NEBRASKA ENERGY OFFICE

1990 ANNUAL REPORT

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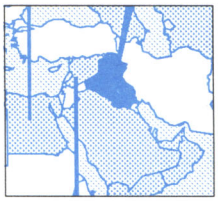

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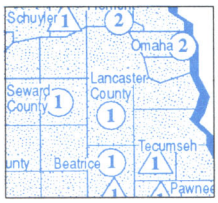

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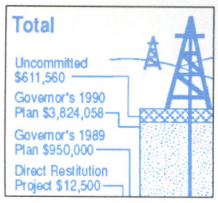

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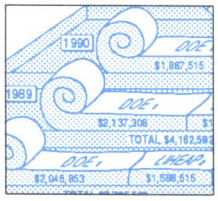

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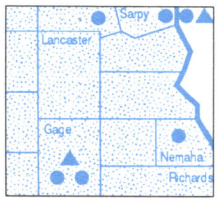

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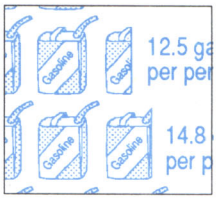

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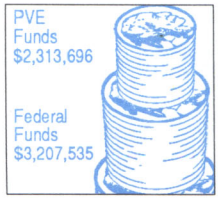

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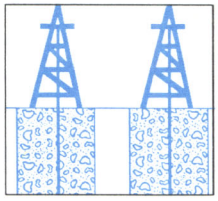

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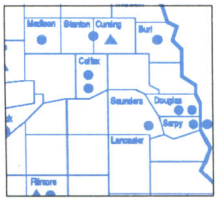
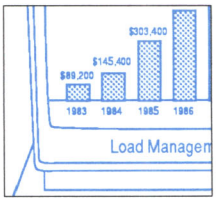




ISSUES TRENDS

"America's excessive dependence on imported oil is like being addicted to an affordable drug. The choice, consequently, both now and in the long run, boils down to this: Either pay up, or find a way to break the addiction."

Editorial, *Omaha World Herald*, August 30, 1990

The Price of America's Energy Appetite

In the almost twenty years since the oil crisis of the early 1970s, America's increasing reliance on imported oil has contributed to a disturbing complacency. In spite of the warning signs, energy demand has continued to rise.

Nebraska's energy policy continues to focus on reducing the state's dependence on imported resources to meet energy needs and using available supplies more efficiently. This report discusses the important energy issues that have emerged in 1990, from both the broad perspective of a nation trying to manage its burgeoning appetite for energy, as well as Nebraska's specific policies and programs for meeting the state's energy goals.

Two significant events in 1990 will have far-reaching effects on this country's energy consumption patterns, especially in regard to energy used for transportation. Internationally, volatile conditions in the Persian Gulf region following Iraq's invasion of Kuwait will exert an unpredictable influence on supplies and the cost of oil imports. Domestically, recent clean air legislation will force changes in the ways in which we use the energy supplies we have.

This section looks at Nebraska's use and management of three types of energy resources in 1989-90: petroleum products, natural gas, and electricity.

Iraqi Invasion of Kuwait

Iraq's invasion of Kuwait in August 1990 has shaken us out of our complacency and forced us to assess our dependence on imported petroleum products and to consider seriously the consequences of our past addictive behavior. The impact of this most recent Mideast crisis has been felt on all levels and the repercussions are likely to continue. Not only do we face rising energy costs — we also face the consequences of past misuse, whether blatantly indiscriminate or merely unwise, of our energy resources. The future we have been warned to prepare for has abruptly begun.

Nebraska, like the rest of the nation, has had to brace against impending oil shortages as well as the oil price shocks created by the Persian Gulf crisis. But the state seems to be well-positioned to weather the consequences of Iraq's invasion of Kuwait. During 1989-90,

Chronology of Events: Nebraska's Response to the Iraqi Invasion of Kuwait

August 2, 1990 - Iraq invades Kuwait.

August 4 - United Nations adopts embargo resolution.

August 2 - Energy Office intensifies monitoring of state's petroleum supplies and moves from Contingency Plan's Readiness to Verification Phase. Staff members submit daily reports on petroleum supply status to the agency's director.

August 7 - Governor calls meeting of state's major petroleum suppliers and pipeline operators to assess status of state's petroleum supplies.

August 8 - Governor writes to Secretary of Energy Watkins commending federal action to investigate rapid increase in price of petroleum products.

August 13 - Governor meets in Lincoln with petroleum suppliers and pipeline operators.

August 14 - Governor announces that state's supply of petroleum products is sufficient, if other nations help offset shortfall induced by embargo.

