

**Nebraska
Energy
Office**

Annual Report 1989

This Annual Report is for the period July 1, 1988 through June 30, 1989, except where otherwise noted.
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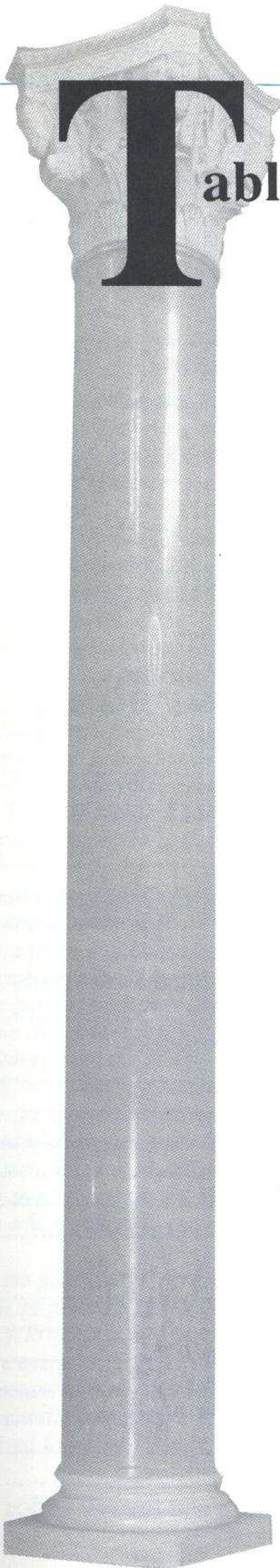


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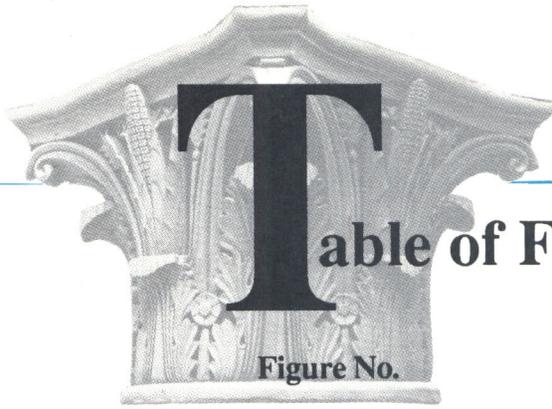


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Letter from the Director

February 15, 1990

Shortly after President Bush took office, he directed his new Secretary of Energy to develop a national energy strategy. Even though this strategy will not be presented to the President and Congress until April, 1990, it is likely that the strategy will contain a renewed emphasis on energy conservation and renewable energy resources as ways to reduce the nation's growing oil dependence. Before the oil crisis of the 1970s, most Americans believed that cheap energy was a right and not a product. As our growing reliance on imported energy increases, the lessons of the 1970s seem to have been forgotten. We end this reporting period with renewed hope that the federal government will adopt a national energy policy which will again focus the nation's attention on its increasing reliance on imported petroleum products.

World energy demand is expected to increase by two percent each year during the next decade, while energy intensity (energy use per unit of economic activity) is expected to decline at the rate of one percent each year. In the United States, this decline in use will result from incentives — both regulatory and economic — to continue conservation efforts. Energy management policies at all government levels should promote low-cost development of energy supplies and greater efficiency in their use. We should seek to avoid shortages and price shocks, but should be prepared to manage those which occur.

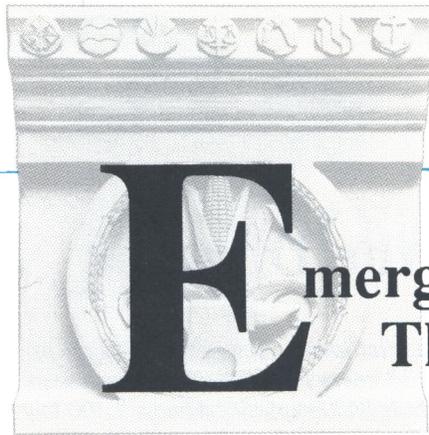
In the past year, Nebraska has continued programs to promote energy conservation and efficiency, to manage fuel shortages, to develop alternative energy sources and to encourage recycling as a means to increase energy efficiency and environmental protection. Twenty school districts received loans and funds were set aside for 21

additional district loans. Sixty-one technical assistance and 13 energy conservation grants were made to schools and hospitals. Almost 2,300 low income homes were weatherized and 2.82 trillion Btus (the equivalent of 22.5 million gallons of gasoline) were saved through state energy conservation programs. Of note are the success of Nebraska's energy shortage management plan in minimizing the negative effects of a temporary diesel fuel outage in spring of 1989 and the Nebraska Gasohol Committee's pioneering research into ethyl tertiary butyl ether (ETBE) as an alternative fuel.

In addition, the Governor's Oil Overcharge Plan was completed in 1989 and reviewed by the Legislature. The plan addresses a number of energy concerns and provides funds for programs which support energy-related research, low income weatherization and residential and public sector energy conservation improvements.

This report describes the activities and accomplishments of the Nebraska Energy Office through June 30, 1989. Oil Overcharge Programs, however, are reported through December 31, 1989. It examines a wide variety of issues — from energy development to conservation, from future energy planning to the role of energy in the state's economy. Energy is too vital to be taken for granted. The challenge of the next decade is to identify options and develop policies and programs that will keep Nebraska energy-sound in the 1990s and beyond.

Gary Rex, Director
Nebraska Energy Office



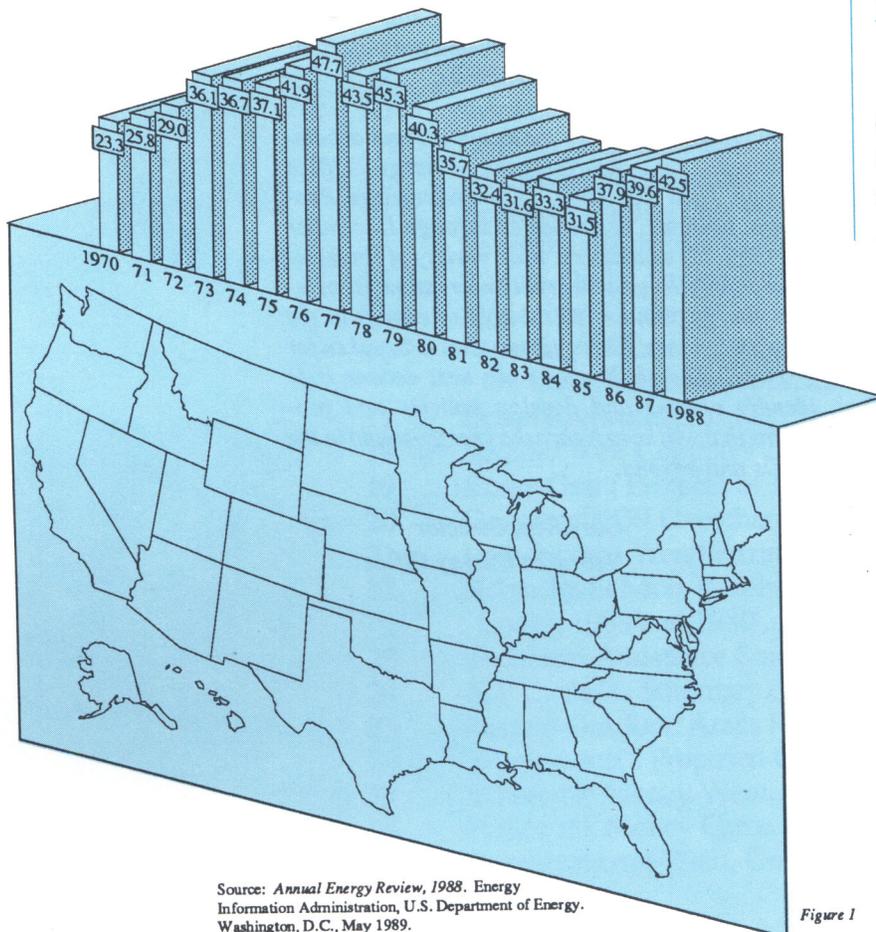
Emerging Issues and Trends: The Challenge of the 1990s

Figure 1 illustrates national oil consumption trends from 1970 through 1988, showing U.S. crude oil imports as a percentage of consumption. These figures exclude crude oil imports into the Strategic Petroleum Reserve. As the graph indicates, national oil consumption continues to rise slowly.

Nebraska has two primary energy goals — to continue to reduce the state's dependence on imported resources to meet energy needs and to attain the most effective use of available supplies. In 1988-89, Nebraska imported 91 percent of its en-

ergy resources, at a cost equivalent to almost nine percent of our gross state produce. As we move into the 1990s, the energy management challenges we face go beyond issues of availability and cost of energy resources. We must continue to use available resources more efficiently, to develop alternative energy sources, to protect our environment from the harmful effects of energy generation, and to safely dispose of the by-products of energy production.

Imports as Percentage of Crude Oil Consumption, United States, 1970-1988



Source: *Annual Energy Review, 1988*. Energy Information Administration, U.S. Department of Energy. Washington, D.C., May 1989.

Figure 1

ENERGY CONSERVATION AND EFFICIENCY

In the next decade, world energy demand is expected to increase by two percent each year, from the equivalent of 157 million barrels of oil each day in 1988 to 200 million barrels in 2000. About half the total increase will occur in develop-

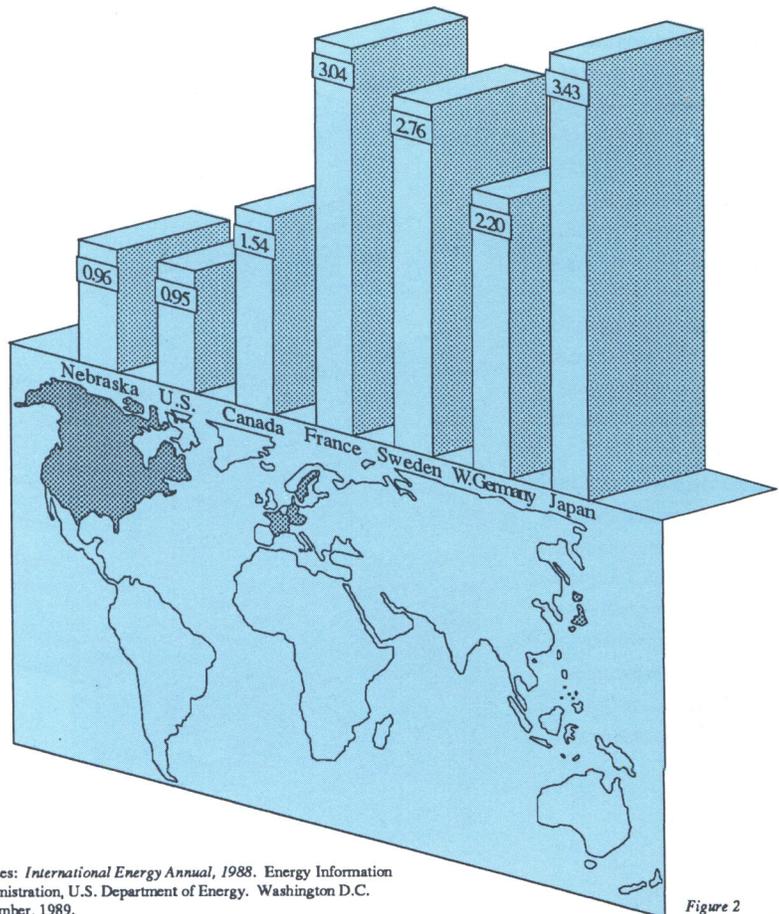
ing nations, where growing urbanization and industrialization are stimulating greater energy consumption. On the other hand, world energy intensity (energy use per unit of economic activity) is expected to decline by approximately one percent each year. Energy use per unit of economic activity will remain fairly constant in developing nations, but developing nations will continue a downtrend in energy intensity.

Energy demand in the U.S. is expected to grow 1.5 percent each year by the year 2000 — about half the rate of economic growth, reflecting continued U.S. efforts to improve efficiency and create a less energy-intensive economy. Efficiency continues to be the nation's most valuable energy source. Since the 1970s, when oil price shocks sent Americans searching for ways to decrease energy

In 1988, gasoline and diesel fuel prices remained in line with the national average at 96 and 95 cents per gallon, respectively, but were far below the average costs in other countries. Figure 2 provides a graphic comparison of gasoline prices.

Gasoline Prices*, Nebraska, United States and Selected Countries, 1988

* Dollars per gallon



Sources: *International Energy Annual, 1988*. Energy Information Administration, U.S. Department of Energy. Washington D.C. November, 1989.
Nebraska Energy Office

Figure 2

Total energy consumption figures in this report refer to total primary energy consumption (consumption not adjusted for associated energy loss) less interstate electricity sales. Consumption figures for all types of energy are presented in Btus (British Thermal Units) to facilitate comparisons.

In 1988, Nebraskans used a total of 540.7 Trillion Btus of energy a 7.5% increase in energy consumption over 1987 consumption levels of 502.9 trillion Btus. Petroleum use increased 8.1%, use of natural gas increased 12.5%, coal use increased 19.4%, nuclear power use decreased 20.8% and hydroelectric power use decreased 13.6%.

Per capita consumption of energy in Nebraska increased by 22.2 million Btus in 1988, to 337.7 million Btus. In addition, Nebraska's per capita consumption was nearly four percent higher than the 324.6 million Btus per capita national average. Figure 3 compares Nebraska's per capita energy consumption from 1980 through 1988 to per capita consumption in the United States and selected other countries.

consumption, the nation has saved more energy through efficiency and conservation than it has gained from all new energy sources. Continued improvements in energy efficiency would also increase U.S. competitiveness in world markets. Currently, the United States uses twice as much energy as Japan, West Germany, Italy or France to produce a dollar of goods and services. Improved efficiency would help narrow the gap.

Nebraskans have also realized important energy savings due to increased efficiency. The state has saved over \$9 billion in energy costs in the past ten years through more efficient energy use and conservation of resources. This represents a substantial contribution to the state's economy and makes money available to spend in other areas.

Per Capita Net Primary Energy Consumption, Nebraska, United States and Selected Countries, 1980-1988 (MBtus)

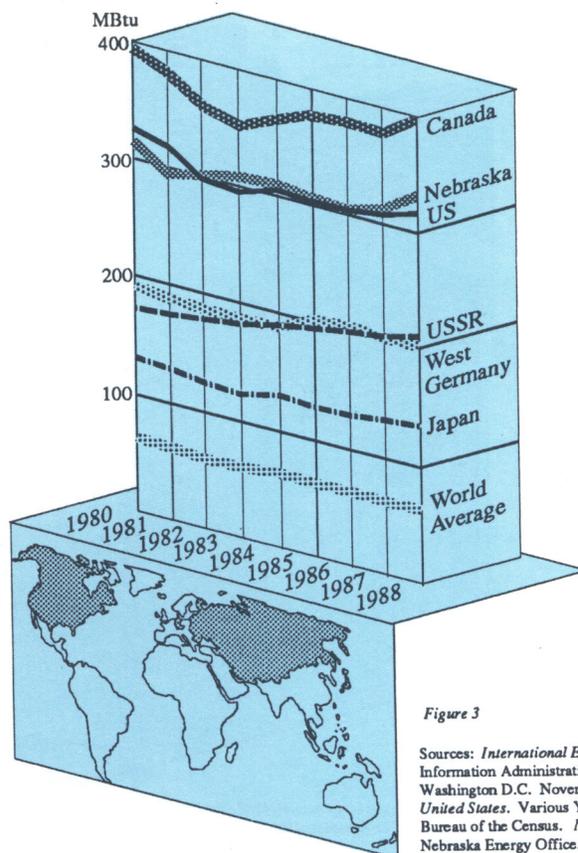


Figure 3

Sources: International Energy Annual 1988. Energy Information Administration, U.S. Department of Energy. Washington D.C. November, 1989. Statistical Abstract of the United States. Various Years. U.S. Department of Commerce. Bureau of the Census. Nebraska Energy Statistics, 1960-1987. Nebraska Energy Office.

