with the Nebraska Department of Aging, Area Agencies on Aging, Community Action Agencies, Senior Diners and the Nebraska Educational Television Network, the Nebraska Energy Office is developing a plan which has the goal of doubling our effort to reach the eligible elderly in the state.

Weatherization of homes in Nebraska and America is of critical national importance. If America is to remain strong, it must reduce its consumption of foreign oil. The Weatherization Program enables those in our society who can least afford to participate in this national effort.

III. PLANNING WITH OUR COMMUNITIES TO DETERMINE THEIR ENERGY FUTURE

People at the Local Level Will Determine Their Energy Needs for Today and Tomorrow

The Nebraska Energy Office is committed to assisting local communities plan for their own energy future. We in state government recognize that we can never plan and organize energy utilization from the Capitol. We know that lasting energy conservation and planning must happen in City Halls, churches, and in civic group meetings all across Nebraska. The Nebraska Energy Office will be there--organizing, researching, and supporting them along the way towards energy independence.

THE NEBRASKA COMMUNITY ENERGY MANAGEMENT PROGRAM

The Nebraska Community Energy Management Program, has selected three towns--Fremont, Lexington, and Bayard--to serve as pilot cities. A four-phased planning and action program starts with the formation of a local energy committee representing as many different segments of the community as possible. The Nebraska Energy Office then provides an energy specialist who conducts a data analysis of the energy used by type and consumption. In a subsequent town energy meeting, the data is presented and the assembled group determines how they want to concentrate their efforts to minimize energy consumption. With the help of the Nebraska Energy Office, a comprehensive energy management plan is developed. In the last phase, local activities are developed to implement the plan selected. The Governor has designated $150,000 in oil overcharge monies to fund the initial phase of this program.

ELECTRICAL LOAD MANAGEMENT

On March 17, 1983, Governor Bob Kerrey announced a $50,000 grant to the Nebraska Municipal Power Pool to establish a Load Management Resource Fund for purchasing and installing load management equipment for the members of the Power Pool. The $50,000 in funds came from a portion of oil overcharge settlements. Since the Load Management Resource Fund will be reinbursed from energy savings, communities across Nebraska will eventually be able to benefit from load reductions.

CONSUMER INFORMATION ON LOAD MANAGEMENT

At the end of April, the Nebraska Rural Electric Association under a contract funded by the Nebraska Energy Office will complete a three format consumer information package which explains load management and its benefits. An information guide, overhead transparencies, and a slide show will be made available to consumers, managers, employees, and board members of the rural electric systems in Nebraska.

SOLAR ENERGY STUDY

The Nebraska Energy Office has tentatively agreed to fund a portion of the proposed solar energy study by the city of Lincoln. Other potential sources of funding are being investigated.

ENERGY CONSERVATION IN HOMES

The Nebraska Energy Office has been awarded $600,000 from the U.S. Department of Housing and Urban Development (HUD) Solar Bank to create a low-interest loan program to install conservation devices in the homes of people with low or moderate incomes in both Lincoln and Omaha. HUD is currently drafting the proposed rules and regulations under which these funds can be spent.

IV. EDUCATING NEBRASKANS TO CONSERVE ENERGY

By conserving today, we're making an investment in the future quality of life.

IN THE CLASSROOM

The Nebraska Energy Office is embarking upon an "energy literacy" program which will reach into the classrooms of Nebraska. On April 6, 1983, Governor Kerrey recognized the immediacy of this need and designated $150,000 in oil overcharge monies to fund the program. The goal of the program is to create "energy literacy" in today's students who are tomorrow's decision makers.

In workshops, teachers will be presented with the latest print and audio-visual materials available for use in the classroom. With a broadened curriculum emphasis, more students will be reached under the conservation banner. Students will be given the critical tools necessary for decision-making in social studies, vocational education, science and home economics classes.

ON NATIONAL ENERGY EDUCATION DAY

The Nebraska Energy Office has participated in the National Energy Education Day since its inception. This year the Nebraska Energy Office shared coordination of the multi-school event and provided $2,000 in funding and services. 44 schools across Nebraska competed for awards in various categories.

IN SIMULATING THE ENERGY FUTURE

With a $6,000 grant from the Nebraska Energy Office, Wayne State College will be purchasing an environmental and energy simulator to help students in making energy-related decisions. Provisions have been made to ensure that this simulator is utilized by others throughout the state.

IN THE FUEL EFFICIENCY RUN

For the past several years, the Nebraska Energy Office has worked cooperatively with the Kearney State College Safety Center, its Driver Energy Conservation Awareness Training (DECAT) Program, Driver Excellence Program and Fuel Efficiency Run. That commitment continued with financial and staff support of the Fuel Efficiency Run which was held this year on April 21st and 22nd.

IN PASSIVE SOLAR WORKSHOPS

Educating Nebraskans about passive solar concepts and how they can be integrated into existing residences has been the topic of six workshops held across the state during this quarter. Two additional workshops are planned in the near future. At the workshops, Path to Passive, a solar primer published by the Nebraska Energy Office last year, is offered at a half-price discount to the participants. Path to Passive continues to be made available to other interested parties.

V. PREPARING FOR AN ENERGY EMERGENCY

Some day--probably when we least expect it--an interruption in one of our conventional energy sources will occur. That's why the Nebraska Energy Office continues to monitor a wide variety of sources of data to understand, analyze, and project Nebraska's energy needs today and tomorrow.

Under Legislative mandata and as part of the monitoring process, the Nebraska Energy Office provides information on a regular basis which documents energy-related activity in the state and attempts to project the state's needs to 1990.

On subsequent pages, the state's past and current energy picture is charted in detail. Of particular note is the projection by sector of Nebraska's energy needs in 1983. In the agricultural model, adjustments have been made to take into account the effect of the Payment-In-Kind (PIK) program.

A. ENERGY AND NEBRASKA

Energy in Nebraska is derived primarily from five basic sources: oil, natural gas, coal, nuclear power, and hydro power. Refined petroleum products are the single largest contributor of energy consumed in Nebraska and accounted for 32% of the energy consumed in the state in 1982. Natural gas was the second largest source of energy, comprising 25% of the total energy consumed, and coal was the third largest energy source, providing just under 23% of the energy consumed in 1982. Eighteen percent of Nebraska's energy was provided by nuclear power, and hydro power accounted for the last 2% of the energy used in Nebraska.

Only small amounts of the various natural resources mentioned above are available in Nebraska for energy production. This means that most of Nebraska's energy must be imported. Alternate energy sources hold some promise for the future, although in 1982 alternates such as solar, wind, biomass, geothermal and alcohol fuels provided less than 1% of the energy consumed in Nebraska. Among these alternates, the ethanol portion of gasohol accounted for approximately 1% of the fuel used by motor vehicles. To date, this is the most promising alternate source of energy.

At this time, only 9-10% of Nebraska's total energy requirements are met from in-state resources. Out of 35 million barrels of petroleum products (motor fuels, propane, distillates) used in the state in 1982, Nebraska produced nearly 7 million barrels of crude oil which were exported from the state for refining. Therefore, although 20% of the yearly petroleum requirement originates in the state before being exported for refining, Nebraska imported all 35 million barrels of petroleum products consumed. Of the 135 billion cubic feet of natural gas consumed in Nebraska in 1982, only 2.5 - 3.0 billion cubic feet (2% of gas required) were produced in Nebraska. Coal and uranium were imported into the state for the generation of electricity, but hydro power originating in the state generated 2.1% of the state's total electricity requirement.

B. PETROLEUM

> "Energy is Oil," so stated Lewellyn King, editor of Energy Daily, at a recent seminar in Lincoln. "Oil is a very precious commodity--relatively abundant in the world considering the way we use it which is fairly wantonly--that does more probably for the human race than anything else because we can make so much of it."

In Nebraska, 32% of the energy consumed in the state in 1982 came from refined petroleum products.

B.1 NEBRASKA'S PETROLEUM RESOURCES

Nebraska's proved petroleum reserves are estimated at 40 to 45 million barrels, lying mostly in the Panhandle. Some natural gas occurs with these deposits. Proved petroleum reserves are defined as the estimated amount of crude oil which geological and engineering data demonstrate with reasonable certainty to be recoverable from known reservoirs under existing economic and operating conditions. Thus, proved petroleum reserves constitute a conservative and practical economic measure of Nebraska's petroleum resource.

It is likely that there is physically a great deal more petroleum underlying the state than the proved reserve reveals. Although no Nebraska-specific estimates are hazarded, the United States Geological Survey made estimates in 1981 of the physical presence of petroleum within the four geological basins that converge in Nebraska. Those estimates are:

	Millions of barrels
Denver Basin (Nebraska Panhandle, eastern Wyoming and eastern Colorado)	200 - 1,800
Cambridge Arch (central Nebraska, central Kansas and northern Oklahoma)	100 - 1,000
Nemaha Ridge (Richardson County, Nebraska, eastern Kansas, eastern Oklahoma and northwestern Arkansas)	negligible - 200
Salina Basin (eastern half of Nebraska and north central Kansas)	0 - negligible

Oil was first produced in southeast Nebraska, however, near Falls City in 1939. Currently there are 19 producing wells in this Richardson County area. This crude oil is not refined but rather is used directly as boiler fuel. Most of Nebraska's production is in Cheyenne, Kimball, Banner, Morrill, and Scotts Bluff counties in the Panhandle, and in Hitchcock County and Red Willow (the largest oil producing county in Nebraska) both in the southwest. The top production year was 1962 when almost 25 million barrels were produced. In 1973, about 7 million barrels were recovered. Production dropped to just over 6 million barrels in 1979 and has since rebounded to 6.9 million barrels in 1982.

Nebraska's crude oil is refined in neighboring states. There was one refinery in the state, at Scottsbluff, with a capacity of 5,000 to 5,400 barrels per day, but this refinery was closed in 1982.

Because of the state's dependence on refined petroleum products, the Nebraska Energy Office monitor on:

--World and U.S. oil prices
--Regional stocks and imports in Petroleum Allocation District 2
--Nebraska's oil production
--Average retail price of gasoline in Nebraska
--Nebraska's Petroleum Status of Fuel Availability)
--Gasoline Available for Sale In Nebraska
--Super Unleaded with Ethanol (Gasohol) Available for Sale In Nebraska
--Middle Distillates Imported into Nebraska
--Special Fuels for Highway Use Delivered in Nebraska
--Special Fuels for Non-Highway Use Delivered in Nebraska
--Aviation Fuels Available for Sale in Nebraska
--Propane Delivered in Nebraska