August 16 - Governor announces support for U.S. Department of Energy's petroleum conservation plan and emphasizes support for increased use of ethanol.

August 21 - In letter to state propane suppliers, Governor indicates that demand for propane in agricultural sector will be higher this year and seeks assurance that supplies will be adequate.

September 28 - Governor urges propane suppliers to encourage customers to fill tanks and service appliances and heating equipment before winter.

October 1990 - It becomes apparent there is no energy shortfall, but market remains volatile, making prices subject to wide and sudden swings. Energy Office returns to Readiness Phase of Contingency Plan.

October 16 - Governor asks state agencies to submit plans for reducing use of petroleum-based fuels by five percent.

Chronology of Events: The Iraqi Invasion of Kuwait

August 2,1990 - Iraq invades Kuwait. The United Nations Security Council adopts a resolution demanding that Iraq withdraw.

Aug. 3 - The United States announces a naval force for the Persian Gulf and orders in combat troops and planes. A large buildup ensues, with major Western and Arab powers and other nations also deploying forces.

Aug. 6 - The Security Council bans trade with Iraq except for medicine and some food.

Aug. 8 - Iraq annexes Kuwait.

Aug. 10 - Twelve Arab leaders agree to send a pan-Arab force to protect Saudi Arabia.

Aug. 16 - Iraq orders more than 6,500 Westerners in Kuwait seized as human shields against attacks.

Nov. 29 - The Security Council authorizes the use of force against Iraq unless it quits Kuwait by Jan. 15.

Dec. 6 - President Hussein orders the release of all foreign hostages.

January 12, 1991 - The United States Congress authorizes President Bush to use military force against Iraq.

Jan. 16 - The United Nations deadline for Iraqi withdrawal expires.

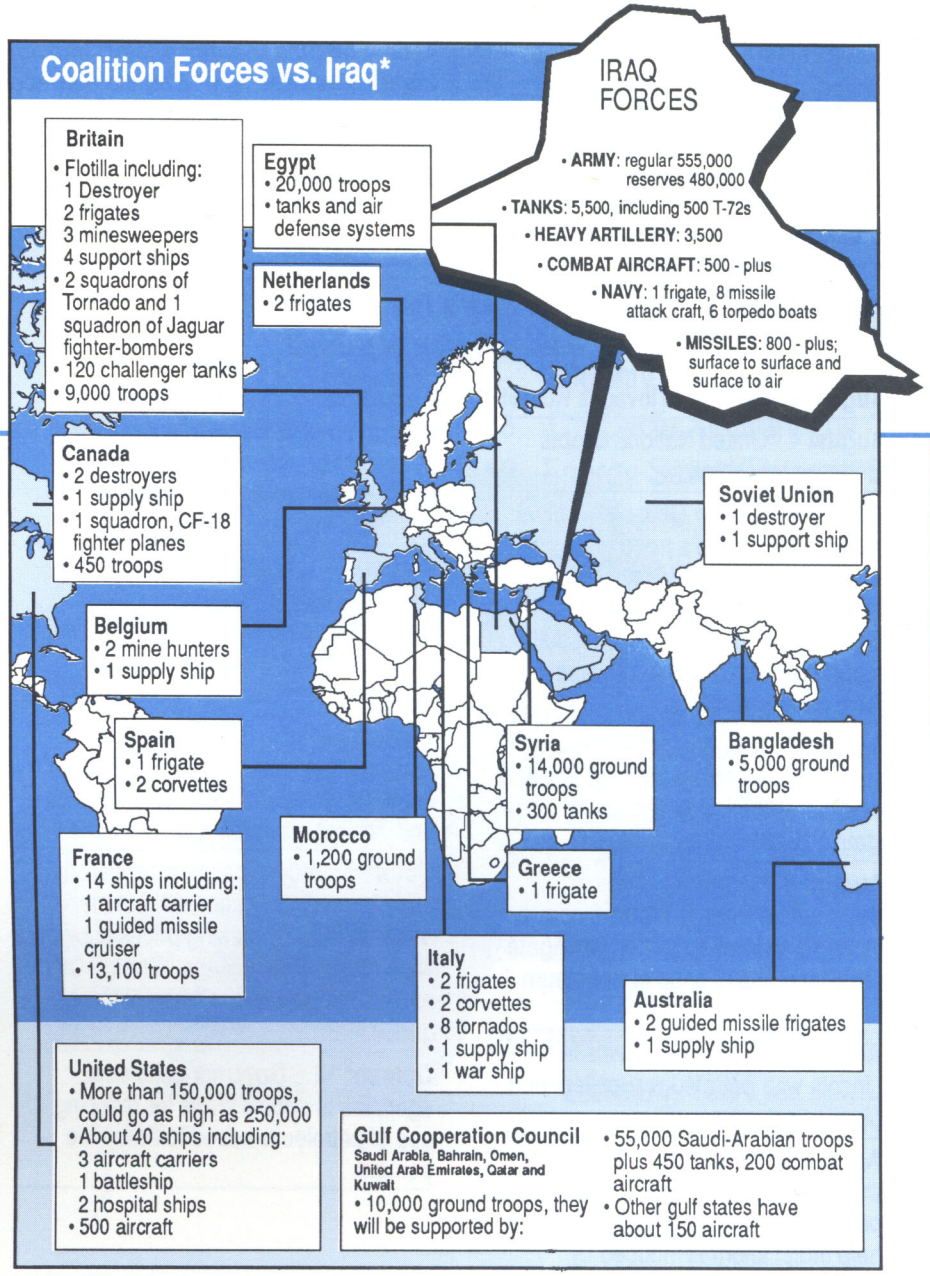
Jan. 17 - The gulf war begins. The allied forces launch air attacks against Iraq and Kuwait.

