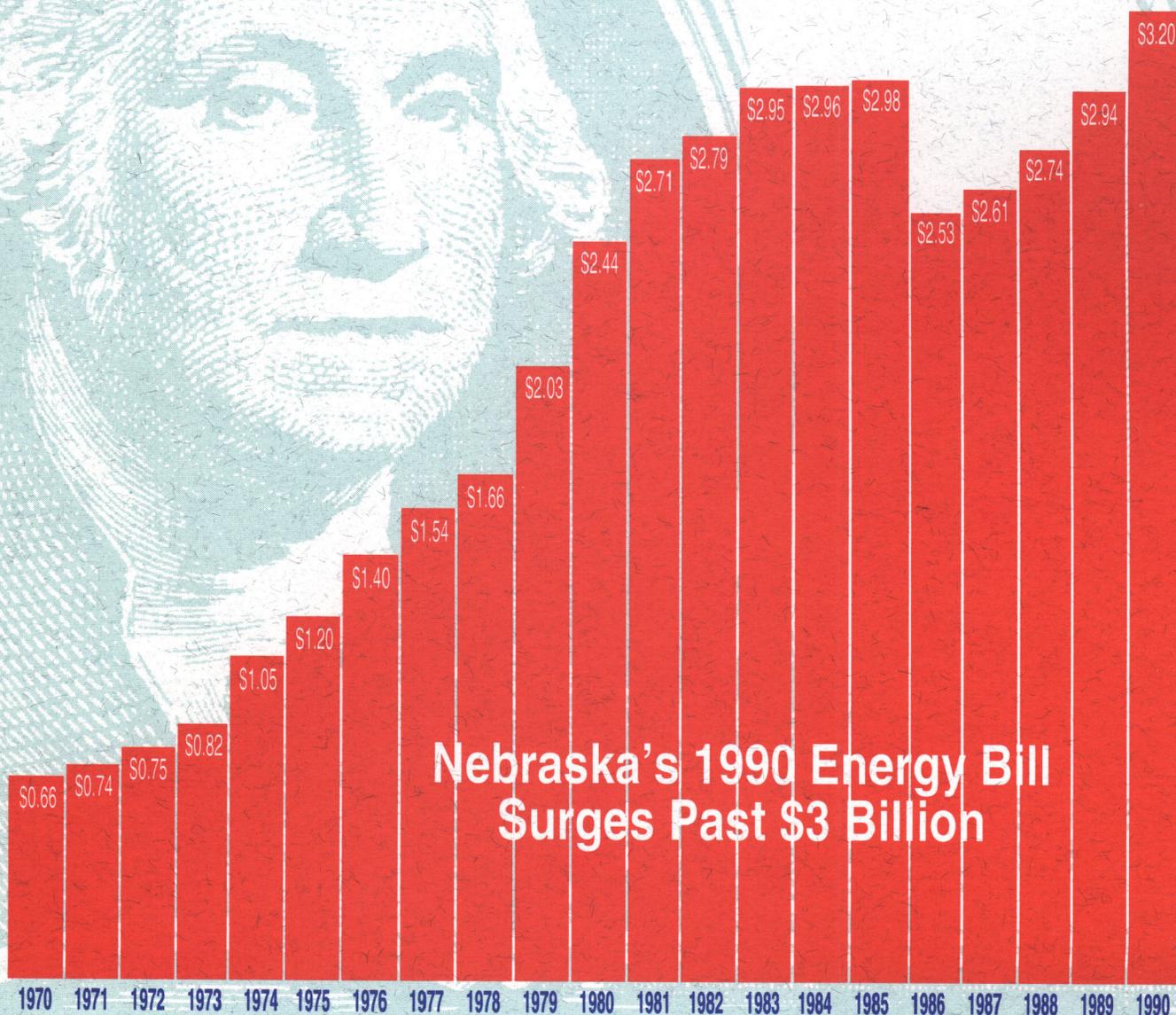


Nebraska Energy Office

ANNUAL REPORT 1991



(Billions of Dollars)

Sources: State Energy Price and Expenditures Report: 1989, Energy Information Administration, U.S. Department of Energy, Washington D.C., September 1991. 1990 Preliminary Estimates, Nebraska Energy Office.

STATE OF NEBRASKA



E. Benjamin Nelson
Governor

EXECUTIVE SUITE
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Phone (402) 471-2244

February 14, 1992

Dear Nebraskans:

Shortly after I took office in 1991, we were facing an impending oil crisis caused by Iraq's invasion of Kuwait. Oil price rises were sudden and dramatic, sparing no one, including state government. For that reason, I immediately ordered state agencies to reduce fuel use by five percent. I am pleased to report that their response was both rapid and positive. State government has reduced its use of petroleum products, saving tax dollars.

Less than a month later, I directed the Energy Office to develop a long range plan for using Nebraska's energy resources more efficiently. I appointed 52 Nebraskans to assist in the first stage of development of an energy policy plan. They worked over eight months, visited more than 20 cities and listened to hundreds of individuals and experts. Last month, they presented me with the result of their efforts — recommendations for Nebraska's first energy policy plan. By this time next year, I will have a state Energy Policy Plan available for consideration by the Legislature and others. Until then, I will be using their recommendations to assist in making decisions in areas like the environment, education, economic development and research.

In September, many months of work culminated in the organizational meeting of the 13-member Governors' Ethanol Coalition in Lincoln. In honor of the state's role in creating this group, I was chosen to lead the coalition during its first year. In just several months, the coalition has played a significant role in ensuring that ethanol is an option for reducing America's dependence on imported oil and for meeting the nation's need for clean burning fuels.

The response to the Energy Office's Dollar and Energy Saving Loan Program during its first year demonstrates Nebraskans' willingness to make energy saving improvements in their homes and businesses. These low interest loans are an excellent example of the type of financing tool states can offer to their citizens to spur local economic activity while reducing energy use.

It is with pleasure that I present the Nebraska Energy Office's 1990-91 Annual Report.

Sincerely,

A handwritten signature in blue ink that reads "Ben Nelson".

E. Benjamin Nelson
Governor

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WEATHERIZATION DIVISION

“The improvement in my house is worth noting, as it remains cooler in the summer. As well as personal savings, the Weatherization Trust, Inc. is a program which supports the country’s growing consciousness of the importance of energy conservation. All in all, it’s a high quality program employing good people. Thank you.”

*With appreciation,
An Omaha client*

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 25 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.

In 1990-91, total funding for the program was \$4,573,711. The Department of Energy’s Low Income Weatherization Assistance Program provided a total

percent over last year. In keeping with the agency’s priority to serve Nebraska’s elderly community through the Low Income Weatherization Assistance Program, the Weath-

of \$2,185,897 and the Low Income Home Energy Assistance Program, administered through the Nebraska Department of Social Services, supplied a total of \$1,461,203 and \$926,611 came from Exxon Petroleum Violation Escrow Funds.

Number of Homes Weatherized

A total of 2,616 homes were weatherized in fiscal year 1990-91 — an increase of about 13

erization Division weatherized 880 elderly households, or 33.6 percent — an increase of almost three percent from last year — of all the homes weatherized during that period.

The map of Nebraska on page 2 shows the ten Weatherization Assistance Program Service Areas and the number of homes weatherized in each area from July 1, 1990 through June 30, 1991.

Home improvements made through the program saved Nebraskans a total of \$313,920 in avoided energy costs during 1990-91. The home improvements represent a one-time investment that most likely will yield a rate of return for at least twenty years.

On April 1, 1991, subgrantees began performing efficiency inspections on all furnaces and boilers (including forced-air, gravity, wall and floor furnaces, console heaters and mobile home furnaces) which use natural gas, propane or fuel oil as the heating source.

As of October 1, 1990, mandatory blower door sealing is being implemented in all single family homes.

Low Income Weatherization Assistance Program Funding Sources

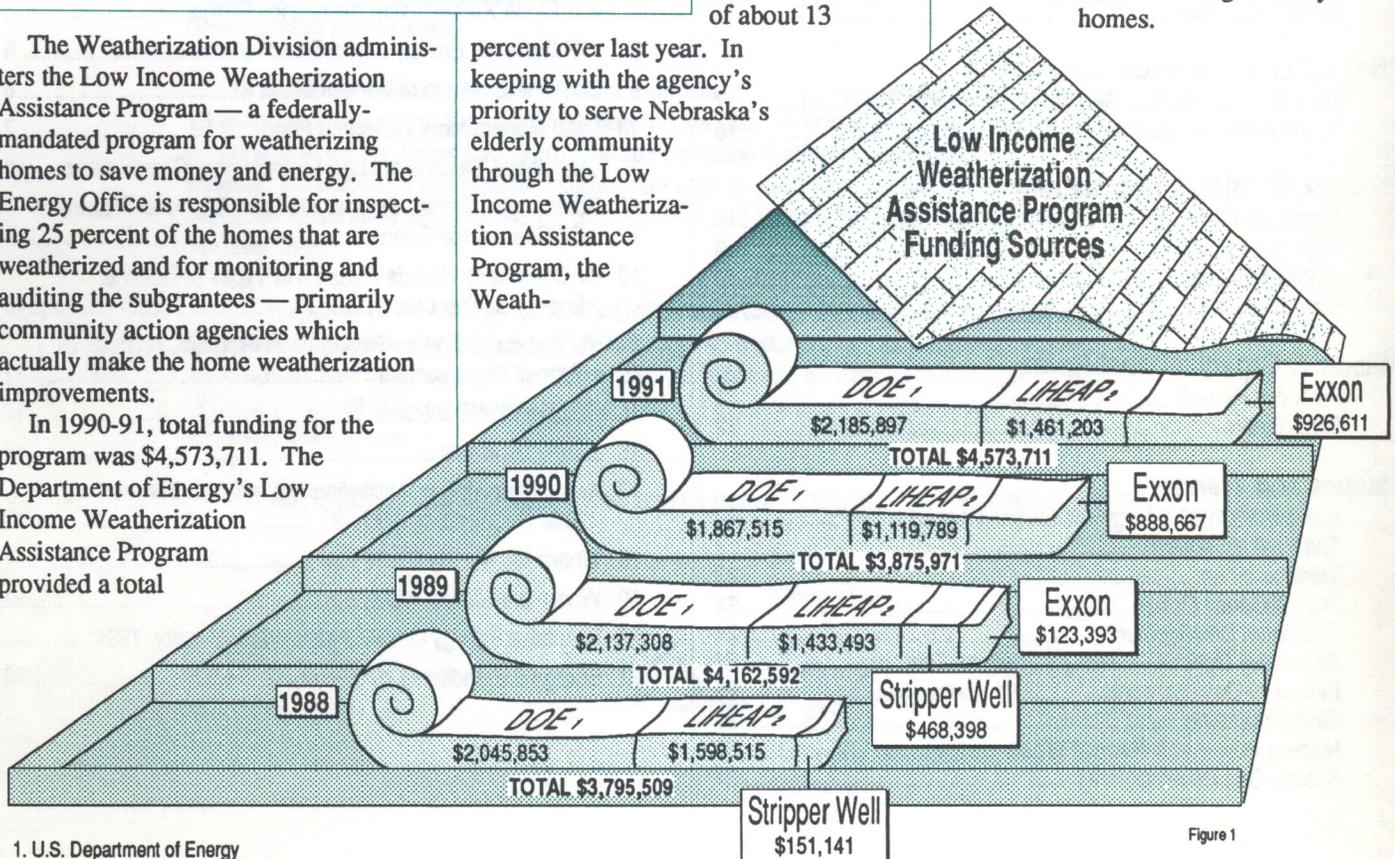
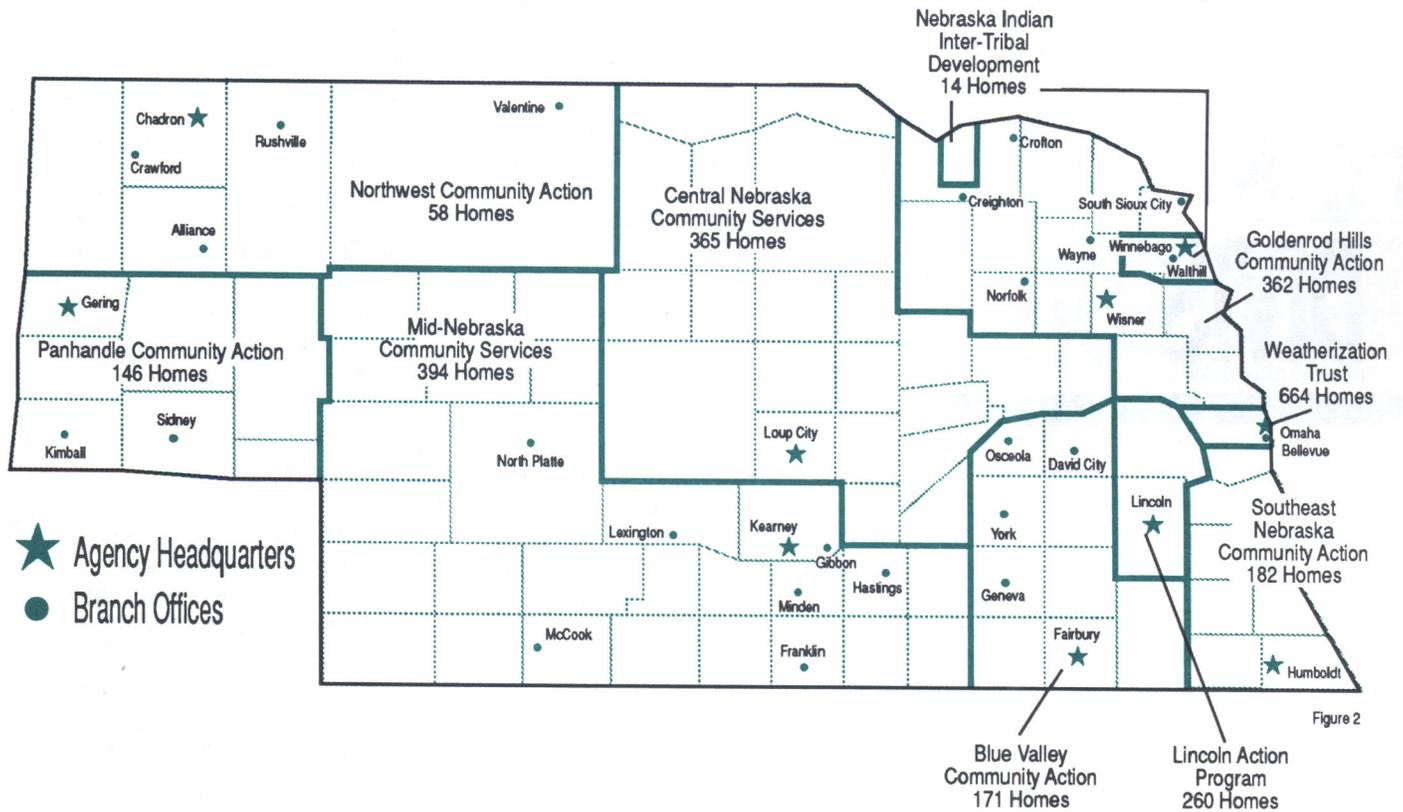


Figure 1

1. U.S. Department of Energy
2. Low Income Home Energy Assistance Program

Nebraska Weatherization Assistance Program Service Areas and Homes Weatherized July 1, 1990 through June 30, 1991



Omaha Housing Authority Project

Under a cooperative arrangement between the Energy Office and the Omaha Housing Authority (OHA), the Energy Office provides funds for purchasing weatherization materials and OHA contributes funds for installing them. Through the Weatherization Trust, Inc., the agency's Douglas County sub-grantee, the Energy Office provides the Omaha Housing Authority with up to \$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 1990-91, 239 Omaha Housing Authority units in north Omaha were weatherized.