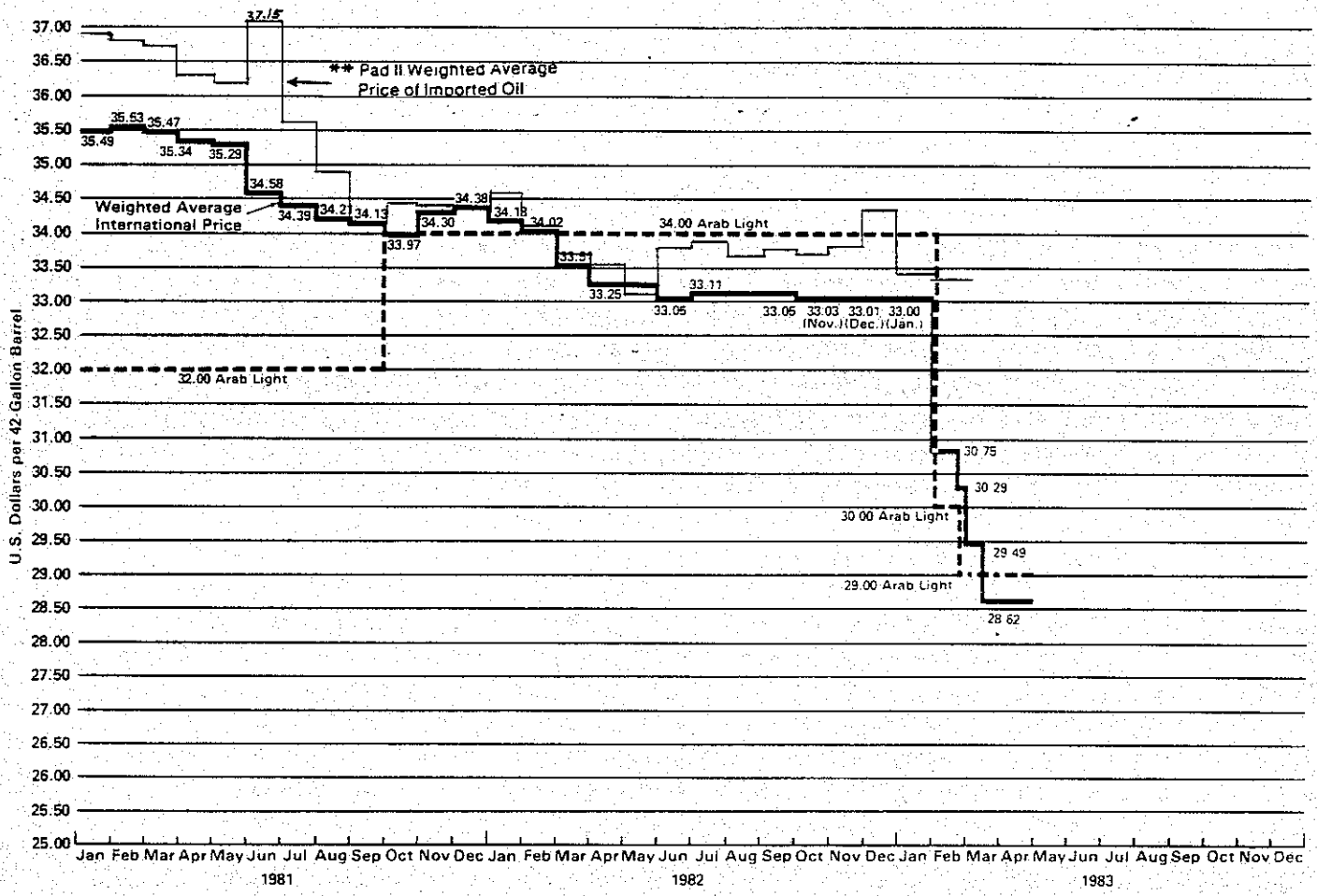
B.2. WORLD AND U.S. OIL PRICES

The price of internationally traded oil fell from $33.00 per barrel on January 1, 1983 to $26.82 per barrel on April 1, 1983. This is in contrast to the price stability experienced over the last six months of 1982 at $33.00 to $33.11 per barrel. Prices are expected to remain near this level provided the pricing and production agreement reached by OPEC in early March proves effective in maintaining production levels.

The U.S. average refinery acquisition cost of crude oil from domestic sources was $30.55 per barrel in January and $31.41 per barrel from import sources, correspondingly 8.5 and 11.6 percent lower than in January 1982 ($30.73 per barrel and 9.5 percent for all sources).

The lower prices have caused a decrease in exploration and drilling activity. As of January, 1983, the national drilling rig count was 40.9 percent lower, and the number of crews engaged in seismic exploration was 34.4 percent lower, compared with January 1982. A decrease in both development and exploratory well permits was also recorded at the state level.

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



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

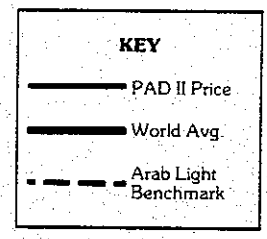
NOTE: Beginning with the May 1, 1981 issue of the Weekly Petroleum Status Report, the world crude oil price is based on a revised crude list.

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, 1982. An asterisk shows the January 1, 1980 price based on the revised list. All other 1980 prices represent the oil crude list before revisions.



Source: Weekly Petroleum Status Report

B.3. REGIONAL STOCK AND IMPORTS IN PETROLEUM ALLOCATION DEFENSE DISTRICT 2

Nebraska is in a fifteen-state U.S. Department of Defense Petroleum Allocation Defense District (PAD 2) which ranges from Nebraska to Ohio. As of February 28, 1983, stocks of crude oil in PAD 2 were up 3 percent from the level of February, 1982. This year's stock is still viewed as in the normal range.

Motor gasoline stocks in PAD 2 were down 0.9 percent, distillate fuel oil stocks were up 5.8 percent, and residual fuel stocks were down 38.2 percent in February as compared to a year earlier.

During the first two months of 1983, imports of foreign oil into PAD 2 were down 21.4 percent from 1982 with 70.9 percent coming from Canada; 11.8% from Mexico; and 7.3 percent from OPEC.

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

B.4 NEBRASKA OIL PRODUCTION AND EXPLORATION

The following table presents data on oil production and exploration in the State from reports of the Nebraska Oil and Gas Conservation Commission. Oil production in the state for the first two months of this year was 98 percent compared with the corresponding a year earlier. It is not certain, however, how long this trend will remain at this level because drilling activity is dropping substantially.

As shown in the table, the number of development well permits was 76 and 54 percent of the corresponding period of 1982 and 1981, respectively. A development well is a well drilled within the presently known or proven production area. The number of exploratory well permits was 53 and 62 percent of the corresponding period of 1982 and 1981 respectively. An exploratory well is a well drilled to find and produce oil or gas in an unproved area.

NEBRASKA OIL PRODUCTION AND EXPLORATION

Month	Oil Production in Barrels					Drilling Permits									
						Exploratory					Development				
	1980	1981	1982	1983	**	1980	1981	1982	1983	**	1980	1981	1982	1983	**
January	502,703	554,180	560,334	562,152	100	45	27	26	15	58	21	27	23	16	70
February	480,512	503,868	532,073	508,684	96	21	22	22	13	59	27	29	15	13	87
March	516,836	565,799	605,026			20	16	27	12	85	25	22	17	13	76
April	486,000	559,925	591,723			19	23	18			30	56	7		
May	540,000	553,556	594,224			27	15	15			28	40	13		
June	509,397	548,195	568,019			17	50	13			32	30	20		
July	504,840	547,937	586,941			14	27	13			33	44	22		
August	547,833	578,214	580,348			13	39	15			16	20	12		
September	534,617	559,887	556,491			34	23	18			22	24	11		
October	539,889	580,388	571,808			41	34	20			32	24	12		
November	502,264	541,312	551,662			34	41	27			30	26	15		
December	529,079	571,699	558,911			24	37	47			27	32	22		
TOTALS	6,193,970	6,664,930	6,857,560	1,070,836	98	309	354	261	40	53	323	374	189	42	76
*Annual Summary	6,239,652	6,671,313	6,872,204			309	354	261			311	374	191		

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

**Percent for corresponding period of previous year.

Source: Nebraska Oil and Gas Conservation Commission

April 25, 1983

Nebraska Energy Office

182F

B.5 Average Retail Price of Gasoline in Nebraska

(Dollars per Gallon)

	1978	1979	1980	1981	1982	1983	Percent of Previous Year
January	$ .63	$ .67	$1.09*	$1.21	$1.27	1.14	89.8
February	.63	.68	1.15	1.28	1.26	1.11	88.1
March	.63	.71	1.18	1.35	1.22	1.08	88.5
April	.63	.74	1.21	1.35	1.12		
May	.63	.79	1.22	1.32	1.14		
June	.63	.87	1.22	1.31	1.23		
July	.64	.90	1.20	1.29	1.26		
August	.65	.94	1.18	1.29	1.24		
September	.66	.97	1.17	1.28	1.21		
October	.66	.97	1.16	1.28	1.21		
November	.66	1.00	1.19	1.28	1.21		
December	.67	1.02	1.19	1.28	1.22		
							88.9%

Average 1981: $1.29
Average 1982: $1.22
Average first three months 1983: $1.11

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

B.6 NEBRASKA PETROLEUM STATUS REPORT OF FUEL AVAILABILITY

Gasoline available for sale in Nebraska is defined as total gasoline (excluding super unleaded with ethanol) imported into Nebraska, minus the total exported. Since 1978, consumption has gradually decreased, and is now levelling off. The consumption of super unleaded with ethanol (gasohol) and gasoline combined for January, February, and March, 1983 was 2.4% below the same period in 1982. We assume this was in anticipation of the five cents per gallon gasoline tax increase scheduled to go into effect April 1. We will continue to monitor the situation.

The quantity of super unleaded with ethanol (gasohol) available for sale in Nebraska has shown definite growth over the last two years. In 1982, consumption of super unleaded with ethanol increased sharply and was 288.1 percent of 1981. Super unleaded with ethanol comprised 11.4 percent of all Nebraska gasoline sales in 1982, compared with 3.9 percent in 1981, 3.6 percent in 1980 and .8 percent in 1979. In the first four months of 1983, super unleaded with ethanol made up 20.5 percent of total sales.

Middle distillate (diesel, heating oil, kerosene, and other similar fuels) imports in 1982 were 103.5 percent of 1981, and 83.4 percent of 1979. The first three months of 1983, middle distillate consumption was 149.0 percent of the same period in 1982.

Special fuels are any fuels other than gasoline that may be used in a motor vehicle fuel tank. These include diesel, propane, and natural gas. Special fuels for highway use are fairly constant, reflecting the stability of the commercial transportation system. Consumption in 1982 and thus far in 1983 followed the regular seasonal pattern.

Special fuels for non-highway use include fuels used for agricultural, industrial, and railroad operations or for any other motor vehicle use not on Nebraska roads. The non-highway use is quite dependent upon the Nebraska economy and weather and is more volatile than highway use.

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

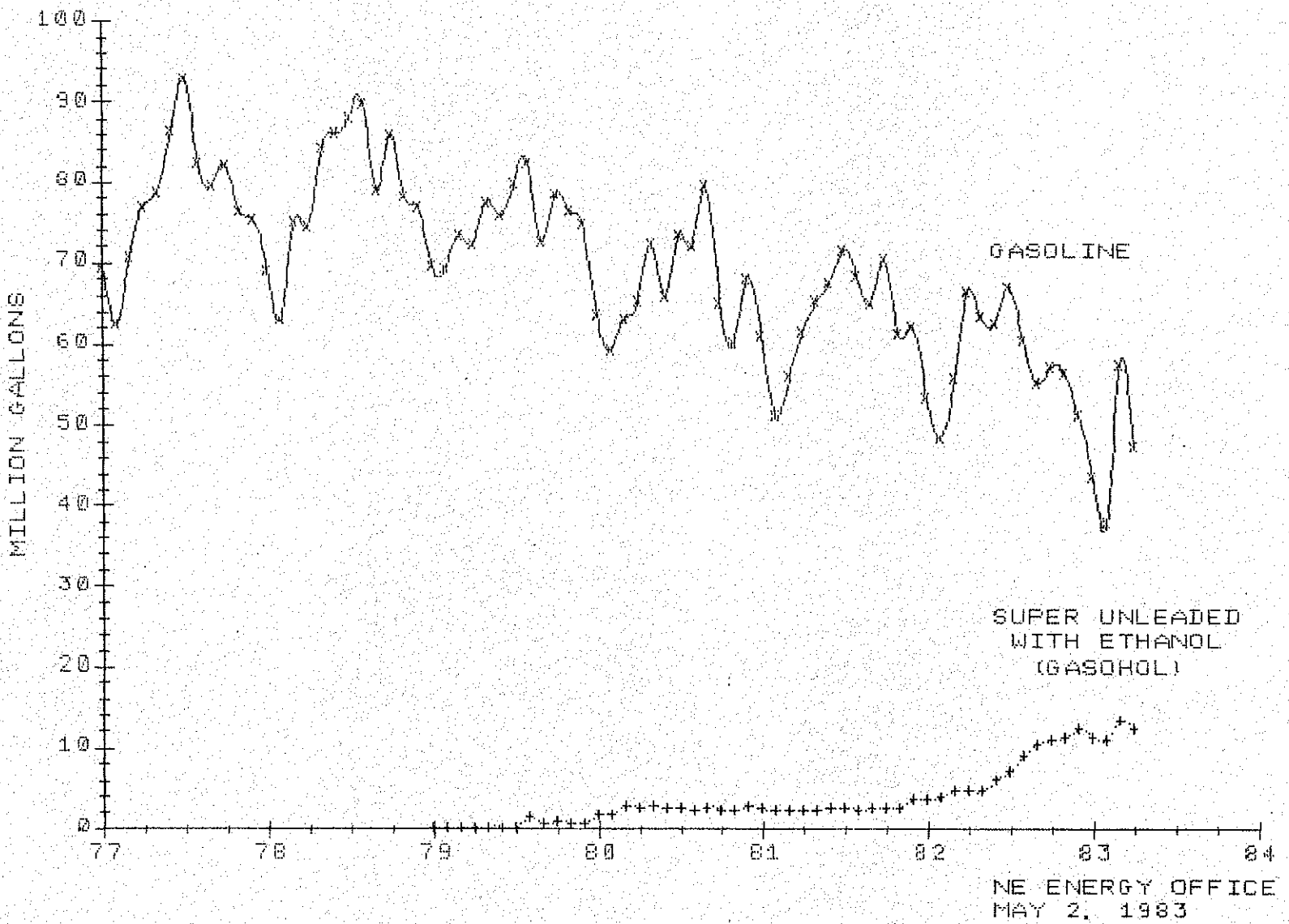
	1977	1978	1979	1980	1981	1982	1983	Percent of Previous Year
January	69,334	69,166	69,602	63,763	60,917	53,344	43,545	81.6%
February	62,501	63,227	69,367	59,381	51,123	48,611	37,870	77.9
March	70,780	75,162	73,397	63,151	56,183	55,705	57,118	102.5
April	77,085	74,597	72,399	65,318	61,489	66,295		
May	79,039	84,422	77,631	72,440	65,221	63,343		
June	86,543	86,165	75,955	65,801	67,524	62,454		
July	92,844	88,253	80,054	73,498	71,593	66,998		
August	82,343	89,733	82,473	72,201	68,404	60,415		
September	79,853	79,202	72,609	79,754	65,057	55,340		
October	82,107	86,061	78,565	65,140	70,363	57,106		
November	76,506	78,351	76,555	60,261	61,203	56,534		
December	75,453	76,887	74,824	68,169	62,200	51,082		
TOTAL	934,388	951,226	903,431	808,877	761,277	697,498	186,504	83.3%