Jan. 25 - The United States says Iraq has deliberately spilled oil into the Persian Gulf.

Feb. 24 - The ground offensive has begun with dramatic success, achieving its first day objectives in 10 hours.

Feb. 25 - 26 - 27 - Allied Forces penetrate deep into Iraqi territory pushing north to cut off the retreating Iraqi army. Saudi, British and American Forces liberate Kuwait City with little resistance. Thirty thousand Iraqi prisoners of war are taken.

Feb. 28 - President Bush orders cease fire. Iraq says it will comply with all UN Security Council resolutions. Victory is declared by Coalition Forces.



*As of September 17, 1990

Figure 1

Nebraska has continued programs to promote energy efficiency and conservation, to develop alternative fuels and to encourage recycling as a means to increase energy efficiency and environmental protection. 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.

Clean Air Legislation

Legislation passed in 1990 to update the Clean Air Act of 1977 will significantly influence energy consumption habits and costs. These are some key objectives of the legislation:

- To cut pollution from automobiles 30 to 60 percent
- To require oil companies to provide cleaner gasoline
- To reduce the amount of toxic chemicals industries release into the air

• To force cities to meet federal air quality standards

• To reduce sulfur dioxide and nitrogen oxide emissions from utilities by almost half

(See page 11 of this report for more details on Clean Air Legislation.) The most immediate effects will be economic — implementing the provisions of the legislation is expected to touch almost all sectors of industry and cost $22 to $25 billion.

In Nebraska, the most noticeable impact of the clean air legislation will be on electric utilities. Although the original bill sought to limit total sulfur-dioxide emissions at individual plants to their 1985-87 averages, amendments to the legislation now allow Nebraska's public utilities to continue to operate at (but not exceed) current capacity emission percentages. Because Nebraska's public utilities burn "clean" coal, sulfur dioxide emissions from their plants already fall well below the imposed limit of 1.2 pounds per million Btus.

1990 Oil Tremor

America's appetite for oil will not be easy to curb. Petroleum products account for more than 40 percent of our annual energy consumption. Of the 27.3 million barrels of oil Americans used each day last year, 10.9 million (or 62.7%) went into transportation; 4.3 million (15.7%) into industry; 1.4 million (5.1%) into commercial and residential uses; .7 million (2.5%) into electric utilities.

Former Navy Secretary John Lehman estimates that the true price America pays for Persian Gulf oil is $140 per barrel. He arrived at that figure by concluding America spends $40 billion a year to maintain a military presence in the gulf. Divide that $40 billion by the 330 million barrels that the U.S. imported in 1986 and add today's $19 a barrel purchase price and you get $140 per barrel.

Rocky Mountain Institute's preliminary research into the cost of America's Persian Gulf military force and its support systems is uncovering even more costs. It is probable that the 1986 cost of the military presence was closer to $50 billion a year, corresponding to a $176 a barrel last year and probably $200+ today.

In Nebraska, higher fuel costs are affecting both agriculture and road construction.

Farmers are likely to feel the results of Gulf unrest on two fronts: rising production costs, due to increases in price of diesel fuel and petroleum - based fertilizers, and reduced sales of U.S. commodities to Iraq and Kuwait because of the economic sanctions adopted by the United Nations.

Higher fuel prices also may slow county and state road construction projects. Fuel price increases have raised maintenance costs, forcing cutbacks in highway improvement and construction.