Regional Technical Working Group

In August 1990, the Energy Office received a fourth \$10,000 Training and Technical Assistance grant from the U.S. Department of Energy to assist in regional planning. A regional program development meeting for weatherization program staff from Nebraska, Iowa, Kansas and Missouri was held in July 1990 in Lincoln. Participants discussed

space heating systems, the balancing of heating distribution systems like ductwork and wall insulation practices as they relate to the Weatherization Assistance Program. Another meeting was planned for July 1991 in Lincoln.

ENERGY FINANCING DIVISION

“Ask your leaders. Ask the school board member that goes to church with you, if the school system is doing the very best it can to conserve energy in all ways. Ask the city council member the same questions.”

Editorial, *Syracuse Journal-Democrat*, December 6, 1990

The Energy Financing Division administers three state and federal programs that fund the weatherization of homes, schools and hospitals: the Nebraska Energy Efficiency School Loan Program, the School Weatherization Program and the Institutional Conservation Program.

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 Energy Efficiency School Loan Program

In 1981, the Nebraska Legislature created the School Weatherization

Program — the first on-going 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. Since its beginning, the School Weatherization Program has supported projects in 1,096 school buildings, representing a total investment of \$17,989,127.

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. The program is funded through the state severance tax on natural gas and oil.

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 reports filed by schools.

Zero Interest Loans

During the 1990-91 fiscal year, \$701,302 in energy improvement loan funds were approved for projects in 30 buildings in 23 school districts.

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.

During the current fiscal year, school districts reporting consumption data in the third year since project completion have shown an actual energy savings of 31,979.3 Mbtus, which represents an 11.4% reduction in energy use. The cumulative energy savings in the three

School Weatherization Technical Assistance Grants, July 1, 1990 - June 30, 1991

School	No. of Buildings	Amount
Ansley Public Schools	1	\$2,500
Arthur County Schools	2	\$5,000
Ashland-Greenwood Public Schools	1	\$2,500
Bruning Public School	1	\$2,500
Campbell Public School	1	\$2,500
Chambers Public School	1	\$2,500
Exeter Public Schools	2	\$5,000
Hartington Public Schools	1	\$2,500
Ithaca Public School	1	\$2,500
Lakeside Public School	1	\$2,500
Logan View Public School	1	\$2,500
Marquette Public Schools	2	\$5,000
Maywood Public Schools	2	\$5,000
McPherson County Schools	2	\$5,000
Mitchell Public Schools	1	\$2,500
Ogallala Public Schools	1	\$2,500
Omaha Public Schools	2	\$5,000
Papillion LaVista Public Schools	2	\$5,000
Polk-Hordville Public Schools	1	\$2,500
South Sioux City Community Schools	4	\$10,000
Trenton Public Schools	2	\$5,000
Waterloo Public Schools	2	\$5,000
Winside Public Schools	2	\$5,000
Wolbach Public Schools	3	\$7,500
TOTAL	39	\$97,500

Figure 3

School Weatherization Program Energy Improvement Loans, July 1, 1990 - June 30, 1991

School Name	No. of Buildings	Loan Amount
East Butler Public School	1	\$24,260
Chadron City Schools	4	\$62,324
Stuart Public Schools	1	\$12,361
Oshkosh Elementary School	1	\$53,921
Theford High School	1	\$18,200
Emerson-Hubbard Schools	2	\$82,491
Wheatland Schools	1	\$5,947
Uehling Elementary School	1	\$3,021
Bancroft-Rosalie Public Schools	1	\$56,672
Cody-Kilgore Public Schools	2	\$12,971
Weeping Water Public School	1	\$35,616
Hooper Elementary School	1	\$6,071
Hyannis Elementary School	1	\$93,042
Sioux County High School	1	\$31,342
Humboldt Public School	1	\$6,337
Trenton Public Schools	2	\$14,966
Telbasta School	1	\$3,402
Fairmont Public School	1	\$19,271
Homer Community School	1	\$32,606
Logan View High School	1	\$65,800
Sutherland Public School	1	\$31,450
Bruning Public School	1	\$16,805
Falls City Public Schools	2	\$12,426
TOTAL	30	\$701,302

Figure 4

reporting years for these districts is 63,479.3 Mbtus.

As of June 30, 1991, the Program's loan pool contained \$12.9 million, of which \$5.28 million was still available for loans and \$95,050 for Technical Assistance Grants. Currently, 102 school districts have 199 loans in repayment, totaling \$6.3 million dollars. Approved loans for energy improvements in 31 buildings in 21 districts amount to \$1.4 million. Another \$241,831 has been set aside for 13 accepted project inquiries in ten school districts. Applications and inquiries currently under review for seven buildings in five school districts amount to \$222,081.

Projects funded through the Loan Program must have an anticipated payback period of less than their expected life. The maximum loan period can be up to fourteen years.

Figure 4 and the map below list the school districts receiving loan funds in 1990-91.

Technical Assistance Grants

The Technical Assistance Grant Program provides up to \$2,500 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 improvements, as well as energy-efficient changes in operation and maintenance procedures.

During 1990-91, the Energy Financing Division issued technical assistance grants totaling \$97,500 to 24 school districts for technical assistance studies in 39 buildings. Figure 3 and the map below identify the school districts receiving grants.

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

1990 and 1991 Grants

In July and August 1991, the U.S. Department of Energy awarded a total of \$354,906 during the first half of 1990-91 under ICP's Cycle XII — \$22,717 for engineering studies on 13 buildings and \$332,189 for energy conservation projects in 18 buildings. The energy conservation projects funded by the 1990 grants are expected to cost \$682,853, but are expected to save \$111,771 annually in avoided energy costs. Figures 6, 7 and 8 list Cycle XII recipients of both technical assistance grants and energy improvement grants.

Under ICP's Cycle XIII, ten schools and hospitals applied for engineering study grants in 17 buildings estimated to cost \$59,465. Ten schools and hospitals applied for grants to fund energy-saving building improvement projects estimated to cost \$495,139 in 12 buildings. Only \$354,208 is available for grants in ICP's Cycle XIII. Grants are expected to be awarded in August, 1990*.

* Technical Assistance Grants of \$59,465 and Energy Conservation Measure Grants of \$294,743 for Cycle XIII were awarded on August 31, 1991.

School Weatherization Grants and Loans by County, 1990-91

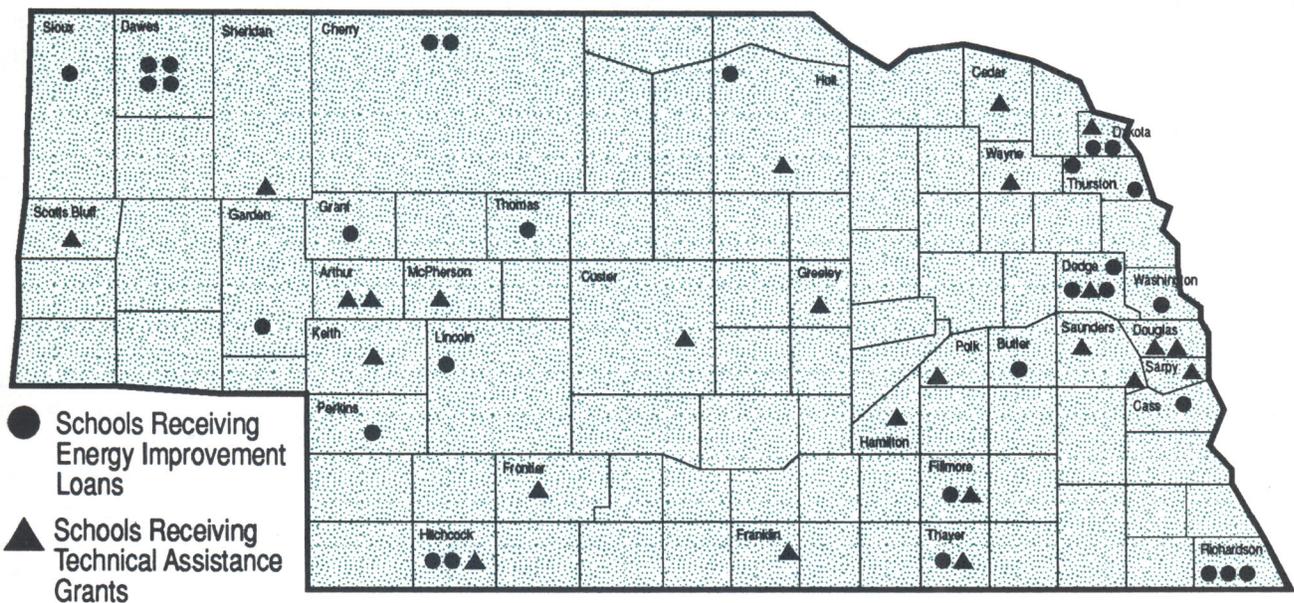


Figure 5

ICP Cycle XII Grants by County

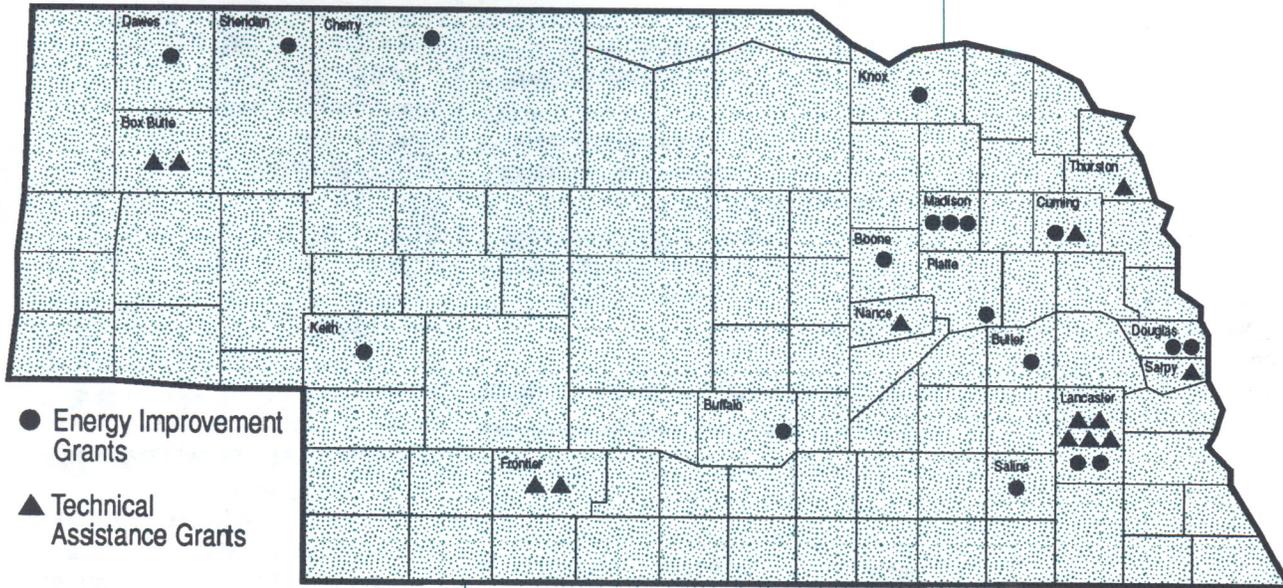


Figure 6

Institutional Conservation Program Cycle XII Technical Assistance Grants

Institution Name	Study Cost	Grant Amount
Alliance City Schools	\$15,100	\$7,550
Fullerton Memorial Hospital	\$1,742	\$1,394
Madona Centers	\$10,500	\$5,250
Neb. College of Tech. Ag.	\$2,489	\$1,244
Neb. Indian Comm. College	\$1,880	\$1,692
St. Francis Memorial Hospital	\$6,000	\$3,000
St. Mary's School	\$2,275	\$1,137
Union College	\$2,900	\$1,450
TOTALS	\$42,886	\$22,717

Figure 7

Institutional Conservation Program Cycle XII Energy Improvement Grants

Institution Name	Project Cost	Grant Amount
Chadron State College	\$29,750	\$4,044
Cody-Kilgore Unified Schools	\$6,210	\$3,105
Crete Municipal Hospital	\$50,292	\$25,146
East Butler Public Schools	\$9,561	\$4,780
Gordon Memorial Hospital	\$125,500	\$62,750
Marian High School	\$13,650	\$9,555
Nebraska Christian College	\$8,093	\$6,474
Ogallala Community Hospital	\$140,235	\$71,917
Our Lady of Lourdes Hospital	\$174,350	\$76,981
Pius X High School	\$35,858	\$17,929
Scotus Central High School	\$13,579	\$6,789
Shelton Public Schools	\$3,618	\$1,809
St. John the Baptist Parish	\$2,976	\$2,678
St. Ludger Elementary School	\$6,451	\$5,806
St. Paul Lutheran School	\$2,655	\$2,389
St. Teresa School	\$34,925	\$17,462
University of NE at Omaha	\$25,150	\$12,575
TOTALS	\$682,253	\$332,189

Figure 8

Return on Investment

The first year rate of return on the investment for 1990 is 16 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 1990 will yield more than a 246 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.

STATE ENERGY CONSERVATION PROGRAM ENERGY EXTENSION SERVICE DIVISION

INCLUDING
OIL OVERCHARGE
FUNDS

“As a nation we tend to be terminally short-sighted on more than our energy policy. We already know that oil will not last forever. What kind of crisis will it take before we make a long term commitment to discovering energy alternatives and to changing our energy-dependent lifestyles?”

Editorial, *Lincoln Star*,
August 19, 1990

The Energy Office is responsible for administering two federally-funded programs created under the Energy Policy Conservation Act (EPCA) 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 SECP and EES Division manages both 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. The Division is also responsible for preparing annual energy savings reports, *Nebraska Energy Statistics* and for overseeing oil overcharge programs such as the Dollar and Energy Saving Loan Program (see pages 9, 10 and 11).