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

May 2, 1983
NEBRASKA ENERGY OFFICE

07F(2)

GASOLINE AND SUPER UNLEADED WITH ETHANOL (GASOHOL) AVAILABLE IN NEBRASKA



Super Unleaded with Ethanol (Gasohol)
Available for Consumption in Nebraska* (Thousands of Gallons)

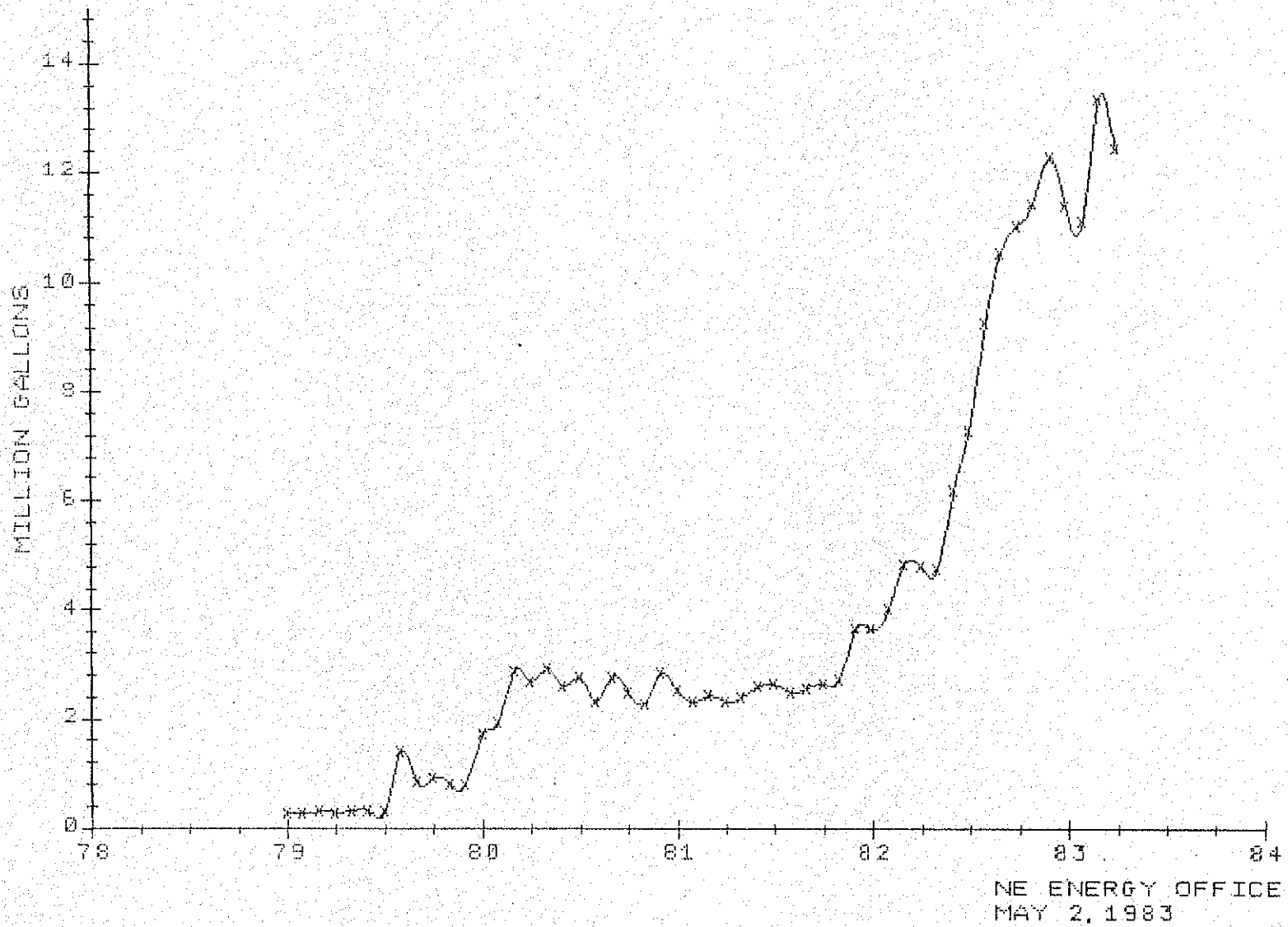
	1979	1980	1981	1982	1983	Percent of Previous Year
January	280	1,729	2,514	3,637	11,379	312.9%
February	280	1,926	2,308	4,016	11,107	276.6
March	296	2,878	2,413	4,817	13,266	275.4
April	291	2,687	2,311	4,772		
May	313	2,915	2,397	4,734		
June	306	2,579	2,587	6,188		
July	320	2,749	2,616	7,279		
August	1,413	2,320	2,478	9,254		
September	823	2,761	2,547	10,524		
October	922	2,485	2,631	11,030		
November	802	2,284	2,713	11,431		
December	844	2,825	3,666	12,283		
TOTAL	6,890	30,138	31,181	89,965	35,752	286.7%

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

May 2, 1983
NEBRASKA ENERGY OFFICE

125F

SUPER UNLEADED WITH ETHANOL (GASOHOL) AVAILABLE FOR SALE IN NEBRASKA



*Middle Distillates Imported Into Nebraska (Thousands of Gallons)

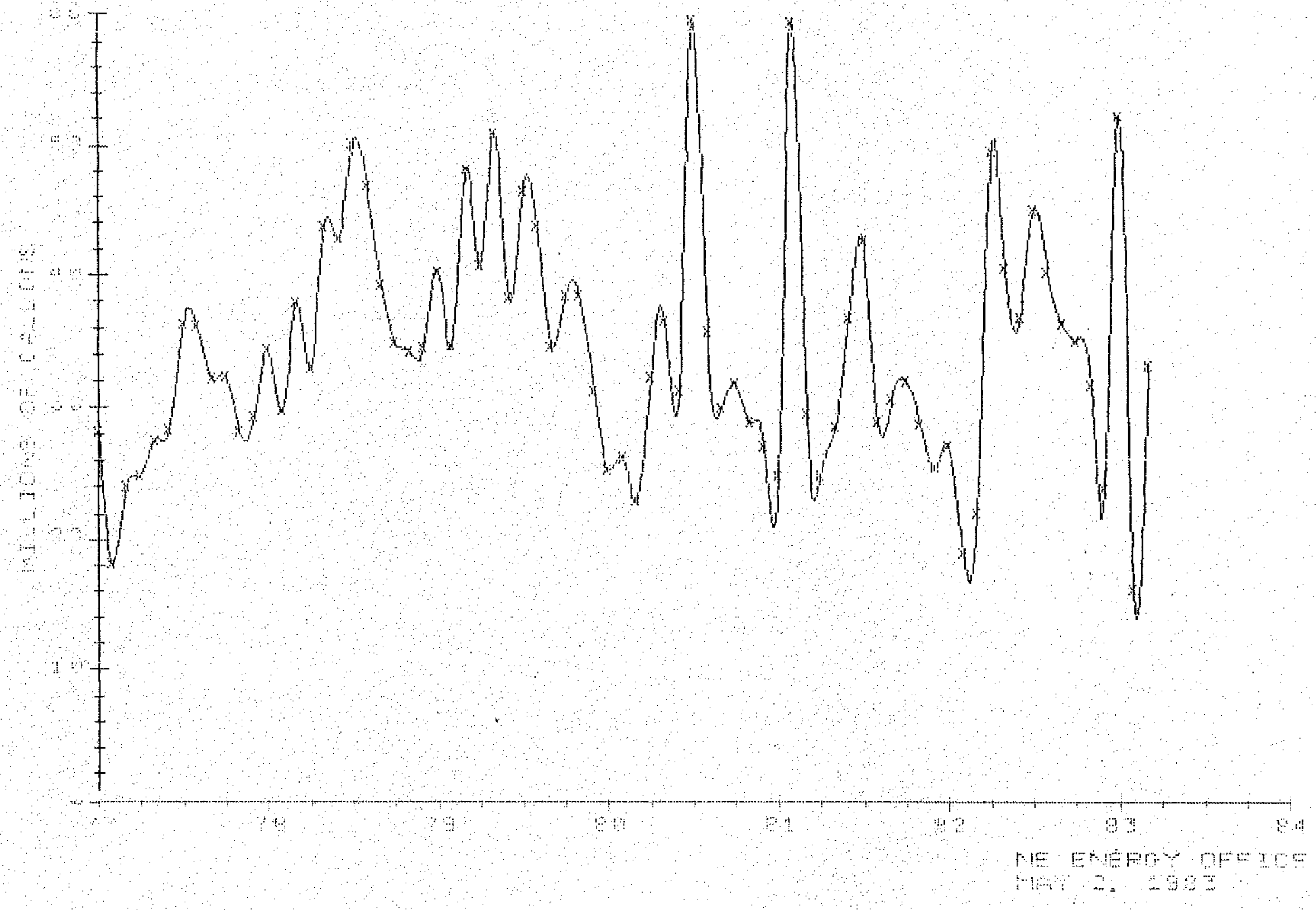
	1976	1977	1978	1979	1980	1981	1982	1983	Percent of Previous Year
January	16,408	28,165	34,298	40,244	25,381	24,891	26,926	52,168	193.7%
February	14,081	18,169	29,735	34,600	26,157	59,280	19,013	16,240	85.4
March	19,222	24,028	37,886	48,150	23,102	29,450	22,130	32,981	149.0
April	23,495	24,833	32,942	40,745	32,255	24,922	49,480		
May	26,239	27,521	43,673	50,992	36,486	28,494	40,283		
June	28,744	28,267	42,739	38,258	31,247	36,640	36,516		
July	32,022	36,250	50,051	46,443	59,339	42,389	44,675		
August	29,857	36,183	46,934	43,635	35,548	28,808	40,075		
September	24,475	32,160	39,245	34,495	29,905	30,595	36,035		
October	24,160	32,295	34,802	38,383	31,691	31,896	34,857		
November	26,464	28,073	34,156	38,326	28,840	28,695	31,526		
December	24,461	29,294	34,524	31,200	27,060	25,464	23,954		
TOTALS	289,628	345,238	460,985	485,471	392,619	391,524	405,470	101,389	149.0%

*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

May 2, 1983
NEBRASKA ENERGY OFFICE

43F(1)