U.S. Oil Use by Sector 1990

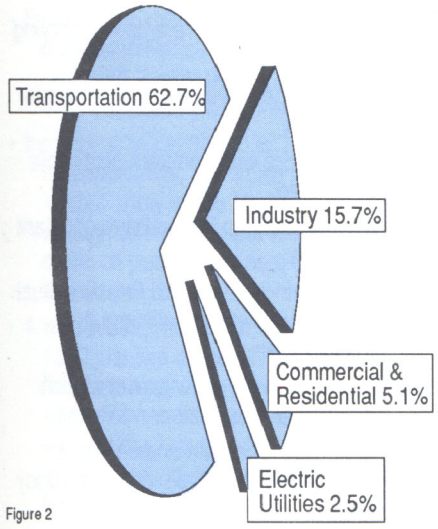


Figure 2

America's Oil Reliance

According to the Cambridge Energy Research Associates, between 1980 and 1989, Germany's reliance on oil dropped by 31 percent, France's by 35 percent, and England's by 37 percent. By comparison, however, the U.S. became only 20 percent less oil-reliant in the same period.

Declining Reliance on Oil 1980-1989

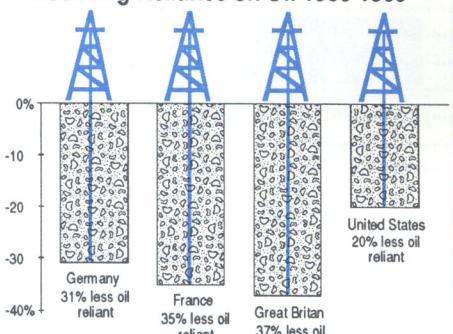


Figure 3

Transportation Energy Costs

The cost of transportation is getting higher — and Nebraskans, like everyone else, are attending to the energy and economic demands of transportation, both public and private.

Transportation accounts for consumption of 62.7 percent of the oil Americans use each day, most of it for gasoline. In 1987, per capita consumption of gasoline in the United States was estimated to be about 350 gallons, compared with 150 gallons in West Germany. Higher fuel efficiency could help. If American cars were as fuel-efficient as German cars, average consumption could be reduced by as much as 75 gallons. Yet, American car makers have made virtually no gains in average fuel efficiency since 1987; more than half the 1991 model year cars get fewer than 23 miles per gallon.

Unfortunately, 1989-90 was not the year of the car in terms of legislative efforts to increase fuel economy. The U.S. Senate killed a bill that would have required automakers to increase average fuel efficiency to 40 miles per gallon by the year 2000. Coincidentally, at the same time of the Senate action, the Environmental Protection Agency reported that nine out of the ten most fuel-efficient 1991 cars were made in Japan.

Gasoline Taxes by State & Selected Countries

January 1, 1991 & December 2, 1990 in cents per gallon

States[1]	
Nebraska	**26.50¢**
Illinois	25.69¢
North Carolina	22.30¢
Colorado	22.00¢
Connecticut	22.00¢
Washington	22.00¢
Wisconsin	21.50¢
California	21.01¢
Massachusetts	21.00¢
Rhode Island	21.00¢
Tennessee	21.00¢
Indiana	20.49¢
West Virginia	20.35¢
Iowa	20.00¢
Louisiana	20.00¢
Minnesota	20.00¢
Montana	20.00¢
Ohio	20.00¢
Oregon	20.00¢
Utah	19.50¢
Michigan	19.39¢
Delaware	19.00¢
Idaho	19.00¢
Nevada	18.60¢
Maryland	18.50¢
Arizona	18.00¢
District of Columbia	18.00¢
Mississippi	18.00¢
South Dakota	18.00¢
Virginia	17.70¢
Pennsylvania	17.40¢
Hawaii	17.00¢
Maine	17.00¢
North Dakota	17.00¢
Oklahoma	17.00¢
Kansas	16.00¢
New Hampshire	16.00¢
New Mexico	16.00¢
South Carolina	16.00¢
Vermont	16.00¢
Kentucky	15.40¢
Texas	15.00¢
New York	13.80¢
Arkansas	13.70¢
Alabama	13.00¢
Georgia	12.55¢
Missouri	11.00¢
Florida	10.90¢
New Jersey	10.50¢
Wyoming	9.00¢
Alaska	8.00¢
Selected Countries[2]	
Italy	357.00¢
France	312.00¢
Great Britain	209.00¢
Germany	199.00¢
Japan	139.00¢
United States	14.00¢

1. AAA Cornhusker Motor Club, Omaha, NE., 1-1-91.
2. Lincoln Journal Star, 12-2-90.

Figure 4

Coupled with the poor fuel economy of newer cars are concerns about the contributions to air pollution made by older cars. As of 1988, 42 percent of the nation's registered automobiles predated 1980. Nebraska's 1988 percentage was higher than the national average — 55 percent of registered cars in Nebraska in 1988 were built before 1980. While those cars accounted for only 43 percent of vehicle miles traveled by Nebraska-registered cars in 1988, they were responsible for 84 percent of the hydrocarbon and carbon monoxide emissions that year, and 73 percent of the nitrogen oxide emissions.