In 1988-89, state and federally-funded energy efficiency programs have saved Nebraskans an estimated 3 trillion Btus. (A Btu, or British Thermal Unit, is a standard unit for measuring the amount of energy required to raise the temperature of one pound of water one degree fahrenheit.)

Energy efficiency in the United States increased by 26 percent between 1973 and 1988. The ratio of Btus of energy consumed to each dollar of Gross National Product decreased during that period from 27,100 to 20,000. By comparison, in 1988 Nebraska consumed 21,700 Btus for every dollar of Gross State Product (GSP)—achieving a 16 percent increase in energy efficiency since 1973. 1986 energy consumption in the West North Cen-

tral Census Region (a seven-state region of which Nebraska is a part) averaged 21,500 Btus to each dollar of GSP—a 16 percent improvement in efficiency since 1973.

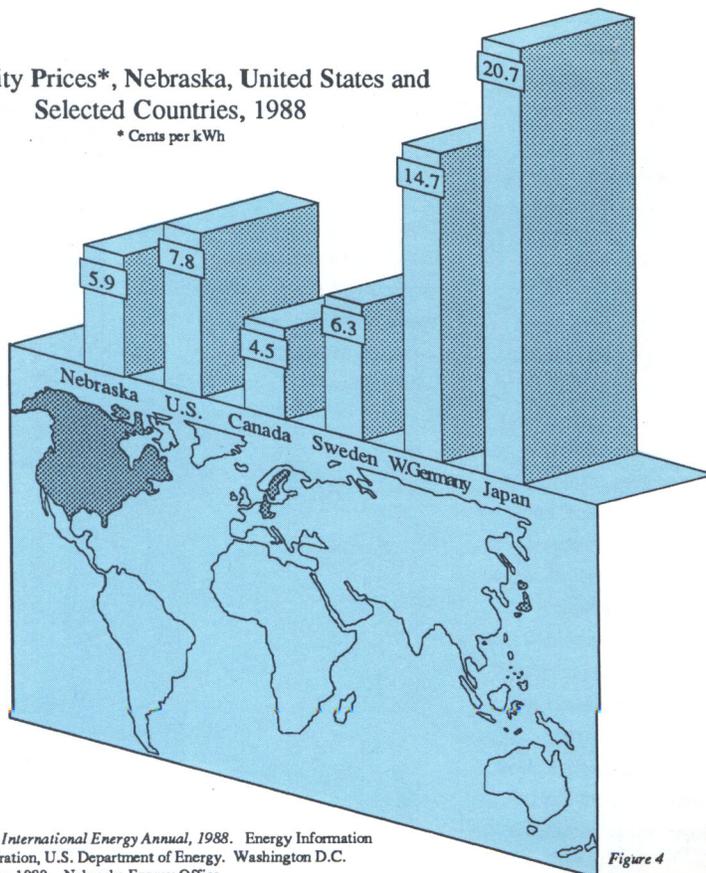
ELECTRICAL POWER SUPPLIES

In spite of the promise shown by efficiency, some power-supply forecasters are predicting that

In 1988, energy prices in Nebraska continued to compare favorably with both national and worldwide energy costs. 1988 residential electricity rates in Nebraska were 5.9 cents per kilowatt hour (kWh), compared to the national average of 7.8 cents per kWh (see Figure 4).

Electricity Prices*, Nebraska, United States and Selected Countries, 1988

* Cents per kWh



Sources: *International Energy Annual, 1988*. Energy Information Administration, U.S. Department of Energy. Washington D.C. November, 1989. Nebraska Energy Office.

Figure 4

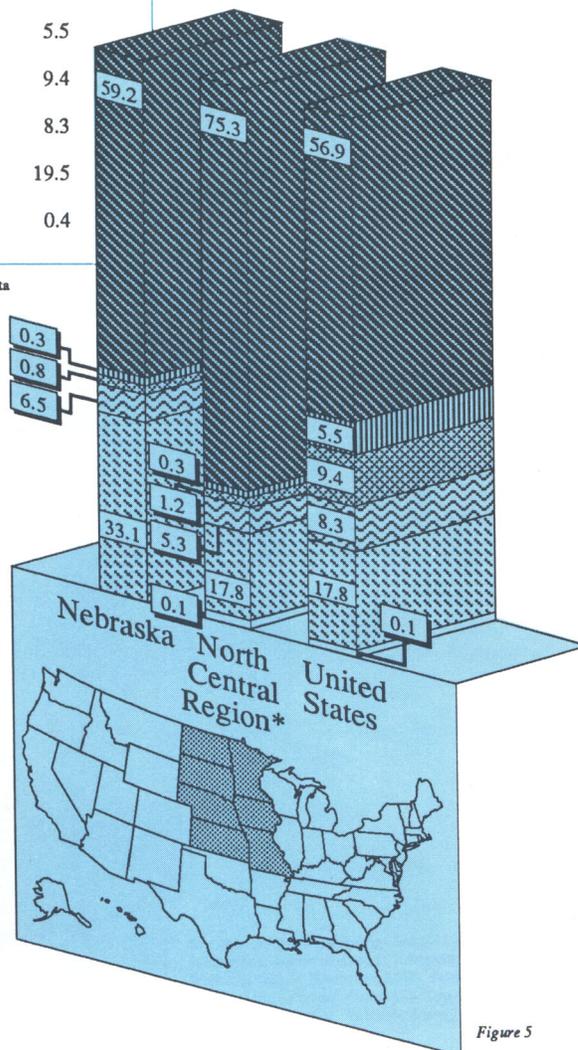
in the next decade shortages of electrical power will occur in certain areas of the nation, hindering economic growth and inconveniencing millions of Americans.

Efforts to conserve oil have led to more widespread use of electricity in manufacturing processes, making U.S. industry more efficient and

Percent of Electricity Generated by Fuel Type, Nebraska, United States and Selected Region, 1988

Fuel Type	Nebraska	North Central Region*	United States
Coal	59.2%	75.3%	56.9%
Petroleum	0.3	0.3	5.5
Natural Gas	0.8	1.2	9.4
Hydro	6.5	5.3	8.3
Nuclear	33.1	17.8	19.5
Other	0.0	0.1	0.4

Percent of Electricity Generated by Fuel Type, Nebraska, United States and Selected Region, 1988



* Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota and South Dakota

Source: *Electric Power Monthly*, Energy Information Administration, U.S. Department of Energy. Washington D.C.

In 1988, generation of electricity in Nebraska amounted to 20,633 million kilowatt-hours — 0.7 percent higher than 1987 production levels of 20,489 million kilowatt-hours. Nebraska relies on three primary types of electrical generation: coal, nuclear and hydroelectric. The bar graph (Figure 5) shows the percentage of electricity generated in Nebraska in 1988 from each major source, as well as from petroleum and natural gas. The chart compares Nebraska to other states in the North Central Region and to the nation in

terms of the amount of electrical power generated by coal, hydroelectric, nuclear power, oil, natural gas and other sources.

Figure 5

globally competitive. However, because of cost and regulatory hurdles, utilities have been reluctant, in spite of the growing demand for electricity, to build more power plants. The unrelenting heat

of the summer of 1988 increased the already high demand for electricity and highlighted the potential crisis in electric power supply facing some parts of the United States. In the next few years,

Percent of Electricity Generated by Fuel Type, Nebraska, United States and Selected Countries, 1987

Fuel Type	Nebraska	North Central Region*	United States	Canada	West Germany	Japan	USSR	World
Thermal ¹	50.4%	75.6%	72.1%	19.9%	63.4%	4.6%	61.9%	63.3%
Hydro	7.6	6.2	9.7	65.0	4.9	50.1	11.8	20.1
Nuclear	41.9	18.1	17.7	15.1	31.2	45.3	26.1	16.2
Other	0.0	0.1	0.5	0.0	0.5	0.0	0.2	0.4

* Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota and South Dakota
¹ Thermal includes generation from coal, petroleum and natural gas.

Sources: *Electric Power Monthly*, Energy Information Administration, U.S. Department of Energy, Washington D.C. *International Energy Annual*, 1988, Energy Information Administration, U.S. Department of Energy, Washington D.C.

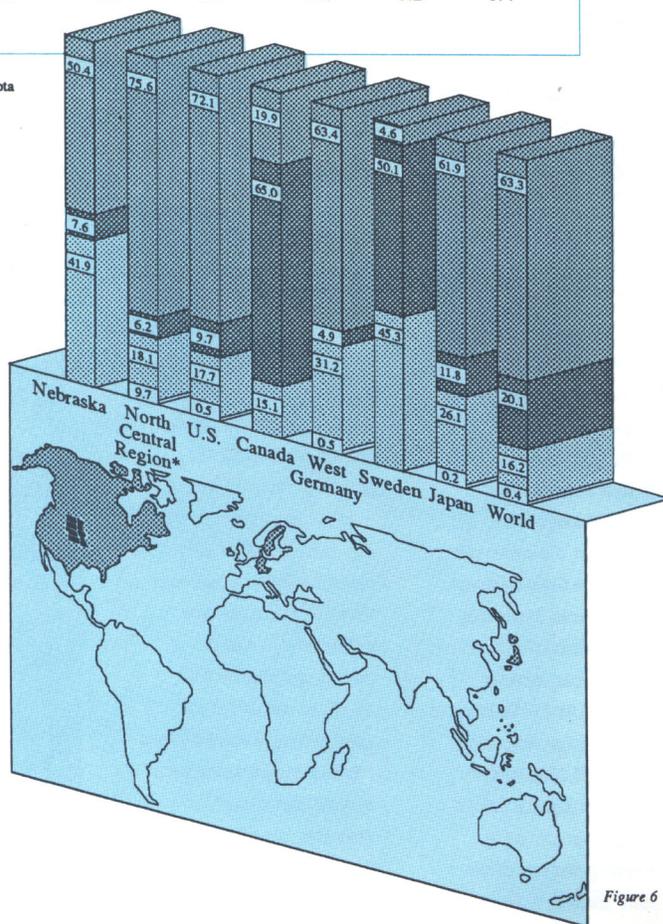


Figure 6

forecasters predict that some states, especially in the South Central, Middle Atlantic and New England regions, will not have enough power to meet the demands for electricity during peak summer usage periods.

In 1988, the Nebraska Power Association began a two-year study to evaluate Nebraska's future power needs. Although Nebraska has generally been an exception to the power shortage prediction, forecasters expect that in the next five years Nebraska will also face potential power shortages during periods of peak demand. One of the chal-

Percent of Sulfur Content of Coal Used by Electric Utilities, Nebraska, United States and Selected Region, 1988

% Sulfur Content	Nebraska	North Central Region*	United States
More Than 3.0%	0.0%	10.84%	10.23%
2.0% up to 3.0%	0.0	5.36	13.89
1.5% up to 2.0%	0.0	0.68	7.57
1.0% up to 1.5%	0.0	3.60	11.09
0.5% up to 1.0%	2.18	37.60	32.04
0.5% or Less	97.82%	41.92%	25.17%

* Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota and South Dakota

Sources: *Electric Power Quarterly*, Energy Information Administration, U.S. Department of Energy. Washington D.C. Nebraska Energy Office.

Nebraska must import all of the coal required to generate electricity for the state's energy consumers. In 1988, the state burned a total of 7,485,200 tons of coal. By comparison, the seven states in the North Central Region (Iowa, Kansas, Minnesota, Missouri, Nebraska, North and South Dakota) together consumed 98,418,900 tons of coal, while the entire nation burned 725,862,200 tons.

Most of the coal burned in Nebraska originated in Wyoming and was of low sulfur content. In fact, 97.82

percent of all the coal burned in Nebraska in 1988 contained less than 0.5 percent sulfur and the remaining 2.18 percent contained no more than 1.0 percent sulfur. By comparison, only 41.92 percent of the coal burned in the North Central Region contained less than 0.5 percent sulfur, while only 25.17 percent of the coal used nationally was that clean. Figure 7 compares the sulfur content of coal used in Nebraska, the Region and the Nation in 1988.

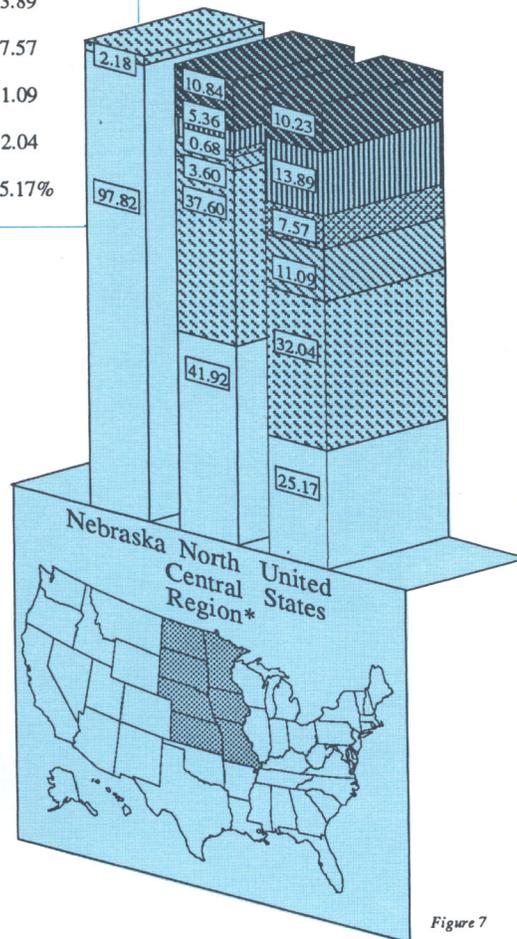


Figure 7

lenges of the next decade is to determine the most cost-efficient way to add to the state's base load capacity, while mitigating environmental impact.

ENERGY EMERGENCY MANAGEMENT

In the last several years, the United States has been forced to look more closely at its growing petroleum dependency. In 1988, about 43 percent of the U.S. energy supply was derived from oil and 40 percent of this oil was imported—compared to 1985 oil imports which accounted for only 29 percent of supply. In fact, the nation is now more dependent on oil imports than it was in 1973, when imports accounted for 37 percent of the total U.S. oil supply. Forecasters predict that oil imports could top 50 percent of supply by the mid-1990s—and that, by then, half of the world's oil will come from OPEC nations.

