nebraska energy office

first quarter report
may 15, 1981

CHARLES THONE
GOVERNOR

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

WILLIAM H. PALMER
DIRECTOR

May 15, 1981

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

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

Dear Governor Thone and Clerk O'Donnell:

This Quarterly Report from the Nebraska Energy Office, for the period January-March, 1981, is submitted in accordance with provisions of Section 81-1606 RSN (1980).

If you have any questions, please contact this office.

Sincerely,

William H. Palmer

William H. Palmer
Director

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INTRODUCTION

Nebraskans continued their thrifty ways during the first three months of 1981 and posted a 10.1 percent decrease in gasoline consumption over the same period of 1980. Nebraska Energy Director William H. Palmer attributes the increase to lifestyle changes in which people are driving less, combining trips, purchasing fuel efficient cars, improving vehicle maintenance, carpooling and using mass transit services where they exist in Lincoln and Omaha.

Lifestyle changes are also evident in a 6 percent decrease in per capita energy consumption in 1980 over 1979. Per capita coal use has almost tripled from 1974 to 1980 as the state switches from oil to coal for electricity generation thus reducing its dependence on costly and erratic foreign petroleum supplies.

To both focus attention on the state's progress, and heighten awareness of the need for transportation and residential conservation, the Nebraska Energy Office conducted a broad-based "March is Energy Conservation Month" campaign during the first quarter. The multi-media promotion included a public service campaign for television and radio, a retail promotion for lumberyards and hardware stores, kick-off of the Residential Conservation Award Program, "E-Flag" presentations and Driver Energy Conservation Awareness Training sessions.

Nebraska's geothermal potential also started generating a lot of excitement in March. At a coordinating meeting of the state energy agencies, Governor Charles Thone announced release of a U.S. Department of Energy study showing the western two-thirds of the state as having "abundant geothermal potential."

CONSERVATION RESPONSIBILITIES

Section 81-1602(2) RSN(1980) requires the Nebraska Energy Office to undertake a continuing assessment of the trends in the availability, consumption and development of all forms of energy.

Section 81-1602(4) RSN(1980) requires that the Nebraska Energy Office recommend to the Governor and the Legislature energy policies and conservation measures for the state and to carry out such measures as are adopted.

Section 81-1602(5) RSN(1980) requires the Nebraska Energy Office to provide for public dissemination of appropriate information on energy, energy sources, and energy conservation.

Section 81-1602(6) RSN(1980) requires the Nebraska Energy Office to accept, expend, or dispense public funds for demonstration projects and other activities related to energy conservation or development.

Section 81-1602(7) RSN(1980) requires the Nebraska Energy Office to study the impact and relationship of state energy policies to national and regional energy policies.

Section 81-1602(8) RSN(1980) requires the Nebraska Energy Office to actively seek the advice of the citizens of Nebraska regarding energy policies and programs.

Section 81-1602(10) RSN(1980) requires the Nebraska Energy Office to design a state program for conservation of energy.

Section 81-1602(11) RSN(1980) requires the Nebraska Energy Office to provide technical assistance to local subdivisions of government.

Section 81-1602(12) RSN(1980) requires the Nebraska Energy Office to provide technical assistance to private persons desiring information on energy conservation techniques and the use of renewable energy technologies.

CONSERVATION DIRECTIONS

Generally, energy conservation programs of the past have been used to balance domestic energy supply and demand. From 1973 through 1975, the emphasis was on patient acceptance of reduced fuel supplies and a patriotic willingness to "make do" with lines

at service stations and reduced thermostat settings. From 1976 to 1980, the message has been that alternatives to wasteful energy practices are available and cost effective. Whether in the car, at home, at work, or in government, most Nebraskans have adopted self-help and subsidized energy approaches that emphasize burning fuel more efficiently, reducing heat loss or fuel waste, and making investments (such as insulation) to reduce the impact of rising fuel prices.

These techniques have historically provided a cost-effective alternative to the development of additional domestic supplies with the least adverse impact on the environment. That is, in most instances it has cost less to SAVE a barrel of oil than to DEVELOP a new barrel of domestic supply.

In the '80s Nebraskans are requesting information on (1) alternatives to traditional fuels; (2) improved technology to make more than a single use of an energy source; and (3) re-examining neglected energy systems that now appear to be effective once more. Examples of these interests are the sharp rise in the use of passive solar principles and wood burning; the rapid acceptance of new heat recovery and waste utilization technologies, and renewed study of the energy to be obtained from wind and water.

Presently there is a clear message from the energy industry to change the emphasis from talk of limits and finite supplies to aggressive pursuit of energy sources. This is evident from the increased production and distribution of electricity, secondary or tertiary recovery from declining oil and gas fields, and increased exploration activities.

Government's emphasis has shifted from the allocation of diminished supplies to the positive evaluation of available indigenous energy resources from whatever source. In late 1980 the stress clearly shifted from apology and explanation to solution and development! In the midst of economic hard times, energy talk now focuses on OPPORTUNITY for energy efficiency, on INDEPENDENCE from outside control, on NEBRASKA resources rather than on imported products, and on UTILIZATION of waste materials for energy, rather than on the costly dilemma of waste disposal.

Therefore, conservation division activities were intensified during the first quarter with the development of a broad-based "March is Energy Conservation Month" promotion. This campaign broke all participation records for driver efficiency, vehicle efficiency, irrigation pump efficiency, building envelope efficiency and alternate energy training requests. It focused attention on Nebraska's wind and hydroelectric potential, and saw the beginning of a study to determine the impact of an all-alcohol economy in the state, and increased technology and data capabilities for solar, wind and geothermal measurement.

The transition from the conservation activities of the '70s to the exploration of alternatives and technologies in the '80s was gradual. Numerous projects for television, education, driver awareness, residential energy auditing, lighting and thermal standards and intergovernmental coordination were completed during the last half of 1980. Activities related to waste oil burning, construction of refuse-derived energy plants and recycling have been yielded to environmental agencies. Federal regulations and financing limitations impose more barriers than voluntary energy projects can overcome.

Legislative direction has also established priorities for thermal and lighting code services and data gathering that require a shift of personnel and federal funds. During the past quarter, four professionals and related support services have been shifted from conservation activities to L.B. 954 operations.

CONSERVATION PRIORITIES

For the remainder of 1981 the Energy Office conservation priorities will be (in ranked order of importance):

Transportation services to reduce Nebraska's dependency on imported petroleum;

Residential programs to provide audit support, consumer referrals and information on supplemental energy assistance for passive solar and earth-sheltered housing;

Education programs that focus on vocational preparation, energy efficient construction, home economics and agriculture;

Commercial services that feature energy savings from improved mechanical systems operation and demand charge reduction;

Utility support services for auditor training, load management studies, hydro and wind assessment; and

Agricultural demonstration projects that highlight energy independence and alcohol production.

"MARCH IS ENERGY CONSERVATION MONTH" CAMPAIGN

Section 81-1602(5) RSN(1980) requires that the Nebraska Energy Office provide for public dissemination of appropriate information on energy, energy sources and energy conservation.

To call special attention to the importance of residential and transportation energy conservation, the Nebraska Energy Office conducted a statewide awareness campaign during March, 1981. The campaign coincided with planning for American Energy Week and National Energy Education Day. It included a retail promotion, public service announcements, kick-off of the Residential Conservation Award Program, "E"-Flag presentations, and Driver Energy Conservation Awareness Training (DECAT) sessions.

Planning

In late 1980 a series of meetings was held with the March is Energy Conservation Month Advisory Committee and representatives of the Petroleum Marketers Association; Mid-America Lumberman's Association; Heating, Ventilating and Air Conditioning Association; and the Western Retail Hardware Association to determine the best methods of reaching the public with energy information.

Representatives from the lumberyard and hardware retailers associations cited their customers' enthusiasm for printed information about home weatherization materials and techniques. The petroleum representatives suggested the use of television and radio announcements to publicize the need for transportation conservation. Based on these recommendations a retail promotion and public service campaign were developed.

Retail Promotion

Capitalizing on the need for printed materials about home weatherization, the Nebraska Energy Office designed a poster, fact sheet and store banner (see examples of poster and fact sheet on pages 8-9). The poster pointed out that the hot or cool air loss from the average home is like having a one-square-foot hole in the wall.

A letter describing the retail promotion and an order form were sent to lumberyards, hardware stores and heating, ventilating and air conditioning distributors. Response to the promotion was outstanding. Approximately 500 posters, 275 banners and 65,000 fact sheets were distributed to 250 retailers and distributors during the last week of February. Before the end of the first week of March supplies of the printed materials were running low. An additional 150 posters were printed to fill mail and phone requests.

Public Service Advertising Campaign

A public service campaign stressing the importance of residential and transportation conservation was developed for television and radio. In two television and two radio spots Governor Charles Thone points out the importance of home weatherization and congratulates Nebraskans for using 11 percent less gasoline in 1980 than in 1979. Four radio spots featuring conservation techniques and a ringing cash register theme were also produced.

The spots were distributed to all radio and television stations in the state along with a letter from Governor Thone asking that they be aired beginning in March and continuing throughout 1981.

Kickoff Activity

At a February 26 press conference on the steps of the Capitol Governor Thone proclaimed March as "Energy Conservation Month in Nebraska." After issuing the proclamation the Governor pumped 190-proof Nebraska-produced alcohol into two Nebraska State Patrol vehicles.

Media Relations

Weekly press releases on special "March is Energy Conservation Month" activities were distributed to newspapers through the Nebraska Press Association and to television and radio stations.

Nebraska Energy Office staff members discussed the March promotion on five radio and television talk shows.

Statehouse Observer

Rising energy costs have prompted many state agencies to develop energy conservation programs. To recognize and publicize these conservation activities the Nebraska Energy Office published and distributed a special energy edition of The Statehouse Observer to approximately 13,500 state employees. Copies of this special energy edition are also being distributed to local government units.

Special Education Programs

Among the special education programs conducted during March were 6 boiler efficiency workshops; 18 Driver Energy Conservation Awareness Training sessions (including 4 instructor workshops); residential energy auditor training sessions and a commercial passive solar energy workshop. (See the Energy Extension Service, Education and Transportation sections of this report for additional information on these educational programs.)

Exhibits

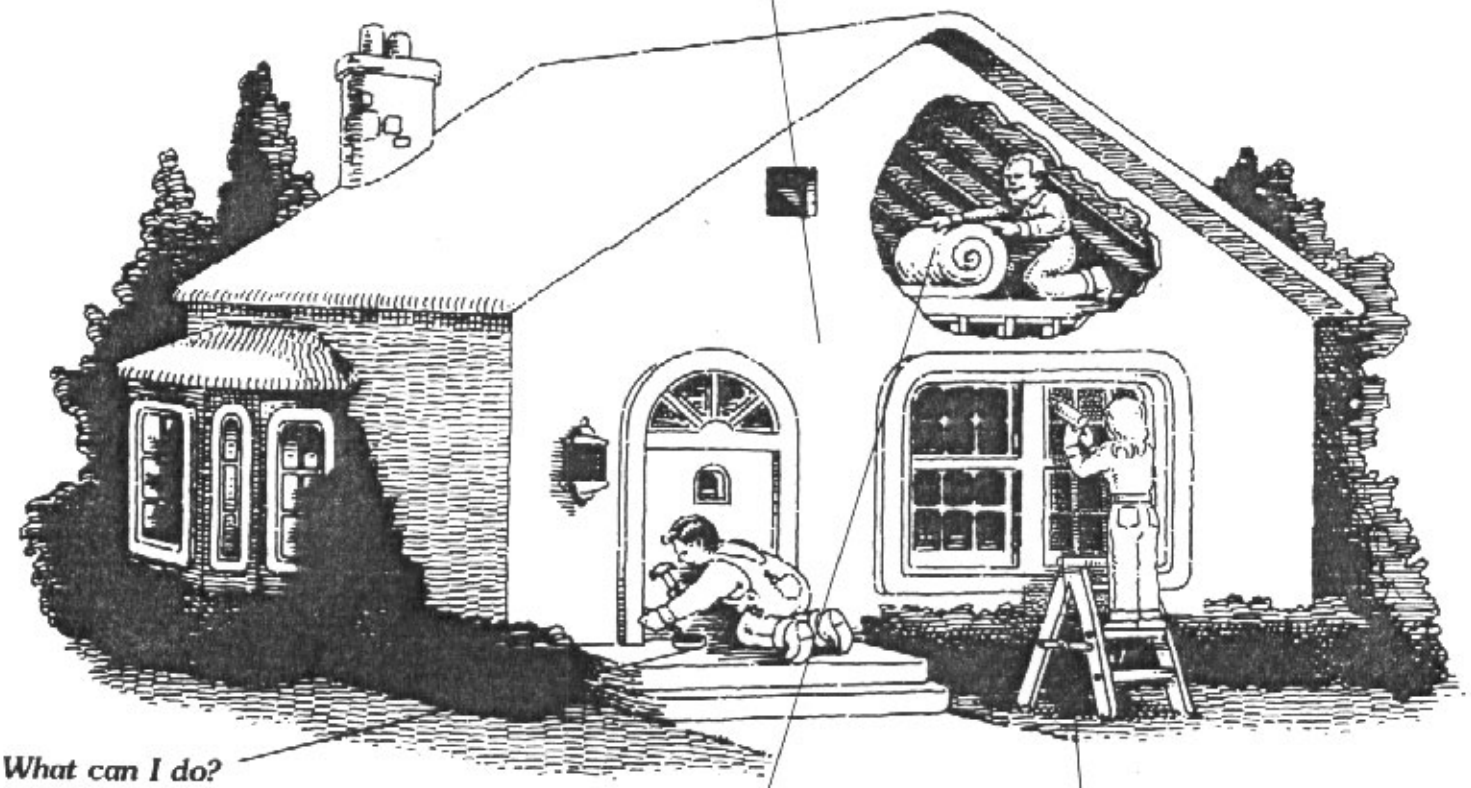
During March the Nebraska Energy Office sponsored booths at the Mid-America Lumberman's Convention (Omaha), Columbus Home Show, Triumph of Agriculture (Omaha), Hastings Home Show and the Omaha Home Show.

Easy on Energy

An overview of "March is Energy Conservation Month" activities was featured on the "Easy on Energy" program which aired March 12, 1981, on the Nebraska ETV Network.

DID YOU KNOW...

...that a house without adequate insulation, caulking and weatherstripping is like a house with a one-square-foot hole in the wall?



What can I do?

Use weatherstripping to stop drafts and SAVE on gas and electric bills.

What can I do?

Insulate the attic and other cold spots and SAVE energy and money during winter and summer.

What can I do?

Caulk around windows and doors and SAVE on heating and cooling costs.

March Is Energy Conservation Month

nebraska energy office

Help Conserve the Good Life of Nebraska

Printed with federal funds by the Nebraska Energy Office under P.L. 94-163 and P.L. 94-385

WEATHERIZE NOW—YOU CAN DO IT!

Start your annual home maintenance routine with these cost effective, easy do-it-yourself projects which will save you both energy and money!

Caulking and Weatherstripping

Check all outside areas where two different materials or parts of the house meet. Caulk wherever a permanent seal is desired and weatherstrip where surfaces must be moved, but a snug seal is needed.

Caulking materials that adhere to wood, glass, metal, plastic and masonry should be selected since these materials expand and contract. Resistance to weathering, cracking, shrinkage, water and mildew are also important.