During calendar year 1990, SECP/EES Programs produced an estimated annual energy savings of 4.218 trillion Btus, which is equivalent to 33.744 million gallons of gasoline. Figure 9 shows savings over the past six years as a result of various SECP/EES projects.

State Energy Conservation Program (SECP)

Since the inception of the State Energy Conservation Program, the federal government has granted funds on an 80/20 matching basis to the states. In 1990-91, Nebraska received \$92,400 in federal funds which were matched with \$18,480 in state funds.

- In 1990-91, SECP projects included:
- Federally-Mandated Projects
 - Oil Overcharge Projects
 - Energy Shortage Management and Emergency Preparedness

Federally-Mandated Projects

According to the Energy Policy Conservation Act, the Energy Office must undertake mandatory projects in the specific areas of equipment procurement, vanpooling/ carpooling, lighting standards, thermal standards and right-turn-on-red. Brochures on Life Cycle Costing, Transportation, Street and Park Lighting and Building Codes are distributed to affect the procurement practices of the state and its political subdivisions to improve energy efficiency. Since the Legislature passed legislation allowing right turns on red lights in Nebraska, the federal government has required no further action on this mandatory activity.

Oil Overcharge Project Management

The majority of oil overcharge projects are managed as SECP projects. See pages 8-16 for a full description of projects financed by Petroleum Violation Escrow Funds.

Energy Shortage Management and Emergency Preparedness

During 1990-91, Nebraska continued contingency planning and energy emergency preparedness activities. The Energy Shortage Management Plan provided guidelines for action during the Middle East crisis. Nebraska entered the Verification Phase of the plan immediately following Iraq's invasion of Kuwait on August 2, 1990. During this phase,

Gasoline Saved in Millions of Gallons (Energy Equivalent Saved by SECP/EES Programs)

Project Type	1985	1986	1987	1988	1989	1990
Thermal Lighting Standards	11.312	14.696	18.720	22.720	25.968	30.536
Nebraska Community Energy Management Program	0.248	0.336	0.034	0.034	0.392	0
Agricultural Energy Management	0.504	0.774	0.992	1.240	1.240	1.400
Omaha Traffic Light Program	0	0	0	0	0.225	0
Dual Fuel Vehicles	0	0	0	0	0	1.800
Municipal Loan Programs	0	0	0	0	0	.008
Total Gallons of Gasoline Saved (In millions)	12.264	15.776	20.096	23.816	29.400	33.744

Source: Nebraska Energy Office

Figure 9

the state's petroleum supplies were intensively monitored and analyzed. Daily reports were sent to the Director of the Energy Office.

Emergency Preparedness Activities

On August 13, 1990, the Governor convened a meeting of the state's petroleum suppliers to consider the effect of the Middle East crisis on energy supplies to Nebraska. There were two immediate concerns: 1) the state faced a projected bumper crop that would require large amounts of fuel to harvest and dry; and 2) winter heating needs would require adequate supplies of propane and heating oil at reasonable prices. All propane dealers in the state were asked to encourage customers to fill tanks in anticipation of harvest and heating needs.

Record inventory levels of petroleum and petroleum products throughout the world, as well as surge production, substantially offset embargoed Iraqi and Kuwaiti petroleum. While prices increased, there was no decrease in available supplies of petroleum. Volatile price changes resulted from shifts in

expectations regarding the magnitude of the crisis.

By mid-October, a degree of market stability had been re-established and the daily reports required in the Verification Phase were no longer necessary. The Energy Office discontinued the Verification Phase, but continued to monitor market prices and supplies daily during the Middle East crisis. When Desert Storm began, the state entered the Verification Phase again, which remained in effect until the cease-fire.

Contingency Planning

After the invasion of Kuwait, the Governor asked state agencies to reduce fuel use by five percent and to submit plans to the Energy Office for achieving the reduction. The plans form the basis of a State Agency Conservation Plan. A *Guide for Local Governments for Managing Energy Contingencies* also was prepared and will be distributed in 1992.

Energy Policy Council

In the spring of 1991, Governor Nelson appointed a 52-member Energy Policy Council to develop recommenda-

tions for the state's first energy policy plan. The Energy Office coordinated the Council's work.

The Council was composed of five working committees in the areas of alternate fuels, buildings, electricity, fossil fuels and waste. The first draft of each committee's



recommendations was approved by the entire Council on June 7, 1991 and distributed to nearly 2,000 Nebraskans. These citizens were invited to provide input on the plan at 15 regional meetings held across the state.

Six additional public meetings will be held in the fall when the second draft is completed. The final recommendations will be submitted to Governor Nelson in 1992.

Energy Extension Service (EES)

Since the inception of the Energy Extension Service, the federal government has granted funds on an 80/20 matching basis to the states. In 1990-91, Nebraska received \$49,000 in federal funds which were matched with \$9,800 in state funds.

- In 1990-91, EES was responsible for:
- Electrical Load Management Resource Fund
 - Education and Information Programs
 - Oil Overcharge Project Management
- 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 and install load management systems. Load management systems allow utilities to

**Load Management Resource Fund
1983 - 1991**

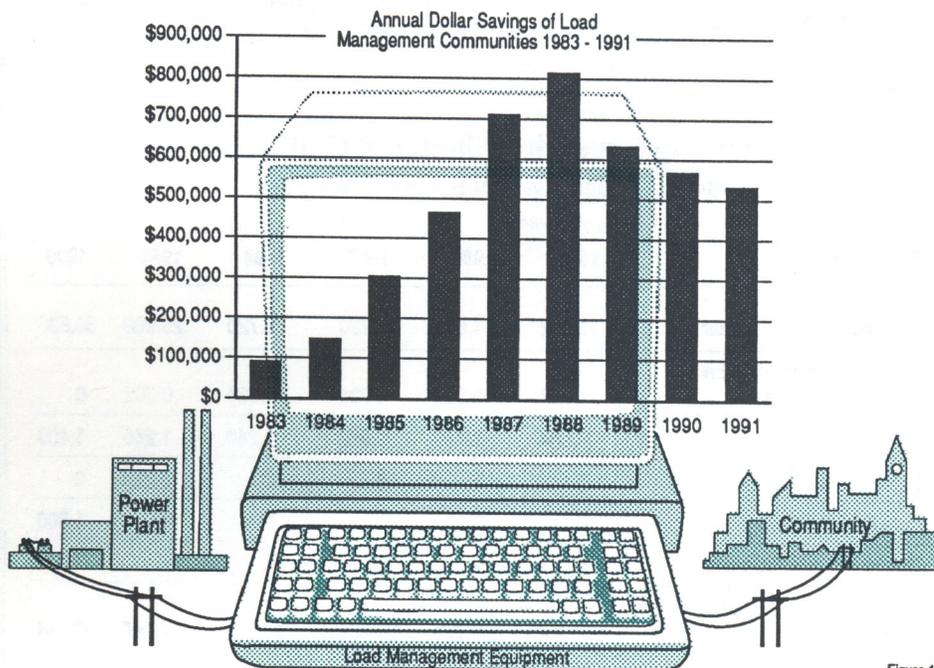


Figure 10

reduce peak demand, thus saving energy and avoiding demand charges.

The Nebraska Municipal Power Pool made four loans in 1990-91 for purchasing or upgrading load monitoring and management systems. The city of Gering received a second loan for \$10,000, the city of Mitchell received \$10,000, the city of Fairmont received \$3,000 and Beaver City received \$7,000 to purchase or upgrade load monitoring and management systems.

Cumulative Savings of Load Management Communities

Year of Loan	Member	Savings
1983	South Sioux City	\$762,500
1983	Wood River	\$254,600
1984/91	Beaver City	\$52,200
1984/85	Benkelman	\$113,300
1984	West Point	\$237,800
1984	Broken Bow	\$260,700
1985	Lexington	\$274,600
1985	North Platte	\$1,684,100
1985/90	Sutton	\$37,600
1986	Bridgeport	\$100,500
1986	Oxford	\$70,100
1986	Pierce	\$79,700
1986	Wilcox	\$24,400
1987	Callaway	\$23,600
1987	Wauneta	\$16,100
1988	Arnold	\$56,200
1988	Greenwood	\$6,800
1988	Burwell	\$45,800
1988	Lyons	\$49,300
1989	Kimball	\$5,200
1990	Seward	\$42,000
1990/91	Gering	\$47,200
1991	Fairmont	\$2,700
1991	Mitchell	\$2,900
TOTAL	\$4,249,900

Figure 11

Figures 10 and 11 show the annual dollar savings of each community participating in the Load Management Resource Fund. Communities that install load management systems continue to earn additional savings during the lifetime of the equipment. However, the savings earned each year will fluctuate as the cost of demand changes.

Education and Information

The Nebraska Energy Office continued a program to deliver energy education materials targeted for grades K-12. Classroom materials and audio-visual aids are available upon request at no cost to Nebraska educators.

The Energy Office cooperated with the Nebraska Department of Education to sponsor a three-day energy education workshop as part of the Cadre Project for Science and Math Teachers. The workshop included field trips and presentations about alternative fuels for transportation, recycling, energy-efficient lighting and home weatherization.

The Energy Office publishes and distributes the *Nebraska Energy Quarterly* to thousands of Nebraskans. This publication highlights a variety of energy conservation projects and ideas. The

Energy Information Services offered by the U.S. Department of Energy

CAREIRS — Conservation and Renewable Energy Inquiry and Referral Service answers energy conservation questions at no charge to the general public. 1-800-523-2929, Box 8900, Silver Spring, MD 20907

NATAS — National Appropriate Technology Assistance Service offers free tailored technical and commercial assistance. 1-800-428-2525, Box 2525, Butte, MT 59702

NREL/TIS — The National Renewable Energy Laboratory/Technical Inquiry Service offers technical solar information for science and industry professionals. 1-303-231-7303, 1617 Cole Boulevard, Golden, CO 80401

NEIC — The National Energy Information Center provides data and projections on energy production, consumption, prices and supplies. 1-202-586-8800, U.S. Dept. of Energy, Forrestal Bldg., E1-22, Room 1F048, 1000 Independence Ave., S.W., Washington, D.C. 20585

SECP and EES programs also support, in part, annual publication of two mandated agency publications: the *Annual Report* and *Energy Statistics*.

For Earth Day 1991, Energy Office personnel participated in events in Omaha and Lincoln, distributing trees, furnace whistles, electrical outlet plugs and informational materials.

Oil Overcharge Project Management

Some oil overcharge projects are also managed as EES projects. These Petroleum Violation Escrow-funded projects and others managed by other divisions are detailed on this and subsequent pages.

Oil Overcharge Funds

Since 1982, Nebraska has been receiving oil overcharge funds (also referred to as Petroleum Violation Escrow funds) as a result of various court actions against oil companies that overcharged their customers from 1973 through 1981 during a period of federal price controls. Since direct compensation to injured consumers seemed unrealistic, the courts ordered the oil companies to distribute award money to the states to fund programs that provide indirect restitution to injured energy consumers. States were directed to use the money, within parameters established by the courts, to fund energy assistance and conservation programs. In 1987, the U.S. Department of Energy began a program of direct restitution to consumers who had been injured by overcharges. For details about direct restitution, see page 16.

The Weatherization, Energy Financing and State Energy Conservation Program/Energy Extension Service Divisions of the Nebraska Energy Office oversee and manage projects financed by oil overcharge funds.

The Nebraska Energy Settlement Fund

The Nebraska Energy Settlement Fund was established by the Legislature for money paid to Nebraska from awards or allocations to the state in oil overcharge cases since March of 1986. Total funds received as of June 30, 1991

(including interest) was approximately \$36.7 million: \$22.25 million in *Exxon* funds, \$13.95 million in *Stripper Well* funds and \$.49 million in *Diamond Shamrock* funds.

A total of \$2.91 million (\$1,260,360 from *Exxon* and \$1,087,554 from *Stripper Well*) remains in a reserve fund and has not been committed to any new or existing programs.

Specific Oil Overcharge Projects

The status of each oil overcharge project financed by the Nebraska Energy Settlement Fund, reviewed by the Legislature and approved by the U.S. Department of Energy is described here.

Arbor Day Center Project

Exxon funds totaling \$562,400 are planned to support an integrated wood fuel project to plant, culture, process and use trees for both functional and educational purposes at the National Arbor Day Center in Nebraska City.

The project is intended to be a model for other public and private institutions in the use of energy from a renewable source. No action occurred on this project during 1990-91.

BERT Loan Program

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. An outgrowth of NCEMP, the Benson Energy Resource Team (BERT) incorporated in 1986 with an Energy Office grant of \$90,000 in *Amoco* oil overcharge funds. BERT established a revolving loan program to help householders finance energy-efficient home improvements.

On November 6, 1990, BERT signed a new contract for the period July 1, 1990 to June 30, 1991. Douglas County Bank and Trust Company administers the program and handles loans. The program was also expanded to include business owners making commercial energy conservation improvements.

One commercial loan of \$25,000 was made in FY1990-91 to finance \$36,128 in improvements. BERT buys 50 percent of the loan. The interest rate is eight percent to the borrower.

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

(June 30, 1991)

	<i>Exxon</i>	<i>Stripper Well</i>	<i>Diamond Shamrock</i>	Total
Total Received	\$15,504,944	\$11,090,268	\$359,172	\$26,954,384
Interest Earned	6,742,486	2,864,797	130,365	9,737,648
Total	\$22,247,430	\$13,955,065	\$489,537	\$36,692,032
Less Budgeted				
Contracts	\$3,700,849	\$5,652,000	\$0	\$9,352,849
Program Development	107,411	0	6,434	113,845
Monitoring/Evaluation	292,589	0	0	292,589
Education	26,824	0	0	26,824
Load Management	50,039	0	0	50,039
Attorney General Legal Fees	0	263,595	0	263,595
Bank Wire Fees	0	75	0	75
Low Income Weatherization	3,864,076	2,290,579	0	6,154,655
Emergency Preparedness	95,000	0	0	95,000
Dollar & Energy Saving Loan Program	10,394,097	2,855,903	0	13,250,000
Loan Program Delivery	115,970	0	0	115,970
Special Projects	191,328	0	0	191,328
Designated Interest	749,487	471,160	0	1,220,647
Oil Overcharge Administration	0	384,199	470,603	854,802
Direct Restitution Project	0	0	12,500	12,500
Governor's Overcharge Plan '89	0	950,000	0	950,000
Governor's Overcharge Plan '90	1,399,400	0	0	837,000
Subtotal	\$20,424,670	\$12,867,511	\$489,537	\$33,781,718
Uncommitted Balance	\$1,260,360	\$1,087,554	\$0	\$2,910,314

Figure 12

People interested in the Dollar and Energy Saving Loan Program who have a 68104 zip code are referred to BERT. **College of Technical Agriculture at Curtis Building Weatherization**

The University of Nebraska College of Technical Agriculture at Curtis will receive \$250,000 in *Stripper Well* funds to weatherize campus buildings. Contract negotiations were delayed pending results of a scheduled evaluation by a national review team. Negotiations continued after the review team recommended continued operation of the College.