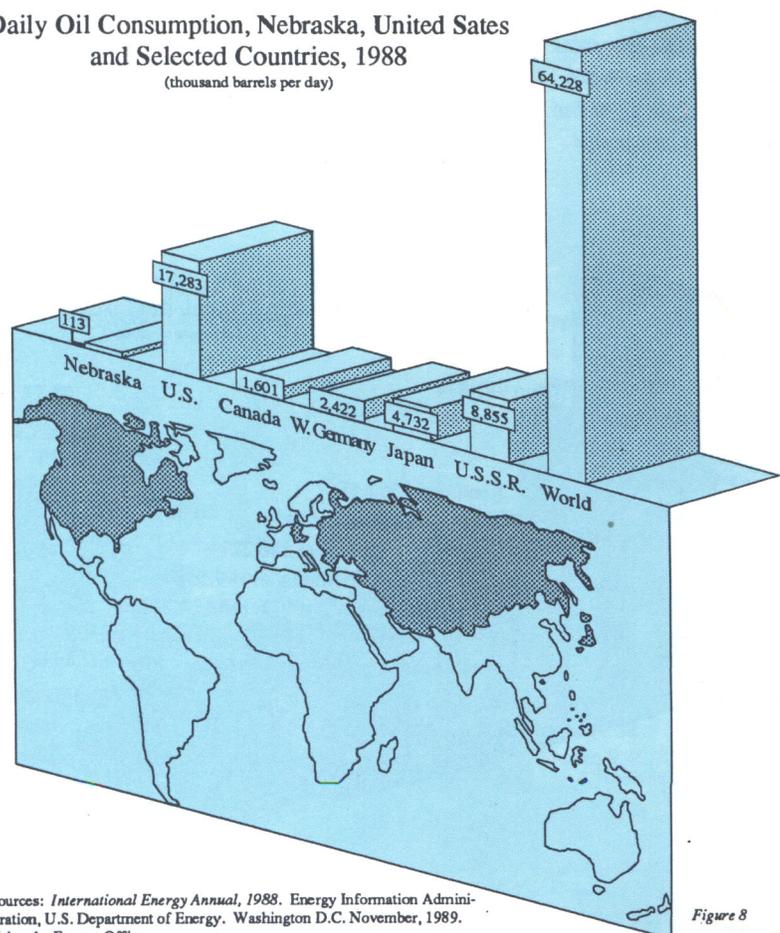
There is little doubt that rising imports are increasing the nation's vulnerability to energy supply disruptions and sharp price increases. The nation's current Strategic Petroleum Reserve—about 550 million barrels of oil—could be tapped to replace OPEC imports. But the reserve would provide a grace period of only a few months, and could not prevent price hikes if OPEC establishes control over world markets.

Behind the nation's growing dependence on imported oil is the decline in domestic crude oil production. U.S. oil fields, among the oldest in the world, are nearing exhaustion, and we simply cannot produce as much oil as we consume. With production from Alaska's Prudhoe Bay reaching its peak, total U.S. crude oil supplies are likely to continue sliding downward. In March, the Exxon

Valdez accident also highlighted the vulnerability of the nation's domestic oil supplies. The spill resulted in a 13 million barrel supply disruption over the next two weeks. Although the impact of the spill was most acutely felt on the West Coast, speculation about the impact of the accident affected the price of petroleum products in Nebraska.

National energy planning is receiving renewed attention from Congress and the Bush Administration. A national energy strategy is likely to address

Daily Oil Consumption, Nebraska, United States and Selected Countries, 1988
(thousand barrels per day)



Sources: *International Energy Annual, 1988*. Energy Information Administration, U.S. Department of Energy. Washington D.C. November, 1989. Nebraska Energy Office

Figure 8

Nebraska continues to be a major producer and consumer of ethanol (agricultural ethyl alcohol), which is used primarily to blend gasohol — a mix of 90 percent gasoline and 10 percent ethanol. In 1988, Nebraska ranked twelfth among the fifteen leading states in gasohol sales, with 258,073,000 gallons sold (see Figure 9). Of the other states in the North Central Region, only Iowa ranked higher than Nebraska in 1988 gasohol sales.

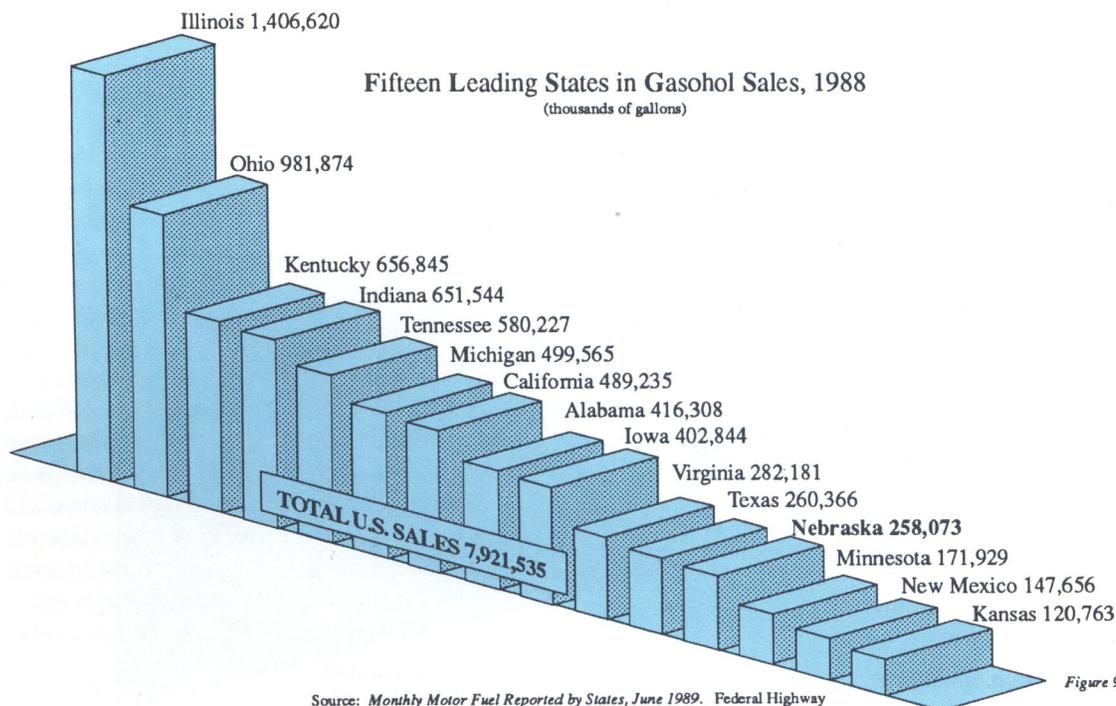
energy conservation, environmental protection, domestic petroleum exploration and production and alternate fuels. Also, many state energy offices are re-examining their readiness to respond to various energy emergencies. As part of this effort, the Nebraska Energy Office sponsored a workshop on energy emergency planning and preparedness. The workshop provided states in the region with information on the preparation of contingency plans.

ETHANOL AND ETBE

An intrinsic link exists between fossil fuel use and environmental concerns. Energy strategy and

policy must not only address issues of energy availability and energy security, but must also consider environmental factors related to the use of energy.

President Bush chose Lincoln, Nebraska as the site to announce proposed amendments to the Clean Air Act. These amendments would mandate the use of alternate fuels such as ethanol, methanol and natural gas to help meet air quality standards. Nebraska was an appropriate site for the President to announce these amendments since the state has been a leader in ethanol use and ethanol derivatives such as ethyl tertiary butyl ether, or ETBE. In fact, ETBE has emerged as a promising and effective



Source: *Monthly Motor Fuel Reported by States, June 1989*. Federal Highway Administration. U.S. Department of Transportation. Washington D.C. 1989.

fuel to reduce carbon monoxide and ozone pollution from automobiles while at the same time using our grain surpluses to produce this renewable fuel.

Ethanol fuel research is strongly supported in Nebraska, and funds for such research have been made available through the Governor's oil over-charge plan.

RECYCLING

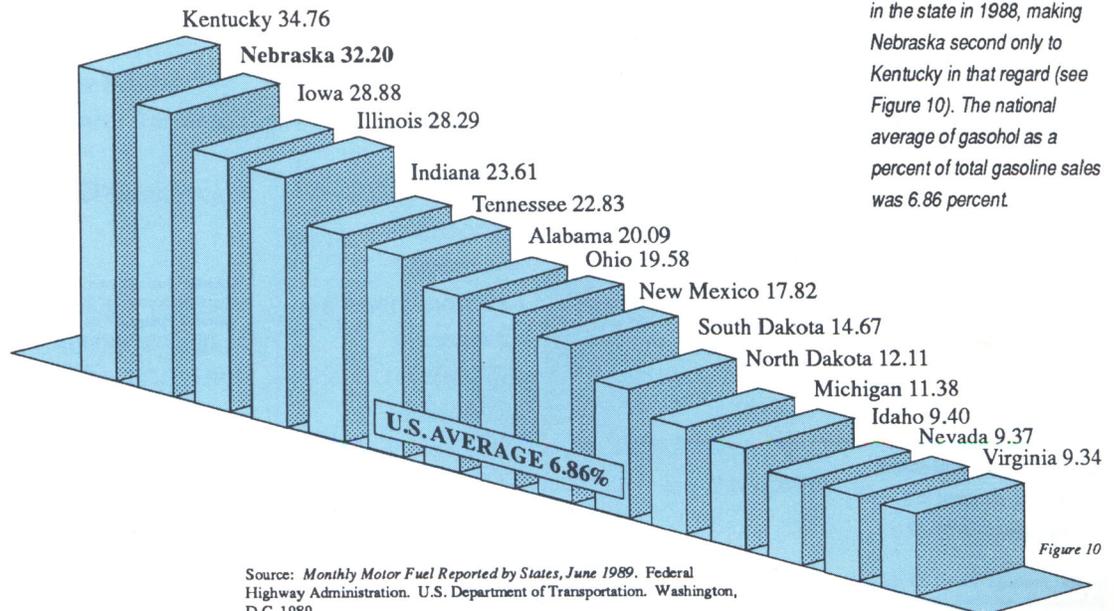
It is estimated that more than half of our garbage is reusable or recyclable; yet the nation recycles only ten percent of its garbage. This compares to a 50 percent recycling level in Japan and a 30 percent level in western Europe. In rural areas of this country, such as Nebraska, the percentage of garbage recycled is often much less than 10 percent due to the lack of facilities and distance to markets.

However, many communities in Nebraska are already involved in successful recycling programs. These communities recognize that recycling and other resource recovery techniques can turn solid waste into energy and recycled materials to meet our consumer needs. Recycling also continues to reduce our dependence on imported petroleum products and lessens the need for other—more costly—methods of managing our solid waste.

Recognizing that state government should set an example of good recycling practices, the Governor issued an executive order requiring state agencies to recycle and to purchase recycled paper. Through this initiative, state government will provide a strong example of recycling leadership.

As we move into the 90s, we must remain vigilant, ready to accept and respond to the changes

Sales of Gasohol as a Percent of Gasoline Sold, Fifteen Leading States, 1988



Source: *Monthly Motor Fuel Reported by States, June 1989*. Federal Highway Administration. U.S. Department of Transportation. Washington, D.C. 1989.

and challenges of the century's last decade. Energy will always be of serious concern to Nebraska. The challenge facing us is multi-faceted and demands a complex solution. Our reliance on external sources for energy supplies makes us more vulnerable to energy supply disruptions, especially in light of the still unpredictable Persian Gulf situation. Our current energy use practices threaten the safety of our environment. We must pursue energy policies and practices that help ensure our

energy future. In addition, we also must find ways to use energy to foster a strong economy and to preserve the environment.

The Nebraska Energy Office continues to work toward these goals—to make the most of opportunities that will allow us to meet and resolve the challenges of the 90s. This annual report describes the efforts of the Energy Office in 1988-89 to encourage development of reliable energy technologies, to disseminate information about efficient energy practices, to explore new ways of financing energy projects, to nurture partnerships that promote energy efficiency and to plan for a more efficient and cost-effective energy future.

Nebraska ranks 20th in total production among the nation's 31 oil-producing states. In 1988, 1,723 wells in 17 counties in Nebraska produced 5,978,429 barrels of oil, a decrease of 1.8 percent from 1987 production of 6,090,931 barrels. Current crude oil reserves were estimated at 50 million barrels as of December 31, 1988.

Source: *Nebraska Oil and Gas Commission Annual Report*, Nebraska Oil and Gas Commission. Sidney, NE. Annual.

Nebraska Oil Production 1987 and 1988
(barrels)

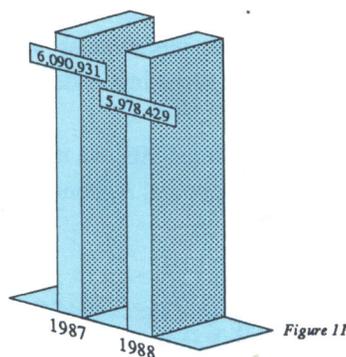


Figure 11

Nebraska's total natural gas production in 1988 amounted to 910,468 thousand cubic feet—a decrease of 27.8% from 1987 production levels of 1,260,540 thousand cubic feet. 1988 production was the lowest reported in Nebraska since natural gas production amounts were first recorded in 1950.

Nebraskan's paid \$4.46 per thousand cubic feet of natural gas in 1988, compared to a national average of \$5.49.

Source: *Nebraska Oil and Gas Commission Annual Report*, Nebraska Oil and Gas Commission. Sidney, NE. Annual.

Nebraska Natural Gas Production
1987 and 1988
(thousand cubic feet)

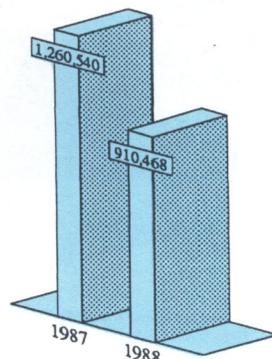


Figure 12

Nebraska Electricity Production, 1987 and 1988
(million kilowatt-hours)

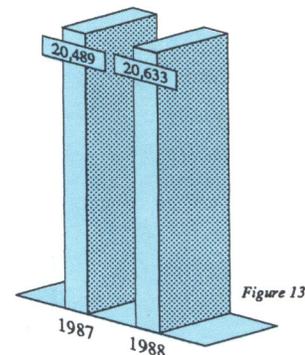


Figure 13

Sources: *International Energy Annual, 1988*. Energy Information Administration, U.S. Department of Energy. Washington D.C. November, 1989. Nebraska Energy Office.



Energy Projects Division

The Nebraska Energy Office is responsible for administering two federally-funded pro-

grams created under the Energy Conservation Act of 1975—the State Energy Conservation Program (SECP) and the Energy Extension Service (EES). Both programs let the state use its discretion in providing energy conservation services, but the Energy Office must submit annual program plans to the U.S. Department of Energy.

The Energy Projects Division manages SECP and EES programs. In general, agency staff run the programs directly. In some cases, the agency may work closely with outside contractors hired to perform the work. In 1988-89, this division was responsible for supervising:

- Federally Mandated Projects
- Oil Overcharge Projects (see pages 19-30 for a full description of projects receiving Petroleum Violation Escrow Funds)
- The Electrical Load Management Resource Fund
- The Agricultural Energy Conservation Project
- Other projects and studies

During calendar year 1988, SECP programs produced an estimated annual energy savings of 2.82 trillion Btus, which is equivalent to 22.5 million gallons of gasoline.

FEDERALLY-MANDATED PROJECTS

According to the Energy Conservation Act, the Energy Office must undertake projects in the spe-

cific areas of equipment procurement, vanpooling/ carpooling, lighting and thermal standards and right-turn-on-red. Since the Legislature adopted legislation allowing right turns on red

lights in Nebraska, the federal government has required no further action on this mandatory activity.

In 1987-88, the Energy Office formed a partnership with four Economic Development Districts — West Central, Panhandle Area, Southeast and Northeast — and the Metropolitan Area Planning Agency, to distribute four brochures it had developed in 1986-87. In 1988-89, the partnership continued to distribute brochures to appropriate county and community officials throughout the state. The brochures dealt with:

- Life Cycle Costing, encouraging civic officials to purchase more efficient equipment.
- Transportation, highlighting energy-saving transportation options available to Nebraskans.
- Street and Park Lighting, describing ways communities can increase the efficiency of such lighting without sacrificing illumination.
- Building Codes, explaining building code options available to municipal officials.

“SECP programs produced an estimated annual energy savings of ...22.5 million gallons of gasoline.”