Given the number of older cars still on the road, imposing higher emission control standards on new cars will do little to improve air quality. Instead, providing incentives for trading in old cars would make a major contribution to quickly improving air quality. In California, oil refiners and utilities have begun a program to buy back older model cars in an effort to reduce the pollution they cause.

Transportation costs increased in 1991, too, as a result of a federal fuel tax increase. Most people will notice the increase at the gas pump, where the Federal gasoline tax went from 9¢ to 14¢ a gallon. Nebraskans face an even stiffer increase when the state gasoline tax goes up (See table at left).

Governor Orr Blames Hussein For 5-Cent Gas Tax Hike

"Nebraska motorists will pay a nickel a gallon more tax at the fuel pumps beginning Jan. 1, 1991.

Governor Orr referred to the 5.1-cent tax hike as 'Saddam's tax increase'.

The increase means that for at least three months Nebraska again will have the nation's highest state gasoline tax — 26.5 cents. Nebraska's current 21.4-cent tax ranks fifth. The 26.5-cent rate will boost Nebraska past the national leader Illinois, which has a 25.2-cent rate."

Omaha World Herald, December 22, 1990

The Efficiency Diet

The most serious energy management challenges of the next year 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

New Appliance Standards

The National Appliance Energy Conservation Act of 1987 required a range of energy-savings options for household appliances:

- Dishwashers must have a no-heat drying cycle
- Clothes washers must have a cold water rinse cycle
- Clothes dryers with constant pilot lights are banned
- Gas ovens may no longer have constant pilot lights
- By 1993, refrigerators and freezers must be 25% more energy efficient than today's models
- Minimum efficiency ratings have been tightened for room air conditioners
- In 1992, new furnaces and central air conditioners will have higher efficiency ratings.

would not need any oil from the Persian Gulf today. Simply improving the nation's average 20 miles-per- gallon automobile efficiency by three miles per gallon could replace U.S. pre-crisis oil imports from Iraq and Kuwait. Oil savings is possible in other areas, too. Technical refinements can save more fuel used by jet liners, heavy trucks, buses, and ships.

In Nebraska in 1989-90, energy savings due to increased efficiency amounted to 3.68 trillion Btus, which translates to a cost savings of $27.2 million. The state must rely on the willingness of citizens and communities to increase energy efficiency, to decrease our dependence on external energy sources and to bring down the cost of energy.

In the wake of the oil shocks from the Persian Gulf, Nebraskans have done some belt-tightening. In October, the Governor required state agencies to develop plans to reduce petroleum fuel consumption by five percent. The Nebraska State Patrol has adopted practices that will reduce patrol car mileage by carpooling to meetings and conferences, parking patrol cars "in-view" for a certain amount of time each shift, and considering purchase of lower-mileage patrol cars. Counties are also asking agencies for fuel conservation plans and are promoting strategies to lower transportation fuel costs.

The Power of Conservation

According to the Electric Power Research Institute, replacing existing electric appliances with more efficient ones could cut U.S. electricity consumption over time by 31.3 percent. Here are the areas the savings could come from:

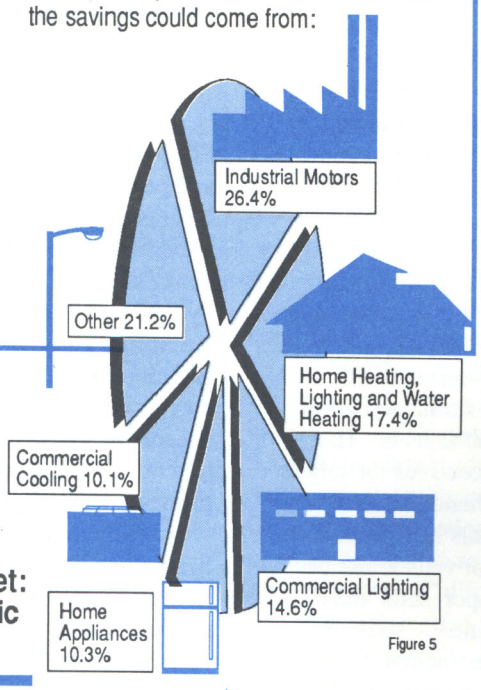


Figure 5

A Replacement Diet: Increased Domestic Production

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. Not only has the volatile situation in the Persian Gulf sharply reduced oil exports from that region, but strained production capacity has also 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. But higher crude prices have encouraged 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.