MIDDLE DISTILLATES IMPORTED INTO NEBRASKA



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

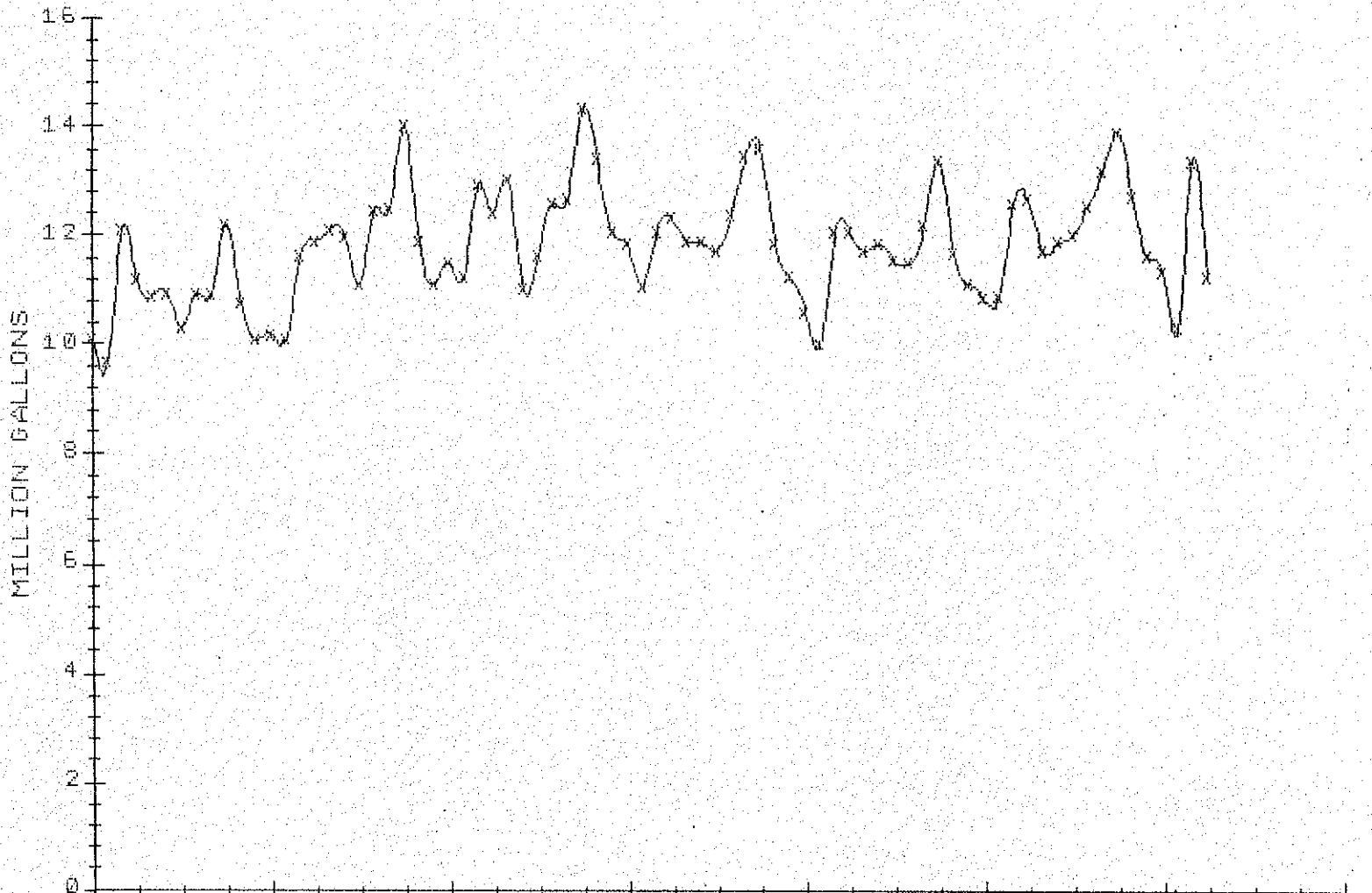
	1976	1977	1978	1979	1980	1981	1982	1983	Percent of Previous Year
January	8,828	10,123	10,200	11,482	11,840	10,598	10,861	11,312	104.2%
February	8,889	9,654	10,104	11,256	11,067	10,022	10,871	10,120	93.1
March	10,363	12,092	11,615	12,944	12,068	12,041	12,564	12,852	102.3
April	10,306	11,180	11,906	12,415	12,324	12,072	12,650		
May	10,059	10,901	12,114	13,035	11,895	11,706	11,712		
June	10,372	10,938	11,971	11,019	11,884	11,849	11,866		
July	9,698	10,336	11,121	11,637	11,714	11,544	12,008		
August	10,243	10,915	12,454	12,570	12,349	11,483	12,535		
September	10,491	10,937	12,476	12,686	13,439	12,180	13,206		
October	10,849	12,198	13,996	14,310	13,592	13,367	13,887		
November	10,660	10,774	11,894	12,412	11,823	11,664	12,709		
December	10,027	10,116	11,114	12,047	11,224	11,101	11,609		
TOTAL	121,785	130,161	140,965	147,813	145,219	139,627	146,478	34,284	100.0%

*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

May 2, 1983
NEBRASKA ENERGY OFFICE

46F

SPECIAL FUELS FOR HIGHWAY USE DELIVERED IN NEBRASKA



NE ENERGY OFFICE
MAY 2, 1983

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

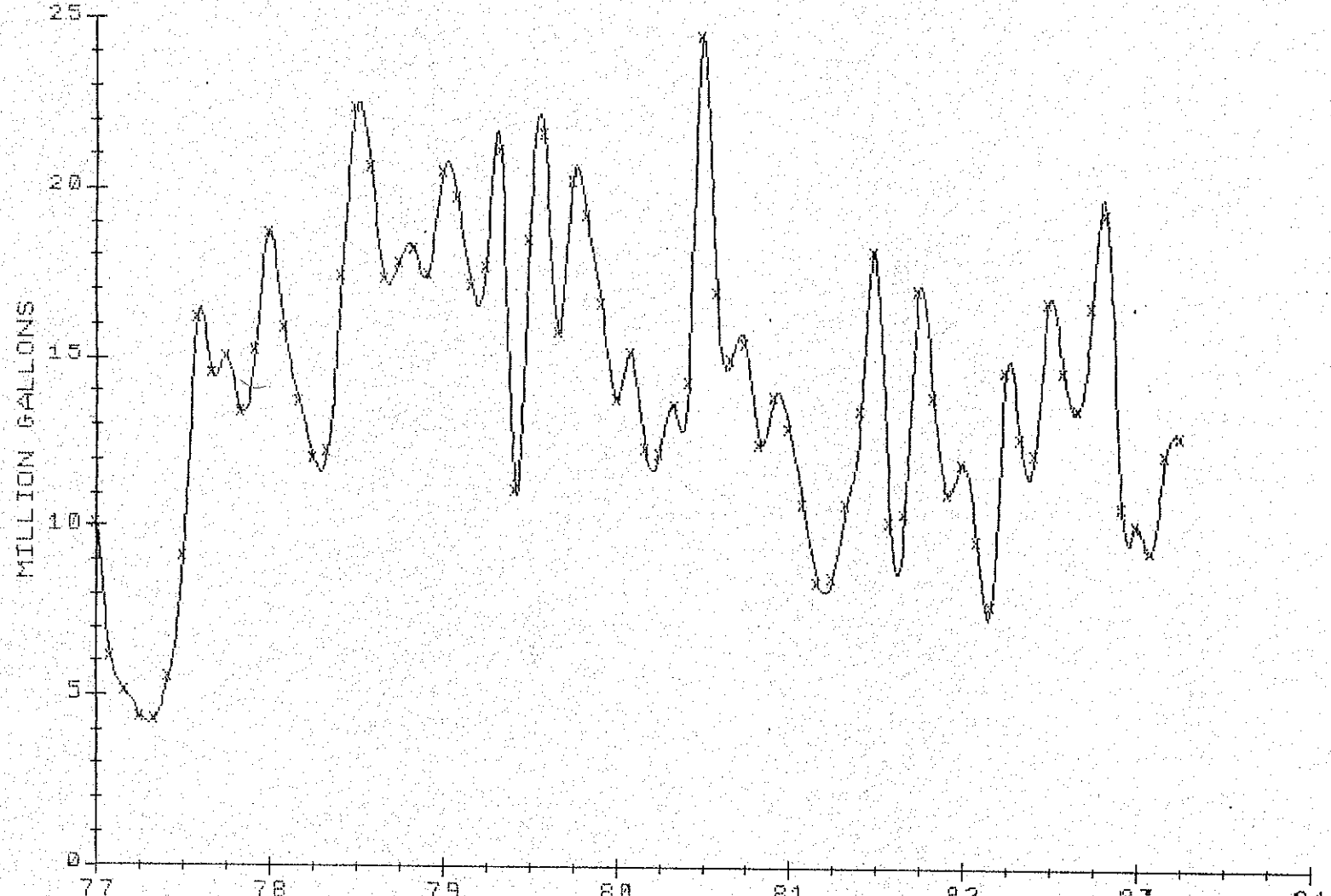
	1980	1981	1982	1983	Percent of Previous Year
January	13,800	12,943	11,917	10,072	84.5%
February	15,164	10,669	9,630	9,256	96.1
March	12,336	8,384	7,723	11,974	155.0
April	12,201	8,558	14,627		
May	13,619	10,705	12,642		
June	14,332	13,473	12,207		
July	24,485	18,163	16,677		
August	16,920	10,187	14,642		
September	14,990	10,418	13,520		
October	15,457	17,026	16,544		
November	12,488	13,919	19,348		
December	13,913	11,020	10,633		
TOTAL	179,695	145,465	160,110	31,302	106.9%

*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

May 2, 1983
NEBRASKA ENERGY OFFICE

05F

SPECIAL FUELS FOR NON-HIGHWAY USE DELIVERED IN NEBRASKA



NE ENERGY OFFICE
MAY 2, 1983

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

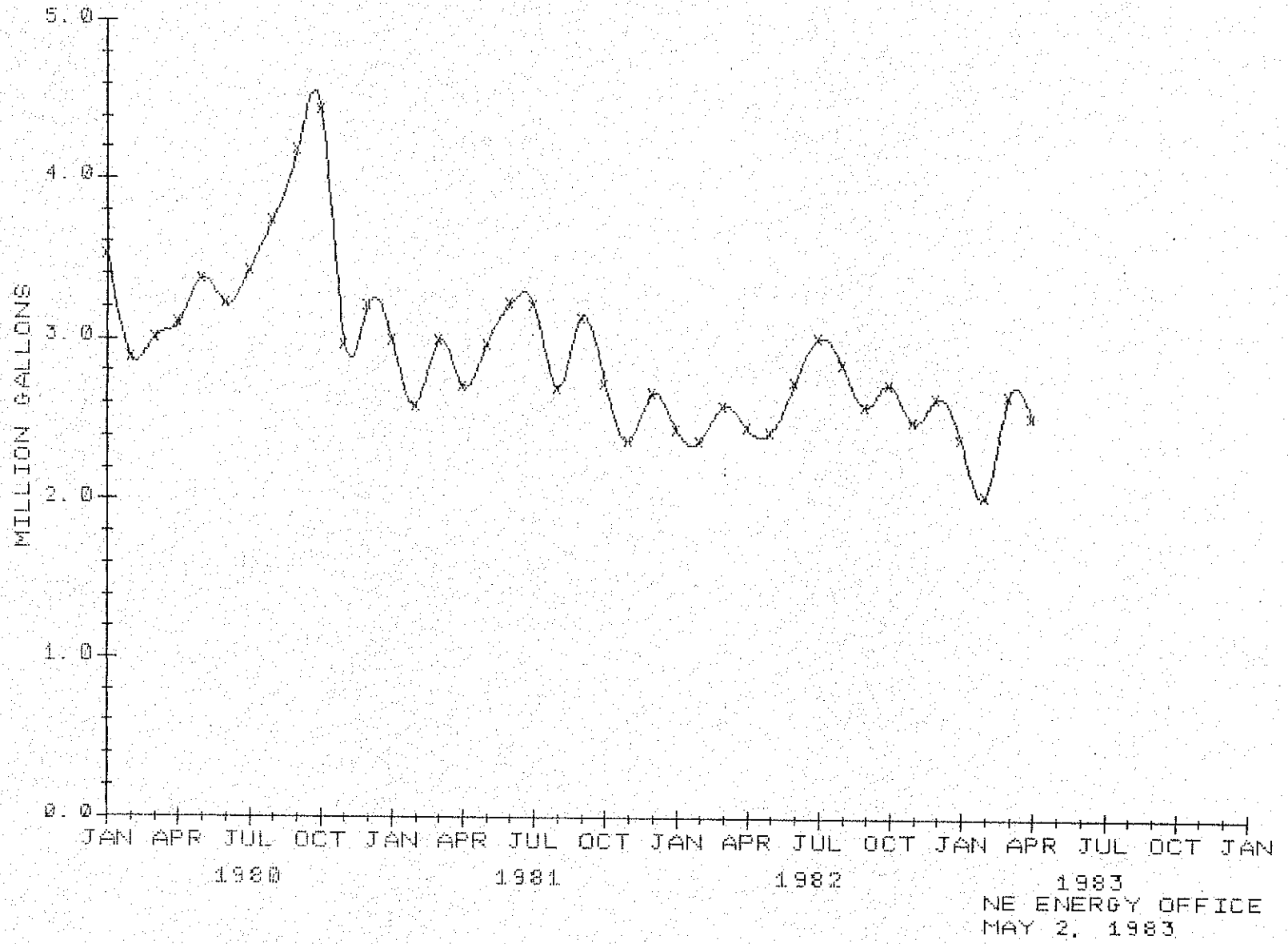
	1980	1981	1982	1983	Percent of Previous Year
January	3,523	2,997	2,444	2,378	97.3%
February	2,883	2,591	2,368	2,029	85.7
March	3,011	2,997	2,588	2,637	101.9
April	3,099	2,710	2,446		
May	3,371	2,974	2,429		
June	3,220	3,220	2,735		
July	3,431	3,208	3,007		
August	3,746	2,700	2,845		
September	4,190	3,131	2,586		
October	4,444	2,727	2,724		
November	2,972	2,371	2,487		
December	3,209	2,663	2,640		
TOTAL	41,099	34,289	31,299	7,044	95.2%