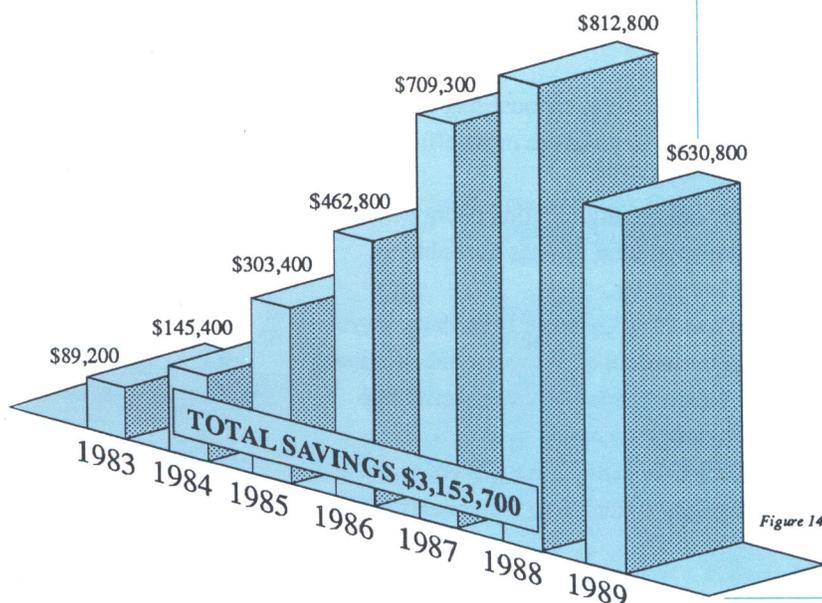
ELECTRICAL LOAD MANAGEMENT RESOURCE FUND

In 1983, the Energy Office created the Electrical Load Management Resource Fund with a \$50,000 grant to the Nebraska Municipal Power Pool (NMPP). On May 29, 1987, the two agencies executed a new contract to replace Section 155 Warner Amendment funds with *Exxon* funds. The Fund offers interest-free financing to NMPP-member communities to help them purchase load management systems. Load management systems allow utilities to reduce peak demand, thus saving energy and avoiding demand charges.

The Nebraska Municipal Power Pool made one loan in 1988-89. The City of Kimball received \$10,000 in early 1989 to upgrade the city's direct control management system.

Since the Electrical Load Management Resource Fund began in 1983, the initial \$50,000 grant has recycled itself almost five times as the communities repay the no-interest loans. Total savings since 1983 have amounted to over \$3 million — a significant return on the state and local investment. Figure 14 shows total power cost savings over the life of the programs initially supported by the Fund.

Annual Dollar Savings of Load Management Loan Fund Participants, 1983-1989



Annual Dollar Savings of Load Management Loan Fund Participants 1983-1989

Year of Loan	Member	Total Dollar Savings
1983	South Sioux City	\$663,500
1983	Wood River	\$199,800
1984	Beaver City	\$42,800
1984	Benkelman	\$85,900
1984	Broken Bow	\$175,100
1984	West Point	\$189,900
1985	Lexington	\$234,900
1985	North Platte	\$1,229,300
1985	Sutton	\$28,300
1986	Bridgeport	\$68,100
1986	Oxford	\$52,500
1986	Pierce	\$47,300
1986	Wilcox	\$18,200
1987	Callaway	\$15,300
1987	Wauneta	\$9,300
1988	Arnold	\$37,800
1988	Greenwood	\$4,300
1988	Burwell	\$21,700
1988	Lyons	\$29,700
1989	Kimball	\$0
TOTAL SAVINGS		\$3,153,700

Figure 14

Source: Nebraska Energy Office

THE AGRICULTURAL ENERGY CONSERVATION PROJECT

In 1983, the Nebraska Energy Office, in conjunction with the University of Nebraska-Lincoln Cooperative Extension Service, began a five-year project designed to encourage efficient use of energy, water and soil in the agricultural sector. During 1988-89, project activities focused on three areas: conservation tillage, ecofallow and irrigation water management. All program components seek to reduce soil erosion, on-farm fuel consumption, labor and energy requirements for crop production.

Conservation tillage, no-till and ecofallow systems reduce or eliminate tillage operations to leave at least 30 percent of the soil covered with residue, lessening erosion while saving fuel and labor. Irrigation management employs scheduling and improved pumping methods to save fuel and water.

Funding for the project comes from a variety of sources, among them state oil overcharge funds, the University of Nebraska Foundation and accumulated interest. Total financial support since the project began has amounted to \$1,228,879.

Over five years, producers in the project area have realized impressive savings:

- more than 3.3 million gallons of fuel
- over \$3 million in energy costs
- nearly 250,000 hours of labor
- over \$1.2 million in labor costs
- 9.3 million tons of soil

Producers who have been involved in the Agricultural Energy Conservation Project describe its positive impact:

“No-tillage farming definitely cuts down on the expense of planting...”

“We have completed no-till test plots on both soybeans and corn. We feel these tests have been beneficial in getting other farmers to adopt this

conservation practice because they see someone in their area making it work. No-tillage farming definitely cuts down on the expense of planting, elimi-

nates tillage passes across the field, cuts down on the man-hours spent and stops erosion.” (Lyle C. Thielfolt, Herman)

“The first few years I saw a reduction in the number of trips across the field and a real reduction in soil erosion during heavy rains. In 1989, with very little rainfall, I saw a yield advantage when comparing no-till to conventionally tilled fields.” (Randy Fisher, Adams, NE)

“Every spring I notice more and more farmers incorporating conservation tillage into their farming practices. Unfortunately, I do not believe the [project’s] work is done. This is just the beginning of the implementation of thousands of conservation plans that require the use of conservation tillage to maintain residue cover.” (Charles L. Meyers, Lyons)

Conservation Tillage

Seven counties — Wayne, Thurston, Burt, Washington, Johnson, Saline and Gage — were

involved in activities that promote conservation tillage, a highly cost-effective means of controlling soil erosion.

During the five-year program period, use of no-till practices increased three-fold and conservation tillage increased by over 20 percent. Residue management and reduced tillage saved 1.2 million gallons of fuel and 178,000 hours of labor, for a total dollar savings of about \$2 million. Soil erosion has been reduced by nearly 7.5 million tons.

Irrigation Water Management

This portion of the project led to improved irrigation management practices in Buffalo, Holt and Antelope counties.

Irrigation scheduling has reduced water application and energy requirements by 8.9 percent. More efficient pumping plants have used 4.2 percent less

energy for pumping. These improvements have been adopted on 172,500 acres, saving about 1.7 million gallons of diesel fuel, or over \$1.5 million in energy costs.

Ecofallow

Winter wheat crop rotations in Cheyenne, Garden, Deuel, Keith, Perkins, Chase and Lincoln counties were the focus of the ecofallow portion of the Agricultural Energy Conservation Project. Farmers were urged to use corn, sorghum or millet in rotation with wheat to increase yields without using irrigation.

Since the project began, more than 71,000 acres have been converted to ecofallow. Producers have saved more than 400,000 gallons of fuel and 68,000 hours of labor, for a total dollar savings of \$700,000. In addition, soil erosion has been reduced by nearly 2 million tons.

ENERGY SHORTAGE MANAGEMENT AND EMERGENCY PREPAREDNESS

During 1988-89, Nebraska continued contingency planning and energy emergency preparedness activities. A technical assistance grant from the U.S. Department of Energy (DOE) enabled Nebraska to sponsor an energy emergency preparedness seminar for Region VII states.

Contingency Planning

During 1988-89, Nebraska continues to develop strategies for dealing with a potential energy crisis. Nebraska's Energy Shortage Management Plan Advisory Committee developed recommendations

Agricultural Energy Conservation Projects by County

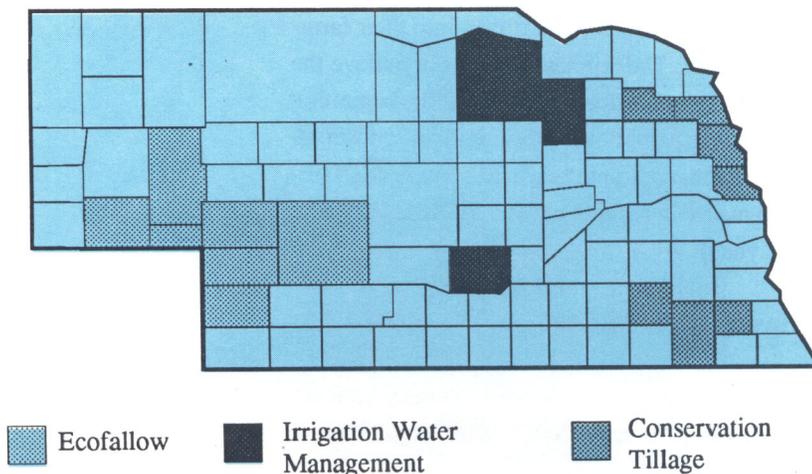


Figure 15

Source: Nebraska Energy Office

for managing petroleum product shortages. The Shortage Management Plan will incorporate those recommendations as well as strategies for managing natural gas and electricity shortages. The plan was released in December 1989.

An implementation network of representatives from local energy suppliers, local governments, emergency services, other state agencies, agriculture and business is being formed to help coordinate the shortage management process outlined in the plan in case of an energy crisis. The network is to be complete and in place in 1990.

Federal-State Coordination of Emergency Preparedness Activities

Nebraska was selected to serve on DOE's Office of Energy Emergencies Steering Committee, as part of a federal initiative to support federal and state cooperation in the event of an energy emergency. In addition, Nebraska was asked to host DOE's annual regional seminar for Iowa, Kansas, Minnesota, Missouri, North Dakota and South Dakota, to be held in July, 1989.

Technical Assistance Grant

The Department of Energy awarded the Nebraska Energy Office a \$10,180 technical assis-

tance grant to plan and sponsor two regional meetings with adjacent states (Iowa, Kansas and Missouri). The seminars are intended to stimulate interstate cooperation and information exchange for dealing with energy shortages and emergencies.

“Nebraska’s Energy Shortage Management Plan Advisory Committee developed recommendations for managing petroleum product shortages.”

The first seminar was held in November, 1988. Representatives of the petroleum, electric utilities and natural gas industries pre-

sented information on the structure of their industries within the four states and explained how they manage supply disruptions. Staff members from energy offices in California and Oregon made presentations on their states contingency planning and interstate coordination efforts.

The second seminar is planned for July, 1989 and will focus on energy management in the transportation sector, recent fuel shortages in the midwest, coordination with other agencies, and the ramifications of contingency planning implementation occasioned by the Exxon Valdez oil spill.

Management of Petroleum Product Shortages in Spring 1989

Wholesale level outages of diesel fuel and some grades of gasoline occurred at various pipeline terminals throughout the state in the spring of 1989. Although spot outages of diesel fuel in the

spring are not uncommon, the 1989 outages were more numerous and longer lasting than those of previous years and new diesel fuel supplies coming into the state were quickly exhausted. The situation was critical because of farmers' dependence on diesel fuel for spring planting.

When the Energy Office received word in April of the potential crisis, contingency planning staff contacted refiners, pipeline companies and distributors to ensure that no outages would occur at the retail level. Representatives of these groups met with agricultural producers in May to discuss the factors that led to the outages and to identify ways to confine shortfalls to the wholesale level.

The outages resulted from a combination of factors:

- Due to the drought, farmers were using more diesel fuel than usual for pre-planting irrigation.

As a result, refiners had no chance to rebuild inventories as they normally do during spring rains.

- The price of diesel fuel was lower in Nebraska than in adjacent states, causing distributors in Colorado to drive to Doniphan, Nebraska, to purchase product.

- Refiners were producing more gasoline than diesel fuel, due to a pronounced spread in base price favoring gasoline.

“...the 1989 outages were more numerous and longer lasting than those of previous years...”

- One of two pipelines serving Nebraska was undergoing hydrostatic testing, impeding the transportation of sufficient amounts

of diesel fuel to meet the demand.

Prompt response to the outages prevented serious crises, keeping shortfalls on the wholesale level. The Energy Office continues to monitor the situation, maintaining weekly contact with the pipelines.

Petroleum Violation Escrow Funds

Nebraska has been receiving oil overcharge funds since 1982, as a result of various court actions against oil companies that overcharged their customers from 1973 through 1981 when federal price controls were in effect. The courts ordered the oil companies to distribute award money to the states to fund programs that provide indirect restitution to injured energy consumers. In addition, in 1987, the U.S. Department of Energy began a program of direct restitution to consumers who had been injured by overcharges.

Because oil price control violations affected so many unidentified injured consumers, the courts distributed oil overcharge funds to the states on behalf of consumers. States were directed to use the money, within parameters established by the courts, to fund energy assistance and conservation programs.

A summary of the *Exxon*, *Stripper Well* and *Diamond Shamrock* funds as of December 31, 1989, is illustrated in Figure 16.

EXXON GRANTS

Exxon funds are used to finance projects that promote energy education and conservation. The Energy Projects Division administers the contracts under the State Energy Conservation Program and Energy Extension Service. Figures 17 and 18 list expenditures by category of all *Exxon* and

Stripper Well funds through December 1989. Figure 19 indicates the groups that have been approved for *Exxon* grants and the types of projects they have proposed.

Projects Underway

As of December 1989, the following *Exxon* projects had been negotiated and are in various stages of completion.

Summary of *Exxon*, *Stripper Well* and *Diamond Shamrock* Oil Overcharge Funds

(December 31, 1989)

	<i>Exxon</i>	<i>Stripper Well</i>	<i>Diamond</i>	Total
Total Received	\$15,504,944	\$9,119,780	\$359,172	\$24,983,896
Interest Earned	4,906,266	1,795,958	90,520	6,792,744
Total 12-31-89	<u>\$20,411,210</u>	<u>\$10,915,738</u>	<u>\$449,692</u>	<u>\$31,776,640</u>
Less Budgeted:				
Contracts	\$4,309,004	\$2,500,000	\$0	\$6,809,004
Program Development	107,411	0	6,434	113,845
Monitoring/Evaluation	305,000	0	0	305,000
Education	26,829	0	0	26,829
Load Management	50,039	0	0	50,039
Attorney General Legal Fees	0	195,472	0	195,472
Bank Wire Fees	0	53	0	53
Low Income Weatherization	910,000	619,584	0	1,529,584
Emergency Preparedness	95,000	0	0	95,000
Oil Overcharge Administration	0	0	430,758	430,758
Direct Restitution Project	0	0	12,500	12,500
Governor's Overcharge Plan	\$12,970,000	\$4,270,000	0	\$17,240,000
Subtotal	<u>\$18,773,283</u>	<u>\$7,585,109</u>	<u>\$449,692</u>	<u>\$26,808,084</u>
Uncommitted Balance	<u>\$1,637,927</u>	<u>\$3,330,629</u>	<u>\$0</u>	<u>\$4,968,556</u>

Figure 16

Source: Nebraska Energy Office

Energy Education

Nebraska Council on Economic Education

(NCEE) completed the second of its three-year contract to promote energy education in schools across Nebraska. NCEE made over thirty presentations to teachers and students, distributed over 3,000 informational brochures and responded to over 1,800 requests for energy education materials. A twice-yearly newsletter highlighting current energy/economics issues and describing the services of the Office of Energy Economic Education was published and distributed to 5,000 teachers throughout the state. The Council, in cooperation with the National Energy Foundation, completed and distributed the Energy Education Activities book and junior/senior high school curriculum guide. A statewide National Energy Education Development (NEED) effort was coordinated. A Nebraska elementary school placed second in the national NEED project competition.