More durable types of weatherstripping are the best investment since they are more effective and will last longer. Effectiveness against drafts, durability, aesthetics and ease of installation are all factors to consider when making your choice.

Where to Apply Caulking

1. Around windows and doors where the frame meets the siding.
2. Around exterior plumbing fixtures, electric outlets, exhaust vents and air conditioners which penetrate the siding.
3. Along skylights, vents and chimney flashings where they penetrate the roof and siding.
4. At sill joists and between dissimilar materials such as wood and masonry.
5. At corners where two pieces of siding meet.

Where to Apply Weatherstripping

6. Around loose fitting windows.
7. Inside the frames of entrance doors.
8. On the bottom of doors or on the threshold.
9. At the bottom of garage doors.
10. Around doors or any other openings between heated and unheated areas (example: attic openings, doors between living space and garage or another unheated room).

CAULKING MATERIALS

TYPE	COST	DURABILITY	COMMENTS
SILICONE	high	20 years	seals most dissimilar building materials; cannot be painted
BUTYL RUBBER	high	7-10 years	seals most dissimilar materials; can be painted
ACRYLIC LATEX	moderate	5-7 years	seals joints, fills cracks and nailholes
OIL-BASE	low	1-2 years	seals holes and cracks in exterior building materials not subject to stress

WEATHERSTRIPPING MATERIALS

TYPE	COST	DURABILITY	COMMENTS
FOAM or FELT STRIPS	low	poor	good for irregular gaps in low friction areas
TUBULAR GASKET	moderate	moderate	good against sliding surfaces; poor for irregular gaps
SPRING METAL	moderate	good	use between sliding surfaces; poor for irregular gaps
INTERLOCKING STRIPS	high	good	best seal; must be installed professionally
DOOR SHOES & THRESHOLDS	high	moderate	suitable for slightly uneven gaps; vinyl gaskets are replaceable
DOOR SWEEPS	moderate	moderate	suitable for slightly uneven gaps; adjustable
GARAGE DOOR STRIP	moderate	moderate	suitable for uneven gaps

TRANSPORTATION

For the second consecutive year transportation has been designated the state's most critical conservation activity. Nebraskans significantly reduced their gasoline use during 1980 and in the first three months of 1981.

Price increases are forcing Nebraskans to consider more efficient and economical forms of travel. This fact is reflected in the increased use of public transit and carpooling, improved small car sales and popularity of the free automotive diagnostic services offered through the Ga$ $aver Van program of the Nebraska Energy Office. At home shows and public meetings the demand for information on methods of improving vehicle performance has never been greater.

Support for ridesharing programs in Omaha and Lincoln has continued during the first quarter of 1981. Two pieces of legislation passed this session will affect ridesharing activities. L.B. 50, the ridesharing bill, will encourage employers to promote "pooling." L.B. 54, repeal of the Guest Statute, could potentially penalize joint commuting by increasing insurance premiums based on increased risk.

Driver Energy Conservation Awareness Training

The Driver Energy Conservation Awareness Training (DECAT) program was given special emphasis during the first quarter. The national program was designed to provide drivers with information and techniques for saving gasoline. By offering free DECAT courses to fleet operators and driver education programs the Nebraska Energy Office hopes to influence many drivers quickly through the "ripple effect."

The four-hour workshop program includes discussion of driving techniques and behind-the-wheel experience in a vehicle equipped with gauges which register the driver's mileage rate and indicate every one-thousandth of a gallon of fuel consumed. Vehicle selection, trip planning and maintenance techniques are also emphasized.

As part of the "March is Energy Conservation Month" campaign, 14 DECAT workshops were conducted to train 80 individual drivers. Eighteen instructors also were trained at 4 two-day instructors courses. The 18 new instructors work for eight major employers and five school districts which are planning DECAT programs for their employees. There is now a waiting list for the DECAT courses. Instructors' courses now are scheduled for each month during 1981.

At the end of the first quarter there are 27 DECAT instructors and 8 sets of equipment in Nebraska.

AGENCY OR ORGANIZATION	INSTRUCTORS
Nebraska Energy Office	2
Nebraska State Patrol	1*
Nebraska Safety Center at Kearney State College	2*
Educational Service Unit #3 (Millard)	1*
Lincoln Public Schools	1
Lincoln Police Department	1
Nebraska Department of Education	1*
City of Lincoln Maintenance Dept.	2
Metz Bakery (Omaha)	2
Bryan Hospital (Lincoln)	1
University of Nebraska Medical Center (Omaha)	2
Omaha Public Power District	1
Dobson Brothers Construction Company (Lincoln)	2
University of Nebraska-Lincoln Auto Pool	1
Omaha-Douglas County Health Dept.	1
Albion High School	1
Chadron State College	1
Beatrice High School	2
Lincoln Northeast High School	1
Roseland High School	1

* The Nebraska Energy Office has also provided equipment to these agencies. It will be used to train additional Nebraska drivers.

NEBRASKA ENERGY EXTENSION SERVICE

Section 81-1602(12) RSN(1980) requires the Nebraska Energy Office to provide technical assistance to private persons desiring information on energy conservation techniques and the use of renewable energy technologies.

Section 81-1602(8) RSN(1980) requires the Nebraska Energy Office to actively seek the advice of the citizens of Nebraska regarding energy policies and programs.

The Nebraska Energy Extension service provides direct, personalized information and assistance to small-scale energy consumers such as homeowners, small businesses, agriculture, commercial establishments, local governments and automobile owners.

In January, 1981, the Nebraska Energy Extension Service (EES) Advisory Board met to review the proposed 1981 Energy Extension Service Plan. The plan was then submitted to the U.S. Department of Energy and approved. The approved plan brought $228,900 in federal funds to the Nebraska Energy Office to operate Energy Extension Service projects for the 12 months beginning May 1, 1981.

The following Energy Extension Service programs are providing Nebraskans with energy conservation technical assistance.

GA$ $AVER VAN

During the first quarter of 1981 the Ga$ $aver Van provided technical assistance to several communities by testing the fuel efficiency of their vehicle fleets. In addition, workshops and demonstrations of energy efficient automobile maintenance techniques were held at community colleges and high schools across the state.

On April 1, 1981, the Ga$ $aver Van resumed energy efficiency testing of private vehicles. Since July, 1980, over 3,000 vehicles have have been tested and about half of the owners have had the recommended repairs made on their cars.

PUMPING UNIT MANAGEMENT PROGRAM (PUMP)

During the first quarter of 1981 the PUMP Program has prepared training materials and conducted industry training programs on methods of increasing the energy efficiency of irrigation equipment.

Public PUMP demonstrations will begin in late May under the direction of the University of Nebraska-Lincoln Cooperative Extension Service.

Over 2,000 farmers participated in PUMP demonstrations in 1980 and the number of requests for 1981 already exceeds that of last year.

EVALUATION PROGRAM

The Ga$ $aver Van and PUMP programs were evaluated by the Bureau of Sociological Research at the University of Nebraska-Lincoln. Preliminary results of the mail survey on the Ga$ $aver Van are overwhelmingly positive. Over 86 percent of the respondents indicated approval of the Ga$ $aver Van program. The survey also showed that of the vehicles that needed some mechanical work, almost 79 percent of the respondents said that they had their vehicle tuned up. With an average 15 percent gasoline savings per energy efficient vehicle, the state could save 363,000 gallons of gasoline in 1981 (based on 79 percent of 3,000 vehicles). These gasoline savings could rise to 910,000 gallons in 1982 with the approximately 7,500 vehicles which will be tested in 1981.

BOILER EFFICIENCY PROJECT

During the first quarter of 1981 six boiler energy efficiency workshops were held for approximately 240 state and private sector boiler operators. The University of Nebraska-Lincoln College of Engineering is under contract to conduct the workshops.

CONSERVATION RECOGNITION PROGRAM

The Residential Conservation Award Program was kicked off during the "March is Energy Conservation Month" campaign. This program rewards Nebraska homeowners for their energy conservation efforts. If their houses meet specific insulation and weatherization requirements, homeowners receive certificates and seals which can be displayed on windows or doors. Over 3,000 applications for the self-certifying program were distributed during March.

Six Nebraska businesses were awarded "E" Flags for their energy conservation efforts during the first quarter. The "E" Flag program recognizes businesses, industries and organizations for their energy conservation activities in the areas of transportation, building management or alternative energy use.

EASY ON ENERGY

"Easy on Energy," a monthly series on the Nebraska ETV Network, featured programs on energy education and public information, Gasohol and "March is Energy Conservation Month" during the first quarter of 1981. These three programs generated 60 viewer telephone calls and over 100 letters requesting technical information.

SOLAR SUBDIVISION PROGRAM

Acting through the Nebraska Solar Office, the Nebraska Energy Office has provided technical assistance and funds to four housing developers for the design and development of four solar subdivisions. Grants were awarded to the communities of Juniata, Wayne, Lincoln and Omaha and the tentative completion date for the first houses in each subdivision is August, 1981.

NEBRASKA ENERGY NEWS

The bi-monthly NEBRASKA ENERGY NEWS was distributed in January and March. The March press run--11,000 copies--was the largest in the newsletter's history. The newsletter enters its second year with the May issue.

ENERGY EDUCATION

Section 81-1602(5) RSN(1980) requires that the Nebraska Energy Office provide for public dissemination of appropriate information on energy, energy sources and energy conservation.

Curriculum

Extensive evaluation should be performed on the energy education program. Energy education projects have been operating for approximately 2-1/2 years without objective documentation of their effectiveness. Therefore, in 1981 the Nebraska Energy Office is committed to evaluating both the validity and relevancy of all educational materials it has produced and distributed.

The Nebraska Energy Office recently completed the data collection phase of a statewide evaluation of two education projects--the "Energy Conservation Activity Packets" and "Basic Teaching Units on Energy." Analysis of this survey will determine further promotion, revision or replacement of these curricula.

The Nebraska Energy Office is recognized as a national leader in the development of energy education programs. Curriculum materials have been distributed to 36 states and 3 foreign countries. Critical evaluation of these programs is essential to continued leadership in this field.

Services

The education division of the Nebraska Energy Office sponsored and/or participated in the following projects during the first quarter of 1981.

-- The Children's Museum in Omaha received federal funds to plan and construct a "hands on" exhibit of energy concepts and alternative energy sources for elementary students. Planning was completed in January, 1981, and construction began in March, 1981. Expected completion date is May, 1981.

-- In support of "March is Energy Conservation Month" and "National Energy Education Day" (March 20) campaigns, the Nebraska Energy Office sponsored 12 energy education activities

including teacher "in-service" training sessions, energy demonstrations and field trips to power generation facilities.

-- The Nebraska Energy Office sent four teachers to a special one-week workshop on solar energy education. The teachers are now ready to conduct seminars on solar energy education for other Nebraska teachers.

-- Energy education in Nebraska was featured on the January program of the "Easy on Energy" television series.

-- The Nebraska Energy Office subcontracted with Southeast Community College-Beatrice to continue work on the Russian Fireplace Demonstration Project. Students at the college constructed and monitored the efficiency of the alternative fireplace design.

-- In cooperation with the 4-H Youth Development Program at the University of Nebraska-Lincoln, the Nebraska Energy Office sponsored the development of a 4-H energy education curriculum project and accompanying television series. The curriculum has been distributed statewide and the television series was aired in April, 1981.

INSTITUTIONAL CONSERVATION PROGRAM

Section 81-1602(3) RSN(1980) requires that the Nebraska Energy Office collect and analyze data relating to present and future demands and resources for all sources of energy and that it specify the energy needs of the state.

Section 81-1602(11) RSN(1980) requires that the Nebraska Energy Office provide technical assistance to local government subdivisions.

Through the Institutional Conservation Program the Nebraska Energy Office helps building owners/operators reduce energy consumption and costs. Schools, hospitals, local government buildings and public care facilities are eligible to receive energy audits and grants under this federally funded program.

During the first quarter of 1981, 320 buildings received energy audits. Grant monitoring visits were made to 15 institutions which had received federal grants to help finance engineering energy studies and implementation of energy savings projects.

When conducting an energy audit, a Nebraska Energy Office auditor examines the construction of the building, window condition, insulation, infiltration, lighting and mechanical systems.

After inspecting the building, an energy audit report is prepared and sent to the administrator of the facility. The report makes energy-saving recommendations in two categories: (1) operation and maintenance procedures and (2) high initial investments.

Under the program, schools and hospitals may apply for federal financial assistance on a 50/50 matching grant basis to help finance engineering energy studies and implementation of energy savings projects. Preparation for the third grant cycle began in January, 1981. Information and grant applications were distributed to 2,600 eligible institutions and workshops were scheduled across the state to help administrators complete their applications.

To improve coordination with local government units the Nebraska Energy Office contracted with six councils of government to conduct on-site inspections in local government buildings. The Nebraska Energy Office provided auditor training to the designated council of government employees who then performed 80 audits during the first quarter of 1981.

WEATHERIZATION PROGRAM

Section 81-1602(6) RSN(1980) requires the Nebraska Energy Office to accept, expend or dispense funds, public or private, made available to it for research studies, demonstration projects or other activities which are related to either energy conservation or development.

The U. S. Department of Energy makes grants to the states for weatherizing the homes of persons whose incomes do not exceed 125 percent of the federal poverty level. The Nebraska Energy Office subgrants such funds to ten community action programs and the Nebraska Intertribal Development Corporation for delivery of weatherization services based on past performance with the program. Additional funds may be made available to the agencies that demonstrate productivity and need.

During the first three months of 1981 a total of 753 houses were weatherized. This represents a production increase of 5 percent over the same period of 1980 (See Table 1).

Weatherization assistance includes caulking and weatherstripping around doors and windows, insulating attics and sidewalls, covering windows, and other measures which reduce heat loss through infiltration and transmission.

The delivery of weatherization services varies from agency to agency. Some use professional contractors, however, most use Comprehensive Training and Employment Act (CETA) workers whenever possible. Material costs for weatherization assistance may not exceed $700 per home and the total cost for both labor and material may not exceed an average of $1,200 per home.

Quality control is provided by the contracting agencies and the Nebraska Energy Office. Each agency inspects its weatherized homes to ensure that they meet material and labor standards and the Nebraska Energy Office then inspects some homes on a random basis. In addition, the Nebraska Energy Office makes a minimum of two monitoring visits per year.

TABLE 1

NEBRASKA WEATHERIZATION PROGRAM ACTIVITIES

SUBGRANTEE	FIRST QUARTER COMPLETIONS	FIRST QUARTER PARTIAL COMPLETIONS	FUNDS EXPENDED FIRST QUARTER	FUNDS RECEIVED 1/1/81 - 3/31/81	
Blue Valley CAA	160	37	$149,300	$ 27,000	(1980)
				51,846	(1981)
Central Nebraska CAA	24	46	55,670	31,755	(1980)
				113,904	(1981)
Goldenrod Hills CAA	119	230	100,883	42,620	(1980)
				154,778	(1981)
Greater Omaha CA	98	42	81,750	72,024	(1980)
				0	(1981)
Inter Tribal Dev. Corp	0	63	8,916	0	(1980)
				0	(1981)
Lincoln Action	125	11	108,632	31,342	(1980)
				111,518	(1981)
Mid-Nebraska/East	68	15	41,532	12,631	(1980)
				52,281	(1981)
Mid-Nebraska/West	41	6	27,302	2,152	(1980)
				45,976	(1981)
Nebraska Panhandle CAA	26	91	36,278	19,409	(1980)
				0	(1981)
Northwest Nebraska CAA	66	13	59,809	25,067	(1980)
				61,837	(1981)
Southeast Nebraska CAA	26	157	42,065	19,133	(1980)
				72,171	(1981)
TOTALS	753	711	$712,137	$283,133	(1980)
				664,311	(1981)

WEATHERIZATION STUDY

In late 1980 the Nebraska Energy Office conducted a study to evaluate the effectiveness of the federal low-income weatherization program.