The need to encourage domestic oil production must be balanced by environmental concerns. For example, the summer 1990 closing of offshore sites available for drilling has caused the oil industry to warn that such a move could cost the nation millions of barrels of oil as well as the revenues that oil could generate. Environmentalists, on the other hand, called the measure a temporary reprieve, while seeking more permanent protection of sensitive offshore areas. Environmental groups endorse a national energy policy based on conservation and use of renewable energy sources.

The Alaskan Oil Saga

- Exxon Corporation was found liable for the 1989 oil spill in Alaska's Prince William Sound, setting the stage for trials to determine compensation for people who suffered in the wake of the 11-million-gallon spill from the grounding of the *Exxon Valdez*.
- Exxon completed its second summer of cleanup in Prince William Sound, removing a remarkable amount of oil from dozens of miles of shore line.
- Inspection of the 800-mile TransAlaska Pipeline linking the North Slope to Valdez showed the line to be sound enough to increase the amount of crude oil pumped by nearly 40,000 barrels per day.
- A new Alaskan oil field discovered in 1989 just two miles north of Prudhoe Bay is expected to begin production within two years, now that oil producers and the federal government have resolved an environmental dispute that had stalled the project.

An Alternative Diet: Alternative Fuels

Another option that will help extend the usefulness of available petroleum supplies is the development of alternative fuel sources for transportation.

Nebraska's ethanol industry can help fill the gap created by the loss of oil from Iraq and Kuwait and can also provide a market for 60 million bushels of corn. According to the Nebraska Gasohol Committee, ethanol plants nationwide are capable of producing 1.1 billion gallons annually, while current actual production is closer to 900 million gallons. The Clean Air Act, which emphasizes cleaner-burning fuels such as ethanol, also has stimulated production of ethanol-blended fuels. That, coupled with tax incentives for sellers and producers of ethanol, should result in more ethanol plants in Nebraska.

Natural gas for vehicle use can also serve as a cheaper, safer and cleaner alternative to gasoline. A study by INFORM, an environmental research group, concludes that states should promote the development and use of natural gas as an alternative fuel (See page 10 for information on Nebraska's propane and natural gas powered transportation project).

Other alternatives for vehicle-use fuels that merit further investigation include hydrogen, propane, and electricity.

Electricity Consumption and Management

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.

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

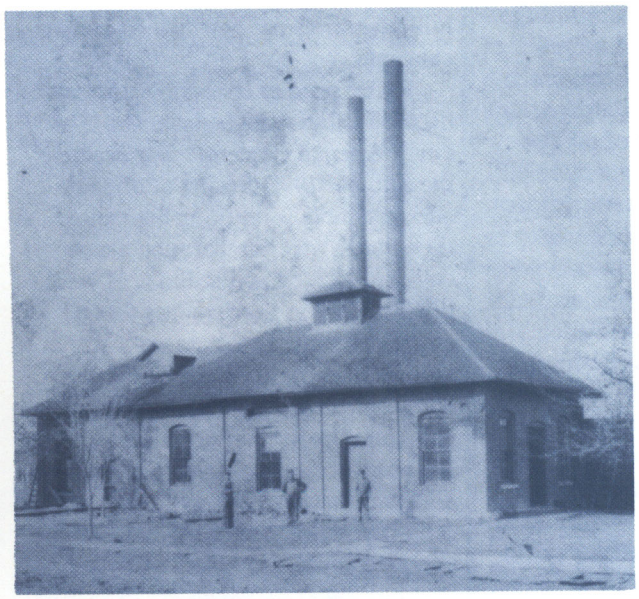
Sulfur Emissions from Nebraska's Coal-Burning Power Plants

Under the Clean Air Act amendments, all electric power plants will be limited to annual sulfur emissions of 1.2 pounds per million Btus by the year 2001. Because Nebraska's public utility plants burn low-sulfur "clean" coal, they already meet that standard.

Owner	Plant Name /Number		1989 Emissions (lbs/million Btus)
OPPD	N. Omaha	No. 1	0.84
		No. 2	0.85
		No. 3	0.85
		No. 4	0.85
		No. 5	0.85
	Nebraska City	No. 1	0.84
NPPD	Sheldon	No. 1	0.80
		No. 2	0.80
	Gerald Gentleman	No. 1	0.7-0.80
		No. 2	0.7-0.80
Grand Island	Platte	No. 1	0.7-0.80
Hastings	Energy Central	No. 1	1.10
Fremont	Fremont	No. 6	0.94
		No. 7	1.06
		No. 8	0.94
LES	Laramie River	No. 1	0.14

Adapted from information provided by the Nebraska Power Association, presented in the *Lincoln Star*, 1-23-90

Figure 6



Falls City's first water and light plant.