Exxon funds for the project amounted to \$98,633.

Central Community College purchased an MCA 3000 Sun Modular Computer Analyzer. At 24 workshops held at schools throughout the state, high school automotive students were taught to use the special diagnostic equipment to improve energy efficiency in automobiles. Several public demonstrations were scheduled throughout the summer before the equipment returned to the schools in the fall.

<i>Exxon Contracts</i>			
Category	Allocated Funds	Contracts Issued	Expenditures Through 12-31-89
Energy Education	\$726,953	\$726,953	\$456,768
Financing Demonstrations	1,100,164	1,100,164	749,434
Agriculture	327,234	327,234	102,896
Feasibility Studies	120,612	120,612	93,827
Building Improvement Demonstration	849,261	849,261	102,896
Transportation	700,000	500,000	500,000
Residential Farm & Ranch, Small Business, and Local Government Revolving Loan Program	10,000,000	0	0
Low Income Weatherization	\$3,680,000	\$910,000	\$503,463
Total Exxon Contracts 12-31-89	<u>\$17,504,224</u>	<u>\$4,534,224</u>	<u>\$2,509,284</u>

Figure 17
Source: Nebraska Energy Office

<i>Stripper Well Contracts</i>			
Category	Allocated Funds	Contracts Issued	Expenditures Through 12-31-89
Low Income Weatherization	\$1,489,584	\$619,584	\$619,584
State Buildings Energy Team	150,000	0	0
Local Government Energy Manager Circuit Rider	400,000	0	100,401
Public Transportation	800,000	500,000	
Energy Related Biotechnology, Solar and Conservation Outreach	2,000,000	2,000,000	0
Innovative Energy Grants	500,000	0	0
Indian Tribal Governments	50,000	0	0
University of Nebraska Building Weatherization	500,000	0	0
Nebraska State College System	\$1,500,000	0	0
Total Exxon Contracts 12-31-89	<u>\$7,389,584</u>	<u>\$3,119,584</u>	<u>\$719,985</u>

Figure 18
Source: Nebraska Energy Office

Central Community College received \$40,332 in *Exxon* funds to implement the project and will provide an in-kind match of \$8,704.

Auburn Public Schools developed a residential energy audit and weatherization program for Auburn High School's industrial arts students. The curriculum includes training in energy auditing, energy management and conservation, residential, construction and weatherization materials, safety and quality control. The program includes a minimum of two classes a year and a special six-week summer course during which students perform weatherization improvements on local homes. Throughout the school year, students also conducted energy audits on local residences.

The project is funded by a \$93,725 *Exxon* grant and a \$1,800 cash match and \$96,010 in-kind match from Auburn Public Schools.

Heartland Center for Leadership Development planned and delivered two workshops to teach business development professionals how to encourage energy management among small business owners. The Center also completed a computerized data base of energy management information and resources.

The contract was financed by \$68,377 in *Exxon* funds and a \$19,380 in-kind match from the Heartland Center. The project was completed in 1989.

Community Action of Nebraska (CAN) continued plans to train building contractors in tech-

“Two four-day training sessions were held at community colleges...”

niques for weatherizing mobile homes. A curriculum and a corresponding videotape were developed and CAN completed subcontract negotiations with the community technical colleges to deliver the training. A pilot test and a workshop schedule for the six community colleges were arranged. Two four-day training sessions were held at community colleges in Omaha, Milford, Hastings, Norfolk, North Platte, Sidney and Scottsbluff.

Exxon funds for the project amount to \$130,810. CAN has provided \$36,650 cash and a \$26,400 in-kind match.

Mid-Nebraska Community Services developed a residential weatherization contractor training program for displaced agricultural workers in central Nebraska. The training involved both classroom instruction and hands-on retrofitting experience. Five people completed the training program, auditing over seventy homes and weatherizing fourteen residences. Three students found jobs in the weatherization field after completing the course.

This project, completed in 1989, received an *Exxon* grant in the amount of \$126,010; Mid-Nebraska contributed a \$17,288 in-kind match.

Local Conservation Financing Demonstrations

South Sioux City Area Chamber of Commerce will lend up to \$10,000 at 4 percent interest to weatherize commercial buildings in South Sioux City. Loan funds are leveraged from local banks

Exxon Grant Projects by Category

Education

	Contract Total	Expenditures as of 12/31/89
Nebraska Council on Economic Education	\$98,633.00	\$64,425.36
Central Community College	40,332.00	24,786.38
Auburn Public Schools	93,725.00	40,849.97
Heartland Ctr. for Leadership Development	68,377.00	57,234.02*
Community Action of Nebraska	130,810.00	26,162.00
Mid-Nebraska Community Services	126,010.00	74,745.79
Central Nebraska Community Services	27,621.00	27,119.19*
Hoeger Communications	80,850.00	80,572.41*
Management Information Education Services	35,448.00	33,028.40*
Propane Gas Association of Nebraska	1,020.00	1,020.00*

Local Conservation Financing Demonstrations

South Sioux City Area Chamber of Commerce	138,664.00	132,539.50
Village of Stuart	161,500.00	97,614.89
City of Schuyler	200,000.00	182,405.60
City of Lincoln	350,000.00	318,292.97
Neighborhood Housing Services	250,000.00	18,581.00

Agricultural Projects

University of Nebraska Institute of Agriculture and Natural Resources, West Central Research and Extension Center	13,000.00	11,701.26
University of Nebraska Institute of Agriculture and Natural Resources, Department of Agronomy	40,000.00	7,258.88
University of Nebraska Institute of Agriculture and Natural Resources, Department of Agronomy	40,000.00	7,471.73
47 Ranch Company	47,575.00	31,385.23
University of Nebraska-Lincoln Institute of Agriculture and Natural Resources, Departments of Agricultural Engineering and Horticulture	186,659.00	45,078.91

Technical Assistance/Efficiency Studies

City of Bellevue Dock Board	100,000.00	67,500.00
City of Kimball	20,000.00	0.00
West Central Nebraska Development District	30,000.00	23,215.12*
Indian Center	5,720.00	3,112.17*

Public and Nonprofit Building Improvement Demonstrations

Northern Natural Gas Company	200,000.00	67,364.70
Jerry Berggren Architects and Associates	629,454.00	416,509.88
Northeast Nebraska Area Agency on Aging	16,307.00	15,387.99
St. Anselm's Church	3,500.00	2,630.95*

Transportation

City of Omaha Public Works Department	500,000.00	500,000.00*
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Load Management

Nebraska Municipal Power Pool	50,000.00	50,000.00
Totals	\$3,685,205.00	\$2,427,994.30

and participating banks have committed up to \$66,000 in capital over three years. Eight energy audits were conducted and four projects have been completed.

Exxon funds have provided \$138,664 to finance the project, together with \$66,000 cash and a \$2,200 in-kind match.

Village of Stuart will lend zero-interest funds for local commercial building weatherization and waste-heat recovery projects. Eighteen energy audits have been completed and five projects totaling \$78,750.52 were funded.

Exxon funds for the project total \$161,500. The Stuart Electrical System provided \$36,000 in matching funds as loan principal and the Village has pledged a \$9,258 in-kind match.

City of Schuyler, through the Schuyler energy Commission, will lend money at 3.6 percent interest to weatherize local commercial, non-profit and government buildings. Three local banks each committed \$66,500 for loan principal. Eleven energy audits have been completed. Four loans totaling \$67,824.31 were approved. Work on three projects has been completed, and work on a fourth project is partially complete.

The project is financed by \$200,000 in *Exxon* funds, \$199,500 in matching cash and a \$19,916 in-kind match.

City of Lincoln began operating an interest buy-down program to reduce interest rates to three percent on loans for weatherizing residential or mixed-use buildings. A local utility provides energy

* Projects Completed

Source: Nebraska Energy Office

Figure 19

auditing services. Homeowners continue to make application for loans. Twenty-six loans totaling \$78,891.03 have been approved.

Exxon funds provided \$350,000, the City of Lincoln will provide a \$450,000 cash match (arranged through NIFA — the Nebraska Investment Finance Authority) as well as a \$90,724 in-kind match.

Neighborhood Housing Services, Inc. began a revolving loan program to provide low-interest weatherization funds to property owners unable to obtain credit from conventional lending sources. Loan funds will be available at a variable interest rate based on the borrower's income and monthly debt-to-income ratio.

Project funds are provided by an *Exxon* grant of \$250,000 and a \$22,953 in-kind match.

Agricultural Projects

University of Nebraska - West Central Research and Extension Center replaced its greenhouse's corrugated fiberglass roofing with double-skinned plastic, which is less opaque and has a higher R-value. The new roof has increased the amount of available light and has reduced furnace use. Since making improvements, fuel consumption is averaging 35.4 percent less than annual consumption in the previous four years. Improved growing conditions have allowed the crop research specialist to grow additional test seed crops. As a result, the time between lab testing and

farmer use of such crops may decrease by three to five years.

Exxon funds provided \$13,000 for the project. The contractor provided \$9,100 cash and an in-kind match of \$17,436.

University of Nebraska's Department of Agronomy conducted a strip and relay cropping project that demonstrates the energy savings potential of alternating crop types in a field from year

“As a result, the time between lab testing and farmer use of such crops may decrease by three to five years.”

to year and growing more than one type of crop in a field at the same time. Alternating grasses and legumes with crops like corn increases the amount of nitrogen in the soil, thus reducing the need to apply additional nitrogen.

Twenty-four farmers throughout Nebraska developed plans and planted demonstration fields. Despite growth-inhibiting drought conditions, the project has produced encouraging results. Soil sample analysis and extension activities continue.

Exxon funds provided \$40,000; UNL made an in-kind match of \$66,940.

University of Nebraska's Department of Agronomy also sponsored a crop rotation project to demonstrate ways of increasing nitrogen in the soil, to reduce the need to apply synthetic nitrogen.

Twenty-five farmers from Nebraska are cooperating in the project. Agronomists took deep soil samples from fields which rely on legumes and manure for nitrogen. Nitrogen application rates

were compared to the nitrogen content in previously collected soil samples. An estimated 1.2 billion Btus were saved by reducing per acre nitrogen applications by 58 pounds, while yields decreased by only one bushel of corn per acre. Results were used to determine appropriate nitrogen application rates. Sample analysis and demonstration activities, including the successful "Neighbor-to-Neighbor" tours, continued.

Exxon funds for the project amounted to \$40,000; UNL provided \$500 cash and a \$68,940 in-kind match.

47 Ranch Company continued a project to utilize photovoltaic-powered water pumps and electric fencing to manage cattle grazing patterns and optimize range use. Wells, pumps and water tanks have been installed and monitoring of the energy output of the photovoltaic cells continues. Solar electric fencing has been installed and is working well.

Funding for the project comes from a \$47,575 *Exxon* grant and 47 Ranch Company's \$5,474 planned in-kind match.

University of Nebraska's Departments of Agricultural Engineering and Horticulture used *Exxon* funds to develop a computerized greenhouse management system. The system includes equations for computing optimal energy/temperature controls and structural design and a database that Nebraska greenhouses can use to minimize energy use and increase plant production. The program also uses degree-day technology to pre-

dict annual fuel requirements and a present-value equation to analyze cost savings.

Greenhouses in four locations were renovated based on computer recommendations. Data collection and monitoring continue to correlate existing environmental conditions, growth responses and energy usage.

Exxon funds covered \$186,637 of the project's costs; UNL provided a \$212,759 in-kind match.

Technical Assistance/Efficiency Studies

City of Bellevue Dock Board studied the feasibility of building a waste-to-energy facility in Bellevue, to serve the Douglas-Sarpy County area. The engineering firm hired to conduct the study

has completed its report which 1) assessed the type and amount of waste produced in the area; 2) discussed the possibility of converting the Kramer electric generating plant (owned by NPPD — Ne-

braska Public Power District) to burn the waste, and 3) explored types of plants which could be built. The report included recommendations as well as a solid waste disposal analysis and assessment of incineration alternatives.

Exxon funds provided \$100,000 for the project, Omaha Public Power District made a \$100,000 cash match and the contractor provided a \$9,983 in-kind match. The project was completed in 1989.

**"...Nebraska's
greenhouses can use to
minimize energy use and
increase plant
production."**

City of Kimball continued its end-use metering survey of electricity users in Kimball. The results of the study will be used to improve the efficiency of the electric system through load management and conservation measures. All metering equipment was installed and programmed. Data will be collected for one year and forwarded to the data analyst for evaluation.

Exxon funds finance \$20,000 of the project costs; another \$20,000 is provided by an in-kind match.

West Central Nebraska Development District

(WCNDD) completed an energy consumption study of the 18 counties around Ogallala, to determine the economic effects of the communities energy use. Results of the study were presented to 16 city councils of the 32 communities' belonging to the District. WCNDD staff continued to both help energy management committees identify conservation needs and solutions and draft community service materials for each area.

Exxon funds covered \$30,000 in project costs; the District provided a \$8,398 in-kind match. The project was completed during 1989.

Public and Nonprofit Building Improvement Demonstrations

Northern Natural Gas Company has continued a project to determine the potential energy savings of using natural gas to cogenerate electricity and hot water or steam in buildings in eastern Nebraska. Cogeneration projects at the Jewish Community Center and the Florence Home were

approved after engineering studies confirmed the feasibility of the projects. Design specifications were completed and the cogeneration equipment was installed.

The project is financed by \$200,000 in *Exxon* funds plus a \$300,600 cash and a \$34,400 in-kind match from Northern Natural Gas.

Berggren and Woll Architects continued the

“Cogeneration projects at the Jewish Community Center and the Florence Home were approved...”

Courthouse Trail program to demonstrate the savings potential of energy efficiency improvements in historically significant courthouses. Courthouses

in Antelope, Gosper, Hamilton, Kimball and Pawnee counties were selected to participate in the program. Unexpected asbestos removal in three counties temporarily delayed the project. However, all subcontract agreements were approved. Calculations of energy consumption and potential savings were completed. Construction is complete at Gosper, Hamilton, Kimball and Pawnee Counties.

Exxon funds financed \$629,454 in project costs. The counties provided \$166,669 in cash and the contractor has made an in-kind match of \$6,120.

Northeast Nebraska Area Agency on Aging is demonstrating the energy savings potential of high-efficiency furnaces and air conditioners. Inefficient equipment has been replaced in the Senior Centers in Randolph, Pierce, Stanton and Decatur. *Consumption data continued to be collected and analyzed.*

Costs of the project are covered by \$16,307 in *Exxon* funds plus the Agency's cash match of \$3,850 and in-kind match of \$1,000.

St. Anselm's Church in Anselmo installed blown-in cellulose insulation in the attic of the church's vaulted ceiling. In addition, the crawl space was insulated, ceiling vents were closed off to reduce energy use in the church and water-source heat pumps were installed. The consumption data collected did not reveal remarkable savings; however, church officials indicated that, due to decreased fuel costs, St. Anselm's Church now operates year-round.

Exxon funds provided \$3,500 for the project, St. Anselm's provided a \$1,875 in-kind match and parishioners donated labor. The project was completed in 1989.

Transportation

Omaha Public Works Department installed traffic signal synchronization equipment and computerized signal timing patterns at 125 intersections. The work reduced traffic stops, delays and idling time making traffic flow more efficient. During the first few weeks of operation, traffic officials estimated that driving delay was reduced by 39 percent, stops decreased by 37.7 percent and fuel consumption was down by 9.7 percent. The system saves an estimated 1.8 million gallons of gasoline annually. The City plans to expand the system to include all Omaha intersections.

Exxon funds financed \$500,000 of total project costs; the contractor has made a \$228,861 match.