The nine community action agencies which have contracts to perform weatherization services provided the data on number of homes weatherized, costs of labor and materials, and energy costs per home from 1978 through 1980. Data from 332 completed questionnaires is contained in the report.

The residents of homes weatherized in 1979 achieved an average 12.1 percent decrease in energy consumption during the 1979-80 winter heating season. The study also indicates that smaller, older homes were weatherized. This conclusion is based on 1) the weighted average home heating area--923 square feet--and 2) the weighted average age of the weatherized homes--58 years.

The average weatherization cost of $483 divided by the average cost savings on fuel of $55.60 gives a payback period of 8.5 years. As the price of natural gas increases the payback period decreases.

The study shows that many homes reported greater than a 12 percent reduction in energy consumption. However, the average was lowered by the 51 homes which reported greater energy consumption after weatherization. The reasons for greater energy use after home weatherization improvements are undocumented at this time. The Nebraska Energy Office will research the problem in a later study.

ENERGY EMERGENCY PLANNING

Section 84-166(4) RSN(1980) states that if the Governor declares a vital resource crisis he or she may delegate any administrative authority vested in him or her to the State Energy Office or any other state agency or its respective director.

There were no energy emergencies during the first three months of 1981. However, several events occurred at the federal level which affect the state's energy emergency planning activities. These events were: 1) President Reagan's executive order decontrolling petroleum (see next section of this report); 2) rescinding of the federal gasoline rationing program; and 3) rescinding of federal funds for state energy emergency planning activities.

These actions resulted in the elimination of all federal support for energy emergency planning at the state level. The Nebraska Energy Office, though, will continue to revise the Energy Emergency Preparedness Plan on a semi-annual basis so that the state is prepared to act quickly and effectively in the event of an energy emergency. The semi-annual up-dates will be financed with state funds and federal funds provided through the Emergency Energy Conservation Act until these federal funds are exhausted.

The Energy Emergency Preparedness Plan for the summer of 1981 will be completed during the second quarter.

At this time only two states--Nebraska and Missouri--have submitted energy emergency plans for gasoline to the U.S. Department of Energy. Nebraska was the first state in the nation to comply with the requirements of the Emergency Energy Conservation Act of 1979 (P.L. 96-102).

PETROLEUM PRODUCT SET-ASIDE FOR ALLEVIATING HARDSHIP AND EMERGENCY SITUATIONS

Nebraska's monthly set-aside program ended on January 28, 1981, when President Reagan removed all remaining controls on

petroleum products, including the provision for monthly set-asides of propane and gasoline. The set-aside program for middle distillates continued through March 31, 1981.

Requests for help from the set-aside were received until March 31, 1981. Releases of fuel in January amounted to 5.5 percent of the gasoline set aside and 21.9 percent of the middle distillates. In February, 33.8 percent of the middle distillate set-aside was released and in March, 11 percent was released.

NEBRASKA BUILDING ENERGY CONSERVATION STANDARD

Sections 81-1608 through 81-1626 RSN(1980) require that the Nebraska Energy Office implement and enforce an energy efficiency standard for new building construction and certain retrofits and additions.

L.B. 954, passed in April, 1980, by the Nebraska State Legislature, designates the American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. Standard (ASHRAE 90-75) as the Nebraska Building Energy Conservation Standard. The Nebraska Building Energy Conservation Standards Board approved the rules and regulations after a public hearing. The residential standard went into effect on April 1, 1981.

All new residential buildings begun after March 31, 1981, and all non-residential buildings, renovations and additions begun after December 31, 1981, must conform to the standard except where an approved local building code is in effect.

Communities are encouraged to adopt and enforce building energy codes which meet or exceed the Nebraska Building Energy Conservation Standard. If a community does not adopt such a building energy code the Nebraska Energy Office will enforce the state standard in that community.

As of May 11, 1981, the following communities have adopted an approved local building energy code: Albion, Belden, Blair, Cedar Rapids, Columbus, Dakota City, Decatur, Elkhorn, Fremont, Friend, Lexington, Lincoln, Nebraska City, Ralston, Randolph, South Sioux City, Tekamah, Wayne, York, Dodge County and Thurston County.

Public Information and Outreach Activities

All city and county clerks in the state were sent a letter explaining the new standard, a copy of the rules and regulations, and a model ordinance which could be used as the basis for a local standard. Every electric utility in the state received a copy of the law and the rules and regulations. All Nebraska lumberyard managers were sent a copy

of the law and a "Notice to Contractors" to post in their stores.

The Nebraska Energy Office also contracted with six councils of government to inform government units of the standard and encourage them to adopt an equivalent local building energy standard. Nebraska Energy Office staff members traveled across the state to explain the standard to members of home builders organizations.

Manuals

Two manuals explaining the standard have been produced. A Manual Of Acceptable Practices was prepared for contractors and people building their own houses. This manual sets out minimum prescriptive requirements for insulation R-values in frame walls, ceilings, slab on grade walls and floors over unheated spaces. Minimum requirements for heating and cooling systems are also described. This manual is only applicable to the construction of one and two family dwellings using common construction techniques.

The Residential Procedures Manual describes two detailed methods of ensuring compliance with the law. One is a step-by-step application of the standard to individual building components. The other presents guidelines for calculating the amount of energy used in the building as a whole. This manual is for designers, architects, engineers and contractors because it allows more design flexibility.

SALES TAX REFUND

Section 66-1016 RSN(1980) requires that the Nebraska Energy Office process requests for approval of alternative energy facilities, and approve such facilities if such facility is designed primarily for the utilization of energy from alternative energy sources, and is suitable, reasonably adequate, and will reduce the consumption of energy from other than alternative energy sources.

Nebraskans who purchase(d) and install(ed) alternative energy systems on or after January 1, 1980, and before January 1, 1984, are eligible to receive a sales tax refund. Applicants must receive facility approval from the Nebraska Energy Office before applying for a sales tax refund from the Nebraska Department of Revenue. Hundreds of facility approval applications were mailed to Nebraska marketers of alternative energy systems and the Nebraska Energy Office has already received many requests for applications from private individuals.

After receiving a completed application the Nebraska Energy Office sends it to the State Solar Office for review. An approved application is then sent to the Nebraska Department of Revenue where the refund check is issued.

NEBRASKA SOLAR OFFICE ACTIVITIES

The Nebraska Solar Office was established in 1978 as a joint office of the Nebraska Energy Office and the University of Nebraska Energy Research and Development Center. The office is responsible for the encouragement, guidance, promotion and coordination of all solar energy programs in Nebraska.

Solar Subdivision Program

In January 1981, the Nebraska Solar Office announced the winners of over $21,000 in grants for the development of design, legal and marketing plans for solar subdivisions. The award recipients are: Park Place, LTD, Lincoln; Vakoc Construction, Wayne; N. P. Dodge Development, Omaha; and T. D. Johnson, Juniata.

Each grant recipient will provide "solar access" to the lots in their subdivision through lot orientation and covenants and easements and will build at least one solar home designed to save 80 percent of the estimated annual heating requirement. These homes will be completed by August 31, 1981, and will be open for public tours.

Solar Consumer Survey

The Nebraska Solar Office is working with the University of Nebraska-Lincoln College of Home Economics to design and conduct a consumer survey for solar residential heating. The survey will focus on factors in consumer decision-making and perceived risk of new products. This information is crucial to the development of solar marketing and consumer education efforts.

Results of the study will be available in late summer 1981.

Grand Island Tornado Assistance

Following Grand Island's June 1980 tornado, the Nebraska Solar Office began providing reconstruction consultation to homeowners and businesses in July and August 1980.

In March 1981, the Nebraska Solar Office conducted a passive solar residential design and construction workshop. More than 90 local builders and construction professionals attended the two-day workshop. In addition, two passive solar house plans were developed specifically for the Grand Island climate

and market and were made available to the workshop participants.

Outreach Activities

During the first quarter of 1981 the Nebraska Solar Office presented programs at the Nebraska Home Builders Association State Convention, the Fremont Contractors Association and the Lincoln Evening Optimists. The office also staffed a booth at the Lincoln Home Show. The office recorded over 4,500 responses to mail, telephone and office visits by the public for the three-month period.

The NEBRASKA SOLAR YELLOW PAGES were updated and reprinted. This 100-page book contains a statewide listing of solar-related manufacturers, distributors and design professionals; solar buildings, education courses, legislation and a speakers bureau.

Upcoming Activities

The Nebraska Solar Office will conduct a passive solar workshop on commercial buildings for architects and engineers in June 1981. The workshop, the first of its kind in the United States, will be a cooperative effort with the National Solar Energy Research Institute in Golden, Colorado.

WIND ASSESSMENT

Section 81-1602(2) RSN(1980) requires the Nebraska Energy Office to undertake a continuing assessment of the trends in the availability, consumption, and development of all forms of energy.

The Nebraska Energy Office, Western Area Power Administration and the Nebraska Rural Electric Association are cooperating in a project to assess Nebraska's wind energy potential.

The Western Area Power Administration will supply 20 anemometers to measure and record wind velocity. Rural public power districts that are members of the Nebraska Rural Electric Association will install, maintain and monitor the meters. The Nebraska Energy Office will recommend sites for the equipment and assist in analyzing the data.

PASSIVE SOLAR

Section 81-1602(5) RSN(1980) requires the Nebraska Energy Office to provide for public dissemination of appropriate information on energy, energy sources, and energy conservation.

In October, 1979, a contract was signed with Solar Energy Associates of Nebraska to document the effectiveness of various design criteria in passive solar construction. The end product of this study, "A Nebraska Passive Solar Primer," will be finished in the summer of 1981. The handbook will contain accurate data and design techniques for utilizing solar energy in Nebraska. It will help builders and contractors use passive solar energy techniques on a realistic and cost-effective basis.

The first 500 copies of the handbook will be distributed to libraries and community colleges. Copies will also be available to the public at nominal cost.

RESEARCH ACTIVITIES

Section 81-1602(1) RSN(1980) requires that the Nebraska Energy serve as or assist in developing and coordinating a central repository within state government for the collection of data on energy.

Section 18-1602(2) RSN(1980) requires that the Nebraska Energy Office undertake a continuing assessment of the trends in the availability, consumption, and development of all forms of energy.

Section 81-1602(3) RSN(1980) requires that the Nebraska Energy Office collect and analyze data relating to present and future demands and resources for all sources of energy and specify energy needs for the state.

U. S. ENERGY SUPPLIES

In 1981 it is anticipated that energy supplies will be more than sufficient to meet the nation's and Nebraska's energy demands. This is due to a large surplus inventory of crude oil and its derivatives at the national level, adequate natural gas deliveries to Nebraska and excellent coal inventories and deliveries from out-of-state sources. The current United Mine Workers coal strike does not include the western coal mines from which Nebraska receives its coal.

National Supply

The current petroleum status at the national level is shown in the following graphs obtained from U.S. Department of Energy publications. These graphs indicate national levels of petroleum, motor gasoline and distillate fuel oil stocks (Tables 2, 3, 4). Nebraska imports most of its refined petroleum products from out of state. Therefore, national stocks have a direct influence on Nebraska's petroleum supply.

As of April 24, 1981 the U.S. crude oil stocks were 5 percent above a year ago and 15 percent above two years ago. These large stocks at the national and world levels will moderate prices in much the same way they did in the spring and summer of 1980 (Tables 5, 6). Midwest stocks of motor gasoline stand at 12 percent above the level of a year ago. At that time, midwest distillate stocks were 55 percent higher and residual fuel oil stocks were 23 percent lower. The lower fuel oil stocks are due to above normal heating oil consumption on the east coast last winter. All current stocks are in the normal or above normal range even though some may be lower than those of last year.

Coal Strike

While the United Mine Workers coal strike will not have a direct effect on Nebraska it could have an indirect impact if the eastern states have electricity supply problems due to a lack of coal. In the event of a prolonged strike, east coast coal stocks would be depleted, base load electric coal fired units could not operate, and peaking units might be unable to meet the extra demand. Nebraska would then be obligated to supply the needed electricity through the electric grid system. This would require Nebraska's coal fired units to

operate continuously at peak capacity. If there were an electric demand peak, the Nebraska oil and natural gas fired peaking units would start production. Since the coal and nuclear units would be operating at capacity, the peaking units would be required to produce more electricity than normal. As a result, Nebraska's oil and coal consumption would show a marked increase.

TABLE 2

Stocks of Crude Oil and Petroleum Products[1]
(Millions of Barrels)

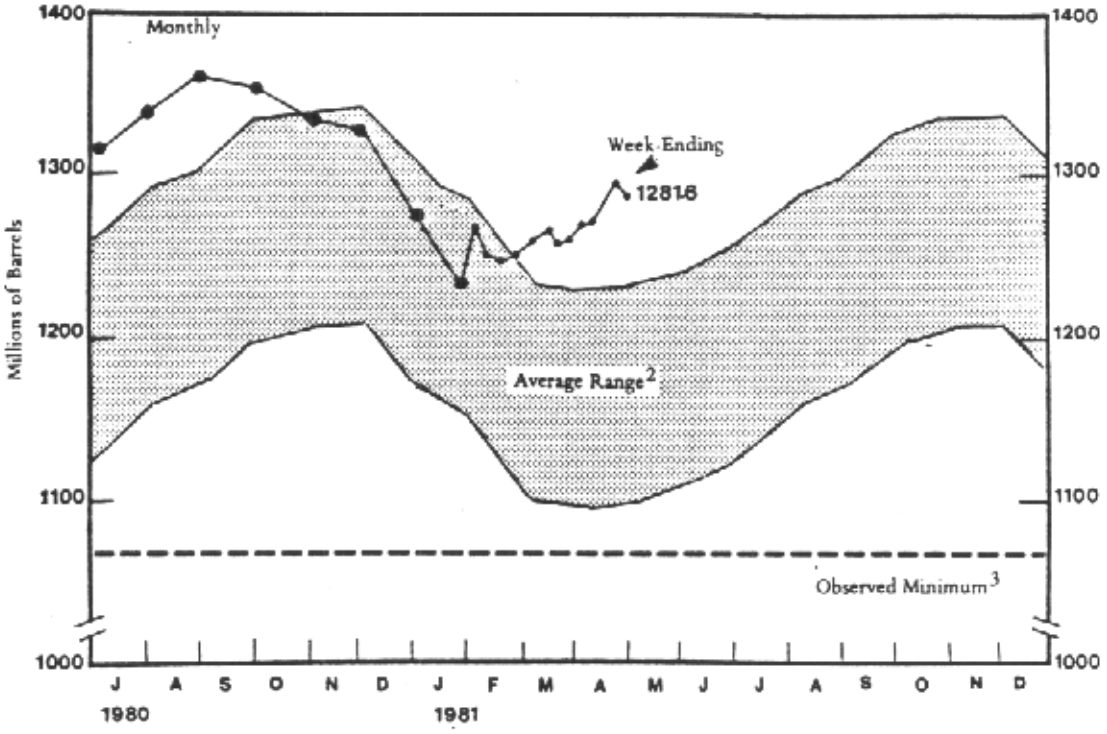
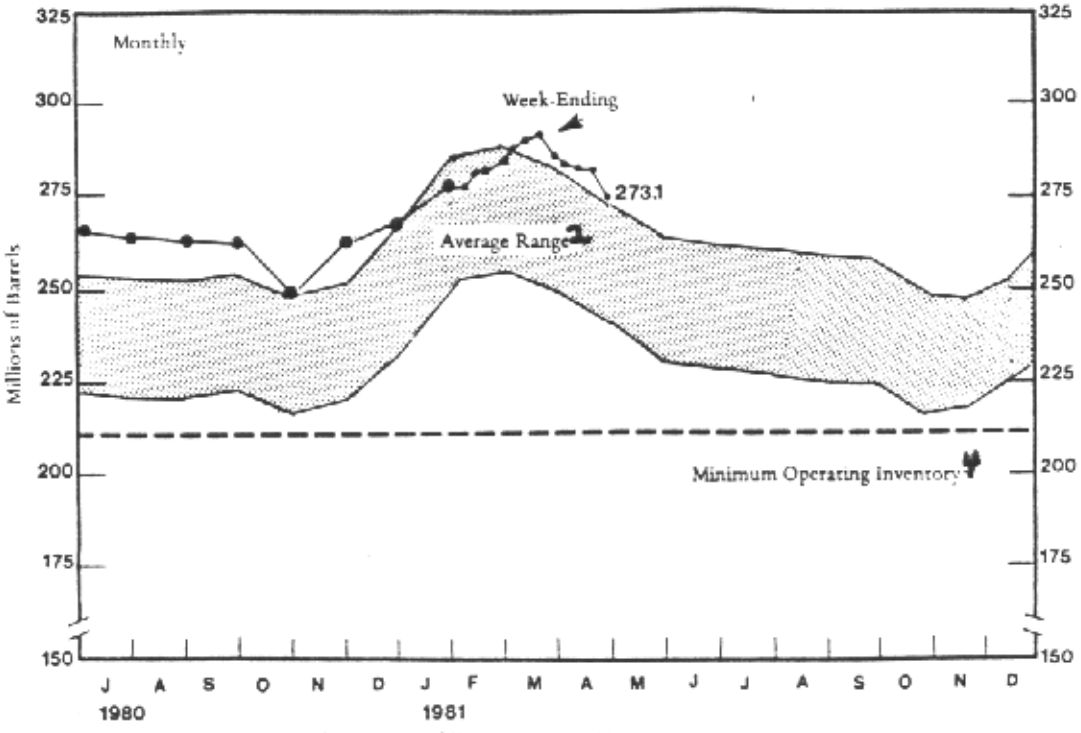