Demonstration Lighting

Exxon funds totaling \$40,000 are planned to support a project to replace incandescent lights with compact fluorescent light bulbs in multi-family

high-rise structures. Dwellings eligible for the Weatherization Assistance Program will be targeted for participation in the lighting project. Data on energy savings reported from the project will be used to support inclusion of lighting projects in the Weatherization Assistance Program. No action occurred on this project during 1991-92.

The Dollar and Energy Saving Loan Program

Ten million dollars in *Exxon* funds and 2.75 million dollars in *Stripper Well* funds support the Dollar and Energy Saving Loan Program, which provides low-interest loans to Nebraskans to finance home, building and system improvements. Participating lenders provide five percent financing for up to ten years on loans for pre-qualified

energy improvement projects in the following areas:

- Doors, walls, windows and ceilings
- Heating, air-conditioning and water heating
- Lighting
- Appliance replacement

All other energy improvements require an energy audit before they may be approved for the Dollar and Energy Saving Loan Program. These may be financed up to five, ten or 15 years depending on the type of improvement. Funds are also available at zero percent interest for energy audits.

Loans are available for homes, apartments, small businesses, non-profits, farms and ranches and subdivisions of local government.

An additional \$500,000 in oil overcharge funds (\$394,097 from *Exxon* and \$105,903 from *Stripper Well*) have been placed in the Dollar and Energy Saving Loan Program to finance energy conservation improvements in rural nursing homes. Energy improvement loans at 5% interest are available to licensed nursing homes located in rural areas and municipalities of 5,000 or less.

Applicants obtain appropriate forms from the Nebraska Energy Office. After obtaining bids, applicants may then

apply for a loan from the lender of their choice. Once the lender approves the loan application, a commitment agreement is submitted to the Energy Office for review. Upon final approval from the Energy Office, the lender notifies the applicant to proceed with the energy improvement project.

Figures 13 and 14 summarize the projects financed by the Dollar and Energy Saving Loan Program in 1990-91.

Downtown Lincoln Commuter Bike Path

Exxon funds totaling \$97,000 are planned to partially support a \$567,000 project to construct a commuter bike path in Lincoln, linking the Capitol with both UNL campuses, Lincoln Center, Lincoln High School and the John Dietrich Trail. No action occurred on this project during 1990-91.

Emergency Preparedness

Ninety-five thousand dollars in *Exxon* funds continued to be used for staff and other costs required to maintain Nebraska's mandatory energy shortage management plan through June 30, 1992. (See pages 6-7 for details about emergency preparedness activities in 1990-91.)

Energy Emergency Activities Fund

\$100,000 in *Exxon* funds would support energy emergency activities during severe or protracted energy shortfalls. This project was deemed an ineligible use of oil overcharge funds by the U.S. Department of Energy.

Energy-Related Research

The University of Nebraska received \$2 million in *Stripper Well* funds to support energy-related research. The University is required to match the grant with private sector contributions.

Grant funds have been allocated to nine projects, which are described below:

- Dr. David Sellmeyer, UNL Department of Physics and Astronomy, received \$124,201 to develop new permanent-magnet materials for use in smaller, more efficient electric motors. The grant was matched by \$132,722 from a United States Department of Energy research grant.
- Dr. Sy-Hwang Liou, UNL Department of Physics and Astronomy, received \$68,200 to develop a method for applying superconducting films to metals, which may help bring superconducting machinery out of the laboratory and into the marketplace. Matching funds came from the NU Foundation and a private endowment.
- Dr. Rodney O. Dillon, UNL Department of Electrical Engineering, received \$49,130 to develop a process for growing a thin diamond film on the metal surface of parts in power plants, to improve power plant efficiency. The Electric Power Research Institute provided \$49,142 in matching funds.
- Dr. Maher K. Tadros, UNO Department of Civil Engineering, received \$88,000 to study ways of fastening the two concrete surfaces of an insulated sandwich panel. This research may lead to more efficient insulated panels in the construction of commercial buildings. A local concrete products company matched the grant.
- Dr. Atorad Azizinamini, UNL Department of Civil Engineering, received \$86,272 to study the best

Oil Overcharge Funds Invested in Types of Dollar & Energy Saving Loans

July 1, 1990 through June 28, 1991

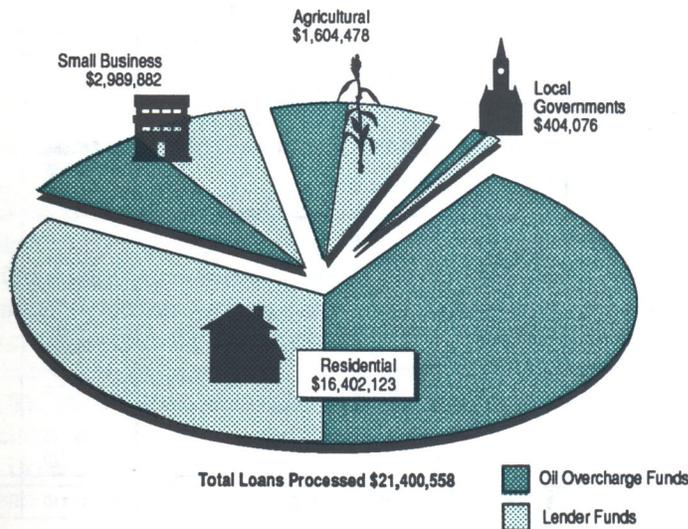


Figure 13

• STATE ENERGY CONSERVATION PROGRAM & ENERGY EXTENSION SERVICE DIVISION •

proportions for making concrete with local aggregates, resulting in high-strength, lighter-weight concrete products. The Portland Cement Association and five local concrete and related products companies provided matching funds.

• Dr. George E. Meyer, UNL Department of Agricultural Engineering, received \$56,765 to study more efficient methods of heating and cooling commercial greenhouses. Matching funds of \$57,106 were provided by a National Science Foundation research

grant and materials donations from several local and out-of-state businesses.
 • Dr. Tyrrell Conway, UNL School of Biological Sciences, received \$228,600 to use genetic engineering to develop a strain of bacteria capable

5% Dollar & Energy Saving Loan Program
Analysis of Improvements

Type of Improvement	Residential		Small Business		Agriculture		Local Government		Total	
	Cost	Percent	Cost	Percent	Cost	Percent	Cost	Percent	Cost	Percent
Appliance Replacement										
refrigerators	\$170,854	1.0%	\$575	0.0%	\$14,900	1.0%			\$186,329	1.2%
freezers	12,482	0.1%							12,482	0.1%
dishwashers	20,327	0.1%							20,327	0.1%
clothes washers	26,116	0.2%					\$6,830	2.8%	34,946	0.2%
Building Envelope										41.7%
weatherstrip door	25,541	0.2%	11,428	0.4%	926	0.1%	181	0.1%	38,076	0.2%
weatherstrip window	10,166	0.1%	5,345	0.2%					15,511	0.1%
repair window	96,044	0.6%	15,083	0.5%	12	0.0%			111,139	0.5%
eliminate window	128,197	0.8%	50,524	1.8%			690	0.2%	179,411	0.8%
add storm windows	535,066	3.2%	25,900	0.9%	200	0.0%	1,280	0.4%	562,446	2.6%
thermal paned window	4,361,245	25.7%	262,569	9.2%			30,813	9.8%	4,654,627	21.5%
insulate frame wall	1,291,604	7.6%	96,007	3.4%	25,568	1.6%	4,854	1.5%	1,418,033	6.5%
insulate masonry wall	139,642	0.8%	70,190	2.5%	6,542	0.4%			216,374	1.0%
insulate floor	24,169	0.1%	8,292	0.3%					32,461	0.1%
insulate band joist	8,437	0.0%	2,119	0.1%					10,556	0.0%
insulate slab edge	1,157	0.0%	743	0.0%					1,900	0.0%
insulate ceiling/roof	554,119	3.3%	358,683	12.6%	5,112	0.3%	12,224	3.9%	930,138	4.3%
replace door	315,187	1.9%	38,929	1.4%	7,092	0.5%	1,267	0.4%	362,475	1.7%
general sealing	346,825	2.0%	135,283	4.8%	390	0.0%	23,159	7.3%	505,657	2.3%
combustion air inlet	7,389	0.0%	1,837	0.1%					9,226	0.0%
heat exchanger	1,914	0.0%			4,716	0.3%			6,630	0.0%
Mechanical System										48.1%
insulate ducts	22,627	0.1%	7,348	0.3%			6,553	2.1%	35,528	0.2%
insulate hot water pipes	1,030	0.0%	2,327	0.1%			1,500	0.5%	4,857	0.0%
seal duct or pipe	12,044	0.1%							12,044	0.1%
replace space heating	5,829,500	34.3%	973,470	34.2%	9,865	0.6%	145,052	46.0%	6,957,887	32.1%
replace cooling	2,764,413	16.3%	311,611	10.9%			24,436	7.7%	3,100,460	14.3%
replace water heating	193,660	1.1%	18,517	0.7%			179	0.1%	212,356	1.0%
water heater insulation	581	0.0%	112	0.0%					693	0.0%
hot water flow restrictors	1,263	0.0%							1,263	0.0%
flue/vent damper	2,259	0.0%	1,320	0.0%			1,000	0.3%	4,579	0.0%
electronic ignition	1,109	0.0%							1,109	0.0%
replace burner	3,035	0.0%	915	0.0%					3,950	0.0%
programmable thermostat	48,596	0.3%	27,248	1.0%	242	0.0%	6,400	2.0%	82,486	0.4%
whole house fan	14,643	0.1%	1,095	0.0%	2,720	0.2%			18,463	0.1%
Lighting										1.2%
replace incandescents	9,145	0.1%	183,978	6.5%	247	0.0%	47,216	15.0%	240,586	1.1%
upgrade fluorescents	2,420	0.0%	16,115	0.6%					18,535	0.1%
install controls	160	0.0%	2,075	0.1%					2,235	0.0%
Energy Audits										7.8%
irrigation (other)					192,561	12.4%			192,561	0.9%
low-pressure center pivot					1,026,289	66.1%			1,026,289	4.7%
livestock production					70,784	4.6%			70,784	0.3%
grain production					184,980	11.9%			184,980	0.9%
HVAC Units			29,926	1.1%					29,926	0.1%
bottle cooler			1,800	0.1%					1,800	0.0%
evaporative cooler			1,326	0.0%					1,326	0.0%
compressor heat recovery			147,016	5.2%					147,016	0.7%
insulating drapes			19,278	0.7%					19,278	0.1%
trenching machine			18,375	0.6%					18,375	0.1%
Totals	\$16,982,971	78.3%	\$2,847,359	13.1%	\$1,553,146	7.2%	\$315,634	1.5%	\$21,699,110	100.0%

Figure 14

of fermenting large amounts of ethanol in a harsher environment than current production strains can tolerate. This research can lead to lower ethanol production costs. Matching funds were provided by a United States Department of Energy research grant.

- Dr. Peter Jenkins, UNL Department of Mechanical Engineering, received \$856,740 for multi-faceted research to develop an engine fueled by a combination of diesel and ethanol or compressed natural gas. Nine hundred thousand dollars in matching funds consisting of materials and cash will be provided by four out-of-state companies.
- Dr. Frazier Williams, UNL Electrical Engineering Department, received \$142,007 to study improved methods for insulating electrical switching systems. Better insulation allows transmission at higher voltages, which decreases line loss. Matching funds were provided by the Electric Power Research Institute.

Energy Management Circuit Rider

Stripper Well funds provide \$400,000 in support for a two-year pilot project to provide technical assistance to cities, counties, school districts, hospitals and nursing homes. The program, hosted by the Central Community College in Columbus and the Mid-Plains Community College in North Platte, has a dual mission: to determine what institutions and communities need to develop a self-supporting energy management program and to help them adopt good energy management techniques.

Once the pilot project is complete, the program will be expanded to offer similar services to commerce and industry.

Circuit riders in Columbus and North Platte help identify low- and no-cost energy efficiency improvements, provide formal energy maintenance training and establish energy accounting systems for tracking energy consumption and savings. The circuit riders report that many facilities can cut their energy bills by 10 to 15 percent with little capital investment.

Stripper Well Contracts

Category	Allocated Funds	Contracts Issued	Expenditures Through 6-30-91
Low Income Weatherization	\$2,290,579	\$2,290,579	\$534,946
State Buildings Energy Team	150,000	0	0
Local Government			
Energy Management Circuit Rider	400,000	400,000	113,625
Public Transportation	800,000	525,000	486,557
Energy Related Biotechnology, Solar and Conservation Outreach	2,000,000	2,000,000	742,099
Greenhouse Project	400,000	400,000	400,000
Innovative Energy Grants	500,000	0	0
Dollar and Energy Saving Loan Program	2,855,093	2,745,497	2,745,497
Indian Tribal Governments	77,000	51,333	16,667
University of Nebraska Building Weatherization	500,000	500,000	1,000,000
Nebraska State College System	1,500,000	1,500,000	1,000,000
Curtis Weatherization	250,000	0	0
Total Stripper Well Contracts 6-30-91	\$11,722,672	\$10,412,409	\$6,130,686

Figure 15

Feasibility Study of Trans-Nebraska Bike Path

Exxon funds totaling \$75,000 are planned to fund a study to determine the feasibility of building a system of trails across the state, linking existing hiker-biker trails. No action occurred on this project during 1990-91.

A Hundred Points of Light

Exxon funds totaling \$250,000 were set aside to subsidize replacement of incandescent bulbs with compact fluorescent lamps in commercial buildings. Compact fluorescent lamps provide a screw-in replacement for incandescent bulbs in many applications, but require only one fourth of the energy to produce an equivalent amount of light. They are more expensive than incandescent bulbs, but last up to ten times longer, often paying for themselves in one or two years.

The Energy Office is working with the Nebraska Public Power District and the Omaha Public Power District to educate building owners about the benefits and proper use of compact fluorescent lamps. Both utilities have decided to operate pilot programs in which they will sell the compact fluorescent lamps to their commercial custom-

ers with a five dollar subsidy. The Energy Office and utility will contribute equally to cover this subsidy. The program may be expanded to other utilities and other sectors of the economy depending on the success of these pilot programs.

Indian Tribal Governments

The *Stripper Well* court order requires the state to provide an equitable share of oil overcharge funds to Indian tribal governments. Based on Native American representation in the general population, \$77,000 in *Stripper Well* funds has been set aside for Nebraska Indian Tribal Governments.