GOVERNOR'S OIL OVERCHARGE PLAN

"The system saves an estimated 1.8 million gallons of gasoline annually."

The Nebraska Energy Settlement Fund was established by the Legislature for money paid to Nebraska since March 6, 1986, from awards or allocations to the State in oil overcharge cases. The balance in the Fund as of October 31, 1988 (including interest), was approximately \$22 million (\$14.6 million in *Exxon* funds and \$7.6 million in *Stripper Well* funds). The Governor submitted a plan for disbursement of the Nebraska Energy Settlement Fund to the Legislature in January 1989.

Three criteria were used for selecting programs to include in the plan: as many Nebraskans as possible should be able to share benefits; restitution should be based on actual consumption patterns during the period of price controls; and geographic distribution of benefits should be equitable among all income levels.

The Governor's Plan identified twelve projects for sharing disbursements from the Nebraska Energy Settlement Fund, as well as a reserve fund. The projects selected are described here.

Demonstration Loan Program

Ten million dollars in *Exxon* funds would support this project, intended to demonstrate how local lending institutions' funds would be leveraged with oil overcharge funds. The project would

provide low-cost financing for energy conservation improvements in four sectors: residential, local government, small business and farms and ranches. Local institutions would make loans at prevailing interest rates, but rates to borrowers would be lowered by using oil overcharge funds to form a fifty percent loan participation pool.

State Buildings Energy Team

\$150,000 in *Stripper Well* funds would finance the State Buildings Energy Team, managed through the 309 Task Force. The team would help building operators in state agencies and colleges identify needed building improvements, train building

Governor's Oil Overcharge Plan

Exxon

	Authorized Funding	Expenditures as of 12/31/89
Residential, farm and ranch, small business and local government revolving loan program	\$10,000,000.00	\$0.00
Low Income Weatherization Assistance Program	3,680,000.00	503,462.90
Rural Revitalization: Public Transportation	200,000.00	0.00
Planning, Evaluating and Monitoring Oil Overcharge Programs	200,000.00	45,433.93
Emergency Preparedness	95,000.00	12,685.42
Reserve Fund	380,000.00	0.00
Subtotals	\$14,555,000.00	\$561,582.25

Stripper Well

State Buildings Energy Management Team	150,000.00	0.00
Local Government Circuit Rider Program	400,000.00	0.00
Low Income Weatherization Assistance Program	870,000.00	0.00
Rural Revitalization: Public Transportation	800,000.00	100,401.10
University of Nebraska — Energy-related Biotechnology, Solar and Conservation Research	2,000,000.00	0.00
Innovative Energy Grants	500,000.00	0.00
Indian Tribal Governments	50,000.00	0.00
University of Nebraska Building Weatherization	500,000.00	0.00
Nebraska State College Building Weatherization	500,000.00	0.00
Wood Projects at Peru and Chadron State Colleges	1,000,000.00	0.00
Reserve Fund	900,000.00	0.00
Subtotals	\$7,670,000.00	\$100,401.10

Governor's Oil Overcharge Plan

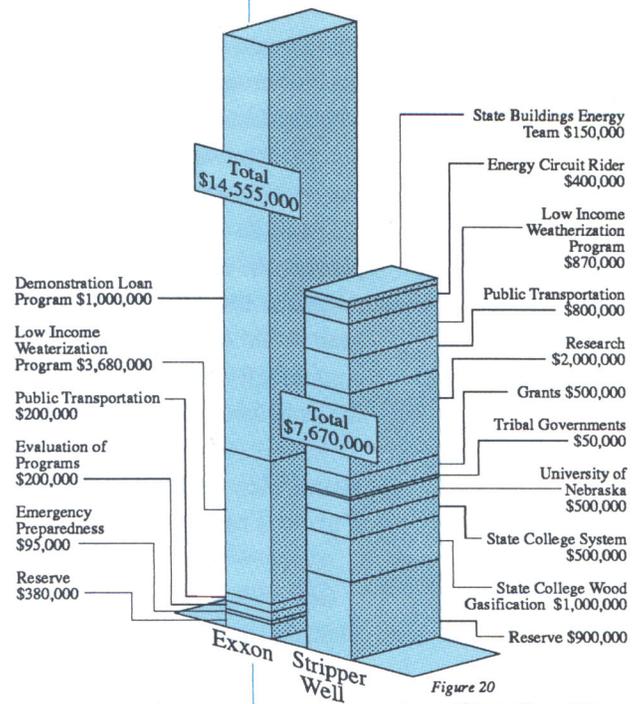


Figure 20
Source: Nebraska Energy Office

managers in proper energy management techniques and solve budgetary problems associated with financing energy improvements.

Local Government Energy Management Circuit Rider

Stripper Well funds would provide \$400,000 in support of a two-year pilot project to provide technical assistance to cities, counties, school districts, hospitals, community colleges and nursing homes. The circuit rider would help local jurisdictions identify needed energy improvements, track energy consumption and perform energy audits.

Low-Income Weatherization Program

A total of \$4.55 million in oil overcharge funds (\$3.68 million from *Exxon* and \$873,192 from *Stripper Well*) would be used to assist low income Nebraskans with residential weatherization to improve efficiency and reduce energy costs.

\$3.3 million would be used over three years to supplement the existing Low-Income Weatherization Program. Over the next five years, \$250,000 per year would be allocated to the Omaha Housing Authority for purchasing weatherization materials for its housing rehabilitation program.

Rural Revitalization: Public Transportation

One million dollars (\$200,000 from *Exxon* and \$800,000 from *Stripper Well*) would support a program to provide transportation for the handicapped, elderly and other residents of rural areas. \$500,000

would be used to purchase new energy-efficient or alternate-fuel-powered buses. Another \$500,000 would provide subsidies to intercity buslines that would otherwise have to discontinue service. The Department of Roads would administer the program.

Energy-Related Research

The University of Nebraska would receive a \$2 million grant from *Stripper Well* funds to support biotechnological, solar and conservation research. The University would be required to match the grant with private sector contributions.

Innovative Energy Grants

\$500,000 in *Stripper Well* funds would provide grants to citizens for research and/or development of innovative energy-related projects. The Energy Office would work with the University of Nebraska's Technical Assistance Center to develop criteria for project selection.

Planning, Evaluating and Monitoring Oil Overcharge Programs

\$200,000 in *Exxon* funds would be used to meet the federal requirement for evaluating and monitoring projects supported by oil overcharge funds. Over the next two years, the State Energy Conservation Program would be responsible for planning, evaluating and monitoring Nebraska Energy Settlement Fund projects.

“...support a program to provide transportation for the handicapped, elderly and other residents of rural areas.”

Emergency Preparedness

\$95,000 in *Exxon* funds would be used for staff and other costs required to maintain Nebraska's mandatory energy shortage management plan through June 30, 1992.

Indian Tribal Governments

The *Stripper Well* agreement requires the state to provide an equitable share of funds to Indian tribal governments. Based on their representation in the general population, Native Americans would receive \$50,000 in *Stripper Well* funds for energy programs through contracts with the Nebraska Indian Commission.

University of Nebraska Building Weatherization

The University of Nebraska would receive \$500,000 in *Stripper Well* funds to increase energy efficiency and conservation in its buildings.

Nebraska State College System

The State College System also will receive \$500,000 in *Stripper Well* funds to finance energy conservation projects in buildings on any of its campuses.

State College Wood Gasification Projects

An additional \$1 million in *Stripper Well* funds will support proposed wood gasification research at Chadron State and Peru State Colleges.

Reserve Fund

A total of \$2.28 million (\$380,000 from *Exxon* and \$1.9 million from *Stripper Well*) would be held in reserve to fund alternative programs, deal with unanticipated energy needs or supplement programs participating in the oil overcharge plan.

“Native Americans would receive \$50,000 in *Stripper Well* funds for energy programs...”

MISCELLANEOUS PROJECTS

Conservation Outreach

Mid-Plains Community College developed a statewide computerized energy management system training program for maintenance personnel. The program combines classroom instruction and use of portable automated building control models to provide energy management information and to simulate applications. Mid-Plains designed and contracted the computerized training units, developed the instructional curriculum and held two instructor training sessions. Courses will be offered at six community colleges.

The Conservation Outreach Project is funded by \$91,244 in *Amoco* oil overcharge funds and \$7,062 of Section 155 funds.

BERT Loan Program

The Omaha Benson was one of the original participants in the Community Energy Management Program, which was initially financed with oil overcharge funds. The Benson Energy Resource Team (BERT) incorporated in 1986 and established a revolving loan program to help householders finance energy efficient home improvements.

Progress has been slow because the administrator hired by the community-based volunteer group which had been overseeing the loan program moved out of state. Preliminary discussions have been held with the business owners in Omaha's Benson neighborhood, to find a local business organization willing to administer a revamped program offered to both the business and residential sectors of the area.

The Omaha Benson neighborhood was one of the last participants in the Nebraska Community Energy Management Program (NCEMP), which was initially financed with Section 155 oil overcharge funds. As an outgrowth of NCEMP, the Benson Energy Resource Team (BERT) incorporated in 1986 and established a revolving loan program with \$90,000 in Amoco oil overcharge funds received through a grant from the Energy Office to help householders finance energy efficient home improvements.

Direct Restitution

Consumers who purchased oil products between August 13, 1973, and January 27, 1981, were

eligible to apply for a share of the \$80 million set aside to provide direct restitution to those injured by overcharges. DOE established a refund standard of \$8 for each 10,000 gallons of petroleum products purchased during the overcharge period. The Nebraska Energy Office provided information through newspaper, television and radio publicity detailing how and where to file claims with the Department of Energy before the December 31, 1987, deadline.

Nebraskans led the nation with 5,714 refund claims, documenting purchases of 2.6 billion gallons of petroleum products and representing a total of \$2,080,000 in restitution payments.

“If DOE approves the claim, it would result in a \$204,000 refund to the state.”

As of March 27, 1989, DOE had approved 75% of the claims filed in Nebraska — covering 1,002,991,021 gallons of petroleum products, or 38% of the total volume of documented purchases. Only four claims had been denied.

Refunds totaled slightly more than \$802,000, at a rate of \$8 per 10,000 gallons. Additional payments are expected to increase the awards for these claims as DOE collects additional overcharge funds.

The Energy Office filed a claim on behalf of the state government of Nebraska for purchases of 255,589,981 gallons of petroleum products. If DOE approves the claim, it would result in a \$204,000 refund to the state.



Weatherization Division

The Weatherization Division administers the Low Income Weatherization Assistance Program—a federally-mandated program for weatherizing homes to save money and energy. The Energy Office is responsible for inspecting about 35 percent of the homes that are weatherized and for monitoring and auditing the subgrantees — primarily community action agencies which actually make the home weatherization improvements.

program for weatherizing homes to save money and energy. The Energy Office is responsible for inspecting about 35 percent of the homes that are weatherized and for monitoring and auditing the subgrantees — primarily community action agencies which actually make the home weatherization improvements.

“...funding...was approximately 9.7 percent (or \$367,083) higher than funding in 1987-1988.”

Community Services. The projects are intended to help the Energy Office develop an implementation strategy for incorporating blower door technology into the 1990 program.

Blower doors are large fans set within frames that can be fitted snugly into outside doorways. With the fan blowing air outward, air pressure within the house is reduced and outside air infiltrates through cracks and holes. The blower door artificially creates the conditions under which infiltration normally occurs within a house. It can locate air movements and pinpoint the locations and magnitude of air leaks in the building shell.

WEATHERIZATION ASSISTANCE PROGRAM

In fiscal year 1988-1989, total funding for the program was \$4,162,592. The Department of Energy’s Low Income Weatherization Assistance Program provided a total of \$2,137,308 and the Low Income Home Energy Assistance Program through the Nebraska Department of Social Services, supplied a total of \$1,433,493. *Stripper Well* petroleum violation escrow funds contributed \$468,398 and \$123,393 came from *Exxon* petroleum violation escrow funds. As figure 21 shows, 1988 and 1989 funding for the Weatherization Assistance Program was approximately 9.7 percent (or \$367,083) higher than funding in 1987-1988.

Pilot Projects

Three subgrantees are engaged in ongoing blower door pilot projects: Central Nebraska Community Services, Lincoln Action Program and Panhandle

Low Income Weatherization Assistance Program Investments 1987-1988 and 1988-1989

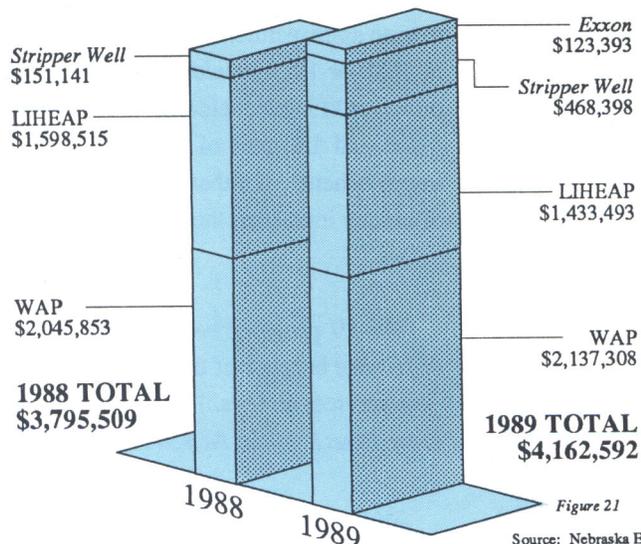


Figure 21
Source: Nebraska Energy Office

Number of Homes Weatherized

A total of 2,292 homes were weatherized in fiscal year 1988-89. In keeping with the agency's priority to serve Nebraska's elderly community through the Low Income Weatherization Assistance Program, the Weatherization Division weatherized 781 elderly households, or 34.1 percent of all the homes weatherized during that period.

Home improvements made through the program saved Nebraskans a total of \$247,536 in avoided energy costs during 1988-89. That translates to an average of \$108.00 per household.

Home energy improvements result in an average year-to-year return of 6.0 cents on the dollar. Fluctuations in first year return are generally due to changing labor and materials costs.

The home improvements represent a one-time investment that will most likely yield a rate of return for at least twenty years. Thus, the rate of return on an investment made in 1988 or 1989 would return over 119 percent for the functional lifespan of the improvements. If either energy prices or the value of money increases, the rate of return also will increase.

1988-89 program beneficiaries have noticed a difference because of the program, as reflected in post-service surveys. The following comments came from Lincoln Action Program clients:

"...thank you very much. I would have froze my behinder off this winter if not for you."

"I was very pleased with the work. It changed how cool my house became as each job was done."

"My father was very pleased to have this work done as his heating and cooling bills have been terrible. We can already tell the difference."

"I have already noticed an improvement in the apartment for conserving heat. Also no drafts are coming under my door or through the sides of my windows."

Inter-Tribal Development Corporation as Subgrantee

The Nebraska Indian Inter-Tribal Development Corporation, which serves Native American clients on the Omaha, Santee Sioux and Winnebago Reservations, became a new subgrantee in April of 1988. Inter-Tribal has completed two contracts, one through DOE's Low Income Weatherization Assistance Program and the other through the Low Income Home Energy Assistance Program. The Energy Office provided technical and administrative assistance for both projects.

Omaha Housing Authority Project

Under a cooperative arrangement with the Omaha Housing Authority (OHA), the Energy Office

"...the rate of return on an investment made in 1988 or 1989 would return over 119 percent..."

provides funds for purchasing weatherization materials and OHA contributes funds for installing them. Through the Weatherization Trust, Inc., NEO's Douglas County subgrantee, the Energy Office provides the Omaha Housing Authority with \$250,000 annually for purchasing replacement windows, caulking, weatherstripping and ceiling insulation. In turn, the Omaha Housing Authority uses federal rehabilitation funds to pay for the labor to install these materials.