The last three months are preliminary
*Gross Gallons imported into Nebraska minus gallons exported out of state.
Source: Department of Revenue Form 85

May 2, 1983
NEBRASKA ENERGY OFFICE

04F

AVIATION FUEL AVAILABLE FOR SALE IN NEBRASKA



NE ENERGY OFFICE
MAY 2, 1983

Propane Delivered in Nebraska (Thousands of Gallons)

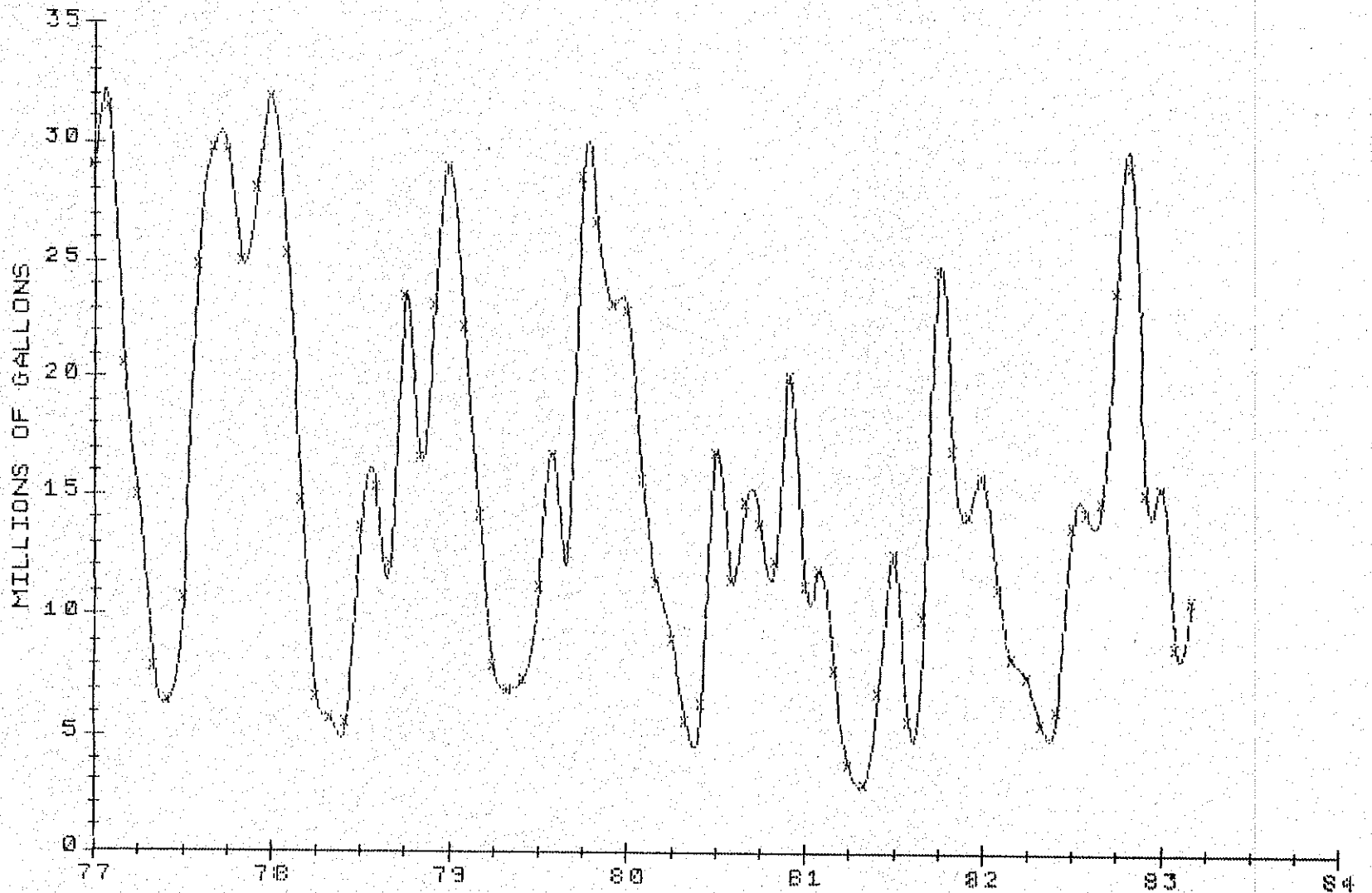
	1976	1977	1978	1979	1980	1981	1982	1983	Percent of Previous Year
January	26,437	29,017	31,848	28,908	22,902	11,186	15,739	15,284	97.1%
February	25,163	31,505	25,331	22,164	15,673	11,841	11,045	8,840	80.0
March	16,844	20,609	14,839	14,142	11,331	7,822	8,318	10,618	127.7
April	16,500	14,952	6,717	8,008	9,115	3,731	7,524		
May	7,348	7,958	5,754	7,035	5,669	2,947	5,556		
June	6,456	6,494	5,611	7,447	6,402	6,864	6,142		
July	11,845	10,676	13,654	11,217	16,772	12,502	13,649		
August	24,855	24,895	15,328	16,671	11,447	5,631	14,185		
September	24,054	29,767	12,137	12,611	14,727	9,906	14,687		
October	16,624	29,735	23,492	28,577	13,767	24,673	23,753		
November	27,439	25,027	16,558	26,709	12,237	16,877	29,091		
December	24,227	28,123	23,138	23,181	19,977	14,173	15,068		
TOTAL	227,792	258,758	194,407	206,670	160,019	128,153	164,757	34,742	99.0%

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

May 2, 1983
NEBRASKA ENERGY OFFICE

47F

PROPANE DELIVERED IN NEBRASKA



NE ENERGY OFFICE
MAY 2, 1983

C. NEBRASKA AND NATURAL GAS

Natural gas deposits do occur in Western Nebraska. During 1982, 2.5-3.0 billion cubic feet of natural gas were produced which supplied only 2% of that consumed within the state. A portion of the natural gas is refined in the state at a facility in Sidney.

Nebraska is supplied in large part by two major natural gas pipelines. They are Northern Natural Gas and K-N Energy (formerly Kansas Nebraska Natural Gas). There are, however, several other large natural gas pipeline companies that supply a minimal part of natural gas to the state. All these sales are referred to as the wholesale market.

At the retail level the following companies distribute most of Nebraska's natural gas. Minnegasco headquartered in Minneapolis, serves 57 communities in the state. K-N Energy, headquartered in Lakewood, CO, not only serves as a pipeline company but also retails in 192 cities and towns. Peoples Natural Gas, a subsidiary of Internorth, headquartered in Omaha, retails in 42 communities in eastern and southeastern Nebraska. Northwestern Public Service Company, headquartered in Grand Island, retails in three Nebraska communities. The final major retailer of natural gas in Nebraska is the Metropolitan Utilities District, a public district which retails in Omaha and in four surrounding communities. There are four other small companies that retail in 21 other towns:

- Gas Service Company in Kansas City, Missouri serves 2 towns
- Natural Gas Distributing Company in Ogallala serves 13 towns
- Iowa Electric Light and Power Company in Atlantic, Iowa serves 5 towns
- Iowa Public Service in Sioux City, Iowa serves 3 towns

In addition, there are eight Nebraska municipal gas companies that serve their respective cities:

- Ponca
- Stromsburg
- Hastings
- Central City
- Alma
- Lyons
- Pender
- Nebraska City (also provides service to Dunbar, Syracuse and Unadilla)

Of all the energy used in Nebraska in 1982, natural gas accounted for just over 25% of the total. The residential sector was the single largest user of natural gas, accounting for just over 43% of the total natural gas consumed.

D. ELECTRICITY IN NEBRASKA

"Electricity contributes more to the quality of human life than almost anything else that we have around. Nebraskans, like all americans, have become truly dependent upon electricity. "If you were to move from Lincoln to California you might have a lot of concerns about your new accommodations, churches, whether your bank cards would be appropriate, many things, but you wouldn't hesitate to plug in your appliances with the full expectation that there would be electricity and that it would be available on demand to you."

--Lewellyn King
April 19, 1983

In Nebraska, the sources of this convenience form of energy are nuclear power, coal and hydro power. It should be noted that electricity is generated from sources that are often impractical or impossible as a direct energy source (coal, uranium and hydro power).

D.1. Nebraska Coal

An estimated 7.5 billion tons of coal underlie extreme southeastern Nebraska at depths of 2,000 feet or more. This coal has been considered uneconomical to mine. It is of bituminous grade and of relatively high sulfur content. The field extends into Iowa and Kansas where the coal lies closer to the surface and is mined.

D.2 Electric Generation--Coal

There are ten coal fired electric generating stations owned in whole or in part by Nebraska electric utilities. The following table lists the owner, location, and nameplate rating (the capacity rating assigned by the manufacturer of the generator) of these stations.

Coal Fired Generating Plants

Owner	Location	# of Units	Total Nameplate Rating
1) NPPD	Kramer Station, Bellevue	3	135.5 Megawatts
2) NPPD	Sheldon Station, Hallam	2	227 Megawatts
3) NPPD	Gentleman Station, Sutherland	2	1278 Megawatts
4) OPPD	North Omaha Station, Omaha	5	644.7 Megawatts
5) OPPD	Nebraska City Station, Nebraska City	1	565 Megawatts
6) LES *	Laramie River Station Wheatland, Wyoming	3	183 Megawatts
7) Fremont	Wright Station, Fremont	3	129 Megawatts
8) Grand Island	Platte River Station, Grand Island	1	100 Megawatts
9) Hastings	Hastings Energy Center	1	76.3 Megawatts
10) Alliance	Alliance	4	16.5 Megawatts

(At the Alliance plant natural gas is the primary fuel used with coal as an alternate source of fuel.)

* LES owns 10.5% of the output. There are three 550 megawatt units at Laramie River Station. Basin Electric is the largest shareholder and is the operator of the facility.

D.3. Electric Generation--Nuclear

The single largest source of electricity in Nebraska is nuclear generation. During 1982, 50% of the electricity produced came from this source. Nebraska's nuclear generated electricity comes from two sources: Cooper Nuclear Station near Brownville, Nebraska, operated by NPPD with a rated capacity of 778 megawatts and the Fort Calhoun Station near Omaha with a rated capacity of 457 megawatts.

During 1982, coal was used to produce 43% of the total electricity generated in Nebraska.

The state of Nebraska has two major electric utilities. They are the Omaha Public Power District which serves 13 counties in southeastern Nebraska and the Nebraska Public Power District which supplies electricity to most of the rest of the state. In addition, Nebraska receives significant amounts of electricity from two sources outside the state. They are the Western Area Power Administration (Western) which is a 15-state federal power marketing authority, and Tri State Generation and Transmission is a cooperative serving Colorado, Wyoming and Nebraska which supplies power wholesale to most of the rural public power districts in western Nebraska. Western has its headquarters in Golden, Colorado, but Nebraska is served by two regional offices located in Loveland, Colorado and Billings, Montana. Tri State is headquartered in Thornton, Colorado.