In 1990-91, the Omaha Tribe received a contract totaling \$9,000. A total of \$6,000 was used to supplement its Tribal Transportation Program and \$3,000 was used to supplement its Housing Improvement Program.

A \$25,666.66 contract with the Santee Sioux Tribe of Nebraska provided \$5,666.66 to supplement the tribe's Transportation Program and \$20,000 to supplement its Home Improvement Program.

Innovative Energy Grants

Stripper Well funds totaling \$500,000 have been earmarked for grants to

citizens for research and/or development of energy-related inventions. The Energy Office, along with the University of Nebraska's Technical Assistance Center, has developed evaluation criteria for project review. Pre-application forms are available from the Energy Office.

Fifteen applications were received. Four applicants were invited to submit further information for detailed technical review. No grants have been made to date.

Kearney State College Boiler Modifications for Refuse-Derived Fuel

Exxon funds totaling \$150,000 were expected to finance a project to retrofit one of the boilers at Kearney State College to burn waste fuel instead of natural gas. However, this project was deemed an ineligible use of oil overcharge funds by the U.S. Department of Energy.

Low-Income Weatherization Assistance Program

A total of \$4.55 million in oil overcharge funds (\$3.68 million from *Exxon* and \$870,000 from *Stripper Well*) have been allocated to the Low-Income Weatherization Assistance Program to assist low income Nebraskans with residential weatherization to improve efficiency and reduce energy costs. Funds continue to be spent at the rate of \$910,000 per weatherization program year.

In accordance with terms of the *Stripper Well* court order to provide an equitable share of funds to the state's low-income population, approval was granted to spend an additional \$725,000 for the Low-Income Weatherization Assistance Program. Because 18 percent of the households in the state are eligible for low-income weatherization, a proportionate amount of *Stripper Well* funds have been set aside for low-income programs.

For details on Low-Income Weatherization projects, see pages 1- 2.

Nebraska State College System

Construction of a wood-fired boiler was completed on the campus of Chadron State College. The boiler, paid for with \$1 million in *Stripper Well* funds, will heat 18 campus buildings and

save the college \$140,000 a year. Project engineers estimate that the boiler will use 13,000 tons of wood chips annually and should have a payback period of seven years.

The College Board of Trustees is considering using the remaining \$500,000 in oil overcharge funds for a variety of projects, including development of a comprehensive utilities master plan for the Peru State College campus. Engineers have proposed a master plan design and implementation strategy that are currently being considered by the College Board and the Energy Office.

Planning, Monitoring and Evaluating Oil Overcharge Programs

To comply with federal regulations, \$384,199 in *Stripper Well* funds have been committed to the State Energy Conservation Plan for planning, monitoring and evaluating programs supported by oil overcharge funds.

Rural Revitalization: Public Transportation

One million dollars (\$200,000 from *Exxon* and \$800,000 from *Stripper Well*) supported rural transportation, through bus subsidies and alternate-fuel-powered vehicles. A total of \$500,000 subsidized operating costs for Black Hills State Lines, Inc. (\$360,000) and Star Transportation Services, Inc. (\$140,000). An estimated 18,986 riders used the subsidized transit programs over a two-year period.

The remaining \$500,000 was used to provide the state's contribution to an alternate fuel vehicle program. This program was also supported by a \$831,000 Urban Mass Transit Authority grant to purchase propane- and natural gas-propelled buses, vans and cars for use by 30 rural transit systems and three native American tribes. The vehicles will be used in rural community- and county-based programs that provide transportation for the handicapped, elderly and general public. Twenty-six mini vans and thirteen passenger vans were provided to 35 counties.

Total cost of the vehicle replacement project is \$1.16 million. Under the terms of the grant, the state has contributed \$221,600, rural transit systems contrib-

uted \$55,400 and three natural gas utilities (Minnegasco, KN Energy and the Fremont Municipal Utilities System) have built five refueling stations at an estimated cost of \$54,000. The state will use the balance of the overcharge funds, \$275,000, to purchase additional rural transportation vehicles in 1991-92.

Both the bus subsidy and the alternate fuels demonstration program were coordinated by the Nebraska Department of Roads.

S.T.A.R.T. Energy Component

Exxon funds totaling \$75,000 are planned to finance a project to add an energy component to Strategic Targeting and Resource Training (START) programs in Nebraska.

START is an analytical and decision-making process that has been used in 1989-90 by 25 towns and three counties in Nebraska to evaluate community needs and resources for meeting them. This project would add an energy component to the START planning process, allowing communities to evaluate and make decisions about energy conservation. Communities that don't participate in START would also be able to use the energy component. No action occurred on this project during 1990-91.

State Buildings Energy Team

\$150,000 in *Stripper Well* funds will finance the State Buildings Energy Team. It is the intent of the team to coordinate management and use of energy in all state buildings, recommend efficiency projects and provide training for building managers in proper energy management techniques. The Energy Office is negotiating a contract with the Department of Administrative Services to manage the State Buildings Energy Team.

Statewide Energy Education Initiative

\$200,000 in *Exxon* funds is planned to coordinate statewide energy conservation instruction in grades K-12 with groups such as the Educational Service Units and the Department of Education training teachers and disseminating program materials. The program will promote energy conservation to future

energy consumers. Preliminary planning occurred on this project during 1990-91.

Study of Controlled Residential Ventilation

Exxon funds totaling \$500,000 would support a study of the benefits of maintaining positive indoor air pressure in homes. This project was deemed an ineligible use of oil overcharge funds by the U.S. Department of Energy.

University of Nebraska-Lincoln Greenhouse Renovation Project

Stripper Well funds totaling \$400,000 were used to renovate 20 greenhouses on the University of Nebraska's East Campus, which are used for research and teaching in the departments of Agronomy, Plant Pathology, Horticulture and Entomology. Renovations included adding individual controls for heating, cooling and lights for each zone within the greenhouses; making efficiency improvements in the cooling systems; and improving roof glazing. The project was completed in Spring 1991.

University of Nebraska Building Weatherization

The University of Nebraska received \$500,000 in *Exxon* funds to finance ten projects in buildings at three campuses — University of Nebraska-Lincoln, University of Nebraska at Omaha and University of Nebraska Medical Center. The projects focus on increasing energy efficiency and conservation in campus buildings and generally include installation of energy management control systems, astute thermostats and boiler economizers.

One project, a boiler economizer for the College of Business Administration at the University of Nebraska at Omaha, has been completed. The other nine projects are under construction. The payback periods for the projects range from two to 6.8 years.

Exxon Grants

Exxon oil overcharge funds are used to finance projects that promote energy education and conservation. The SECP/EES Division administers contracts and programs supported by *Exxon* funds. Figure 16 lists expenditures by category

of all *Exxon* and *Stripper Well* funds through June 30, 1991.

As of June 1991, the following *Exxon* projects are in various stages of completion.

Energy Education

Nebraska Council on Economic Education completed the final year of its contract to promote energy education in Nebraska schools. Library materials were returned to the Energy Office.

Exxon funds awarded: \$98,633. Actual funds expended: \$93,880.

Central Community College completed a diagnostic program that used the MCA 3000 Sun Modular Computer Analyzer to teach high school automotive students how to improve energy efficiency in automobiles.

Exxon funds awarded: \$40,332. Actual funds expended: \$36,615. In-kind match provided by Central Community College: \$16,264.

Auburn Public Schools Foundation continued its three-year residential energy audit and weatherization program for Auburn High School's industrial arts students. During 1990-91, the school offered two courses that provided training in energy auditing, energy management and conservation, residential construction and weatherization materials, safety and quality control. Students conducted energy audits on seven local residences. In summer 1991, six students also participated in the final

hands-on session to weatherize Auburn homes.

Exxon funds awarded: \$93,725. Actual funds expended: \$69,332. Support provided by Auburn Public Schools Foundation: \$1,800 cash and \$96,010 in-kind match.

Community Action of Nebraska's project to train building contractors to weatherize mobile homes was canceled due to low interest and lack of participants.

Exxon funds awarded: \$132,810. Actual funds expended: \$32,815. Support provided by Community Action of Nebraska: \$36,650 cash and \$26,400 in-kind match.

Local Conservation Financing Demonstrations

South Sioux City Area Chamber of Commerce continued to lend funds at four percent interest to weatherize commercial buildings in South Sioux City. Loan funds are leveraged with a \$66,000 commitment from local banks. To date, eight energy projects have been completed, using loan funds totaling \$72,333.

Exxon funds awarded: \$132,000 for the revolving loan fund and \$6,664 for program operation. Actual program funds expended: \$826. Support provided by South Sioux City Area Chamber of Commerce: \$66,000 cash and \$2,200 in-kind match.

Exxon Contracts

Category	Allocated Funds	Contracts Issued	Expenditures Through 6-30-91
Energy Education	\$628,056	\$563,056	\$534,946
Financing Demonstrations	1,100,164	1,100,164	980,389
Agriculture	327,234	327,234	290,450
Feasibility Studies	113,827	113,827	108,448
Building Improvement Demonstration	848,392	848,392	724,258
Transportation	710,000	710,000	700,000
Load Management	50,039	50,039	50,039
Dollar and Energy Saving Loan Program	10,000,000	7,676,223	7,676,223
Low Income Weatherization	3,864,076	3,864,076	1,938,671
Total Exxon Contracts 6-30-91	\$17,641,788	\$15,253,011	\$13,003,424

Figure 16

Village of Stuart completed a three-year revolving loan program to provide zero-interest loan funds to conduct energy audits and finance local commercial building weatherization and waste-heat recovery projects. Twenty-two energy audits were completed and eleven projects totaling \$108,422 were funded.

Energy analyses of two waste heat recovery projects at local grocery stores indicated average energy savings of 29 percent in the first post-improvement year.

Other projects included installation of replacement furnaces, doors and windows; high-efficiency lighting; and increased insulation. The prorated share of loan principal provided by the Energy Office will be returned as loans are repaid.

Exxon funds awarded: \$143,000 for the revolving loan funds and \$18,500 for program operation. Actual program funds expended: \$13,755. Matching funds provided by the Stuart Electrical System: \$36,000 as loan principal. In-kind match provided by the Village of Stuart: \$10,087.

City of Schuyler and the Schuyler Energy Commission continued to lend funds at 3.6 percent interest to weatherize local commercial, non-profit and government buildings. The program was expanded to include residential weatherization and was extended to operate for ten years, the maximum term for an oil overcharge project.

Energy Office loans are leveraged with a \$199,500 commitment from local lending institutions. Fifteen loans totaling \$128,085 have been approved to date.

Consumption analysis of two commercial projects revealed that business owners decreased energy use by an average of 24 percent in the first post-improvement year.

Exxon funds awarded: \$178,007 for the revolving loan fund and \$21,993 for program operation. Actual program funds expended: \$20,309. Support provided by City of Schuyler: \$199,500 cash and \$19,916 in-kind match.

City of Lincoln continued to operate an interest buy-down program to reduce

interest rates to zero percent on loans for weatherizing residential or mixed-use buildings. Rebates of 25 percent, up to a maximum of \$2,500 each, are also available to eligible property owners. To date, 281 property owners have received loans or rebates totaling \$228,165.

Exxon funds awarded: \$313,949 for the interest buy-down/rebate program and \$36,057 for program operation. Actual funds expended: \$342,689. Support provided by the City of Lincoln: \$450,000 cash arranged through the Nebraska Investment Finance Authority and \$90,724 in-kind match.

Neighborhood Housing Services, Inc. continued a revolving loan program to provide low-interest weatherization funds to property owners unable to obtain credit from conventional lending sources. Loan funds are available at a three percent interest rate. Staff changes have delayed program operation.

Exxon funds awarded: \$194,257 for the revolving loan fund and \$55,743 for program operation. Actual funds expended: \$4,810. In-kind match provided by Neighborhood Housing Services, Inc.: \$22,953.

Agricultural Projects

University of Nebraska's Department of Agronomy completed a strip and relay cropping project to demonstrate the energy savings potential of: 1) alternating crop types in a field from year to year and 2) growing more than one type of crop simultaneously in different strips wide enough to permit independent cultivation, but narrow enough for the crops to interact agronomically. The project also demonstrated a practice of relay cropping warm season crops into cool season crops. Alternating or relaying crops can decrease the need for nitrogen fertilizer, reduce tillage operations and reduce insecticide application.

Thirty farmers maintained demonstration sites during the 1990 growing season. Soil samples indicated that these systems show potential for increasing yields and decreasing soil erosion. Information dissemination and extension activities continued.

Exxon funds awarded: \$40,000. Actual funds expended: \$39,529. In-kind match provided by NU: \$71,540.

University of Nebraska's Department of Agronomy also completed a crop rotation project to demonstrate that application of synthetic nitrogen can be decreased through proper fertilizer management practices. Over 80 experiments were conducted on 38 farms during the three year project.

Soil samples indicated that significant residual nitrate would support decreases in nitrogen fertilizer application. Extrapolations based on standard nitrogen use rates in Nebraska suggest that if half of the state's seven million acres in continuous corn production, 2.5 million acres in soybean production and 1.5 million in alfalfa production were grown in rotation with legumes, a savings of 88 to 125 million pounds of nitrogen per year could result — leading to an equivalent savings of 350,000 to 1.1 million barrels of oil. Information and extension activities continued.

Exxon funds awarded: \$40,000. Actual funds expended: \$39,971. Support provided by NU: \$500 cash and \$71,440 in-kind match.

47 Ranch Company continued to use photovoltaic-powered electric fencing to implement planned grazing and maximize range use, without the increased utility costs associated with conventional electric fencing. The 19 miles of new fence, divided into 51 grazing paddocks and powered by five photo-voltaic collectors, allowed the ranch to concentrate larger numbers of cattle in smaller pastures for shorter lengths of time.

With fresh grass available for grazing all summer, cattle growth increased and sickness decreased. Seventy-one cow-calf pairs were added to the stock rates and ranch income increased by an estimated twelve percent in the first year of the fencing operation.

A tour of the ranch was conducted to present the fencing project. However, the solar water pumps, which utilized alternating current cells, continued to be plagued by problems and this component of the demonstration was declared unsuccessful.

Exxon funds awarded: \$47,575.
Actual funds expended: \$31,385. In-kind match provided by 47 Ranch Company: \$52,793.

University of Nebraska's Departments of Biological Systems Engineering and Horticulture completed a program to develop and use computerized data bases and to design technical consultation software for greenhouse personnel throughout the state. The Greenhouse Systems Group compiled information on the energy-efficiency of various greenhouse architectural configurations and glazing materials, using SMART and CAD software to integrate biological, structural, environmental, mechanical and business components into a computerized data base and design system. The software has been used in over 100 design consultations in the United States and has been demonstrated at numerous industry and academic meetings.