During 1988-89, 208 Omaha Housing Authority units in north Omaha were weatherized.

Regional Technical Working Group

In September 1988, the Energy Office received a second \$10,000 training and technical assistance grant from the U.S. Department of Energy to assist in planning future regional approaches to customized energy auditing and moisture control and venting. A regional technical meeting for weatherization program staff from Nebraska, Iowa, Kansas and Missouri was planned for July 1989 in Lincoln.



Energy Financing Division

The Energy Financing Division administers these state and federal programs that fund the weatherization of homes, schools and hospitals: the Nebraska School Weatherization Program, the Institutional Conservation Program and the HUD (Housing and Urban Development) Solar Bank. The Division also administers funds for energy studies and technical assistance and oversees the Municipal Natural Gas Revolving Loan Fund (see page 39 for more information on the Municipal Natural Gas Regulation Revolving Loan Fund).

All these programs are designed to reduce the cost and use of energy in buildings — and they reflect sound public policy. During the time these programs have been in existence, Nebraskans have saved millions of dollars through more efficient use of energy resources.

NEBRASKA SCHOOL WEATHERIZATION PROGRAM

In 1981, the Nebraska Legislature created the School Weatherization Program — the first ongoing state-supported program to weatherize K-12 public schools. The program originally awarded grants for energy conservation building improvements to participating schools. In 1985, the program began making Technical Assistance grants of

up to \$2,500 to pay for energy studies on school buildings. In 1986, the School Weatherization Program became the Nebraska Energy Efficiency School Loan Program, and its format changed from grants to no-interest loans. The agency began making loans in December of that year.

“...Nebraskans have saved millions of dollars through more efficient use of energy resources.”

The program is funded through the state severance tax on natural gas and oil. Since its beginning and until the end of the grant pro-

gram, the program has supported projects in 1,066 school buildings, representing a total investment of \$17,287,825. The investment has generated an average return of \$5,841,525 per year, in energy cost savings.

Energy Office staff review applications for technical assistance grants and energy improvement loans, conduct technical reviews of the planned improvements, monitor the progress of the energy modifications, collect loan repayments and analyze energy consumption data reports filed by the schools.

No Interest Loans

During the 1988-89 fiscal year, \$776,925 in energy improvement loan funds were approved for projects in 34 buildings in 20 school districts, resulting in a projected annual dollar savings of \$134,277. In addition, \$1,896,780 in funds have been set aside for accepted project inquiries in 44 buildings in 21 school districts, for an anticipated annual dollar savings of \$277,040.

The loan portion of the program is designed so that a school district retains half of the savings resulting from the energy improvement, while the rest goes toward repayment of the loan. This structure allows schools to immediately share in the savings their projects achieve.

As of June 30, 1989, the program's loan pool contained \$10.3 million, of which \$4.12 million was still available for loans and \$26,440 for Technical Assistance Grants. Currently, 51 school districts have 78 loans in repayment, totaling \$1.9 million. Approved loans for energy improvements in 42 buildings in 19 districts amount to \$1.8 mil-

lion. Another \$1.9 million has been set aside for 43 accepted project inquiries in 21 school districts. Applications and inquiries currently under review for 13 buildings in ten school districts amount to \$289,960.

Projects funded through the Loan Program must have an anticipated payback period of seven years or less. The repayment schedule can be amortized up to fourteen years.

Figure 22 illustrates, the schools receiving loan funds in 1988-89.

Nebraska Schools Receiving Energy Improvement Loans, 1988 and 1989

School Name	No. of Buildings	Loan Amount	School Name	No. of Buildings	Loan Amount
Adams	1	\$18,922	Holbrook	1	34,189
Atkinson	1	2,496	Hooper	1	15,652
Auburn	2	16,984	Keya Paha Co.,		
Axtell	1	13,300	Springview	1	43,113
Bertrand	1	74,991	Lincoln	2	65,948
Bassett	1	7,443	Lodgepole	2	30,444
Bridgeport	2	60,145	Millard	6	98,665
Cedar Rapids	1	34,755	Oakland	1	26,838
Clarks	1	5,551	Loup Co., Taylor	5	30,301
Deshler	1	44,772	North Loup-Scotia	1	15,831
Diller	2	31,161	Omaha	14	1,423,810
Dodge	3	11,038	Orleans	1	16,225
Elm Creek	1	5,505	Palisade	1	22,903
Elmwood	2	32,858	Rock Co., Bassett	1	10,713
Eustis	2	62,594	Sheridan	1	21,465
Fairmont	1	14,616	Uehling	1	3,166
Fisher School,			Valentine	1	4,147
Colfax Co.	1	5,096	Wakefield	2	20,540
Franklin	1	22,169	Westside	2	226,810
Hall Co. Dist. 501	1	13,937	Wood Lake	1	\$12,973
Hemingford	2	50,904			

Figure 22
Source: Nebraska Energy Office

Technical Assistance Grants

The Technical Assistance Grant Program provides up to \$2500 per building to finance a technical study and report on the building and its energy-using systems. A registered professional engineer or architect must conduct the study, which identifies all potentially cost-effective conservation measures, as well as energy-efficient changes in operation and maintenance procedures.

During 1988-89, the Energy Financing Division issued technical assistance grants totaling \$134,500 to 54 school districts for technical assistance studies in 106 buildings (see Figure 23). As of June 30, 1989, \$214,500 in technical assistance grants had been awarded for studies in 86 buildings in 40 school districts. Funds still available for technical assistance grants amount to \$26,440.

INSTITUTIONAL CONSERVATION PROGRAM

The Institutional Conservation Program (ICP) provides federal funds in 50/50 matching grants to hospitals and public and private schools, either for engineering studies to identify cost-effective, energy-saving building improvements or for actual implementation of energy improvement projects. A certain percentage of funds each cycle is set aside to provide up to 90 percent of the cost for hardship grantees. The Energy Office provides program information to applicants, reviews and ranks applications, submits project proposals

Technical Assistance Study Grants, 1988 and 1989

Alma Public Schools	\$2,500	Hitchcock County School Dist. 64	\$2,500
Ashland-Greenwood Public Schools	\$2,500	Hyannis High School	\$2,500
Auburn Public Schools	\$7,500	Johnson-Brock Public School	\$7,500
Bancroft-Rosalie Community Schools	\$7,500	Johnson County Dist. 42	\$2,500
Bennington Public Schools	\$2,500	Kimball Public Schools	\$10,000
Blue Hill Public School	\$5,000	Lewiston Consolidated Schools	\$2,500
Box Butte County School Dist. 022	\$2,500	Lexington Public Schools	\$2,500
Cambridge Public Schools	\$2,500	Loup City Public Schools	\$2,500
Cass County Dist. 22	\$2,500	Loup County Public Schools	\$10,000
Cherry County Dist. 7	\$2,500	McCook Public Schools	\$7,500
Columbus Public Schools	\$2,500	Mullen Public Schools	\$10,000
Davenport Community School	\$2,500	Niobrara Public School	\$2,500
Dawson County Dist. 100	\$2,500	North Loup-Scotia Public Schools	\$2,500
Diller Community School	\$5,000	Oakland-Craig Public Schools	\$2,500
Douglas County Dist. 1 Omaha	\$20,000	Papillion Lavista Public School	\$2,500
Dundy County Public Schools	\$5,000	Plainview Public Schools	\$2,500
Elmwood Public Schools	\$2,000	Ravenna Public Schools	\$2,500
Emmerson-Hubbard Public Schools	\$7,500	Sandy Creek Public Schools	\$10,000
Ewing Public School Dist. 29	\$5,000	Shelton Public Schools	\$2,500
Fairbury Public Schools	\$12,500	South Sioux City Community Schools	\$7,500
Farnam Public School	\$5,000	Southern Public Schools	\$5,000
Franklin Public School	\$5,000	Stanton Community Schools	\$7,500
Funk Public School	\$2,500	Stuart Public School	\$5,000
Gretna Public School	\$5,000	Sutherland Public School	\$5,000
Garden County High School	\$2,500	Theftord High School	\$5,000
Holbrook Public School	\$2,500	Wheatland Public School	\$10,500
		Wisner-Pilger Public Schools	\$7,500

Figure 23

Source: Nebraska Energy Office

to the U.S. Department of Energy for final review and monitors the progress of approved projects.

1988 and 1989 Grants

In August 1988, the U.S. Department of Energy distributed a total of \$343,758 awarded during the first half of 1988-89 under ICP's Cycle X—\$39,643 for engineering studies on 15 buildings and \$304,115 for energy conservation projects in 20 buildings (see Figure 24). The energy conservation projects funded by the 1988 grants are expected to cost \$640,077, but are expected to save \$153,326 annually in avoided energy costs.

Under ICP's Cycle XI, nine schools and hospitals applied for \$24,657 for engineering studies in 13 buildings. Thirty schools and hospitals applied for \$1,843,812 to fund energy-saving building improvement projects in 48 buildings. Only \$320,402 is available for grants in ICP's Cycle XI. Grants are expected to be awarded in late August, 1989.

Return on Investment

The first year rate of return on the investment for 1988 is 24 percent. The building improvements are a one-time investment which will most likely yield a return for at least fifteen years. Thus, the rate of return on that one-time investment made in 1988 will yield more than a 359 percent return over the lifespan of the improvements. If either the price of energy or the value of the dollar increases, the rate of return will likewise increase.

HUD SOLAR BANK

The U.S. Department of Housing and Urban Development (HUD) Solar Bank Program, which ended in 1989, provided grants or loan subsidies to low- and moderate-income home owners to make energy-saving home improvements. The average value of the improvements was \$1900, of which approximately \$750 was subsidized by the Solar Bank. Homeowners or private lending institutions provided the balance of the funds to make the improvements. The last of the HUD Solar Bank funds

ICP Cycle X,
Summary of Funded Projects, August, 1988

Institution	Project Cost	Grant Amount
Aurora Memorial Hospital	\$8,500	\$4,250
Bertrand Community School	\$32,843	\$16,421
Cambridge Memorial Hospital	\$55,863	\$7,712
Chadron State College (two projects)	\$145,494	\$72,747
Good Samaritan Hospital	\$111,745	\$55,872
Holy Cross Parish School	\$4,000	\$2,000
Kearney County Community Hospital	\$52,990	\$27,445
Lincoln Public Schools (four projects)	\$68,003	\$34,000
Lutheran Community Hospital	\$57,381	\$28,690
Sidney Memorial Hospital	\$6,375	\$3,187
St. Leonard's Elementary School	\$8,856	\$4,428
St. Mary's Parish School (two projects)	\$16,894	\$15,203
Tilden Community Hospital	\$25,133	\$9,160
West Nebraska General Hospital	\$46,000	\$23,000
TOTALS	\$640,077	\$304,115
ENERGY DOLLAR SAVINGS — \$153,326		

Figure 24
Source: Nebraska Energy Office

were paid out in April 1989 and a final report on the program was sent to HUD in June 1989.

The Energy Office contracted with municipal governments to run the Solar Bank Program locally. The Financing Division monitored the local governments' performance and inspected homes in which improvements were made.

When the Solar Bank Program began in 1983, it provided assistance only to Lincoln and Omaha. In 1984, the program was expanded to allocate funds to the communities of Allen, Fremont, Schuyler, South Sioux City and Wood River.

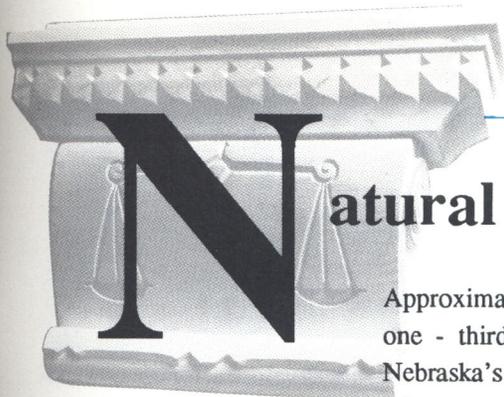
Seven Solar Bank cases concluded in 1989: one each in Schuyler and Sioux City and five in Wood River. The cost of the seven projects totaled \$15,016 with the Solar Bank providing \$4,234. The projects are projected to save approximately

166.1 MBtus in energy and \$662 in energy costs (an average of \$94 per dwelling) per year.

During its life, the Solar Bank program supported 2,006 home energy improvement projects at a cost of \$3.9 million, of which \$1.5 million came directly from the Solar Bank.

Return on Investment

These home improvements represent a one-time investment that will most likely yield a return for at least 15 years. A one-time investment made in 1988 will yield a one-year rate of return of 4.4 percent. Over the functional lifespan of the improvement, however, the rate of return leaps to 66 percent. If the price of energy or the value of money increase, the rate of return would increase accordingly.



Natural Gas Technical Assistance

Approximately one - third of Nebraska's natural gas consumers receive their service from publicly-owned natural gas utility companies. Five investor-owned natural gas companies provide service to the other two-thirds of the state. In the last two years, Iowa Electric Light and Power sold its operations in five towns to Minnegasco. Kansas Power and Light's operations in Falls City and Superior were being negotiated for transference to municipal ownership. Natural gas is imported into Nebraska primarily through major pipelines operated by Northern Natural Gas Company and KN Energy.

“Nebraska is one of only two states in the nation to regulate natural gas at the local level.”

Regulations governing the Loan Fund's administration were adopted and took effect on September 1, 1987. In 1988-89, four rate areas representing 23 communities received loans totaling \$128,303 for rate hearings at the district court appeal stage. The Lancaster County District Court ruled in favor of the communities' adoption of lower rates. That decision was appealed to the Nebraska Supreme Court. At issue in the case was the information provided to a municipality for use in analyzing rate requests. On October 27, 1989, the court reversed that decision, finding that the district court erred in refusing to consider infor-

Nebraska is one of only two states in the nation to regulate natural gas suppliers at the local level. Village boards and city councils review rate requests under the *Municipal Natural Gas Regulation Act* of 1987. The Energy Office also provides technical assistance to communities in this area.

MUNICIPAL NATURAL GAS REGULATION REVOLVING LOAN FUND

The Municipal Natural Gas Revolving Loan Fund was created in 1987 under the *Municipal Natural Gas Regulation Act*. The Loan Fund is capitalized with oil and gas severance tax receipts and serves local governments by providing financial support for rate filing studies and for judicial review, if necessary. Communities receive no-interest loans which area ratepayers repay through the local gas company.

Natural Gas Rate Areas Receiving Loans, 1988 and 1989

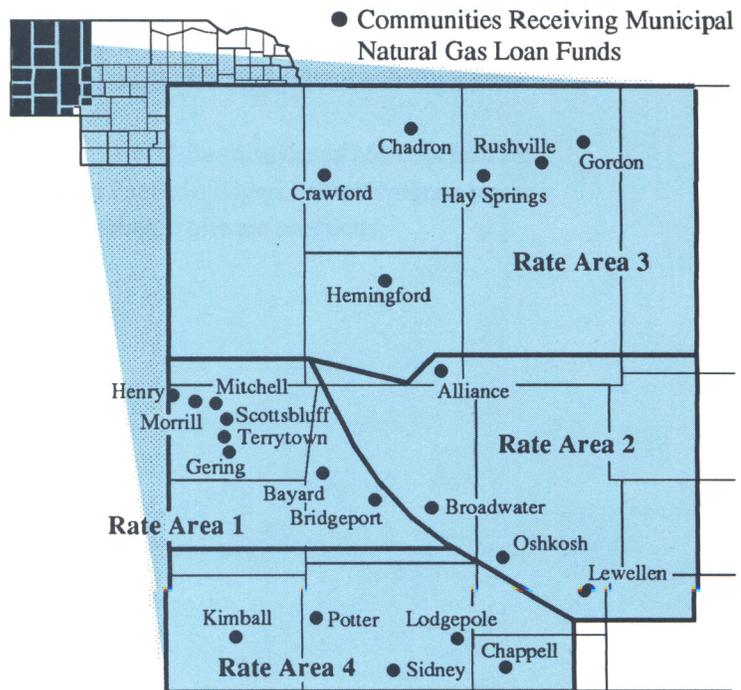


Figure 25

Source: Nebraska Energy Office

mation first offered at the district court level by the natural gas supplier. Loans amounting to \$22,250 had been approved by June 30, 1989 for these four rate areas to cover their anticipated costs in the Supreme Court appeal stage.