TABLE 3

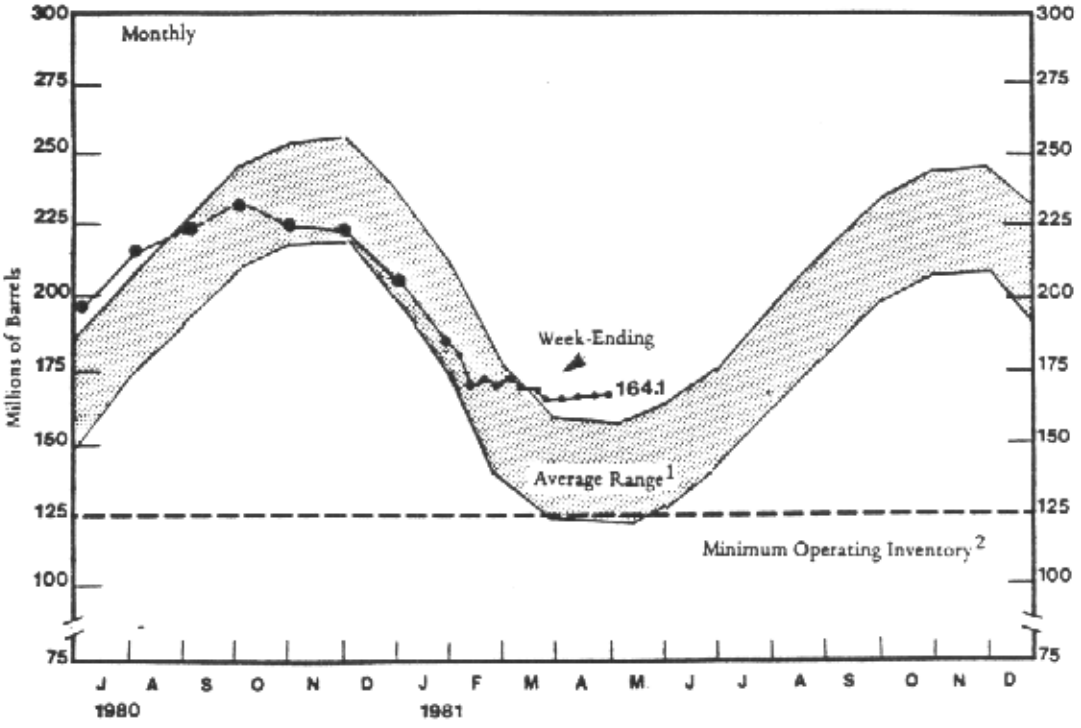
Stocks of Motor Gasoline, U.S. Total
(Millions of Barrels)



1 Excludes stocks held in Strategic Petroleum Reserve and includes crude oil in transit to refineries.
2 Average level, width of average range, and observed minimum are based on three years of monthly data July 1977–June 1980. The seasonal pattern is based on seven years of monthly data January 1973–December 1979.
3 The observed minimum for total stocks (1069.9) occurred in March 1979.
4 The National Petroleum Council defines the Minimum Operating Inventory as the minimum level required for routine operation. By their definition, runouts and shortages will occur if inventory levels fall below that level.
Source: • Ranges and Seasonal Patterns: 1973–1978, EIA, "Petroleum Statement, Annual (Final Summary)."
• Monthly Data: January 1980–November 1980 EIA, "Petroleum Statement, Monthly;" December 1980–January 1981: EIA "Monthly Petroleum Statistics Report."
• January 2, 1981–Current week: Estimates based on EIA data.

TABLE 4

Stocks of Distillate Fuel Oil, U.S. Total
(Millions of Barrels)



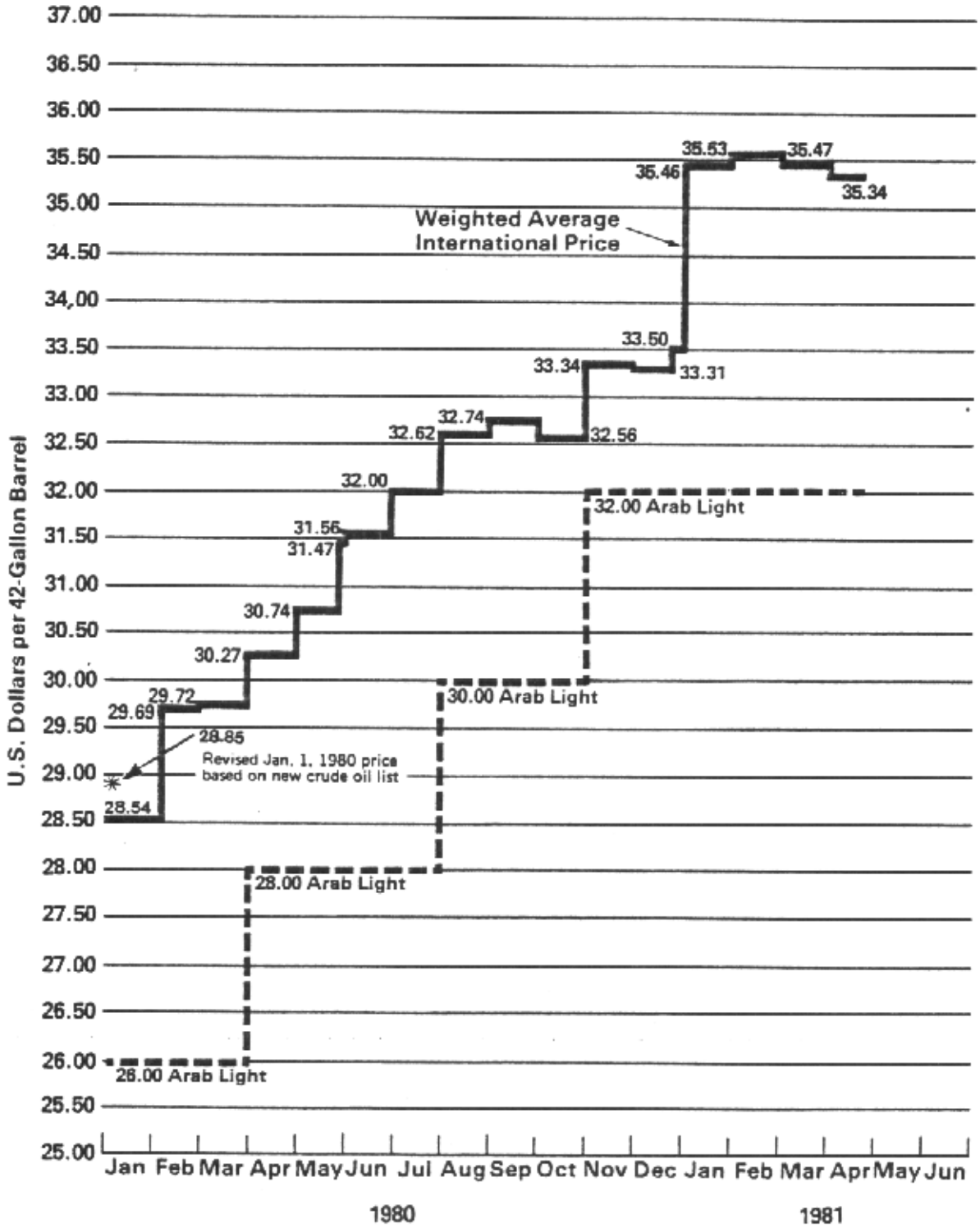
1 Average level and width of average range are based on three years of monthly data: July 1977–June 1980. The seasonal pattern is based on seven years of monthly data: January 1973–December 1979.

2 The National Petroleum Council defines the Minimum Operating Inventory as the minimum level required for routine operation. By their definition, runouts and shortages would occur if inventory levels fall below that level.

Source:
- Ranges and Seasonal Patterns: 1973–1978, EIA, "Petroleum Statement, Annual (Final Summary)."
- 1979 Totals: EIA, "Petroleum Statement, Annual (Final Summary)."
- 1979 Regional Data: EIA, "Petroleum Statement, Monthly."
- Monthly Data: January 1980–November 1980, EIA, "Petroleum Statement, Monthly;" December 1980–January 1981 EIA "Monthly Petroleum Statistics Report."

TABLE 5

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

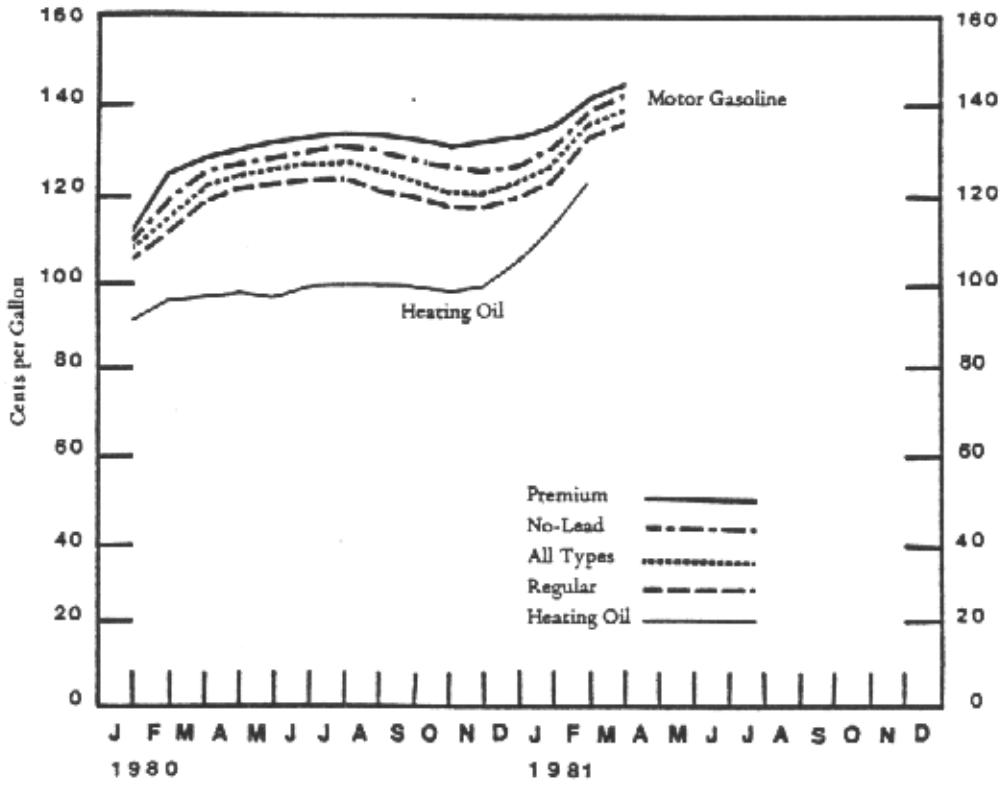


[1] Internationally traded oil only. Average price (FOB) weighted by estimated export volume.

NOTE: The world crude oil price, based on the new crude list (see Highlights), is shown in the above graph beginning January 1, 1981. The January 1, 1980 price has also been revised for purposes of comparison. All other 1980 prices represent the old crude list.

TABLE 6

Average Retail Selling Price
Motor Gasoline and Residential Heating Oil
(Cents per Gallon)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1979												
Motor Gasoline												
Premium	73.7	75.0	77.4	82.4	86.7	92.0	96.5	100.4	103.6	104.6	105.6	108.0
Regular	66.8	68.1	70.6	75.3	79.7	85.6	90.8	94.3	97.3	98.2	99.4	101.8
No-Lead	71.6	73.0	75.5	80.2	84.4	90.1	94.9	98.8	102.0	102.8	104.1	106.5
All types	69.5	70.7	73.3	78.0	82.3	88.0	93.0	96.7	99.8	100.6	101.9	104.2
Residential Heating Oil	53.7	56.3	58.7	61.1	64.2	69.1	73.9	78.4	81.0	82.3	83.7	85.8
1980												
Motor Gasoline												
Premium	114.9	123.2	127.7	129.2	129.5	130.0	130.7	131.0	130.4	129.9	130.1	131.0
Regular	108.6	115.9	120.2	121.2	121.5	121.7	121.6	121.0	119.7	118.8	118.8	119.7
No-Lead	113.1	120.7	125.2	126.4	126.6	126.9	127.1	126.7	125.7	125.0	125.0	125.8
All types	111.0	118.6	123.0	124.2	124.4	124.6	124.7	124.3	123.1	122.3	122.2	123.1
Residential Heating Oil	90.8	95.3	97.1	97.4	97.2	97.9	97.9	97.9	98.1	98.7	101.0	106.5
1981												
Motor Gasoline												
Premium	133.8	141.0	144.9									
Regular	123.8	132.1	135.2									
No-Lead	129.8	138.2	141.7									
All types	126.9	135.3	138.8									
Residential Heating Oil	114.4	P123.3										

R=Revised.
P=Preliminary.
NOTE: Motor Gasoline data include prices from self-serve stations.
Source: Motor Gasoline—Bureau of Labor Statistics. See Definitions for description of survey.
Residential Heating Oil—FEA Form P112-M-1/EIA-9, "No. 2 Heating Oil Supply/Price Monitoring Report."