Engineers were able to compute grower costs and develop models for simulating and analyzing heating and cooling in various greenhouse styles. Forty new designs yielded a total energy savings of 35 percent over the annual fuel costs associated with conventional greenhouse systems. The accumulated energy savings for the next ten years from designs already implemented (3.1 acres) amount to \$962,000 at current natural gas prices. Savings will rise when the final 1.9 acres of greenhouses are built, with a possible total ten-year energy cost savings exceeding \$1.5 million.

Exxon funds awarded: \$186,637.
Actual funds expended: \$166,565. In-kind match provided by NU: \$212,759.

Technical Assistance/Efficiency Studies

City of Kimball continued an 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 improvements. Metering and data verification have been completed and data analysis is proceeding.

Exxon funds awarded: \$20,000.
Actual funds expended: \$14,620. In-

kind match provided by the City of Kimball: \$20,000.

Public and Nonprofit Building Improvement Demonstrations

Northern Natural Gas Company 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 units were installed at the Jewish Community Center and the Florence Home. Data collection has been completed and analysis is proceeding.

Exxon funds awarded: \$90,000.
Actual funds expended: \$83,594.

Support provided by Northern Natural Gas: \$300,600 cash and \$34,400 in-kind match.



Berggren and Woll Architects continued the

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 participated in the program. Post-improvement data analysis is being completed at all sites to determine actual energy savings.

Exxon funds awarded: \$629,454.
Actual funds expended: \$622,337. Cash match provided by counties: \$166,669. In-kind match provided by Berggren & Woll: \$6,120.

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. The U.S. Department of Energy (DOE) established a refund standard of eight dollars 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 DOE before the December 31, 1987, deadline. Additional deadlines have since been established as more money has been added to the fund. Any application submitted before a deadline is eligible for a proportional share of any money added at a later date.

Nebraska led the nation with 6,001 refund claims, documenting purchases of over 3.66 billion gallons of petroleum products and representing a total of \$2,930,000 in restitution payments.

As of September 3, 1991, DOE had granted 5,754, or 96 percent, of the claims filed in Nebraska. These claims cover 2.72 billion gallons of petroleum products — 77.4 percent of the total volume of documented purchases. Refunds to date have totaled \$2,178,766. Included is a refund of \$204,142 on purchases of 255,176,891 gallons of petroleum products documented in a claim filed by the Energy Office in March 1988 on behalf of the state of Nebraska.

Twenty-four claims, representing purchases of over 84 million gallons of petroleum products, have been denied. Most of these claims were made by petroleum product retailers who were not eligible for refunds. Sixty claims, representing purchases of over 161 million gallons, were dismissed or declared moot because of duplicate filings. The remaining 163 claims still being processed represent 19.3 percent of the total documented purchases of petroleum products — more than 705 million gallons. Most of the claims still being processed were filed in the past 18 months.

Applicants may receive additional payments as more funds are added to the pool of money available for direct restitution.

NATURAL GAS TECHNICAL ASSISTANCE

“A procedure laid out by the three-year-old Nebraska Municipal Natural Gas Regulation Act requires the gas company to file for a rate increase and towns can either accept or reject it. If the two sides fail to reach agreement, as in the recent incident, the matter is decided in court.”

Editorial, *The Ord Quiz*,
July 11, 1991

Approximately one-third of Nebraska's natural gas consumers receive their service from municipally-owned natural gas utilities. Five investor-owned natural gas companies provide service to the other two-thirds of the state. Natural gas is imported into Nebraska primarily through major pipelines operated by Northern Natural Gas Company and KN Energy, Inc.

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 Nebraska's *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 receives 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. Regulations governing the Loan Fund's administration were adopted and took effect on September 1, 1987.

In 1990-1991, ten rate areas representing 184 towns and villages received loans totaling \$164,922.40 to offset the costs of rate analysis and court actions regarding rate regulatory activities (see map in figure 17). All of the towns were served by a single investor-owned utility, KN Energy. Twenty-seven towns in the Panhandle were parties to an appeal to the Nebraska Supreme Court. The remaining 155 towns scattered across the central portion of the state contracted for a rate analysis of a general rate proposal.

In February of 1991, in Lancaster County District Court, KN Energy sued 123 towns which adopted lower rates than those proposed by the utility or hadn't accepted a settlement offer. Before the court decided the case, more towns adopted the settlement, leaving 89

Areas Receiving or Appealing Natural Gas Rate Requests in 1990 - 91

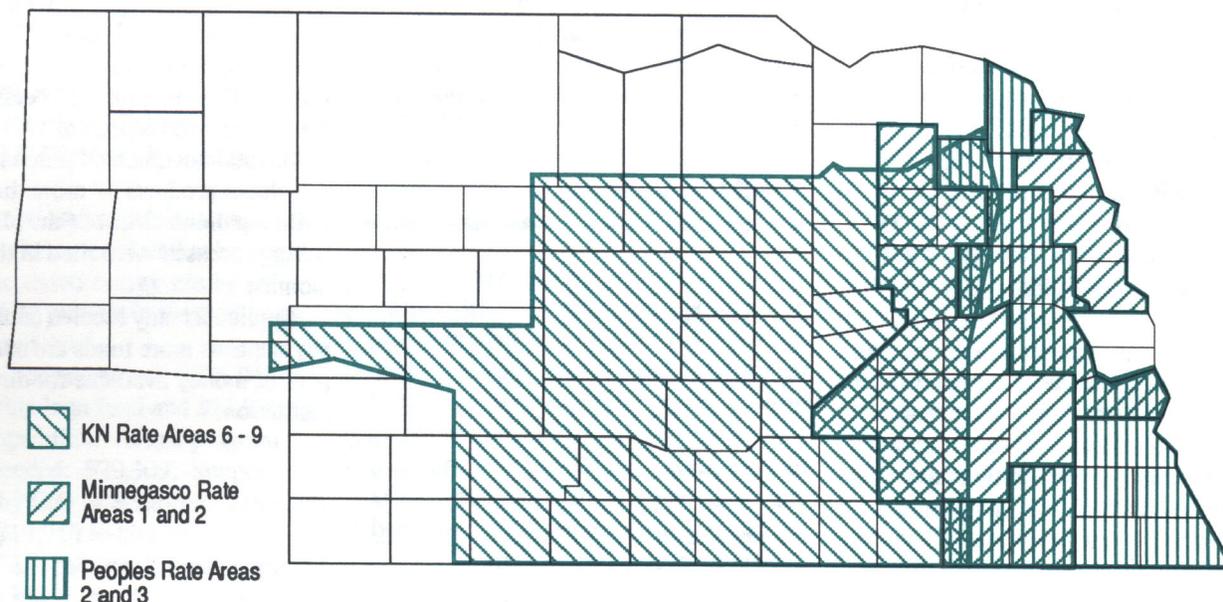


Figure 17

as parties to the lawsuit. At the end of June, the court found in favor of the utility, which kept in effect the rates it had initially proposed.

Also in February, Minnegasco proposed a general rate increase in all the 60 towns it serves in eastern Nebraska. The two rate areas organized and contracted for analysis of the rate proposal.

In June, Peoples Natural Gas Company notified 33 of the 41 eastern

Nebraska towns it serves that it intends to propose a general rate increase.

Informational Resources

During 1990-91, the Energy Office provided assistance to municipal officials during the regulatory process. This assistance included the organizing

of rate area committees, publishing periodic issues of *Natural Gas Rate Regulation Update* in each utilities' service area and responding to specific inquiries regarding the *Municipal Natural Gas Regulation Act*.

GRANTS STUDIES LEGISLATION

“America needs more than a minimalist energy policy. We need a vision of the future in which Americans use less. And we need leaders who ask for sacrifice to meet that vision.

We need incentives to redesign furnaces, boilers and engines, incentives to find new building materials and techniques, incentives and regulations requiring more fuel-efficient cars.”

Editorial, *The Lincoln Star*, January 3, 1991

Grants and Studies

DOE Grant to Monitor Propane and Heating Oil Prices

In 1991, the Nebraska Energy Office received a \$2,008 grant from the U.S. Department of Energy to continue a five year program to monitor residential propane and fuel oil prices during the winter months.

In conjunction with DOE's Energy Information Administration (EIA), the Energy Office surveys selected sellers of propane twice a month from October through March, to ask for current sales prices. Survey results appear weekly in the EIA's *Winter Fuels Report*.

Western Regional Biomass Energy Project

The Western Regional Biomass Energy Project (WRBEP) is a U.S. Department of Energy Program administered by the Western Area Power Administration. The project'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 operations residue aquatic plants and municipal wastes.) Similar projects are underway in other areas of the country.

Two Energy Office representatives sit on WRBEP advisory boards, which direct the entire project as well as specific demonstration projects undertaken as part of WRBEP. Through the WRBEP, Nebraska has conducted an inventory of all biomass produced in the state and available for energy conversion.

Federal Legislation

Update on Clean Air Act Amendments

In June 1989, President Bush announced in Lincoln, Nebraska, the need for increased use of clean-burning fuels such as ethanol so “every American in every city across this country will breathe clean air. Alternative fuels are going to help us get there...”

A little more than a year later, on November 15, 1990, President Bush signed the Clean Air Act Amendments, the first changes in clean air legislation since 1977. For the first time, Congress recognized the importance of producing cleaner gasolines to help reduce pollution from automobiles, rather than relying solely on emission controls on automobiles. Two provisions in particular require the use of clean-burning additives like ethanol: the Reformulated Gasoline Standards for ozone nonattainment areas and the Oxygenated Fuel Programs for carbon monoxide nonattainment areas.

These provisions will create a tremendous new market opportunity for ethanol and ethyl tertiary butyl ether (ETBE)-blended gasolines. The Oxygenated Fuel Program is estimated to create an immediate demand increase of 450-500 million gallons in ethanol per year, requiring between 175 and 200 million bushels of surplus grain. The reformulated gasoline requirements that go into effect in 1995 will create an additional market opportunity for ethanol and EBTE-blends and a corresponding increase in ethanol production facilities in Nebraska.

On a national level, the Clean Air legislation will result in cleaner, safer air and a reduction in the nation's growing dependence on imported oil. A study conducted by the U.S. Department of Energy and the Environmental Protection Agency concluded that increased use of oxygenated fuels like ethanol would displace between 800,000 and 1.5 billion barrels of oil a day.

National Energy Strategy

In February, the President proposed the long-awaited National Energy Strategy which had been in the making for 18 months. Some key points of the more than 100 policy changes were:

- Opening new areas, including the Arctic National Wildlife Refuge in Alaska, for “responsible” development of oil and gas resources.
- Easing regulatory barriers for constructing nuclear power plants and disposing of atomic wastes to “revitalize the nuclear option” as an energy source.
- Streamlining regulations to speed construction of natural gas pipelines and overhaul regulations of electric utilities to increase competition at the wholesale market level.
- Requiring fleet operators to use alternative fuels for cars and trucks if the vehicles and fuels are readily available.

As of June 30, 1991, Congress had taken no action on this proposal.

State Legislation

Amendment to the State Government Recycling Management Act

As amended by the Legislature in 1991, the State Government Recycling Management Act Fund will receive three percent of the funds the state earns from the sale of surplus property. This statute authorizes the coordination, collection and sale of recyclable materials gener-

ated by state agencies. Energy Office personnel have implemented the various aspects of the state effort throughout 1990-91.

Executive Order

Alkaline Paper

Governor Nelson issued an executive order in May 1991, requiring state

agencies to use alkaline paper for printing documents of historical significance. This type of paper is made from recycled paper products and its production creates less waste. Over time, using alkaline paper is expected to save the state millions of dollars in microfilming and reproduction costs.

FISCAL ORGANIZATIONAL NOTES

“In their role as consumers, it behooves Nebraskans to take whatever avenues are available to conserve energy. Upgrading home furnaces, installing improved farm irrigation systems and more efficient industrial lighting systems are among the ways the energy improvement program will help conserve energy — and money in the Cornhusker State.”

Editorial, *Kearney Hub*, July 11, 1990

Financial Review

The accompanying graphics illustrate the Energy Office's budget from July 1, 1990 through June 30, 1991, which amounted to \$21,374,650 and includes federal funds, state funds and petroleum violation escrow (oil overcharge) funds.

Approximately 69 percent of the agency's funding came from petroleum violation escrow funds, a substantial change from the previous year when these funds accounted for only 29.8 percent. Additionally, federal funds increased slightly while state severance taxes declined slightly. State funds came almost exclusively from severance taxes.

Where The Money Came From

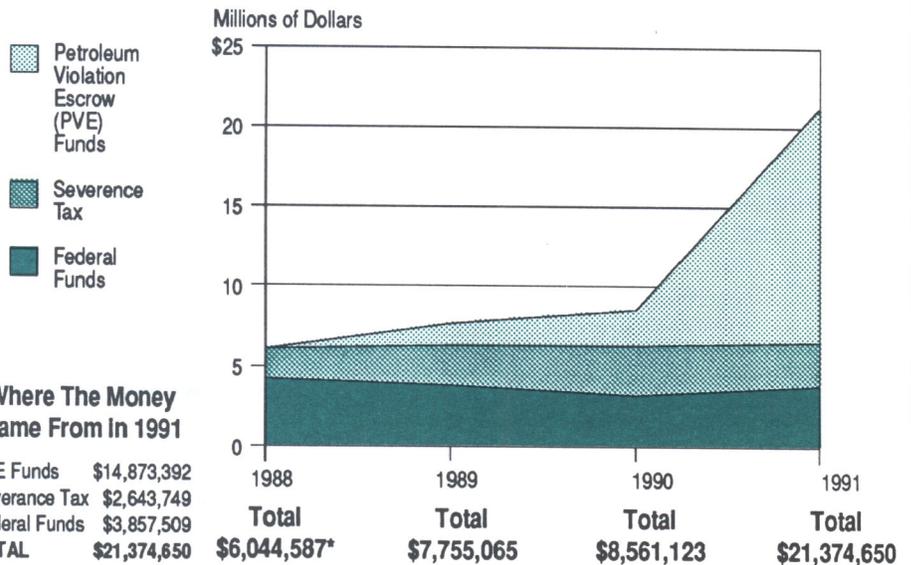
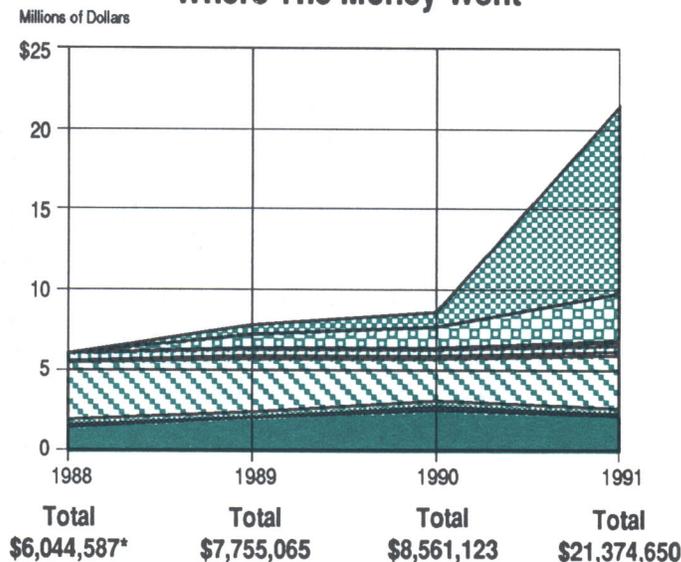


Figure 18

Where The Money Went

- PVE Aid
- PVE Contracts
- PVE Operations
- PVE Salaries
- Federal Salaries
- Federal Operations
- Federal Contracts
- Federal Aid
- State Salaries
- State Operations
- State Contracts
- State Aid



Where The Money Went In 1991

PVE Aid	\$11,636,750
PVE Contracts	\$2,927,090
PVE Operations	\$97,125
PVE Salaries	\$212,427
Federal Salaries	\$419,371
Federal Operations	\$135,935
Federal Contracts	\$27,963
Federal Aid	\$3,274,240
State Salaries	\$351,506
State Operations	\$82,521
State Contracts	\$33,310
State Aid	\$2,176,412
TOTAL	\$21,374,650

* Does not include Petroleum Violation Escrow Funds

Figure 19

No General Funds have been appropriated to the Energy Office since 1983.