In addition, Nebraska is interconnected by agreement with five other states and portions of two others through the Midcontinent Area Power Pool (MAPP). MAPP is a consortium of the utilities in the area who buy and sell power among themselves as needed.

D.4 Hydroelectricity

Nebraska has 20 operating hydroelectric plants, 10 of which are rated 5 megawatts or more. The smaller units are of questionable economic value because of the expense of maintaining an operating crew. A new plant, named Kingsley, is being built at Lake McConaughy. The Kingsley hydro will be rated at 50 megawatts, maximum, and is scheduled to be operational in 1984. The Nebraska Energy Office and the Nebraska Municipal Power Pool have recently completed an initial engineering analysis of seven additional hydro sites. From this study it appears that three sites have significant potential for development. These three are at the Harlan County reservoir, the Merritt Dam near Valentine, and the Calumus Dam near Burwell which is currently under construction as a flood control and irrigation project. Preliminary calculations on all three of these potential projects showed benefit cost ratios of at least 2.0. The total capacity of all hydro facilities in Nebraska is 131.15 megawatts.

These ratios are subject to variability because other uses for the water impounded may have precedence. These figures represent capability, assuming reservoirs are full and river flow is available. Obviously a full reservoir is not compatible with flood control and if water is drawn off upstream for irrigation, it is not available for power generation. Should hydro development proceed, these conflicting demands must be considered in planning electrical use.

The prevailing philosophy for scheduling generation in Nebraska is to make use of the most economic steam plants for the base load required by a system, and to use hydro capacity to supply the peak loads which occur for short periods during the daily load variation.

NET ELECTRICITY GENERATED BY NUCLEAR AND ALL POWER STATIONS

GIGAWATTHOURS (GWH) GENERATED BY FORT CALHOUN AND COOPER STATIONS

MONTH	Cooper		Fort Calhoun		Total Nuclear		Generation		Nuclear Percent of Grand Total	
	1982	1983	1982	1983	1982	1983	1982	1983	1982	1983
January	539	548	355	-3	893	545	1,854	1,698	48.2	32.1
February	500	468	283	0	783	468	1,575	1,254	49.7	37.3
March	489	537	356	0	844	537	1,377	1,202	61.3	44.7
April	508		338		846		1,283		65.9	
May	312		355		668		1,184		56.4	
June	0		340		340		975		34.9	
July	340		340		680		1,645		41.4	
August	475		344		820		1,728		47.4	
September	487		300		786		1,428		55.1	
October	508		192		700		1,312		53.3	
November	551		252		803		1435		56.0	
December	566		22		588		1425		41.2	
Total	5,276	1,553	3,477	-3	8,753	1,549	17,223	4,154	50.8	37.1

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

D.5 ELECTRIC SALES TO ULTIMATE CONSUMERS

Total electric sales as reported by the three largest electric utilities for the first quarter of 1983 were down 7 percent compared with first quarter 1982 sales. The lower demand for electricity during the first quarter was due to economic conditions and the prevailing weather. Heating degree days were 20 percent lower than for the first quarter of 1982.

Sales were down in all sectors of the state's economy. A noticeable difference, however, exists among sectors. Electricity sales were down 9.8 percent to industrial consumers, 8.1 percent to residential consumers, and 4.1 percent to commercial consumers.

ELECTRIC SALES TO ULTIMATE CONSUMERS
GIGAWATTHOURS SOLD
(NPPD, OPPD & LES)

MONTH	RESIDENTIAL		COMMERCIAL		INDUSTRIAL		PUBLIC USE		TOTAL SALES		PERCENT OF PREVIOUS YEAR
	1982	1983	1982	1983	1982	1983	1982	1983	1982	1983	
January	336	303	265	246	185	163	32	29	817	741	90.7
February	309	279	239	240	185	160	30	30	763	709	92.9
March	255	245	224	212	183	176	29	28	691	661	95.6
April	231		214		176		29		650		
May	203		202		163		27		595		
June	190		205		172		26		593		
July	302		254		180		28		764		
August	360		273		189		31		852		
September	272		258		192		32		753		
October	200		212		172		28		612		
November	215		220		169		29		633		
December	284		245		173		32		734		
TOTAL	3,157	827	2,810	698	2,139	498	352	87	8,458	2,111	93.0

1 million kilowatt hours = 1 gigawatt hour = 1 GWH

Source: Edison Electric Institute

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

D.6 FUEL USED FOR ELECTRICITY GENERATION

Reported figures for the first three months of 1983 show a moderate increase of 4.1 percent in the use of coal for electricity generation. Natural gas and oil continue to provide less than 1 percent of the energy used in the generation of electricity.

Use of nuclear power decreased 38.4 percent for the first quarter of 1983 compared with the first quarter of 1982. Total energy used in the generation of electricity decreased 15.5 percent for the same time period.

The Fort Calhoun nuclear station was down for repairs and refueling all of the first quarter of 1983. The station is now back in production.

Nuclear power was used in producing 37.1 percent of all electricity in the state by the five largest electric utilities during the first three months of 1983.

NEBRASKA ENERGY OFFICE

ELECTRICITY GENERATION BY FUEL TYPE
(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		TOTAL ENERGY TRILLION BTU		PERCENT OF PREVIOUS YEAR
	1982	1983	1982	1983	1982	1983	1982	1983	1982	1983	1982	1983	
January	571	558	12	28	15	5	0.2	0.3	9.5	5.8	22.6	18.7	82.7
February	463	438	17	14	24	8	0.2	0.3	8.3	5.0	19.0	15.2	80.0
March	291	379	15	30	8	7	0.2	0.3	9.0	5.7	15.8	14.6	92.4
April	231		33		10		0.2		9.0		14.4		
May	293		21		10		0.2		7.1		14.0		
June	382		13		7		0.2		3.6		12.5		
July	734		163		13		0.2		7.3		24.2		
August	520		115		6		0.2		8.7		20.8		
September	329		59		3		0.2		8.4		16.0		
October	349		56		5		0.2		7.5		15.6		
November	363		206		9		0.2		8.6		17.2		
December	479		130		11		0.2		6.3		17.4		
Total	5,005	1,375	840	72	122	20	2.6	0.9	93.3	16.5	209.6	48.5	84.5

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

E. 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 provisions of Section 81-1607 RSN (1981). The model is used to identify emerging trends relating to energy supply, demand and conservation in the following sectors: agricultural, commercial, industrial, residential, transportation, and utilities. It is a useful tool in evaluating policies on Nebraska's economy and energy status.

A summary of the utilities sector model is analyzed in this report. Other sectors of the model have been analyzed in previous quarterly reports.

E.1 UTILITIES MODEL

The utilities model is one sector of the Nebraska Energy Office energy demand model for the state. The sector includes systems and companies which produce and distribute electricity, Standard Industrial Classification Code 491. The primary goal of the utilities sector is to find existing trends in the use of primary fuels for electricity generation and to forecast these requirements to 1990. The energy sources included in the model are coal, natural gas, petroleum, nuclear, and hydro.

The model can project answers to the following questions:

a. How much energy in Btu's and physical units by fuel type will be used? What will the expected cost be through 1990, assuming current trends in fuel use continue?

b. Same as (a) except using different assumptions concerning price changes.

c. Same as (a), except assuming changes in production due to large unit outage.

Future state electricity generation assumptions were derived from the "Nebraska Power Association Statewide Generation Planning Study 1980-2009." These projections account for electricity requirements within the state and anticipated exports from the state. The amount of electricity generated is projected to increase 4 percent per year through 1990. It is anticipated that nearly all of the increased energy requirements in generation will come from coal. A brief summary of results is given in the following table:

UTILITIES MODEL TABLE

	1985	1990
Gigawatt hours generated	21,437	26,351
Fuel requirements (billion Btu)		
Coal	134,887	190,804
Natural Gas	200	200
Petroleum	1,537	1,667
Nuclear	83,545	82,843
Hydro	14,737	14,628
TOTAL	234,906	290,142
Forecast prices		
Coal ($ per short ton)	$32.24	$54.22
Natural Gas ($ per mcf)	$4.57	$9.42
Petroleum ($ per gallon)	$1.23	$2.03

F. HOW THE ENERGY IS USED

F.1 The Residential Sector

The 1980 Census shows that there were 625,000 dwellings in the state, of which 510,000 were single family dwellings. The remaining 115,000 were multiple dwelling units. For single family dwellings, a typical home in 1977 had a floor area of 1,300 square feet. New single family dwellings constructed for 1979-1981 had an average floor area of 1,500 square feet. Of these dwellings approximately 60% were constructed prior to 1960 and can be considered to have been constructed below current energy standards. Because of market demand and state adoption of minimal energy standards, most new homes are insulated and more energy efficient than older housing. A majority of homes are air conditioned, and there is a trend toward central units or whole-house conditioning. Most new homes are being built with central units.

Energy use in the residential sector can be divided into four major categories: space heating, water heating, space cooling, and other applicance use. Of these space heating accounts for about 60% of the home energy bill. Currently, approximately 70% of single family dwellings are heated by natural gas, 10% by electricity, and 20% by propane or heating oil. For 1979-81, 66% of new homes included gas heat, 33% electric heat, and 1% other. Energy required for space heating is projected to remain constant or decrease slightly in the future with the construction of more and larger homes being offset by better insulation in new homes, more efficient furnaces, and weatherization of older homes. Heating requirements in Nebraska vary from year to year because of variations in weather. It is assumed that heating will be used whenever the outside temperature falls below 65 degrees Fahrenheit. Heating degree days, defined as the difference between a day's average temperature (if below 65 degrees) and 65 degrees Fahrenheit, is the measure used to record and predict heating requirements. A seasonal total can be obtained by summing over all such days. The seasonal normal for Nebraska is 6,326 heating degree days. Data for the recent past are presented in the following table.

Heating Degree Days

Heating Season	Degree Days	Deviation From Normal
1973-74	6,195	- 2.07%
1974-75	6,678	+ 5.56%
1975-76	5,887	- 6.94%
1976-77	6,331	+ 0.08%
1977-78	7,175	+13.42%
1978-79	7,453	+17.82%
1979-80	6,390	+ 1.01%
1980-81	5,565	-12.03%
1981-82	6,854	+ 8.35%
1982-83*	5,274	- 5.95%

* Data for the 1982-83 season is through March 27.

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

It should be noted that three very atypical seasons have occurred in the past ten years. Heating degree days have exceeded 7,000 only four times in the past 50 years and two of them occurred back to back in the 1977-78 and 1978-79 seasons. The 1980-81 season was the second mildest for the same time period.

Electric utility statistics show that a typical Nebraska residence consumed about 9,600 kilowatt hours (kWh) in 1982. Consumption is projected to increase at a rate of about 1.5% a year through 1990 by the Nebraska Energy Office.

F.2 The Agricultural Sector

In 1982, Nebraska had 65,000 farms, down from 71,000 farms a decade earlier. The total farm acreage was 47,700,000 acres, or about 95 percent of the total area of the state. For the period 1979-1982 an average of 19,000,000 acres was planted to crops, about 4,000,000 acres were pasture or unplanted cropland, 23,000,000 acres rangeland, and the remaining 1,700,000 acres were in woodland and other uses. Four major agricultural uses for energy are:

field operations (primarily planting, tilling, and harvesting) irrigation, grain drying, and livestock operations.

The first three uses are dependent upon acreage and yields which in turn are affected by economic and weather conditions. For 1983 the acreage set-aside and diversion programs (including the Payment In Kind Program or PIK) will have a major impact on corn, sorghum, and wheat acreages. The following table presents 1981 and 1982 planted acreages and anticipated plantings for 1983 for major Nebraska crops.

Planted Area by Crop Type
('000 acres)

Crop	1981	1982	1983	1983 *
Corn	7,400	7,400	6,200	5,000
Oats	550	520	480	
Barley	30	28	60	
Sorghum (Milo)	2,300	1,860	1,450	1,300
Soybeans	2,150	2,350	2,100	
Dry Edible Beans	240	225	190	
Sugar Beets	80	52	NA	
All Hay	3,650	3,800	3,900	
Wheat	3,050	3,100	2,850	2,200
Rye	75	75	80	
Total	19,525	19,410	17,310	

Source: Nebraska Agri-Facts for 1981, 1982, and 1983 (February planting intentions). Released March 2, 1983.
* Nebraska Energy Office estimates taking farm programs into account.