NEBRASKA ENERGY CONSUMPTION

Table 7 presents revised 1980 Nebraska energy consumption figures by fuel type and major consuming sector. The totals of each fuel type are derived from existing reporting forms and are relatively accurate. Information on the agricultural, industrial, commercial and residential sectors is estimated.

Comparing the revised table with the preliminary estimate in the 1980 annual report there are only minor changes (0.6 percent of the total or less). Reports on natural gas and coal consumption are incomplete, so further revision is possible. Revised 1979 Nebraska energy consumption is presented in Table 8.

A comparison of 1979 and 1980 shows major shifts in the state's energy use. While total energy consumption decreased 5.2 percent (mainly because of the recession), use of petroleum products decreased 9.3 percent. Petroleum products comprised 37.8 percent of total energy used in 1979 but only 36.2 percent in 1980. In 1980 nuclear energy was used 33.3 percent less because of shutdowns to install new safety equipment. Coal was used 43.8 percent more than in 1979, reflecting completion of two new coal-fired electric generation plants at Nebraska City and Sutherland.

TABLE 7

1980 NEBRASKA ENERGY CONSUMPTION BY FUEL TYPE AND CONSUMING SECTOR

IN TRILLIONS (10^{12}) Btu

Fuel Type	Conversion Factor	Electric Utilities	Residential	Commercial	Industry	Agriculture	Transportation	Total	%
Coal	22.56 10^6 Btu/t	110.0	--	0.2	4.2	--	--	114.4	21.2
Natural Gas	.994 10^6 Btu/mcf	11.6	49.5	33.1	49.0	11.7	--	154.9	28.7
Motor Gasoline	0.12495 10^6 Btu/gal	--	--	0.4	1.0	3.0	96.7	101.1	18.7
Aviation Fuel	0.1334 10^6 Btu/gal	--	--	--	--	--	5.5	5.5	1.0
Liquified Petroleum Gas	0.0955 10^6 Btu/gal	--	5.9	1.1	3.0	5.2	--	15.2	2.8
Other Petroleum	0.1387 10^6 Btu/gal	1.4	9.5	7.9	6.2	28.7	20.1	73.8	13.7
Nuclear		61.6	--	--	--	--	--	61.6	11.4
Hydro		13.9	--	--	--	--	--	13.9	2.6
Electricity	3413 Btu/kWh	(46.8 sales)	19.0	12.1	8.1	7.6	--	NA	
Total		151.7	83.9	54.8	71.5	56.2	122.3	540.4	100
%		28.1	15.5	10.1	13.2	10.4	22.6	100	

Notes: Sum of components may not equal total due to independent rounding.
In order to get physical units, divide the Btu by the corresponding conversion factor.
Data is preliminary; further revision is possible. Nebraska Energy Office. April, 1981

TABLE 8

1979 NEBRASKA ENERGY CONSUMPTION BY FUEL TYPE AND CONSUMING SECTOR (REVISED)

IN TRILLIONS (10^{12}) Btu

Fuel Type	Conversion Factor	Electric Utilities	Residential	Commercial	Industry	Agriculture	Transportation	Total	%
Coal	22.56 10^6 Btu/t	76.5	--	0.1	12.5	--	--	89.1	15.6
Natural Gas	.994 10^6 Btu/mcf	13.9	53.2	31.6	49.8	11.6	--	160.1	28.1
Motor Gasoline	0.12495 10^6 Btu/gal	--	--	0.4	1.0	3.0	108.5	112.9	19.8
Aviation Fuel	0.1334 10^6 Btu/gal	--	--	--	--	--	5.7	5.7	1.0
Liquified Petroleum Gas	0.0955 10^6 Btu/gal	--	8.3	1.3	3.7	6.1	0.3	19.7	3.5
Other Petroleum	0.1387 10^6 Btu/gal	4.6	10.3	8.4	6.7	27.6	19.8	77.4	13.6
Nuclear		92.3	--	--	--	--	--	92.3	16.2
Hydro		13.0	--	--	--	--	--	13.0	2.3
Electricity	3413 Btu/kWh	(45.6-sales)	18.0	13.7	7.4	6.5	--	NA	
Total		154.7	89.8	55.5	81.1	54.8	134.3	570.2	100
%		27.1	15.7	9.7	14.2	9.6	23.6	100	

Notes: Sum of components may not equal total due to independent rounding.
In order to get physical units, divide the Btu by the corresponding conversion factor.

Nebraska Energy Office. May, 1981

ELECTRICITY GENERATION AND SALES

Electricity generated by the five major Nebraska electric utilities and the fuels used for electricity generation by these utilities are presented in Table 9. The Nebraska Public Power District, Omaha Public Power District, Lincoln Electric System, Grand Island and Fremont produced 88.7 percent of all the electricity produced in the state during 1980.

A drastic shift in the fuels used for electricity generation occurred last year. Coal's share as a primary energy source for electricity generation jumped from 38.2 percent in 1979 to 55.4 percent in 1980. At the same time the share of petroleum products shrank from 2.3 percent to 0.7 percent and the natural gas share shrank from 6.9 percent to 5.8 percent. The share of nuclear energy in electricity production decreased abruptly from 46.3 percent to 31 percent because of modifications and repairs at nuclear power stations.

Electricity sales to ultimate consumers by three major Nebraska electric utilities are presented in Table 10. The Omaha Public Power District, Nebraska Public Power District, and Lincoln Electric System produce 85.7 percent of the electricity used in the state. This table also shows the effects of seasonal and weather changes on electricity consumption. The monthly maximum sale exceeded the minimum sale by 48 percent. It is a seasonal peak, with day-to-day and hour-of-the-day fluctuations. This peak and the fluctuations are primarily created by residential customers and to a lesser degree by commercial customers.

Electricity sales decreased substantially in January and February, 1981. Mild weather, rate increases and conservation practices may explain this reduction. During this period 2,493 heating degree days were recorded compared with 2,883 heating degree days the same time a year ago. This resulted in a 19.9 percent decrease in electricity sales for the two-month period.

TABLE 9

PRIMARY FUELS USED FOR ELECTRICITY GENERATION

BY FIVE MAJOR NEBRASKA ELECTRIC UTILITIES
(OPPD, NPPD, LES, GRAND ISLAND, FREMONT)

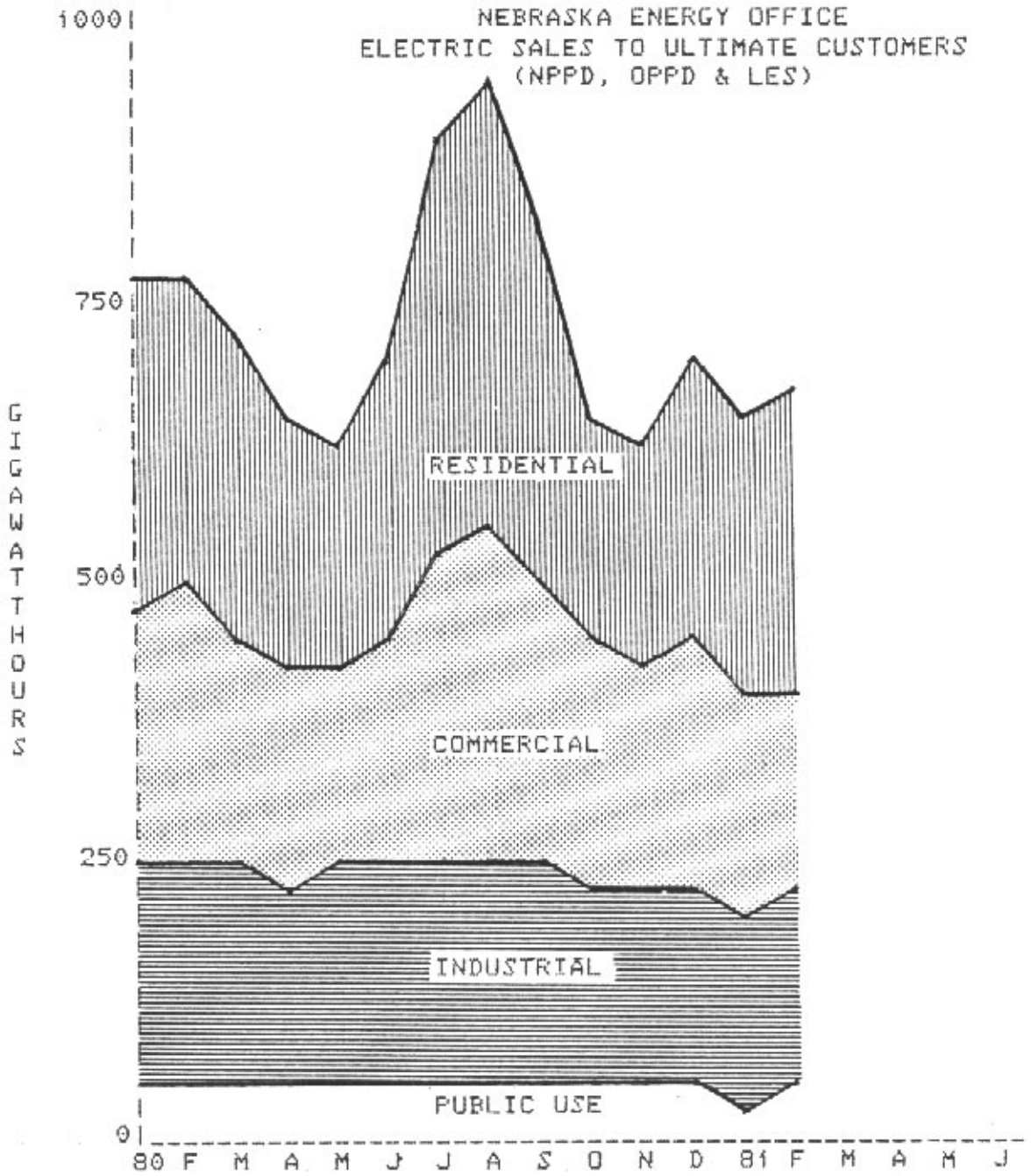
YEAR	MON	NET GENERATION *MWH	BITUM. COAL SH. TONS	HEAVY OIL BARRELS	LIGHT OIL BARRELS	NATURAL GAS MCF	PROPANE GALLONS
80	JAN	1,426,944	404,910	30,602	5,146	244,773	300
80	FEB	1,351,826	469,262	15,784	3,902	292,572	
80	MAR	1,042,353	573,557	1,506	4,767	365,423	1,445
80	APR	853,689	469,414		11,874	217,393	
80	MAY	761,962	416,726		3,464	256,990	
80	JUN	1,084,663	354,570		6,072	298,373	
80	JUL	1,843,024	973,912	15,189	3,902	605,043	
80	AUG	1,485,299	426,001	1,171	2,136	520,763	
80	SEP	1,112,936	208,452	496	2,388	392,707	
80	OCT	1,018,548	148,892	474	471	252,266	400
80	NOV	1,048,071	233,251	8	3,475	191,190	
80	DEC	1,433,941	376,146	1,059	3,151	207,157	
	TOTAL	14,463,256	5,055,093	66,289	50,748	3,844,650	2,145
81	JAN	1,490,959	441,560	202	3,439	186,265	
81	FEB	1,340,074	351,921	4,221	6,836	136,135	
81	MAR						
	TOTAL	2,831,033	793,481	4,423	10,275	322,400	

*1,000 kilowatthours = 1 Megawatthour = 1 Mwh

SOURCE: FPC 12 E2 Reporting forms

NEBRASKA ENERGY OFFICE April, 1981

TABLE 10



1,000,000 KILOWATTHOURS = 1 GIGAWATTHOUR

SOURCE: EDISON ELECTRIC INSTITUTE
MONTHLY SOURCE AND DISPOSITION

PER CAPITA ENERGY USE IN NEBRASKA

Nebraska's per capita energy consumption for the last seven years is presented in Table 11. Total energy consumption in the state, shown in column 2, represents a growth of between one and a half to three percent per year. The only exception is 1980. The sharp decrease in energy consumption in 1980 can be attributed to the recession, a sharp increase in energy (especially gasoline) prices, and conservation efforts.

Nebraska's population is presented in column 3. The 1980 figure is based on 1980 U.S. Census data. The population figures for the other six years are estimates from different sources.

Per capita total energy consumption is presented in column 4 in million Btu's and in column 5 in barrels of oil equivalent (42 U.S. gallons). The rate increase of per capita consumption is lower than the rate of total energy growth.

TABLE 11

PER CAPITA ENERGY USE IN NEBRASKA

Year	Total Energy Used (trillion Btu)		Population (millions)		Per Capita Energy Use		
					million Btu		barrel of oil equiv.
1974	516.3	:	1.541	=	335	or	59.8
1975	523.3	:	1.544	=	339	or	60.5
1976	531.3	:	1.553	=	342	or	61.1
1977	547.9	:	1.561	=	351	or	62.7
1978	553.2	:	1.565	=	353	or	63.0
1979	570.2	:	1.568	=	364	or	65.0
1980	540.4	:	1.570	=	344	or	61.4

Nebraska Energy Office, May, 1981

PER CAPITA ENERGY USE BY FUEL TYPE

Table 12 presents per capita use of different types of fuel in physical units. Though most Nebraskans didn't touch the coal itself, electric generating and industrial plants used 3.2 short tons per person in 1980. During the last six years per capita coal use has almost tripled, showing a resolute switch to coal from other types of fossil fuel.

Per capita consumption of natural gas (see col. 3) is decreasing because industrial users are switching from natural gas and oil to coal and because of conservation efforts.

Per capita gasoline consumption (col. 4) has decreased the last two years, reflecting price induced conservation efforts. A similar reduction can be noted in regard to other petroleum products (home heating oil, diesel fuel, kerosene and other middle distillates) in column 7.

TABLE 12

PER CAPITA ENERGY USE BY FUEL TYPE

Year	Coal (short ton)	Natural gas (mcf)	Gasoline (gallons)	Aviation fuel (gal)	LP Gas (gallon)	Other Petroleum Products (gal)
1974	1.2	128.2			156	
1975	1.1	122.0			156	
1976	1.4	108.2	593	24	177	315
1977	1.4	112.7	599	27	160	342
1978	2.2	97.7	608	29	147	375
1979	2.5	102.1	576	27	132	356
1980	3.2	99.3	515	26	101	339

Nebraska Energy Office, May, 1981

PER CAPITA ELECTRICITY PRODUCTION AND SALES TO ULTIMATE CONSUMERS

Table 13 shows a general trend of growth for both electricity sales and production. The difference between production and sales is due to electricity which was lost in transmission lines or sold out of state.

The decrease in production in 1980 was the result of (1) a decline in out-of-state sales and (2) decreased production at the state's two nuclear plants which were shut down for three months for maintenance and safety modifications.

TABLE 13

PER CAPITA ELECTRICITY PRODUCTION AND SALES TO ULTIMATE CONSUMERS

YEAR	PRODUCTION (KWH)	SALES (KWH)
1974	7,984	
1975	8,610	
1976	8,558	
1977	9,534	7,946
1978	9,713	8,524
1979	11,014	8,518
1980	10,391	8,731

Nebraska Energy Office. May, 1981

NEBRASKA OIL PRODUCTION

Table 14 presents data on oil production in Nebraska from reports of the Oil and Gas Conservation Commission. The energy from oil and gas produced in Nebraska in 1980 comprises less than 7 percent of the energy consumed in the state. Though oil production increased 2.8% in 1980 compared with 1979, total energy production declined one trillion Btu because of a sharp decrease in natural gas liquids production. The number of oil producing wells increased from 1,551 in 1979 to 1,693 in 1980. Recent decontrol may encourage a substantial increase in oil production in Nebraska.