Municipally-Owned Electrics Going For 100 plus years

Publicly owned electrics in Nebraska are not new as illustrated by these three milestones:

• Crete, with a population of 4,444 celebrated 103 years of municipally operated electrical generation. Crete operates seven diesel generating units capable of operating on natural gas or petroleum. Production capacity is between 15 to 16 megawatts.

• In April, Falls City celebrated 100 years since the passage of a $7,000 bond by the citizens to establish an electric light system. On completion, it was operated for five hours each evening. Less than 17 years later, the first of many production capacity increases, was undertaken. Today, Falls City continues to produce electricity from the state's third largest municipally owned diesel power plant.

• West Point also celebrated 100 years of municipally generated electrical service to its residents.

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.

Smith Intertie

In August 1990, the federal power converter station north of Sidney was named for Nebraska Congresswoman Virginia Smith. Through Smith's efforts, the Western Area Power Administration received $30 million in federal funds in 1983 to build the AC-DC-AC converter station, which links eastern and western power grids in the United States.

The converter station, which became fully operational in 1988, saves millions of dollars in electricity that otherwise would have been wasted in transmission.

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. Although FERC's decision on long-term relicensing is not expected for several years, the federal agency is preparing an environmental impact statement on the Platte River projects.

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.

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 and 6.3 percent of its electricity from renewable energy resources.

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. A study conducted during the early to mid 1980s concluded that wind in Nebraska was not constant enough and also was not economically justifiable at this time.

Electrical Suppliers

Nebraska Public Power District (NPPD) is chartered to operate in 87 of Nebraska's 93 counties, selling about 70 percent of its electricity wholesale and 30 percent retail. Under recently negotiated 25-year Professional Retail Operation Agreements, NPPD operates the electrical systems of more than 180 Nebraska cities and villages. Under the agreements, which became effective January 1, 1990, cities and villages lease their electrical distribution systems to NPPD to operate for 25 years. NPPD returns to each town 12 percent of its system's annual adjusted gross revenue.

Some cities and towns, however, did not negotiate NPPD agreements as easily. For 19 months, the City of Norfolk debated the pros and cons of renewing its lease with NPPD, finally reaching a 15-year lease agreement which goes into effect January 1, 1991,

with an option to renew for another 15 years. Under terms of the new contract, the city will receive 12 percent of the system's adjusted gross revenues, as opposed to the ten percent level in effect under the previous agreement. The city plans to return the extra two percent to its ratepayers.

The City of Pierce chose not to renew its NPPD agreement, instead signing a ten year pact to buy wholesale power from the Municipal Energy Agency of Nebraska (MEAN), which is associated with the Nebraska Municipal Power Pool.

Power District Mergers

Nebraska's largest and smallest rural public power districts agreed to merge, effective September 1, 1991. Southern Nebraska Rural Public Power District, headquartered in Grand Island, merged with Franklin County Rural Public Power District in Franklin.

Two years of merger talks between the Cornhusker Public Power District and the Loup Power District ended in late 1990, when the Cornhusker Board of Directors voted to suspend negotiations. Board members agreed to postpone further merger discussions until 1993.

The last public power district merger in Nebraska occurred in the early 1960s between OPPD and the Eastern Nebraska Public Power District. In the last one and a half years, about 10 public power systems have considered merging. Restructuring of Nebraska's Public Power Districts may or may not require legislative action depending on the issues being considered.

Global Warming

The question of global warming generated a great deal of discussion in 1989 and 90, 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 — 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.

The United States is the world's leading carbon dioxide producer, responsible for 1.22 billion tons of carbon emissions in 1987.

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.

State Recycling Initiative

In October 1989, Governor Orr directed all state agencies to participate in a plan to increase recycling efforts in state government. The six-point recycling initiative, administered by the Nebraska Energy Office, includes:

- Appointment of a state recycling coordinator
- Use of source-separation methods for recycling paper and other materials
- A mandate for state government to purchase recycled paper
- Creation of information programs for state employees
- Recognition awards for state agencies that demonstrate exceptional recycling efforts
- Creation of an advisory committee to oversee implementation of the program.

The initiative was intended primarily to serve as an example to Nebraska's citizens, in keeping with the EPA's goal of increasing recycling by 25 percent by 1992. The United States currently recycles only about 10 percent of its waste. By contrast, the number is almost 30 percent in Western Europe and nearly 50 percent in Japan.