REGULATING NATURAL GAS — AN OVERVIEW FOR PUBLIC OFFICIALS

In 1988-89, the Energy Office distributed 600 copies of *Regulating Natural Gas — An Overview for Public Officials* to municipal clerks and attorneys. The handbook provides guidelines for using the regulatory process established by the *Municipal Natural Gas Regulation Act*, to better serve both natural gas suppliers and customers.

Other Information Resources

The agency also has developed, for use on a contingency basis, two vehicles for delivering information about the municipal regulation process. *Natural Gas Regulation*, a twenty-minute videotaped overview, is available to municipal officials, followed by a question and answer session. A municipal attorney experienced in natural gas regulation and under contract to the Energy Office would conduct the discussion.

In addition, the Energy Office would offer a one-and-a-half day workshop, as needed to advise local officials after a Notice of General Rate Increase is filed in one or more rate areas. Staff from the National Association of Regulatory Utility Commissions would cover the key issues in ratesetting, including current trends.



Grants, Studies and Legislation

WAPA WESTERN REGIONAL BIOMASS PROJECT

The Western Regional Biomass Energy Program (WRBEP), is a U.S. Department of Energy program administered by the Western Area Power Administration. The program's objective is to develop short-term, cost-effective uses for biomass energy resources. (Biomass refers to any renewable organic matter, including forest residues, agricultural crops and wastes, wood and wood wastes, animal wastes, livestock operation residue, aquatic plants and municipal waste.) Similar programs are underway in other regions of the country.

Two Energy Office representatives sit on WRBEP advisory boards, which direct the entire program as well as specific demonstration projects undertaken as part of WRBEP.

Under a \$10,000 WAPA grant, the Energy Office has entered into a cooperative agreement with the U.S. Department of Energy to make a comprehensive, county-by-county inventory of Nebraska's actual and potential biomass resources. The En-

ergy Office has sub-contracted with the University of Nebraska to develop the inventory and the University has pledged an additional \$11,000 to the project in matching contributions. The inventory should be completed by the summer of 1990. Neighboring states are making similar inventories.

TIER I

Work under the Tier I grant from the U.S. Department of Energy concluded in December 1988.

“The program's objective is to develop short-term, cost-effective uses for biomass energy resources.”

The \$222,562 grant was used to develop a comprehensive program to increase energy efficiency in institutional sector buildings. Two program components — the Energy Management Team for state government

and the Energy Manager Circuit Rider for local governments — will be implemented under the Governor's Oil Overcharge Plan (see Figure 20).

The Energy Office distributed 150 copies of the Nebraska Public Buildings Energy Program report and 220 related software programs.

VERDIGRE SHARED ENERGY SAVINGS PROGRAM

The first year's post-improvement consumption data has been collected from the 30 businesses participating in the Verdigre Shared Energy Savings Program. This commercial weatherization loan/grant program (funded by a Community Development Block Grant) made \$257,000 available to implement energy efficiency improvements in the village's businesses. The program was administered for the village by the Tri-County Council of Governments through a local commercial weatherization office. The active phase of the program ran from February 1986 through October 1987. Results of the program will be analyzed and a report issued in September 1989 on the program's activities and its impact on energy use.

PENDING FEDERAL LEGISLATION

S. 247 and H.R. 711

S. 247 and H.R. 711 are bills pending in Congress that would amend the Energy Policy and Conservation Act to update state energy conservation programs. The main provision of the bills calls for combining the State Energy Conservation Program (SECP) and the Energy Extension Service (EES). In addition, the bills would create a State Energy Advisory Board which would make recommendations related to the energy programs. The legislation is expected to pass in the next session of Congress.

STATE LEGISLATION

LB 727: Study of the School Weatherization Program

LB 727, passed by the Nebraska Legislature on May 19, 1989, directed the Energy Office to pre-

"...bills are pending in Congress ... to increase the efficiency and effectiveness of state energy conservation programs."

pare a report "assessing (a) the current energy efficiency status of Nebraska public schools, (b) the cost-effective opportunities for further public school weatherization and (c) the adequacy of current funds to accomplish weatherization oppor-

tunities identified in the report" to be completed by November 1, 1989.

To obtain information necessary for this report, which would supplement building data already in the files, the Energy Office selected twenty school buildings, combined into ten sets, for comprehensive energy studies, based on size, energy use, program participation, age and location. Requests for Proposals to conduct the studies were issued to engineering firms. Contracts were awarded to eight engineering firms to complete energy studies in eight of the ten sets. A set of three rural school buildings was added to the other eight sets and one of the contractors agreed to conduct the additional energy studies.

Prior to June 30, 1989, the Energy Office had received signed letters of agreement to commence work on 8 of the 9 sets. Studies will be final by September 8, 1989.

LB 95: City-Regulated Natural Gas Pipeline

The 1989 Legislature passed LB 95, which allows primary class cities (Lincoln) to regulate intrastate natural gas pipelines. Previously, the Federal Energy Regulatory Commission (FERC) in Washington, D.C., was the regulatory authority for intrastate pipelines.

Minnegasco, the natural gas supplier for Lincoln, expressed interest in building a 17-mile natural gas pipeline which would allow Lincoln access to two different natural gas providers. This arrangement is expected to be more cost-effective for Lincoln ratepayers, since Minnegasco can use competition between the two pipelines to provide natural gas at the lowest possible cost.

Minnegasco also contends that allowing Lincoln to regulate this first intrastate pipeline in Nebraska provides more local control and is more cost-effective than FERC regulation. Construction of the pipeline is expected to begin in the summer of 1989 and be completed before the end of the year (see Figure 26).

LR 136: Review of Building Code Standards

LR 136, introduced by Senator Dennis Baack, directed the Legislature's Government Committee to conduct an interim study of the Nebraska Building Energy Conservation Standard, which speci-

fies codes to improve the energy efficiency of new and remodeled buildings. Senator Baack asked the Energy Office to coordinate the study and to make recommendations to the Government Committee.

Energy Office personnel plan to meet with representatives of organizations interested in energy-related building codes. These meetings will be completed by the end of October 1989, at which time the Energy Office will make recommendations to the Government Committee about necessary statutory changes.

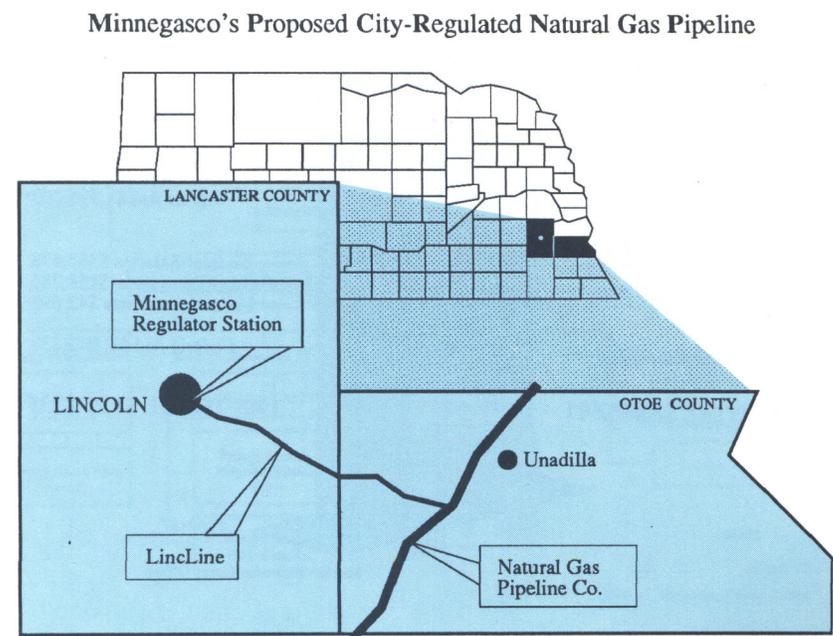


Figure 26
Source: Minnegasco



Fiscal and Organizational Notes

This description of Energy Office Operations reviews the agency's finances and its organization.

Almost 93 percent of federal funds were used for Low-Income Weatherization Assistance.

The Energy Office received \$2,420,520 in state funds for Agency operations and grants. State funds came almost exclusively from severance taxes. No General Funds have been appropriated to the Energy Office since 1983.

FINANCIAL REVIEW

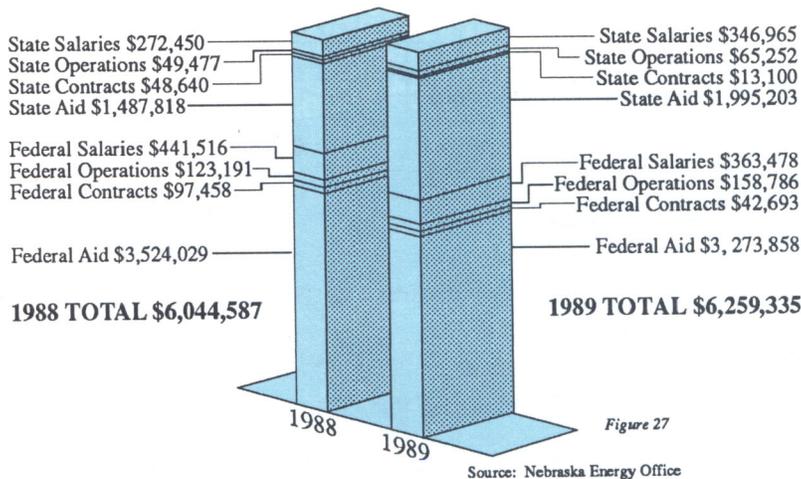
Figure 27 illustrates the Energy Office's operating budget from July 1, 1988, through June 30, 1989, which amounted to \$6,259,335.

Total budget for 1988-89 was three and a half percent higher than last year, an increase of \$214,748.

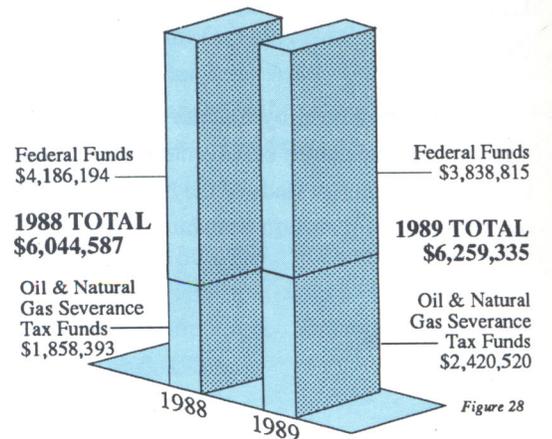
Approximately 61 percent of the Agency's funding, or \$3,838,815, came from federal sources.

As figure 28 shows, the Energy Office spent state and federal dollars in eight different ways. Aid, which makes up the largest portion of the Agency's expenditures, consists of federal or state money which the Agency receives and passes on either to delegate agencies or directly to beneficiaries such as schools. Money spent for operations pays travel, telephone, computers and other administrative expenses. Contracts, funded with

Where The Money Went,
1988 and 1989



Where The Money Came From,
1988 and 1989



state or federal dollars, are primarily for research or demonstration projects. Since petroleum violation escrow funds are trust funds, they are excluded from the budget figures on this page. A full accounting of those funds appears on pages 19-25.

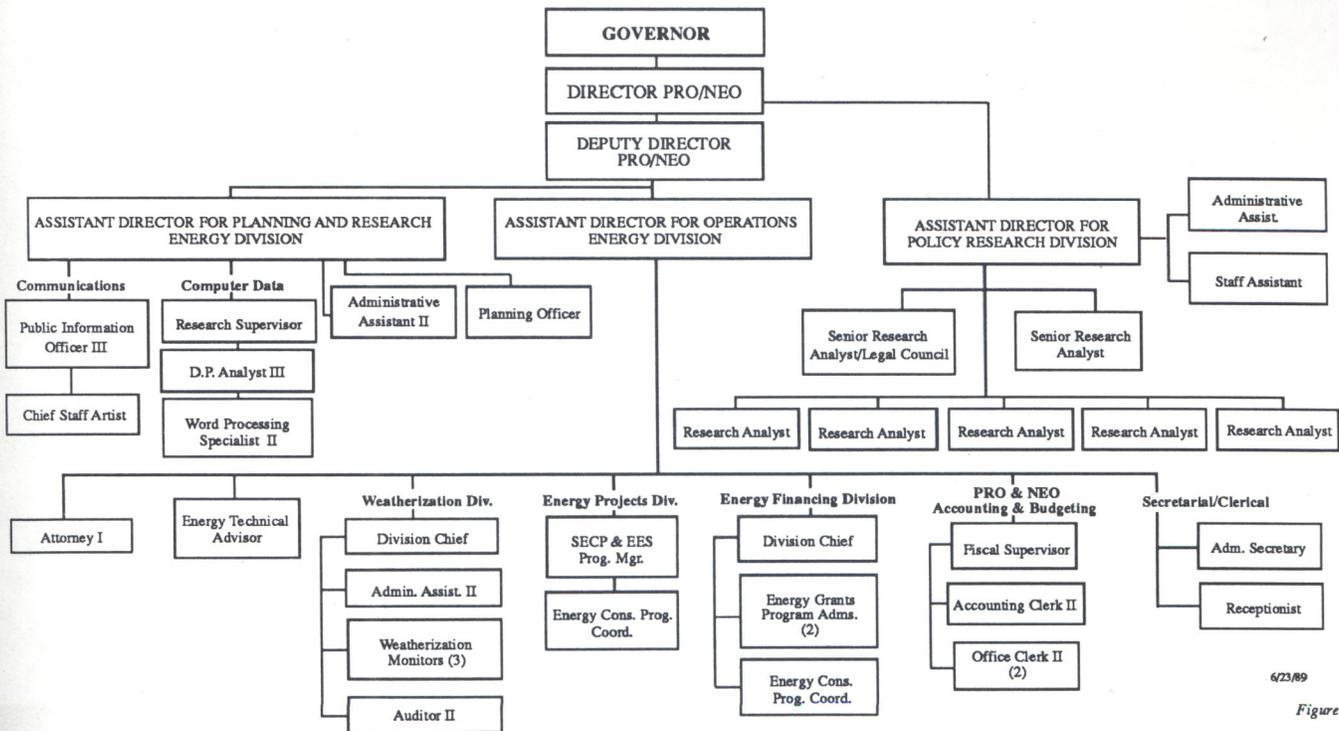
division of the Nebraska Department of Revenue until 1977. The agency had independent status from 1977 to January 1987, when it became by Executive Order, a division of the Governor's Policy Research Office.

ORGANIZATION

The Energy Office was created in November 1973 as the Fuel Allocations Office and was a

The Organizational Chart below (Figure 29) shows the functional structure of the Governor's Policy Research and Energy Office, which has not changed since June 30, 1987.

Organizational Chart, Governor's Policy Research and Energy Office



6/23/89

Figure 29

Source: Nebraska Energy Office

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