TABLE 14

Month	Oil Production in Barrels			Drilling Permits					
				Exploratory			Development		
	1979	1980	1981	1979	1980	1981	1979	1980	1981
January	483,206	502,703	554,180	35	45	27	22	21	27
February	451,691	480,512	503,868	10	21	22	18	27	29
March	515,334	516,836		20	20	16	22	25	22
April	501,530	486,000		25	19		27	30	
May	525,112	540,000		20	27		14	28	
June	507,398	509,397		18	17		20	32	
July	518,302	504,840		36	14		17	33	
August	543,823	547,833		20	13		20	16	
September	508,758	534,617		24	34		16	22	
October	536,185	539,889		38	41		18	32	
November	458,615	502,264		37	34		26	30	
December	501,008	529,079		30	24		33	27	
TOTALS	6,050,962	6,193,970	1,058,048	313	309	65	253	323	78
*Annual Summary	6,068,019	6,239,652		320	309		255	311	

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

WEATHER CONDITIONS

According to the National Oceanic and Atmospheric Administration, Nebraska's 1980-81 winter was very warm. As of April 19, 1981, the population weighted average heating degree days totalled 5,338 or 11 percent less than normal. Proportional savings are expected in the amounts of natural gas, heating oil and propane used for heating houses and buildings.

Precipitation was light during the 1980-81 winter season. Total precipitation from October, 1980, through March, 1981, was lower than normal in seven out of eight climatic divisions, making an average shortage of 15 percent.

April precipitation was lower than normal in six out of eight divisions. The average actual precipitation from April 4-24, 1981, was 1.38 inches compared with a normal of 1.67 inches for the same period.

According to NEBRASKA WEATHER AND CROPS, a weekly newsletter published by the U.S. Department of Agriculture, topsoil moisture supplies as of Friday, April 24, were rated 42 percent short, 57 percent adequate and 1 percent surplus. Subsoil supplies were 85 percent short and 15 percent adequate. A year ago topsoil moisture rated 45 percent short and 55 percent adequate and subsoil supplies were adequate in virtually all areas of the state.

The shortage of soil moisture and the lack of precipitation may hurt summer crops and create high demands for water and energy for irrigation.

FREIGHT TRANSPORTATION STUDY

The Nebraska Energy Office performed a study on "Fuel Efficiency in Freight Transportation from South Sioux City to New Orleans". The study compared barge and rail car load service. Following are brief highlights of the report; the full report is available through the Nebraska Energy Office.

		BARGE	RAIL
1.	Distance from South Sioux City to New Orleans (as the crow flies).	913 miles	913 miles
2.	Distance of the most used route.	1,781 miles	1,317 miles
3.	Circuity (indirectness factor)	1.95	1.44
4.	Average capacity per car or barge	1,500 tons	45 tons
5.	Percent loaded	40% upstream 90% downstream	60%
6.	Gallons of diesel consumed per ton of cargo traveling the full route. (The above factors have been considered.)	5.4 gal.	6.6 gal.
7.	Cost increase of shipping one ton of freight the full route if fuel prices increase by $.50 per gallon.	$2.70	$3.30

NEBRASKA PETROLEUM STATUS REPORT

The deregulation of petroleum products by the Reagan administration on January 28, 1981, will have a definite impact on Nebraska's petroleum stocks and supplies. Opinions are mixed on the effect deregulation will have on each region of the nation. Since the actual distribution of fuel is controlled by the suppliers, the full effect will not be known until the end of the year. All Nebraska stocks will be adequate barring any major interruption in supply (Table 15).

Gasoline available for sale in Nebraska is defined as total gasoline and gasohol imported into Nebraska minus the total exported. It continued to drop in the first quarter to 90 percent of the first quarter of 1980 (Tables 16-17).

Gasoline sold to federal agencies has shown a sharp reduction since 1979. This figure constitutes only one-third of one percent of the total gasoline consumed in Nebraska (Tables 18-19).

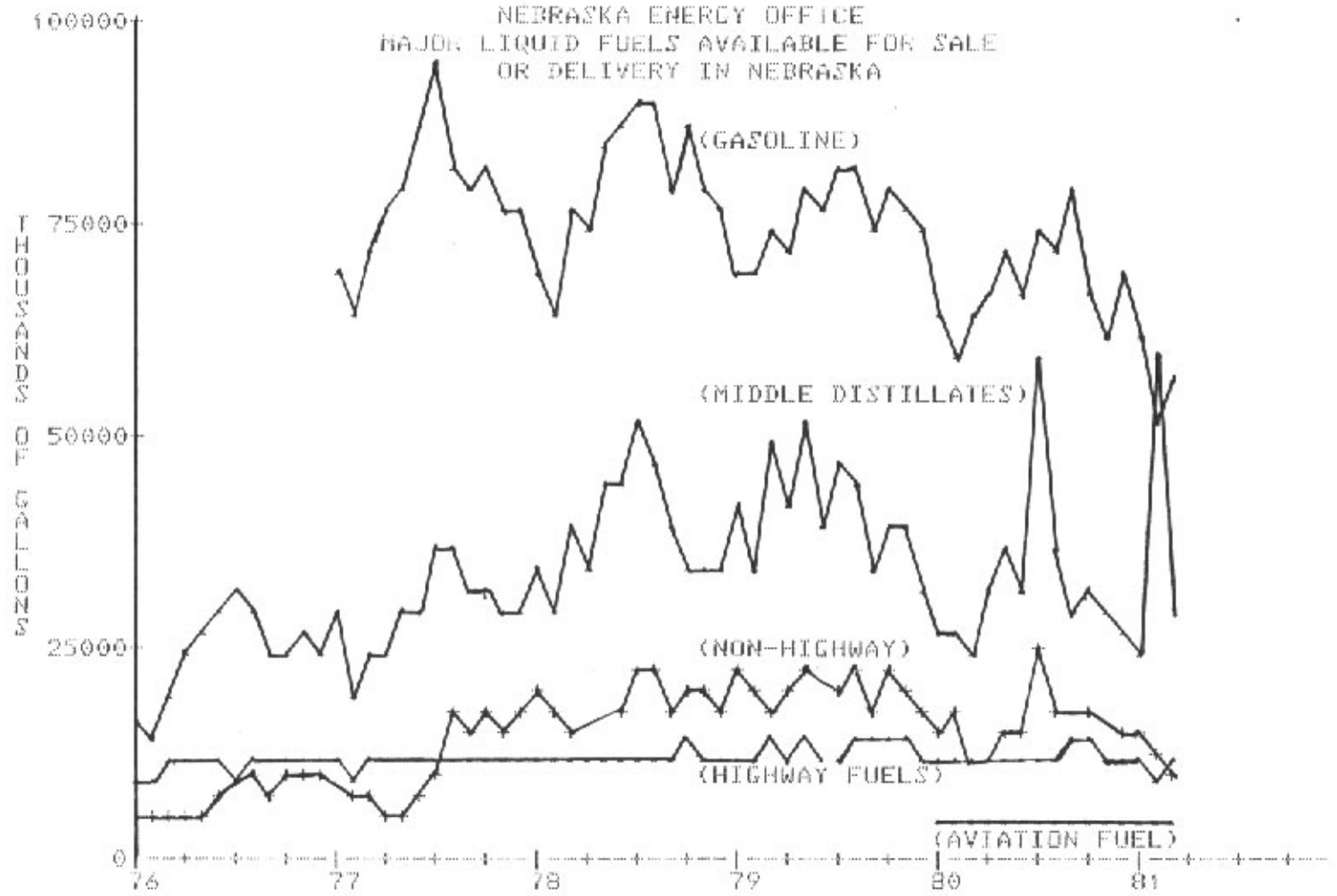
Gasohol available for sale in Nebraska has shown definite growth over the last two years. In the first quarter, consumption of gasohol rose to 102.5 percent of the first quarter of 1980. Gasohol now comprises 4 percent of gasoline sales in Nebraska. Currently, month by month comparisons of gasohol consumption must be viewed with caution due to a reporting form revision in January, 1981. This revision will result in more accurate reporting (Tables 20-21).

Middle distillates show the greatest variation in imports. The large February jump is considered abnormal and may be readjusted substantially. Other comparable sources do not show a similar increase in February (Tables 22-23).

Special fuels are any fuels other than gasoline that are put 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 (Tables 24-25).

Special fuels for non-highway use include agricultural, industrial, railroad and any other motor vehicle fuels that are not used on Nebraska roads. Non-highway use is quite dependent upon the Nebraska economy and is more volatile than highway use (Tables 26-27).

TABLE 15



SOURCE: NEBRASKA DEPARTMENT OF REVENUE
MAY 1981

TABLE 16

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

	1977	1978	1979	1980	1981	Percent of Previous Year
January	69,334	69,166	69,602	63,763	60,932	95.6%
February	62,501	63,227	69,367	59,381	51,136	86.1
March	70,780	75,162	73,397	63,151	55,417	87.8
April	77,085	74,597	72,399	65,318		
May	79,039	84,422	77,631	72,440		
June	86,543	86,165	75,955	65,801		
July	92,844	88,253	80,054	73,354		
August	82,343	89,733	82,473	72,201		
September	79,853	79,202	72,609	79,754		
October	82,107	86,061	78,565	65,155		
November	76,506	78,351	76,555	60,261		
December	75,453	76,887	74,824	68,223		
TOTAL	934,388	951,226	903,431	808,802	167,485	89.9%

The last three months are preliminary.
*Gross import into the state minus exports out of the State.
Source: Department of Revenue Tax Form 81

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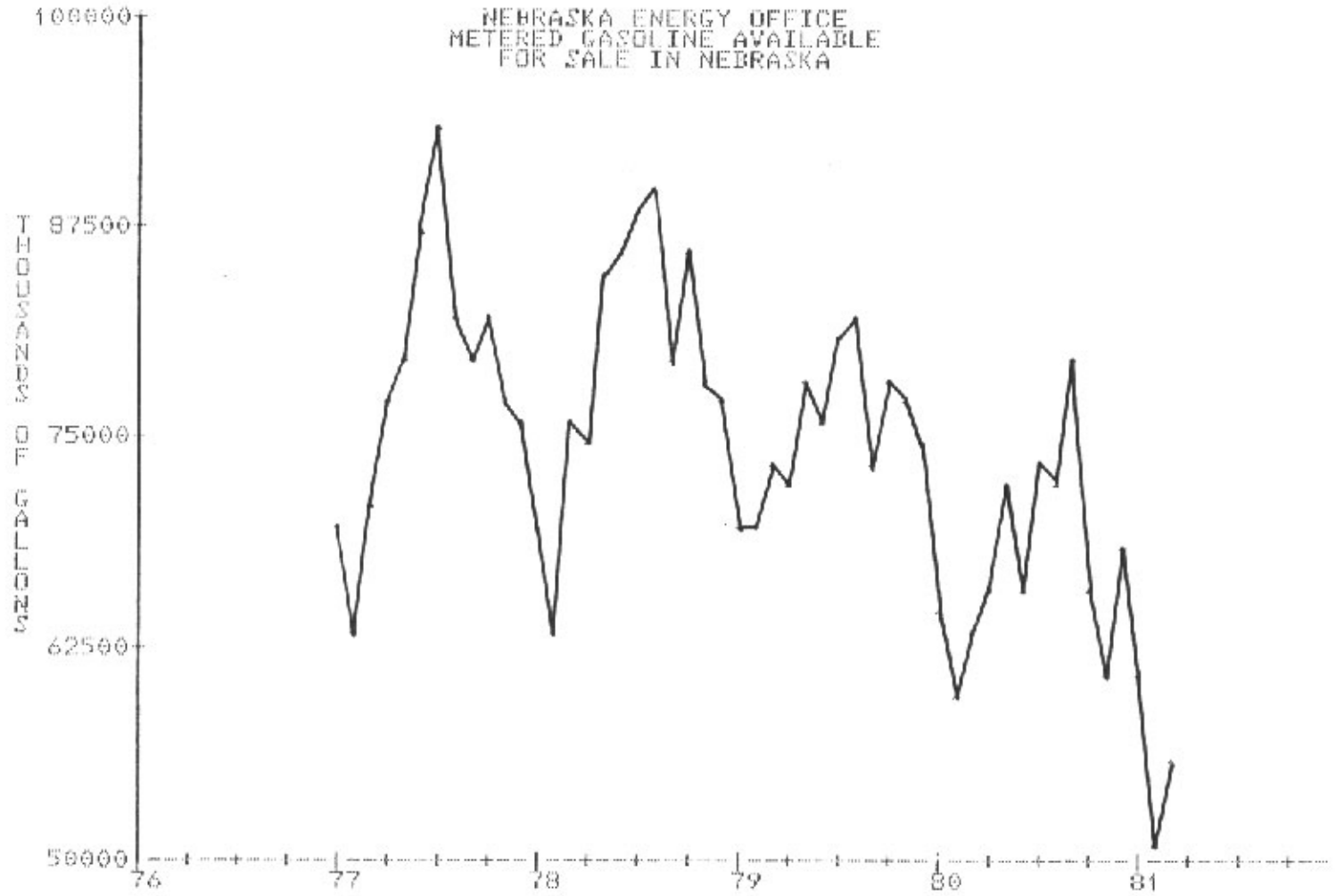
TABLE 17



SOURCE: NEBRASKA DEPARTMENT OF REVENUE
MAY 1981

TABLE 18

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

	1977	1978	1979	1980	1981	Percent of Previous Year
January	250	225	291	198	194	98.0%
February	207	229	508	223	155	69.5
March	208	241	352	259	205	79.2
April	355	254	242	218		
May	563	289	433	197		
June	202	223	201	217		
July	381	170	242	211		
August	234	192	234	187		
September	272	191	162	201		
October	154	153	288	151		
November	214	163	292	126		
December	229	178	203	175		
TOTAL	3,269	2,508	3,448	2,363	554	81.5%