Over 54.4 percent of all expenditures were used for petroleum violation escrow aid which was made in the form of loans under the Five Percent Dollar and Energy Saving Loan Program. Eighty-four percent of all federal funds were expended as aid in the Low-Income Weatherization Assistance Program. In excess of 80 percent of all state severance taxes were spent as aid under the School Weatherization Program.

A full accounting of the Energy Office funds appears in figures 18 and

19. Overall, the agency spent state, federal and petroleum violation escrow funds in eight different ways. Aid, which makes up the largest portion of the agency's expenditures, consists of money from the three sources which is received and passed on to delegate agencies or directly to beneficiaries such as schools, hospitals, small businesses and individuals. Money spent for operations pays travel, telephone, computers, salaries and other administrative expenses.

A full accounting of the petroleum violation escrow funds appears on page 9.

Organization

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

The Organizational Chart below shows the functional structure of the Energy Office.

Nebraska Energy Office Organization January, 1991

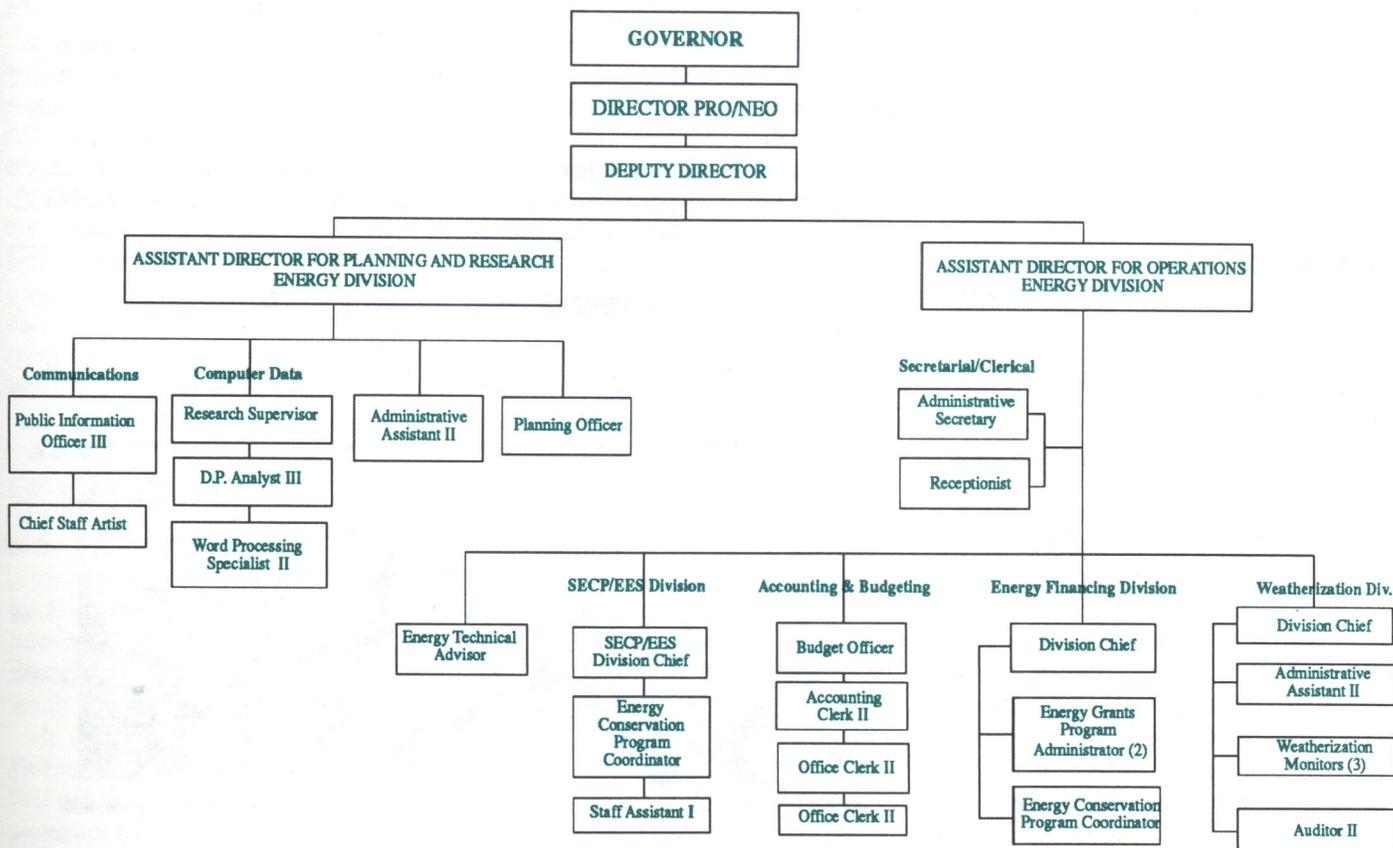


Figure 20

ISSUES TRENDS

“We in the United States produce barely three percent of the Earth’s petroleum, yet we consume 40 percent of all crude oil produced. We’re also heavy consumers of other energy forms and our appetite seems to be growing stronger every day.

Unless we curb our ravenous energy appetite, we will continue to rely heavily on foreign suppliers. In the short term, it’s a threat to the very planet on which we must live.”

Editorial, *Kearney Hub*,
February 21, 1991

Nebraska’s 1990 Energy Bill Surges Past \$3 Billion

Nebraskans spent a total of \$800 million in 1973 and \$1 billion in 1974 on all forms of energy — the period of the first oil price shock. By 1978 and 1979 — the second oil price shock — energy costs had doubled to \$1.66 billion and \$2 billion, respectively. For the next decade energy costs fluctuated, but never surpassed \$3 billion — until 1990 — and then prices surged dramatically to a projected \$3.2 billion. Declines in expenditures for coal, natural gas and

nuclear power were more than offset by a 14 percent gain in petroleum expenditures and a 4.5 percent gain expenditures for electricity.

The Year in Review

In 1990-91, Nebraska’s energy picture remained dynamic. Since 80 to 90 percent of the state’s energy comes from sources outside the state and country, Nebraska can be especially vulnerable to events occurring elsewhere in the world. And the invasion of Kuwait by Iraq on August 2, 1990, rocked not only the country, but the state as well.

The first and most immediate impact was registered in the price of refined petroleum products and was compounded by products requiring petroleum-based inputs like fertilizer.

Nebraska, like the rest of the nation, has had to brace against oil shortages as well as the oil price shocks of the past and, potentially, of the future. But the state seems to be well-positioned to weather the consequences. During 1990-91, Nebraska has continued programs to promote energy efficiency and conservation and to develop alternative fuels. In addition, the state’s energy shortage management plan is in

place to help Nebraska, especially the state’s agricultural industry, respond to problems that may arise due to fuel shortages.

Transportation

A July 1990 report released by *Concerning Cars*, a special interest magazine, stated that Nebraska ranks third in the country, behind South Dakota and Washington in the percentage of registered cars that predate 1980. According to the report, the exact percentages were: Washington, 57; South Dakota, 56 and Nebraska (and Montana), 55.

Other items of note occurring in 1990-91 were:

- The U.S. Senate twice — once in September and then in May defeated bills to raise the Corporate Average Fuel Economy (CAFE) on vehicles to 40 miles per gallon by 2001.
- Federal tax on a gallon of gasoline increased by five cents starting December 1, 1991.
- According to the U.S. Department of Energy, even with no new inventions, car manufacturers will tend to apply existing fuel-saving technologies more widely in years to come. This could raise mileage of new cars to 32-

Energy Expenditures by Sector, 1970 - 1990

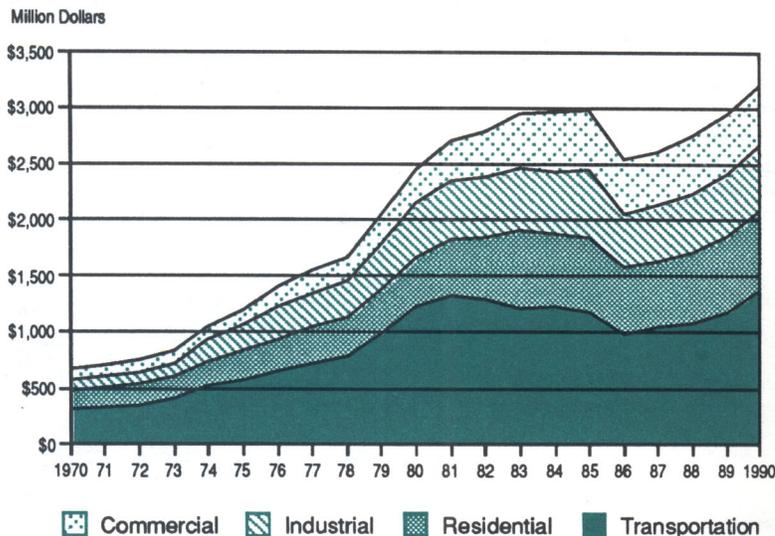


Figure 21

- 34 miles per gallon by the year 2000 from about 28 miles per gallon today.
- The International Energy Agency estimates that Americans comprise only four percent of world population, but use 40 percent of the gasoline produced on an annual basis.
 - The Big Three American automakers — General Motors, Ford and Chrysler — formed the United States Advanced Battery Consortium to develop advanced batteries necessary for use in electric vehicles. Preliminary results are expected within three years.
 - Chicago and North Western Railroad proposed abandoning 317 miles its rail line operating between Norfolk and Chadron. While the legislature authorized creation of a state railway council, no funds were authorized for purchasing the rail line.

The Efficiency Option

The most serious energy management challenges of the next few years require that we face the questions of cost and availability of energy resources with a renewed commitment to conservation and efficient use and management of available resources.

Efficiency cannot be replaced as the most valuable energy resource in the nation. Americans responded to the energy crisis of the 1970s by using energy resources more efficiently and conserving energy resources whenever possible. Since that time, the nation has saved more energy due to conservation and efficiency than it has gained from all new energy sources.

Still, if we had continued to save oil at the rate we did from 1977 to 1985, according to a December 1990 issue of the *New York Times*, supported with information from the U.S. Department of Energy, we would not need any oil from the Persian Gulf today.

In the wake of the latest oil shocks, Nebraskans have done some belt-tightening. In October 1990, the Governor required state agencies to develop plans to reduce petroleum fuel

consumption by five percent. Counties are also asking agencies for fuel conservation plans and are promoting strategies to lower transportation fuel costs.

Petroleum Developments

Although estimates indicate that worldwide proven reserves of oil — the amount that can be recovered with existing technology — are in excess of one trillion barrels, availability of those oil supplies is limited. Additionally, strained production capacity has limited the amount of oil that can be tapped. One way to get more out of proven reserves is to increase production capacity by means of unconventional technology.

America's petroleum producers are squeezing more oil from existing wells by updating their drilling technologies. Ordinary drilling methods tap only about 15% of a well's potential — and until recently it was uneconomical to try to recover the rest. However, higher crude prices encourage oil companies to spend an additional \$5 to \$10 per barrel on enhanced recovery methods to extract as much oil as possible.

The production increases resulting from enhanced recovery technologies could slow the overall decline in U.S. oil production and ease to some extent U.S. dependence on foreign oil.

According to the *New York Times*, the outlook for domestic production is still guarded, though domestic oil prices are steady or rising and domestic drilling is increasing after a dramatic mid-1980s decline following the drilling boom of the early 80s. However, production has been slowly falling off since 1985, down to less than 8 billion barrels per day in 1990. In addition, imports are rising — accounting for 48% of the 16.5 million barrels per day that Americans consume.

Other petroleum developments of import to the state occurring in 1990-91 were:

- While the number of oil wells increased by 51 in the state, overall oil production dropped by 5.5 percent

in 1990 according to the Nebraska Oil and Gas Commission.

- The Director of the state's Oil and Gas Commission believes that production of oil in the Panhandle and Southwest will continue, but future wells will need to be drilled deeper — 6,500-7,000 feet, adding to the production costs.
- For the first time, the nation's Strategic Petroleum Reserve was tapped, in part, to test the auction system and to attempt to dampen the price surge occurring simultaneously with the Persian Gulf crisis.
- In January 1991, the Governor asked the Energy Office to monitor oil prices and supplies as part of its energy emergency responsibilities.

Alternative Options — Today's Fuels for Tomorrow

Another option that will help reduce the petroleum consumption in the state is the development of alternative fuel sources for transportation.

Ethanol

Nebraska's ethanol industry may in the next several years produce enough ethanol to satisfy the demands of the driving public. According to the Nebraska Ethanol Authority and Development Board, 38 percent of all vehicle fuel purchased in the state during 1990 contained ethanol. In total, about 300 million gallons were added to gasoline to achieve a 90 percent/ten percent fuel mixture. The growth of ethanol's use in the state is attributed, in part, to a state exemption of two cents per gallon on excise taxes and an additional 5.4 cents per gallon from the federal government. For the first time since ethanol fuels were marketed in 1979, the retail price for ethanol at some service stations across the state was below the price of unleaded gasoline, also increasing its market appeal.

Other developments affecting ethanol's viability as an alternative fuel were:

- Extension of federal tax incentives for sellers and producers of ethanol to the year 2000.
- In November 1990, Chief Industries of Grand Island purchased ADC-1, the state's largest ethanol facility which produces 12-13 million gallons annually. The company also announced that a potential 25 million gallon expansion was being considered.
- Nebraska Nutrients in September 1990 broke ground in Sutherland for a 16 million gallon ethanol facility.
- June 1991 brought the announcement that Minnesota Corn Processors will build a 26 million gallon ethanol plant near Columbus.