F.2.A. Energy for Field Operations
(Planting, Tilling, Harvesting)

Energy Used *

Fuel	1981	1982	1983 (est.)
Diesel - million gallons	60 (8.3)	58 (8.0)	49 (6.8)
Gasoline - million gallons	18 (2.2)	20 (2.5)	15 (1.9)
Total - (trillion Btu)	(10.5)	(10.5)	(8.7)

* Trillion Btu equivalent given in parentheses.

Although reports on the government programs indicate that feed grain (corn and sorghum) acreage will be down about 40% and wheat about 33%, energy requirements will not fall as much. First, this only accounts for about 20-22% of total acreage and second, a cover crop will be planted on much of the set-aside acreage.

F.2.B. Energy for Irrigation

In 1982, about 7.5 million acres were irrigated in Nebraska. Some 71,000 registered irrigation wells served approximately 90% of this need. The remaining 10% was irrigated from rivers, streams, or reservoirs.

The following table shows 1981-1982 energy usage by fuel type:

Energy for Irrigation

Energy Used *

Fuel	1981		1982	
Diesel - million gallons	81	(11.2)	72	(10.0)
Electric - million kWh	800	(2.7)	800	(2.7)
Gasoline - million gallons	2	(0.2)	2	(0.2)
Propane - million gallons	26	(2.5)	39	(3.7)
Natural Gas - mcf**	4284	(4.3)	4290	(4.3)
Total - (trillion Btu)		(20.9)		(20.9)

* Trillion Btu equivalent given in parentheses.
** 1 mcf = 1000 cubic feet of natural gas.

Assuming similar weather conditions for 1983 as for 1981 and 1982, and an approximate proportionate decrease in irrigation requirements to total acreage, a reduction of 20-25% in energy requirements is projected by the Nebraska Energy Office. If the weather is hotter and dryer than the past two years it is obvious that less of a decrease would occur.

Corn and grain sorghum are the two grains requiring the most energy for drying. Small grains, soybeans, and others require rather insignificant amounts.

The following table shows 1981-1982 energy requirements for drying by fuel type:

F.2.C. Energy for Grain Drying

Energy Used *

Fuel	1981	1982
Natural Gas - mcf	6283 (6.2)	6070 (6.0)
Electricity - million kWh	332 (1.1)	318 (1.1)
Propane - million gallons	36 (3.4)	45 (4.3)
Total - (trillion Btu)	(10.7)	(11.4)

* Trillion Btu equivalent given in parentheses.

Assuming yields similar to those attained in 1981 and 1982 the Nebraska Energy Office expects energy requirements for grain drying to decrease approximately 30%. This is more than the proportionate decrease in total acreage but takes into account that corn and sorghum are the two primary grains involved in drying.

Again, fuel needs depend upon the weather to the extent that if crops dry well in the field, fuel needs are less than otherwise.

F.2.D. Other Agricultural Energy Use

Other agricultural uses for energy include livestock operations, lighting in farm buildings, and other farm machines. This usage for 1981 and 1982 follows:

Other Agricultural Energy Use

Energy Used *

Fuel	1981	1982
Electricity - million kWh	155 (0.5)	146 (0.5)
Propane - million gallons	2 (0.2)	3 (0.3)
Diesel - million gallons	25 (3.5)	25 (3.5)
Gasoline - million gallons	12 (1.5)	15 (1.9)
Total - (trillion Btu)	(5.7)	(6.2)

* Trillion Btu equivalent given in parentheses.

The Nebraska Energy Office projects that requirements for 1983 are expected to remain near the levels of 1981 and 1982. Thus, estimated total energy requirements by agriculture for 1983 are:

F.2.E. Agriculture

Estimated Energy Needs in 1983*

Fuel	Amount
Diesel - million gallons	128-133 (17.7-18.5)
Gasoline - million gallons	28-30 (3.5-3.7)
Electricity - million kWh	960-1030 (3.2-3.5)
Propane - million gallons	53-57 (5.0-5.4)
Natural Gas - mcf	7250-7800 (7.2-7.8)
Total - (trillion Btu)	(36.6-38.9)

* Trillion Btu equivalent given in parentheses.

This compares with usage of 48 trillion Btu in 1981 and 49 trillion Btu in 1982.

3. The Commercial Sector

Nebraska has about 35,000 commercial enterprises, employing approximately 70% of the total labor force. The commercial sector of Nebraska's economy includes 163,000 persons employed in wholesale and retail trade, or about one of every four of the labor force. This is more than the total employment in agriculture. Government, including public schools, colleges, and universities, is included as part of the commercial sector.

Activity in the commercial sector takes place in a variety of settings, such as stores, offices, hotels, motels, theaters, restaurants, and cafes. The needs for energy vary widely among these facilities, but they all have common requirements for:

- space heating and cooling
- lighting
- other special requirements (water heating, office equipment, cooking, elevators, computers, ventilating equipment, and communications systems).

Space heating accounts for about 54% of the total energy budget for the commercial sector, space cooling, 12%; water heating, 4%; and other uses including the special requirements listed above, 30%.

The primary fuels used in the commercial sector are natural gas, electricity, petroleum distillates (diesel, heating oil, kerosene, and other similar fuels), and propane. Use by fuel type for the period 1978-1982 is presented in the following table:

Commercial Sector Use by Fuel Type *

	1978	1979	1980	1981	1982
Natural Gas bcf**	32.0(31.8)	31.8(31.6)	36.6(36.4)	32.5(32.3)	33.2(33.0)
Distillates million gallons	49.7 (6.9)	60.6 (8.4)	44.0 (6.1)	38.9 (5.4)	45.4 (6.3)
Propane million gallons	14.7 (1.4)	13.6 (1.3)	26.2 (2.5)	17.8 (1.7)	28.3 (2.7)
Electricity million kWh	4190(14.3)	4014(13.7)	4073(13.9)	3984(13.6)	3868(13.2)
Total (trillion Btu)	(54.4)	(55.0)	(58.9)	(53.0)	(55.2)

* Trillion Btu equivalent given in parentheses.
** 1 bcf = 1 billion cubic feet of natural gas.

Source: Nebraska Energy Office Annual Reports

4. The Industrial Sector

Nebraska has about 2,400 industrial firms in the state. Many of these are included in the commercial sector for energy data purposes since utilities base their classifications on the amount of power and energy required by a customer. For the same reasons, commercial enterprises may be included in the industrial sector when compiling energy data. Meat packers require large quantities of steam in their processes, as well as large amounts of refrigeration for handling their products. Companies dealing with metals and metal processing require large amounts of electric energy in their machinery operations. From these two examples it is evident that an average or typical Nebraska industry probably does not exist. It is, however, possible to estimate the total energy requirements of this sector of the state's economy by establishing relationships between energy use and value added by industrial group. Value added is the difference between the value of a finished product and the total value of the materials used in it.

Major industries in the state by Standard Industrial code (SIC) are:

SIC 20	Food and Kindred Products
SIC 28	Chemicals and Allied Products
SIC 32	Stone, Clay, and Glass Products
SIC 33	Primary Metals
SIC 35	Machinery, Except Electrical
	Others

Fuels which provide nearly all of the energy requirements in the industrial sector are natural gas, electricity, petroleum distillates (diesel, heating oil, kerosene, and other similar fuels), propane, and coal. Use by fuel for the period 1978-1982 is presented in the following table:

Industrial Sector by Fuel Type Use *

	1978	1979	1980	1981	1982
Natural Gas bcf	51.2(50.9)	50.1(49.8)	35.5(35.3)	32.4(32.2)	30.0(29.8)
Distillates million gallons	39.7 (5.5)	48.3 (6.7)	47.6 (6.6)	43.3 (6.0)	38.9 (5.4)
Propane million gallons	19.9 (1.9)	17.2 (1.6)	7.5 (0.7)	9.5 (0.9)	12.5 (1.2)
Coal million short tons	.554(12.5)	.554(12.5)	.417 (9.4)	.457(10.3)	.306 (6.9)
Electricity million kWh	2666 (9.1)	2768 (9.4)	2783 (9.5)	2783 (9.5)	2607(8.9)
Total (trillion Btu)	(79.9)	(80.0)	(61.5)	(58.9)	(52.2)

* Trillion Btu equivalent given in parentheses.

The marked decline in natural gas use between 1979 and 1980 was the result of several factors. One of these was the Power Plant and Industrial Fuel Act of 1978 which prohibited, with some exemptions, installation of gas-burning power plants and boilers as a response to the then-apparent shortage of natural gas supplies in the eastern one-third of the United States.

Secondly, price increases following the partial deregulation of gas under the Natural Gas Policy Act of 1978 caused industrial customers to look to other energy sources for space heating and process steam.

Finally, the economic recession has had a dampening effect on manufacturing operations, resulting in reduced consumption of natural gas in the industrial sector.

If economic conditions improve as expected, energy use in the industrial sector should show some increase.

5. The Transportation Sector

Practically all of the energy for transportation comes from oil, gasoline, and diesel fuels. Because motor fuels are subject to tax, the State Department of Revenue records consumption. Total motor gasoline consumption in Nebraska for 1982 was 697,227,000 gallons. In addition 89,878,000 gallons of super unleaded with ethanol (gasohol) were consumed. Some 146,434,000 gallons of other motor vehicle fuels (diesel and propane, for example) were consumed during 1982.

Total gasoline and super unleaded with ethanol available for sale in Nebraska was down slightly in 1982 from 1981 levels. This reflects a leveling off of the downward trend in consumption evident since 1978 when usage peaked. Decreases in consumption of gasoline are being made up by increases in super unleaded with ethanol, of which was up 288 percent in 1982 over 1981 and now represents about 10% of motor fuels consumption of Nebraska.

Gasoline and Super Unleaded with Ethanol (Gasohol) Availability
1978 through 1982
(1,000 Gallons)

Year	Gasoline	Super Unleaded with Ethanol (Gasohol)	Total	Change From Previous Year
1978	951,226	*	951,226	---
1979	903,431	6,890	910,321	-4.3%
1980	808,877	30,138	838,015	-7.8%
1981	761,277	31,181	792,458	-5.5%
1982	696,863	89,841	786,705	-0.7%

* Gasohol data not collected until 1979.

Source: Nebraska Energy News, March 1, 1983.

Mileage driven peaked in 1978, then decreased in 1979-80. From 1981 mileage has again been gradually increasing. Fuel use has continued to decrease since improved efficiency in miles per gallon has more than offset any mileage increase. Due to decreasing gasoline prices travel may be up in 1983, leading to minor increases in motor fuel usage over 1982.

The use of aviation fuels has decreased in Nebraska from 41,099,000 gallons in 1980 to 31,299,000 gallons in 1982. This decrease has come about primarily because of the decrease in number of commercial flights in and out of Nebraska.

6. Utilization of Energy in Nebraska

Source	1978	1979	1980	1981	1982 (Prelim)
Natural gas (billion cubic feet)					
Residential	48.2	53.5	60.0	61.5	60.8
Commercial	32.0	31.8	36.6	32.5	33.2
Industrial	51.2	50.1	35.5	32.4	30.0
Other (agric.)	8.7	11.7	10.4	11.2	9.7
Electric Utility	12.8	14.0	11.7	5.2	1.3
Total Natural Gas	152.9	161.1	154.2	142.8	135.0
Middle Distillates (million gallons)					
Aviation Fuel	46.0	42.4	41.1	34.3	30.3
No. 1 Fuel Oils	36.8	42.6	30.7	21.5	19.5
No. 2 Heating Oils	191.0	201.9	177.2	156.8	142.0
Diesel Fuel	309.9	316.2	270.4	236.5	214.3
Total Distillates	583.7	603.1	519.4	449.1	406.1
Propane (LPGas) (million gallons)					
Residential/Commercial	141.5	121.9	84.3	67.6	89.4
Internal Combustion	17.9	15.4	35.2	28.1	37.2
Industrial	19.9	17.2	7.5	9.5	12.5
Other	50.3	43.4	33.0	23.0	30.4
Total Propane	229.6	197.9	160.0	128.2	169.5
Gasoline (million gallons)					
Agriculture	24.0	35.2	30.4	31.0	34.0
Transportation	927.2	868.1	808.3	761.5	754.5
Total Gasoline	951.2	903.4	839.0	792.5	788.5
Coal (million short tons)					
Commercial	0.01	0.01	--	0.016	0.019
Industrial	0.55	0.55	0.42	0.305	0.305
Electric Utility	2.90	3.46	5.05	4.995	5.068
Total Coal	3.46	4.02	5.47	5.316	5.392
Electricity Production (GWH = million kwh)					
Hydrostations	1,187	1,246	1,335	1,197	1,096
Nuclear	7,725	8,658	5,783	5,990	8,980
Coal	4,664	6,027	8,123	8,481	7,705
Natural Gas	994	1,088	947	352	108
Petroleum	631	398	126	46	72
Total Production	15,201	17,417	16,314	16,065	17,960

Electric Sales to Ultimate Consumers by Sector (GWH = million kWh)

Electricity Usage by Sector
(million kwh)

	1978	1979	1980	1981	1982
Residential	5,332	5,274	5,538	5,246	5,679
Commercial	4,190	4,014	4,073	3,984	3,868
Industrial	2,666	2,768	2,783	2,783	2,607
Agricultural	1,151	1,301	1,314	1,318	1,230
	13,339	13,357	13,708	13,331	13,384
Annual Energy (trillion = 10^{12} Btu)	560.3	571.8	540.1	511.6	533.8

Note: Total energy consumption represents all fuel types.