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

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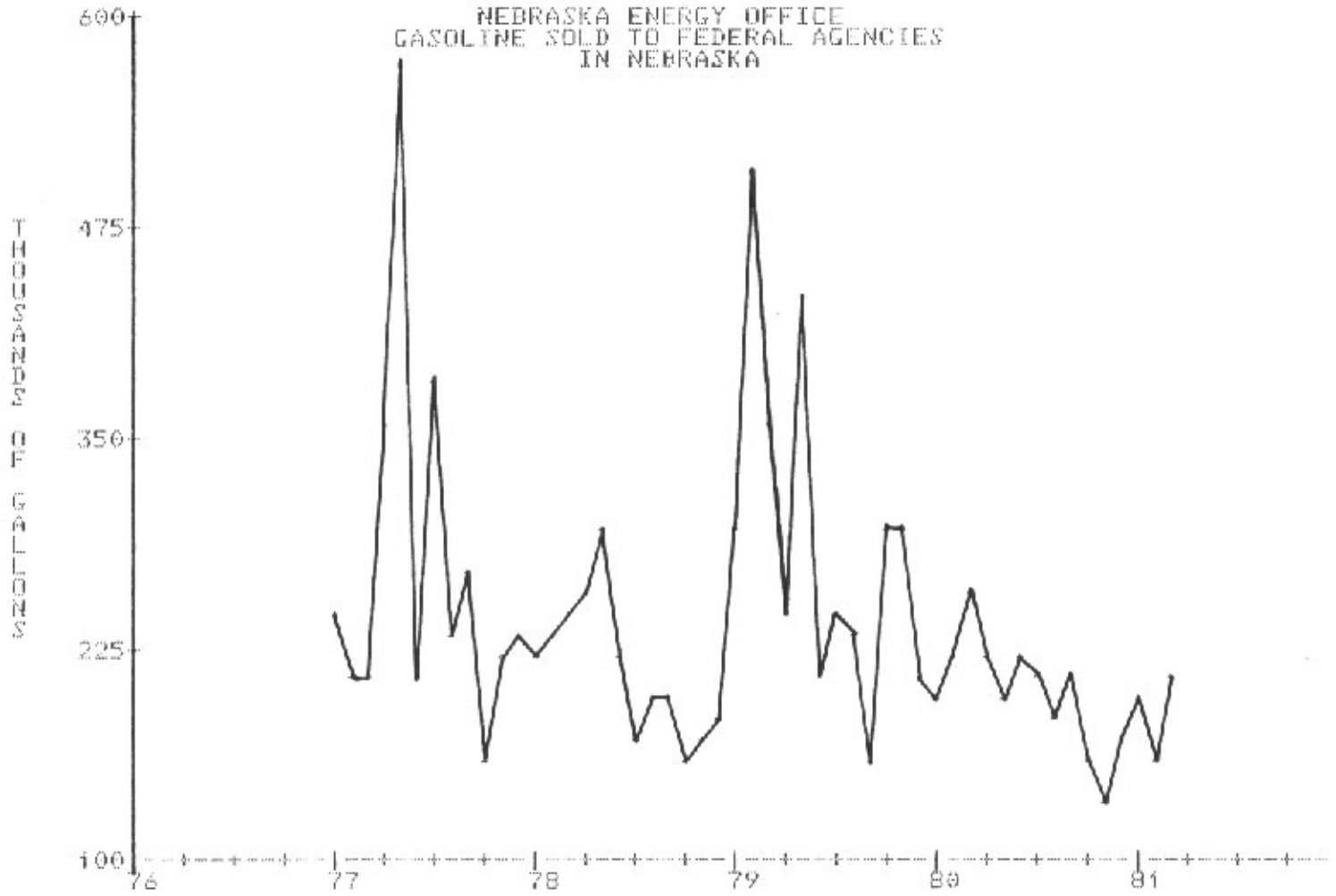
TABLE 19



SOURCE: NEBRASKA DEPARTMENT OF REVENUE
MAY 1981

TABLE 20

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

	1979	1980	1981	Percent of Previous Year
January	280	1,729	2,080	120.3%
February	280	1,926	2,306	119.7
March	296	2,878	2,309	80.2
April	291	2,687		
May	313	2,915		
June	306	2,579		
July	320	2,749		
August	1,413	2,320		
September	823	2,761		
October	922	2,485		
November	802	2,284		
December	805	2,841		
TOTAL	6,851	30,154	6,695	102.5%

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

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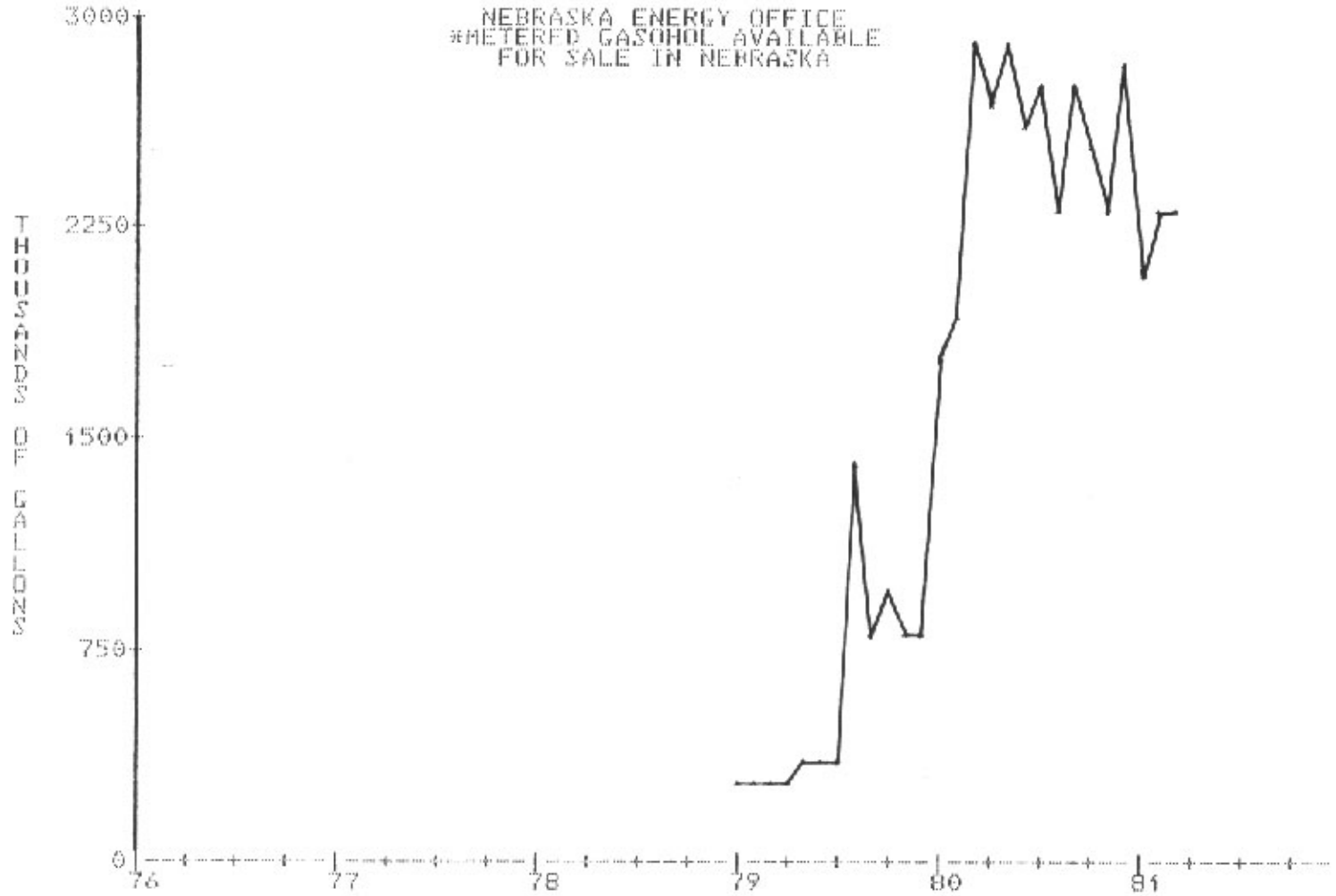
TABLE 21



SOURCE: NEBRASKA DEPARTMENT OF REVENUE
MAY 1981

* A NEW REPORTING FORM WAS USED STARTING IN JANUARY 1981. MONTHLY INFORMATION BEFORE THAT DATE MAY BE QUESTIONABLE.

TABLE 22

Middle Distillates Imported Into Nebraska (Thousands of Gallons)

	1976	1977	1978	1979	1980	1981	Percent of Previous Year
January	16,408	28,165	34,298	40,252	25,381	24,891	96.1%
February	14,081	18,169	29,735	34,600	26,157	59,270	226.6
March	19,222	24,028	37,886	48,150	23,102	28,120	121.7
April	23,495	24,833	32,942	40,745	32,255		
May	26,239	27,521	43,673	50,992	36,486		
June	28,744	28,267	42,739	38,258	31,247		
July	32,022	36,250	50,051	46,443	59,318		
August	29,857	36,183	46,934	43,635	35,548		
September	24,475	32,160	39,245	34,495	29,905		
October	24,160	32,295	34,802	38,383	31,691		
November	26,464	28,073	34,156	38,326	28,840		
December	24,461	29,294	34,524	31,200	27,043		
TOTALS	289,628	345,238	460,985	485,479	386,973	112,281	150.4%

The last three months are preliminary
Source: Unaudited Figures from Department of Revenue Tax Forms 81

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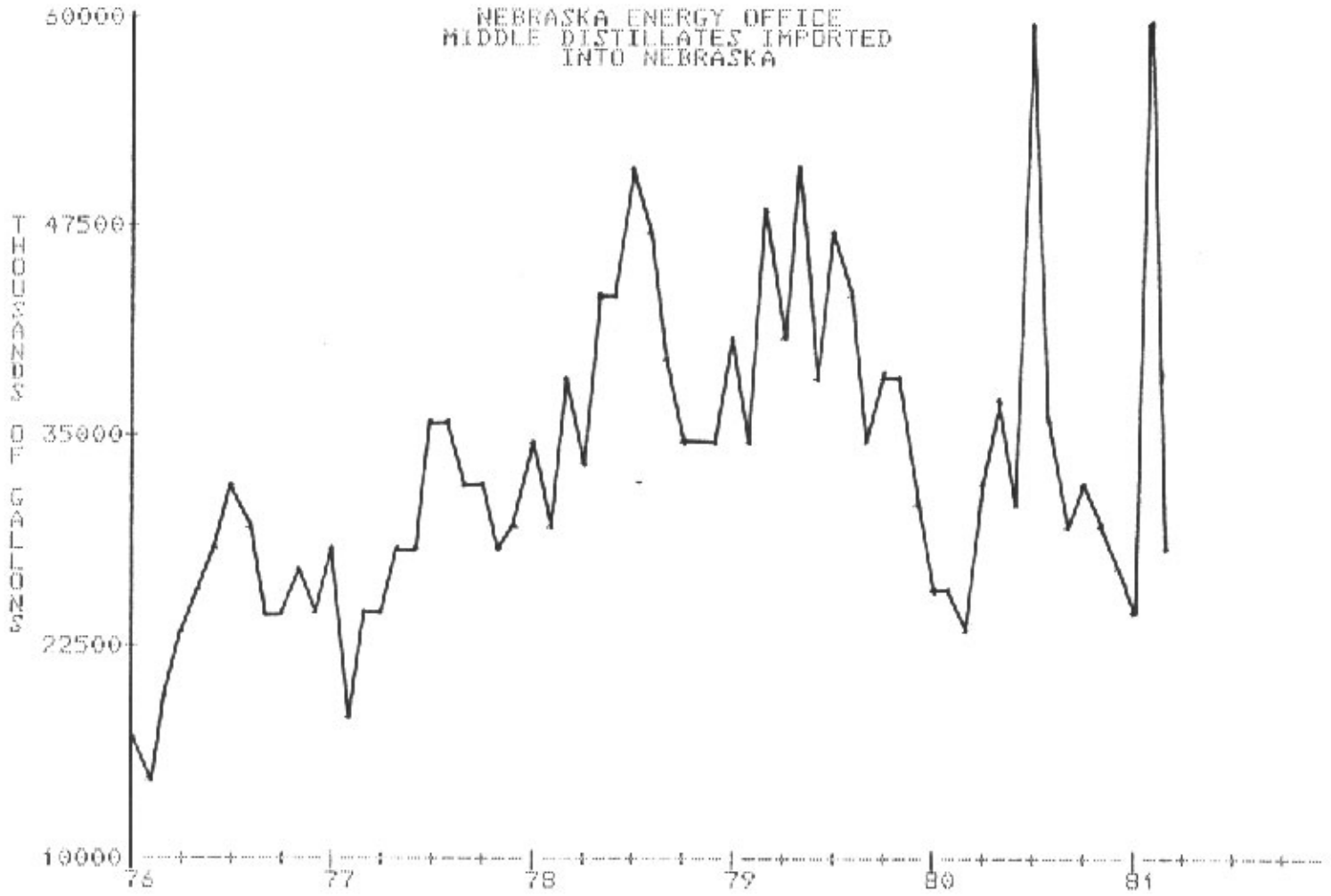
TABLE 23



SOURCE: NEBRASKA DEPARTMENT OF REVENUE
MAY 1981

TABLE 24

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

	1976	1977	1978	1979	1980	1981	Percent of Previous Year
January	8,828	10,123	10,200	11,483	11,839	10,554	89.1%
February	8,889	9,654	10,104	11,257	11,065	9,912	89.6
March	10,363	12,092	11,615	12,945	12,067	11,357	94.1
April	10,306	11,180	11,906	12,416	12,322		
May	10,059	10,901	12,114	13,036	11,894		
June	10,372	10,938	11,971	11,020	11,883		
July	9,698	10,336	11,123	11,637	11,712		
August	10,243	10,915	12,456	12,569	12,348		
September	10,491	10,937	12,477	12,685	13,434		
October	10,849	12,198	13,998	14,309	13,587		
November	10,660	10,774	11,894	12,411	11,815		
December	10,027	10,116	11,114	12,047	11,188	———	———
TOTAL	121,785	130,164	140,972	147,815	145,154	31,823	91.0%

The last three months are preliminary.
Source: Department of Revenue Form 91

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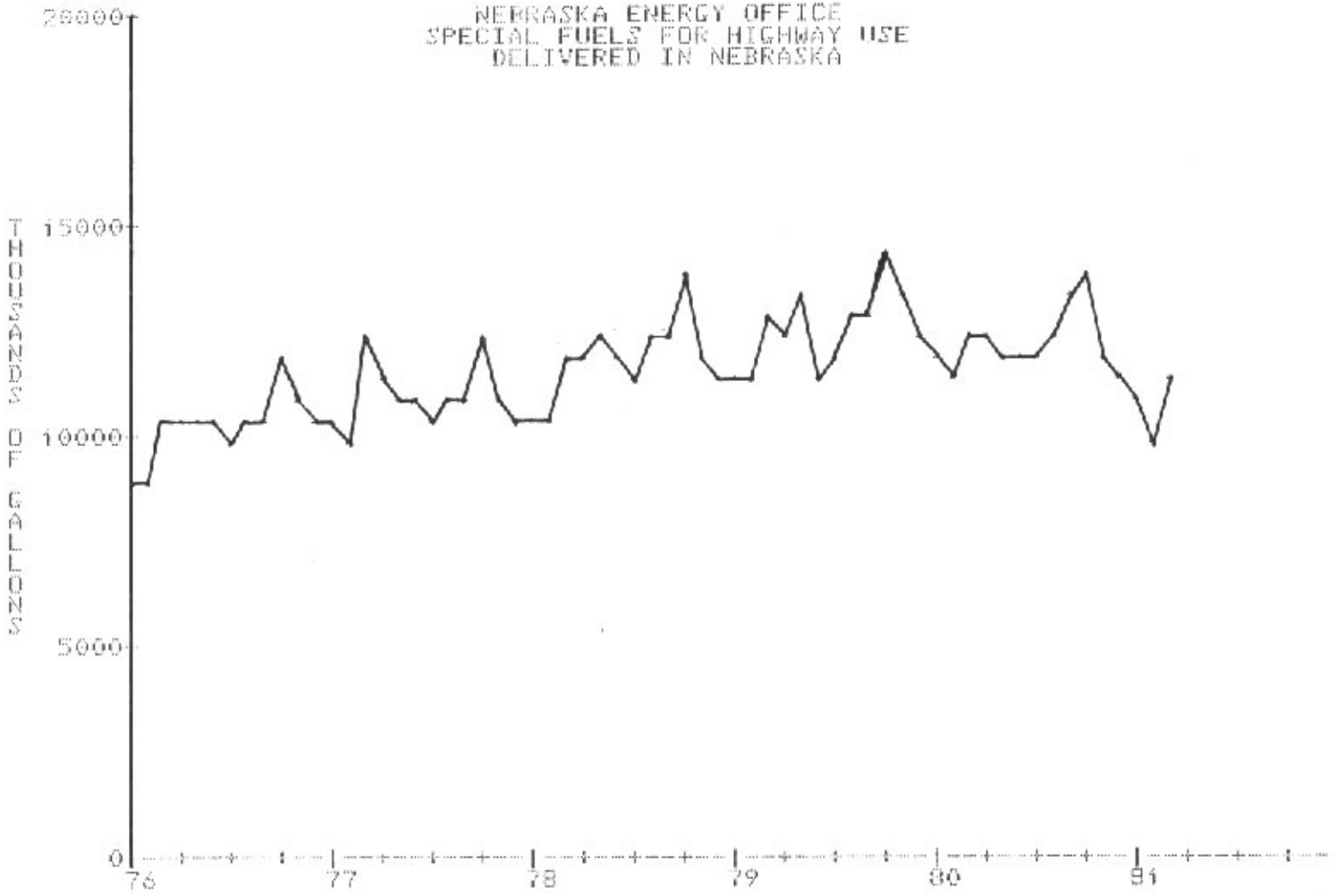
TABLE 25