Natural Gas and Propane

The Nebraska Department of Roads under contract to the Energy Office is demonstrating the feasibility of using natural gas and propane fueled vehicles for public transportation. With an \$831,000 Urban Mass Transit Authority grant and \$221,600 in oil overcharge funds, 30 rural transit systems and three Native American tribes are field testing 39 dual-fueled (propane-gasoline and natural gas-gasoline) vans and buses. Dual fuel vehicles can operate on either fuel based on availability or choice.

Emerging Technologies

Other alternative vehicle fuels like hydrogen and especially electricity may hold future promise for reducing the state's dependency on petroleum based fuels.

Electricity Developments

Unlike parts of the eastern United States, where brownouts have occurred and power shortages are predicted, Nebraska has an abundant supply of inexpensive electricity, provided by a combination of nuclear, coal-fired and hydroelectric power generation. Current usage trends, however, indicate that Nebraskans are using more electric energy than ever and that within the next decade present levels of power generation may not be enough to meet the growing demand.

Future Needs

Even though Lincoln Electric System is investigating the addition of a new peaking facility to meet summer peaking loads, they have made modifications to existing peaking turbines like Rokeby increasing the units' summer capabilities. Omaha Public Power District is also considering adding about 200,000 kilowatts of peaking capacity to meet short-term energy requirements through the 1990s. In addition, OPPD is exploring options to keep pace with expected growth that may require it to double its capacity in the next 25 years.

NPPD, on the other hand, says it has a surplus of power and likely will not need a new power plant until the year 2010.

Conservation and energy efficiency, of course, should be considered viable alternatives to building new power plants. LES's and OPPD's Boards of Directors have approved several demand side management programs which may lessen or delay the need for additional power plants. Regulators in some states (Rhode Island, New Hampshire, Massachusetts, New York and California) have begun to give profit incentives to utilities for investing in energy conservation.

To ensure the future availability of electrical energy, the state must contend with several other obstacles in addition to increased demand for electricity supplies. Among these are holdups in the relicensing of Platte River hydroelectric power plants; restrictions imposed by the recently enacted Clean Air Act amendments; and difficulties surrounding establishment of a low-level radioactive waste disposal facility in Nebraska.

Power Plant Relicensing

In summer of 1989, the Central Nebraska Public Power and Irrigation District (CNPPID) and the Nebraska Public Power District (NPPD) applied to the Federal Energy Regulatory Commission to relicense hydroelectric and irrigation projects along the Platte River. NPPD and CNPPID's 50-year operations license for the projects, which include Kingsley Dam and Lake McConaughy on the North Platte and Sutherland Dam and reservoir on the South Platte, expired

in 1987. The power districts have been operating on annual licenses while the long term license is being considered.

Relicensing has been held up in a dispute between the power districts and environmentalists. The power districts are seeking a license that will establish conditions adequate for power generation and irrigation into the next century. Environmental groups want immediate changes in stream flows to protect Platte River habitat for fish and wildlife downstream from the dams.

Relicensing negotiations are still ongoing and FERC's decision is not expected for several years.

Impact of the Clean Air Bill

Clean Air legislation passed by Congress in 1990 has several important ramifications for Nebraska's coal-fired electrical power plants. Requirements to cut sulfur dioxide emissions and to reduce nitrogen oxides, which contribute to acid rain, will affect operation of Nebraska's coal-fired plants. Although all plants meet the national emission standards established by the Clean Air legislation, future production of electricity may be affected by pollution control standards.

The state is being represented in the development of the regulations implementing Clean Air legislation by Walt Canney, Lincoln Electric System administrator who is one of 44 members of the U.S. Environmental Protection Agency's Acid Rain Advisory Committee. The regulations are expected to be released in mid-1992.

Energy Alternatives

Recent efforts to develop clean, abundant and affordable alternatives to coal- or oil-generated electricity have focused on renewable energy sources — geothermal, solar, hydroelectric and wind powered. Although these sources account for only a fraction of the nation's energy supply, they remain worth investigating.

A recent report by Public Citizen, a Washington D.C.-based citizens' group, ranked Nebraska in the bottom half among the states in developing wind, solar, hydroelectric and other renewable energy resources. According to the

report, Nebraska derives only 3.1 percent of its energy from renewable energy resources. However, in 1989, 5.5 percent of the electricity generated in the state was hydropower. An additional 10 percent produced by hydropower was supplied by Western Area Power Administration, a federal power marketing agency serving the western part of the country.

Wind Power

A recent study sponsored by the American Wind Energy Association showed that 1.5 percent of the area of the 48 contiguous states have winds averaging 16 m.p.h. at 50 meters above ground and 14 percent of the land area has winds averaging 14 m.p.h. or more — establishing wind power as a feasible alternative to other energy sources. Wind power is non-polluting and doesn't contribute to the greenhouse effect.

More than 15,000 wind turbines are in use in California, producing 2.2 billion kilowatts a year (the equivalent of 3.5 million barrels of oil). The Association's study concluded that California has developed only one-fifth of its areas with 16 m.p.h. wind potential. Moreover, California's wind potential is exceeded in 13 states, including Nebraska.

Despite a 1980s study stating that wind in Nebraska was not constant enough for windpower development, state-of-the-art wind generators capable of operating at speeds of 14 miles per hour and less may make wind-generated electricity possible in the state. According to a 1990 Battelle Pacific Northwest Laboratories study, 45.4 percent of the state's land area has the potential for wind power generation given the technologies currently being developed.

Temporary Energy Tax

As part of a temporary solution to the state's personal property tax problems, the Legislature adopted a one year five percent sales tax on electricity provided to manufacturing operations, hospitals and all types of fuel used by power suppliers in producing electricity. This also includes any sale and purchase of electricity by the state's generators. The sales tax will be in effect from October 1991 through September 1992.

Global Warming

The question of global warming generated a great deal of discussion in 1990 and 91, but no clear answers emerged. In fact, much of the exchange focused on whether the question really is a question. A June 1990 report of the Intergovernmental Panel on Climate Change concluded that the earth's temperature already has begun to get warmer and issued an appeal to limit production of "greenhouse gases" to prevent potential climatological disaster.

However, U.S. Environmental Protection Agency officials believe the problem is not well enough understood to warrant action to curb emissions of carbon dioxide (the United States is the world's leading producer) — action that would affect everything from cars to power plants. More study is needed, according to William Reilly, EPA Administrator, to determine whether global warming is taking place and, if so, what causes it.

Gases from automobiles and factories (carbon dioxide, methane, nitrous oxide and chlorofluorocarbons) are "heavier than air." They do not dissipate into the atmosphere and instead form a barrier surrounding the earth. Sunlight can easily pass through the barrier and warm the earth, but the resulting heat can't escape back into space through the barrier of gases. The "greenhouse effect" traps heat close to the earth's surface, which is predicted to cause major changes in global climate patterns.

Nuclear Power and Nuclear Waste

Nuclear power offers a significant alternative to using fossil fuels for production of electricity, but the matter of storage and disposal of nuclear waste creates new problems that must be addressed. Thirty-eight percent of Nebraska's electric power was generated at the state's two nuclear facilities in 1989 according to the U.S. Department of Energy's Energy Information Administration.

Uranium Mining

Ferret Exploration of Nebraska began mining uranium in April 1991 at the Crow Butte Mine near Crawford. About one million pounds of uranium is expected to be mined annually over the next 20 years. Concerns about the mining operation center on environmental issues. The Nuclear Regulatory Commission will oversee Ferret's waste disposal and the state environmental department will monitor protection of the groundwater.

NRC Ratings of Nuclear Power Stations

During its annual Nuclear Regulatory Commission evaluation, Nebraska Public Power District's Cooper Nuclear Station near Brownville had improved in four of seven areas rated. In all areas, Cooper received either "superior" or "good" rankings.

In late 1990, OPPD received the results of a study on the utility's future needs. Options listed in the report regarding the Fort Calhoun Nuclear Power Station included: 1) close it in 1991; 2) continue to operate it until its license expires in 2007, then seek a new license; and 3) operate it and try to reduce costs and decide later whether to close or continue operating. Because nuclear power plays such a vital role in eastern Nebraska, OPPD officials opted to continue operating the plant while trying to reduce costs.

The report also recommended that OPPD begin a program to reduce demand for electricity by promoting customer conservation. The report indicated that if customers adopted energy conservation strategies, between 10 and 20 percent savings could be achieved through the end of the century, saving an estimated \$40-\$65 million.

Nebraska Public Power District's Cooper Nuclear Station received "good" or "excellent" ratings from the NRC for the quality of its operation.

Nuclear Waste Disposal

To take advantage of the benefits of nuclear power, we also must deal with its most serious drawback: where to safely store the waste products of nuclear reactions.

Yucca Mountain

Congressional legislation in 1987 ordered that a site in Yucca Mountain, Nevada, be tested for suitability as the nation's permanent nuclear waste repository. However, clashes involving the state of Nevada, the federal government, environmental groups and the nuclear power industry create doubts about whether the Yucca Mountain repository will open in 2010. It was originally scheduled to open in 1998, then in 2003 before the latest delay.

Estimates by the Nuclear Regulatory Commission indicate that without the Yucca Mountain facility, the nation's nuclear power plants will have space to store spent nuclear fuel until 2025.

Waste Isolation Pilot Plant

The Waste Isolation Pilot Plant (WIPP) is intended primarily for storage of waste from nuclear weapons plants. Legal challenges, however, have delayed opening of this repository.

Transporting Nuclear Waste

The Energy Office, as a member of the Western Interstate Energy Board's High Level Waste Committee, continues to monitor and participate in discussions regarding the development of policies affecting the transportation of spent nuclear fuel likely to be deposited at WIPP or the proposed repository in Yucca Mountain.

Boyd County Radioactive Waste Storage Facility

Nebraskans have been involved in an ongoing controversy about U.S. Ecology's decision to site a low-level radioactive waste storage facility in Boyd County. Nebraska is one of five states — including Arkansas, Louisiana, Oklahoma and Kansas — which formed the Central Interstate Low-Level Radioactive Waste Compact to develop the radioactive waste site. U.S. Ecology is the waste management firm hired by the compact to select the site. Citizens have raised concerns about the decision to locate the facility in Boyd County.

Issues of concern arising in 1990-91 were:

- Would other states besides Nebraska share in long-term liability for storage of the low-level waste? By mid-1991,

only Nebraska and Kansas had approved a shared liability statute.

- In July 1990, U.S. Ecology delivered to the state's Department of Environmental Control its application for a license for a low level radioactive waste facility. The application is comprised of two parts — a 3,525 page Safety Analysis Report (SAR) and 400 page Environmental Report.
- In March 1991, the Department of Environmental Control issued 450 comments or questions resulting from a technical review of the SAR.
- In April 1991, the Executive Director of the Central Interstate Low-Level Radioactive Waste Compact was arrested on charges of theft and wire fraud. It is suspected that hundreds of thousands of dollars of waste compact funds may have been illegally spent. If the Boyd County plans do not go forward, Nebraska must nonetheless find a way of disposing of its own low-level radioactive waste by 1993 to comply with federal legislation passed in the early 1980s. Currently NPPD and OPPD ship low-level waste from the Cooper and Fort Calhoun nuclear power stations to storage sites in other states. If Nebraska fails to find a solution to its radioactive waste storage problems before the federally-mandated deadline, other states could refuse to accept low-level waste from Nebraska or could impose a financial penalty on the power companies before taking the waste.

Natural Gas Developments

Natural gas retail service in the state is provided by five investor-owned utilities serving 298 towns and 14 municipally-owned and operated systems. The remaining 190 towns in the state receive no natural gas service.

In communities served by investor-owned natural gas companies, retail rates are regulated by the *Municipal Natural Gas Regulation Act* administered by the Energy Office. Unlike the rest of the country, retail rates are established by locally elected officials in each town.

(See the Natural Gas Technical Assistance section for further information on general rate filings in 1990-91).

The year's highlights in the area of natural gas were:

- Voters in four towns — Blue Hill, Oshkosh, Stuart and Wood River — considered acquiring their natural gas systems from an investor-owned utility. Only voters in Stuart approved the ballot proposition. Stuart and the utility have not reached agreement on the cost of acquiring the system.
- The nine members of the Nebraska Municipal Power Pool which own their natural gas systems and belong to AGAS (Agreement for Gas Acquisition and Supply) are exploring the creation of an agency which would own its natural gas supplies. The current members are: Alma, Central City, Falls City, Hastings, Nebraska City, Pender, Stromsburg, Superior and Wisner.
- Minnegasco, an investor-owned utility serving 60 communities in the eastern part of the state, merged with Arkla, which is one of the country's largest natural gas companies providing service in eight states. Together, the merged firm will have the third largest gas distribution system in the nation.
- An investor-owned utility — KN Energy — offered to buy two municipally-owned systems in Hastings and Alma. Both offers were declined.
- Lincoln Electric System and the city's natural gas supplier, Minnegasco, entered into a joint venture in which a natural gas pipeline will be built to provide service to the electric utility's Rokeby turbine unit.
- Bills introduced into the Unicameral relating to natural gas service dealt with the ability of investor-owned natural gas utilities to offer sales and services of appliances to their customers and various bills relating to providing services to customers in specific territorial areas.

The Energy Office logo found on the back cover is from the "Creative Genius of Energy" floor mosaic by Hildreth Meiere located between the vestibule and foyer inside the north door of the State Capitol in Lincoln.

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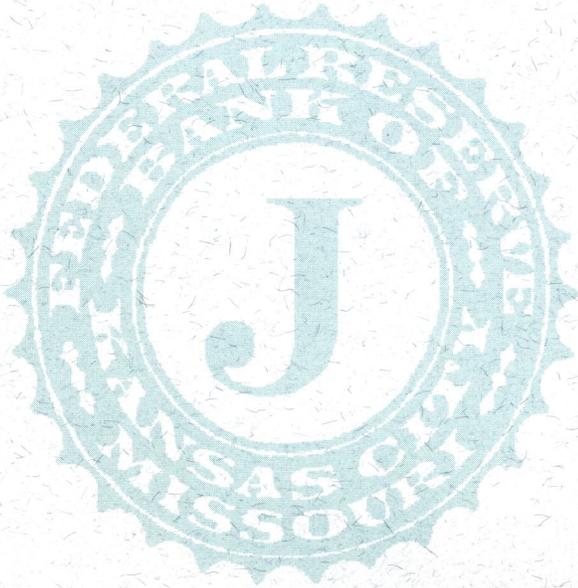
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Katherine Cavalos Ortega

Treasurer of the United States