Source: Nebraska Energy Office Annual Report, 1982.

7. SUMMARY

Total energy use in Nebraska increased each year from 1960 through 1978 except for 1967. The rate of increase during the 1970's was approximately 3% per year, down from the nearly 6% annual increase from 1960 to 1970. After peaking in 1979, energy use declined about 5% in both 1980 and 1981 followed by a 4% increase for 1982. Nebraska Energy Office estimates indicate a continuing increase in demand through 1990, however, at a more moderate 1.5% rate.

VI. EFFICIENCY IN GOVERNMENT

Government must set an example of energy efficiency for all of the citizens

It is imperative that government use its resources for energy prudently. Since energy conservation techniques are readily available, it is the responsibility of both elected and appointed officials to make every effort possible to conserve energy on a daily basis.

In reaching the goal of energy efficiency in government, the Nebraska Energy Office has identified six areas in which government at all levels can reduce its costs by implementing energy conservation measures.

TESTING MUNICIPAL-OWNED VEHICLES

To promote energy efficiency at the municipal level of government, the Ga$ $aver Program, which tests vehicles for fuel efficiency, has been redirected so that local governmental units can benefit from reduced energy costs. To date, 25% of the 200 communities contacted have responded affirmatively to the offer of testing all of their municipally-owned vehicles.

THIRD-PARTY FINANCING

On May 2, 1983, the Nebraska Energy Office and the Department of Administrative Services jointly reported to the Legislature the status of the feasibility of private sector third-party financing of energy conservation projects under Legislative Resolution #31 of 1983. With the cooperation of the Nebraska Building Renewal (309) Task Force, the investigation is continuing and a subsequent report is expected on or about July 1, 1983.

STATE PROCUREMENT

In the area of state procurement, the Nebraska Energy Office has met all of the mandatory requirements of the Energy Policy Conservation Act of 1978. Within the constitutional limits of its authority, it continues to assist local units of government willing to implement voluntary energy-efficient procedures.

Detailed information on STATE BUILDING AUDITS, INSTITUTIONAL CONSERVATION PROGRAM AND NEBRASKA SCHOOL WEATHERIZATION PROGRAM can be found on the next four pages.

A. STATE BUILDING AUDITS

State building audits conducted by the Nebraska Energy Office (NEO) during the first quarter of 1983 covered 180 structures.

The total British thermal units (Btus) consumed annually in the buildings audited in the January-March period amounted to an estimated 301,503 million Btus. Energy savings from following the audit recommendations would be an estimated 52,210 million Btus a year, a savings of 17%

Those projected energy savings represent the equivalent of 372,929 gallons of fuel oil or 50,640 MCF (thousands of cubic feet) of natural gas. Projected annual monetary savings from implementation of the audit recommendations would be $227,880.

The State Building Audits Program is administered by the NEO's Direct Grants Division and is being carried out under the provisions of Section 81-1627 RSN (1981).

Energy cost savings 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.

The State Building Audits Program runs through August of 1983. At this time the NEO has approximately 150 audits left to conduct.

B. INSTITUTIONAL CONSERVATION PROGRAM

The Nebraska Energy Office (NEO) will be conducting a fifth grant cycle of the Institutional Conservation Program during 1983. About one million dollars in federal matching funds will be available to help Nebraska schools and hospitals improve the energy efficiency of their buildings. These funds are part of an initial $56 million national appropriation for Grant Cycle V, and an additional $48 million from the recently passed emerengency jobs bill.

The Institutional Conservation Program was created by the National Energy Conservation Policy Act of 1978. Participation in this program is open to all schools and hospitals, public or non-profit, which meet the requirements for eligibility.

In Grant Cycle V any eligible institution will be able to apply for a federal matching grant to fund up to 50 percent of the cost of a Technical Assistance (TA) Program. A TA Program is an in-depth engineering study of a building to identify all cost-effective energy conservation measures.

An eligible institution will also be able to apply for 50-50 matching funds, up to $50,000 per building, to implement the energy conservation measures identified in a technical assistance study. These measures are capital improvements which have an economic payback period of one to fifteen years, and typically range from lighting replacement, roof insulation and storm windows to computerized energy management systems.

Since the start of the program in 1979, the Federal Department of Energy has awarded $4,088,994 to 41 Nebraska schools and hospitals for energy conservation measure grants. The capital improvements carried out with the help of these funds will save an estimated $1,720,740 in yearly energy costs. The estimate of energy savings from these projects will be the equivalent of 406,317 MCF (thousands of cubic feet) of natural gas.

The NEO has set an application submittal deadline for Grant Cycle V of June 27, 1983. School and hospital administrators received grant application material by the end of April. To further explain the program, the Energy Office conducted informational meetings at the Old Mill Holiday Inn, Omaha, on May 10th and at the Radmada Inn, Kearney, on May 12th.

C. NEBRASKA SCHOOL WEATHERIZATION PROGRAM

During the month of January the Nebraska Energy Office awarded energy efficiency grants to 100 public school districts under the fourth grant cycle of the Nebraska School Weatherization Program.

Approximately $2,950,000 available from State Oil and Natural Gas Severance Tax receipts was distributed throughout the state's three congressional districts. These funds will aid school districts in carrying out some 468 energy and cost-saving projects at 185 school buildings.

The Nebraska Energy Office estimates that the approved projects will result in a first year energy cost-savings of almost $742,000 and will pay for themselves in an average of 4.9 years. The Nebraska Energy Office also figures the annual energy savings will be the equivalent of 151,960 MCF (thousands of cubic feet) of natural gas.

The State Severence Tax receipts will cover approximately 80 percent of the projects' funding. School districts receiving the awards must provide at least the other 20 percent.

The energy efficiency projects being funded involve such capital improvements as insulating ceilings, installing new boiler burners and new boilers, replacing incandescent lights with fluorescents, installing storm windows and reducing glass area, putting thermostat control valves on radiators and adding energy management controls to heating, ventilating and air conditioning systems.

In the fourth grant cycle, over $4.9 million was requested by 108 school districts in 227 applications representing 697 projects. Applications were reviewed within each congressional district on a project-by-project basis. Grant awards were made according to energy savings and cost payback.

To date, more than $6.8 million of State Severence Tax money has been provided through the program to assist in weatherizing 352 school buildings in 178 local districts.

Grant cycle four was the first of two awardings to be made during the second year of this five-year program. Those school districts which plan to participate in the fifth grant cycle submitted their applications to the Nebraska Energy Office by April 29, 1983. The Nebraska Energy Office expects to have $1.5 - $2 million available to award in grant cycle five.

C.1 NEBRASKA SCHOOL WEATHERIZATION PROGRAM

CYCLE V

GRANT APPLICATION SUBMITTAL SUMMARY

CONGRESSIONAL DISTRICT 1:

Number of Applications Received:	104
Number of Projects Submitted:	266
Number of School Districts:	59
Amount Requested:	$1,897,873

CONGRESSIONAL DISTRICT 2:

Number of Applications Received:	35
Number of Projects Submitted:	110
Number of School Districts:	14
Amount Requested:	$ 772,629

CONGRESSIONAL DISTRICT 3:

Number of Applications Received:	109
Number of Projects Submitted:	348
Number of School Districts:	70
Amount Requested:	$2,260,591

TOTAL:

Total Number of Applications Received:	248
Total Number of Projects Submitted:	751
Total Number of School Districts:	143
TOTAL AMOUNT REQUESTED:	$4,931,093

VII. AIDING THE STATE'S ECONOMIC DEVELOPMENT PLANS

"Energy has become a necessity to all of us."
--Lewellyn King*
April 19, 1983

The economic health of all Nebraskans is dependent upon the prosperity of its farms, ranches and businesses. In Nebraska, agriculture is the foundation of the economy. Historically, Nebraska's farmers have always been in the forefront in the use of renewable energy sources. That interest continues to grow as the cost of energy rises. The Nebraska Energy Office is moving in a number of areas in the agricultural sector to promote the use of alternates to provide a reliable source of energy.

NATIONAL ARBOR DAY FOUNDATION GRANT

On Arbor Day, Governor Kerrey announced a $22,500 grant to the National Arbor Day foundation to promote the energy-saving benefits that can accrue from planting trees. The grant will provide for production of public service announcements in print and the electronic media and brochures to encourage rural Nebraskans to take advantage of existing subsidized programs which offer trees for planting in rural settings.

PUMP UNIT MANAGEMENT PROGRAM (P.U.M.P.)

Under a Nebraska Energy Office funded grant to the University of Nebraska Institute of Natural Resources Cooperative Extension Service, demonstrations are held in fields across the state. On-site demonstrations show the value of having irrigation pumping equipment tested and adjusted to save both energy and money. Under the program, testing kits have been made available to county extension agents across Nebraska for loan to farmers to test their irrigation pumps. If adjustment is necessary, they can make the needed adjustments themselves or contact any one of 60 specialists trained under the grant and operating in the private sector.

THE SMALL HYDRO STUDY

The Nebraska Municipal Power Pool, under a contract from the Nebraska Energy Office, completed a study in January of existing and potential sites which could be further developed to maximize Nebraska's hydroelectric generating capacity. The site evaluations showed that three locations held promise for current or future construction of hydroelectric generating facilities.

ENERGY FROM BIOMASS

In cooperation with the Nebraska Gasohol Committee, the Nebraska Energy Office is exploring the economic impact of biomass development in the state. This is the second phase of the study. A copy of the first phase, Nebraska Biomass Study, is available upon request.

SOLAR ENERGY USE IN SWINE HOUSING

With a grant from the Nebraska Energy Office, the University of Nebraska's Institute of Natural Resources Department of Agricultural Engineering, held several workshops to show farmers engaged in raising swine how they could reduce energy consumption by constructing solar-assisted buildings used in raising swine.

POWER FROM THE WIND

Under a grant from the Western Area Power Administration, the Nebraska Energy Office is in the second year of a twenty-site assessment of wind speeds in Nebraska. If wind is to be used as a future source of energy, both wind speed and its reliability are critical to the actual placement of turbines capable of generating electricity. With a grant from the Nebraska Energy Office, Rural Electric Association members are compiling the data on a monthly basis.

SOLAR ENERGY USE IN HOMES

With a grant from the Nebraska Energy Office, Solar Associates of Omaha have held solar retrofit workshops designed for homeowners around the state. In the workshops, participants were presented the options available for adding solar technology to existing housing. As part of the presentation, participants were offered Path to Passive: Nebraska's Solar Primer at a reduced cost.

COMMERCIAL/INDUSTRIAL ENERGY CONSERVATION PROGRAM

With a new emphasis, the Nebraska Energy Office will be aiding the state's industries and businesses to reduce their energy consumption and enhance their economic health. Businesses which participated in an energy audit will be contacted to find out if any of the recommended energy saving actions were taken as a result of the audit. If the energy saving mesures were implemented, the Nebraska Energy Office will attempt to determine

the extent of the savings. Additionally, businesses which have taken the lead in making significant energy saving modifications are being highlighted for the benefit of other area firms.