SOURCE: NEBRASKA DEPARTMENT OF REVENUE
MAY 1981

TABLE 26

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

	1980	1981	Percent of Previous Year
January	13,800	12,871	93.3%
February	15,164	10,609	70.0
March	12,336	8,243	66.8
April	12,201		
May	13,619		
June	14,319		
July	24,485		
August	16,920		
September	14,990		
October	15,457		
November	12,488		
December	13,910		
TOTAL	179,689	31,723	76.8%

The last three months are preliminary
Source: Department of Revenue Form 91

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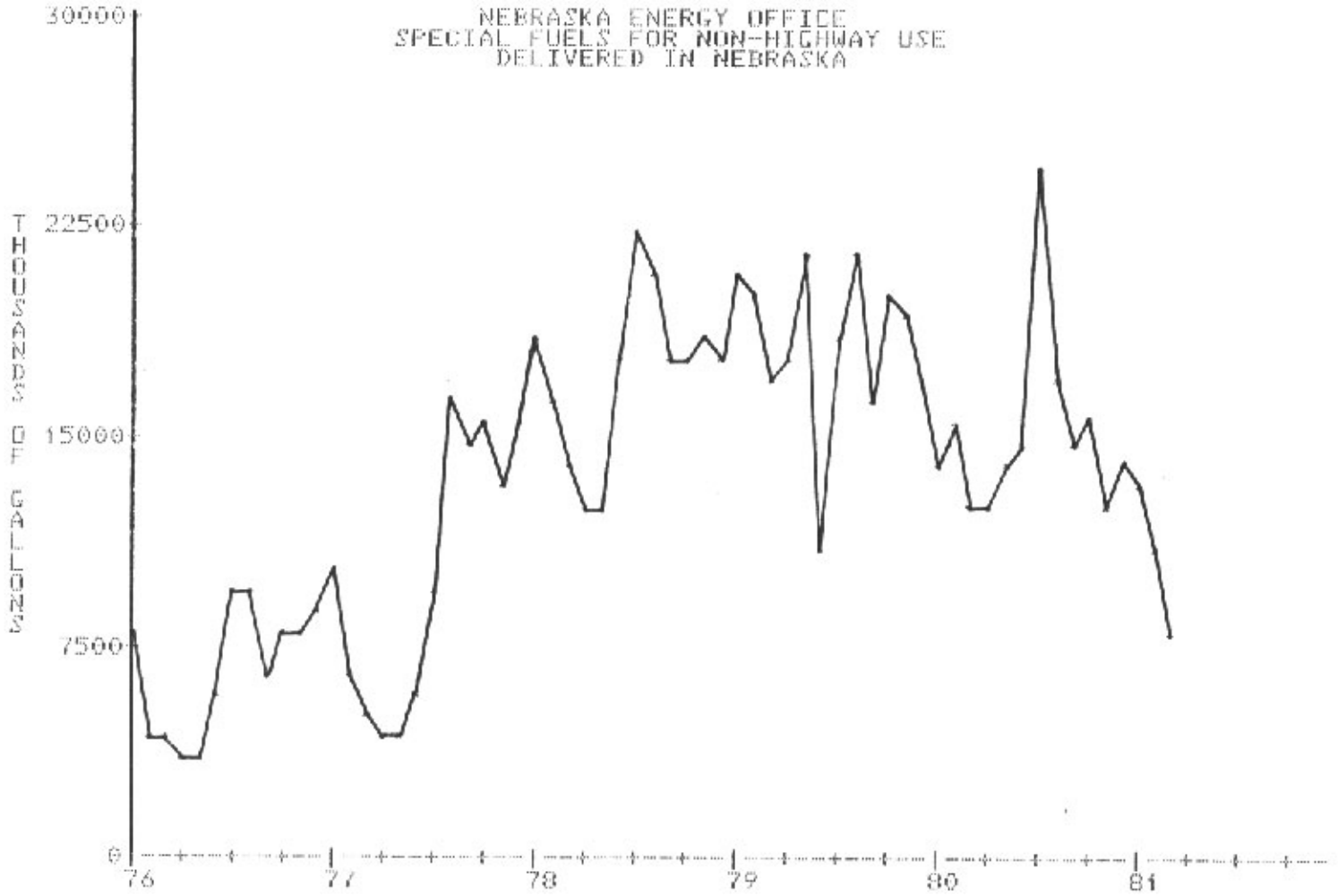
TABLE 27



SOURCE: NEBRASKA DEPARTMENT OF REVENUE
MAY 1981

TABLE 28

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

	1980	1981	Percent of Previous Year
January	3,523	2,997	85.1%
February	2,883	2,591	89.9
March	3,011	2,997	99.5
April	3,099		
May	3,371		
June	3,220		
July	3,431		
August	3,746		
September	4,190		
October	4,444		
November	2,972		
December	3,209		
TOTAL	41,099	8,585	91.2%

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

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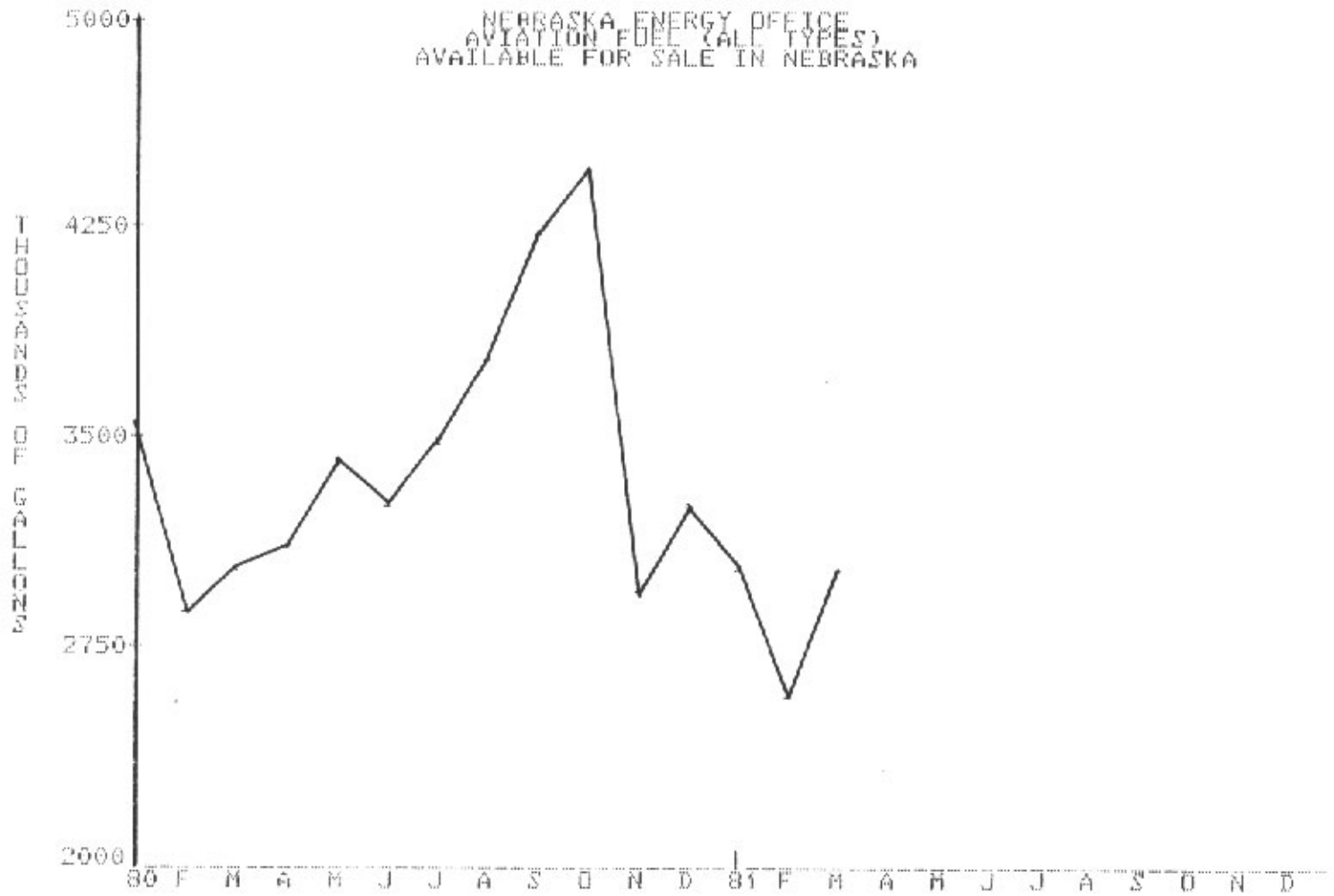
TABLE 29



SOURCE: NEBRASKA DEPARTMENT OF REVENUE
MAY 1981

TABLE 30

Propane Delivered in Nebraska (Thousands of Gallons)

	1976	1977	1978	1979	1980	1981	Percent of Previous Year
January	26,437	29,017	31,848	28,908	22,902	11,186	48.8%
February	25,163	31,505	25,331	22,164	15,673	11,672	74.5
March	16,844	20,609	14,839	14,142	11,331		
April	16,500	14,952	6,717	8,008	9,115		
May	7,348	7,958	5,754	7,035	5,669		
June	6,456	6,494	5,611	7,447	6,402		
July	11,845	10,676	13,654	11,217	16,772		
August	24,855	24,895	15,328	16,671	11,447		
September	24,054	29,767	12,137	12,611	14,727		
October	16,624	29,735	23,492	28,577	13,767		
November	27,439	25,027	16,558	26,709	12,237		
December	24,227	28,123	23,138	23,181	19,977		
TOTAL	227,792	258,758	194,407	206,670	160,019	22,858	59.3%

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

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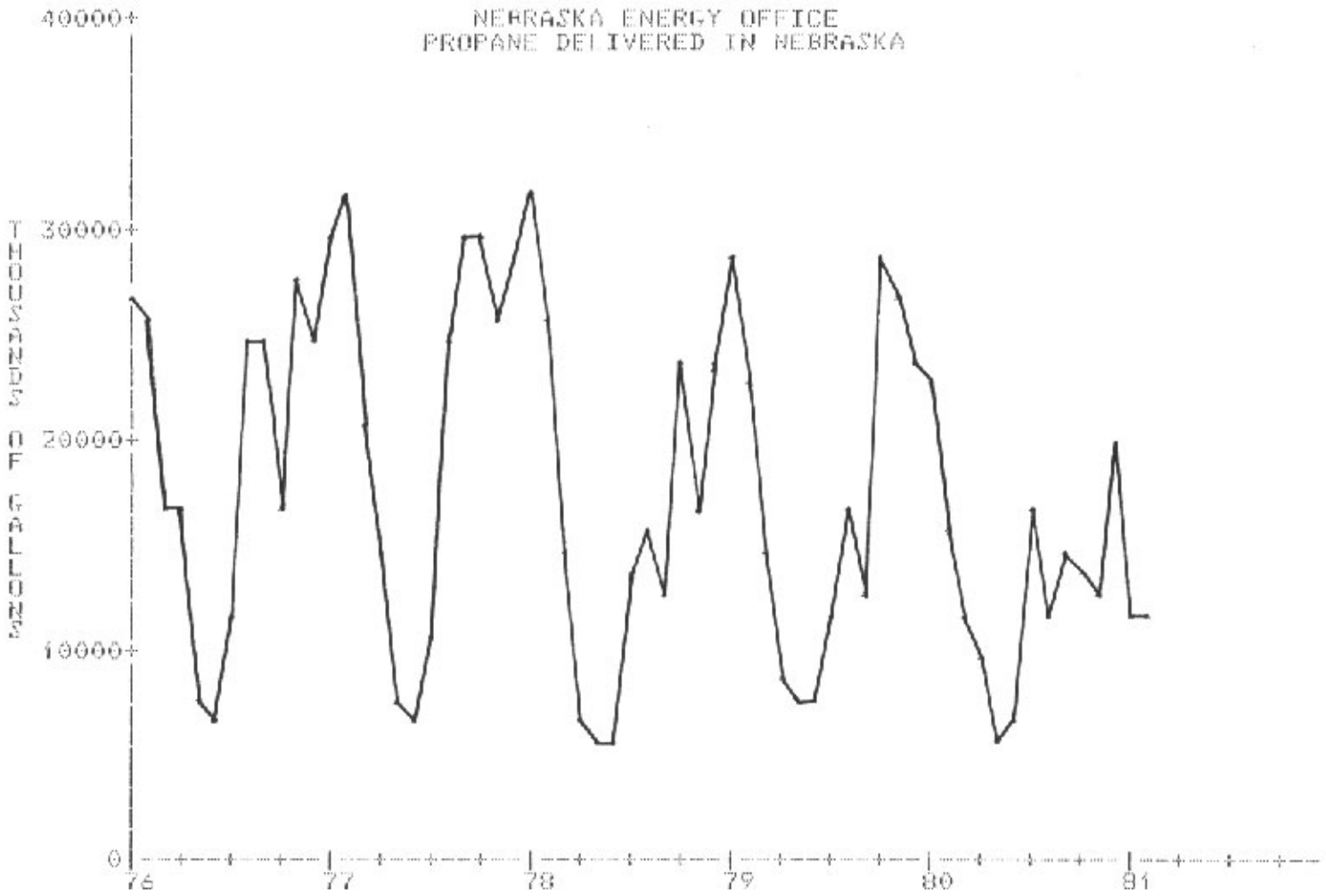
TABLE 31



SOURCE: ENERGY INFORMATION ADMINISTRATION REPORTING FORM (EIA-25)
MAY 1981

TABLE 32

Fuel Delivered In Nebraska In 1981 (Thousands of Gallons)

	Motor Gasoline	Propane	Kerosene	Home Heating Oil	Diesel	*Total Middle Distillates
January	53,951	11,186	4,259	11,773	20,916	36,948
February	49,300	11,672	2,536	10,086	17,498	30,120
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						
TOTAL	103,251	22,858	6,795	21,859	38,414	67,068

The last month is preliminary
* Kerosene, Home Heating Oil, Diesel, Other Middle Distillates
Source: EIA25(FEA-1000) Report Form 12F

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