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. Twenty-Three percent of Nebraska's electric power was generated at nuclear plants in 1989 (1990 Directory of Utilities).

Uranium Mining

In April 1990, the Nebraska Department of Environmental Control issued a permit for Ferret Exploration of Nebraska to begin mining uranium in 1991 at the Crow Butte Mine. About one million pounds of uranium is expected to be mined annually over the next 20 years in about 500 acres of a 3,000 acre site southeast of Crawford. 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

An assessment of operations of Nebraska's nuclear power plants conducted in 1988-89 by the Nuclear Regulatory Commission revealed that Omaha Public Power District's Fort Calhoun Power Station has lingering problems that must be solved. However, the plant has been removed from a list of troubled U.S. nuclear power plants after making substantial improvements in operations and safety.

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.

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

Also in 1990, the EPA gave the Energy Department conditional permission to store radioactive and hazardous waste in a salt cavern 2,150 feet underground in New Mexico. The Waste Isolation Pilot Plant (WIPP) is intended primarily for storage of waste from nuclear weapons plants. Legal challenges to the EPA approval are pending.

Transporting Nuclear Fuel

In December 1989, the Transportation Department approved a route chosen by the Department of Energy to transport by train damaged nuclear fuel from Three Mile Island to a storage facility in Idaho. The route takes the trains through 12 Nebraska counties on Union Pacific tracks. By the end of 1989, 20 trips had been completed safely and two more were expected.

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.

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

In December 1989, Minnegasco opened a new 17.3 mile pipeline connecting a regulator station in southeast Lincoln to Natural Gas Pipeline Company's pipeline near Unadilla. The new pipeline will allow Minnegasco to transport an additional 80 million cubic feet of natural gas per day and is expected to save Lincoln homeowners 8 to 10 percent on their 1990 gas bills.

KN Rate Hikes

In October 1989, KN Energy won a Nebraska Supreme Court decision which ruled that KN is entitled to rate increases proposed two years ago and stalled because of legal action brought by 25 western Nebraska communities. The ruling meant rate increases from 7 to 9.9 percent.

On July 1, 1990, KN Energy filed rate increases averaging 20.68%, affecting 147 municipalities in central and eastern Nebraska. Under the Municipal Natural Gas Regulation Act, each municipality, acting as its own rate commission, has 180 days to review KN's rate increase. The cities, divided into five rate areas, voted to hire a rate analyst with money borrowed from the Nebraska Energy Office.

Past attempts to raise rates have touched off moves by communities to investigate acquiring natural gas distribution systems owned by KN Energy.

Sales, Mergers, and Takeovers

Twenty-five to 30 percent of the people of Nebraska in 18 towns are served by publicly owned natural gas systems. Twelve towns or cities own their own systems, four are served by Metropolitan Utilities District, and two are served by Fremont Department of Utilities.

- Superior and Falls City purchased their natural gas distribution systems from Kansas Power and Light (KPL).
- Oshkosh, Blue Hill, and Wood River considered purchasing their natural gas distribution systems from KN Energy Inc. but rejected proposals to do so.
- Crete considered buying its natural gas distribution system from Minnegasco.
- Wisner purchased its natural gas distribution system from Minnegasco.
- Stuart residents voted to condemn the natural gas distribution system owned by KN Energy Inc.
- KN Energy Inc. discussed buying Alma's gas system.
- Diversified Energy's parent company of Minnegasco, proposed to merge with Arkla.

GRANTS STUDIES LEGISLATION

"Nebraska has the potential to be relatively energy self-sufficient in liquid fuels and electrical power. The use of harvestable residues... appears to be highly attractive."

Nebraska Survey of Biomass: Availability and Energy Utilization Potential, A Report to the Nebraska Energy Office, Dec. 1, 1990

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 (WAPA). 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.

Under a $10,000 WAPA grant, the Energy Office entered into a cooperative agreement with the U.S. Department of Energy to take a comprehensive county-by-county inventory of Nebraska's biomass resources. The Energy Office subcontracted with the University of Nebraska to develop the inventory and the University provided an additional $11,000 in matching contributions to the project. The inventory was completed in the summer of 1990 and the final report was released in January.

Urban Mass Transit Authority Grant

In 1990, Nebraska received an $831,000 grant from the Urban Mass Transit Authority (UMTA) to purchase 39 dual-fueled vehicles. The small buses, vans, and station wagons are targeted for use by 30 rural transit systems and three native American tribes. Fourteen of the vehicles will be converted to operate on compressed natural gas (CNG). The other 25 vehicles will be converted to operate on propane.

Total cost of the vehicle replacement project is $1.16 million. Under the terms of the grant, the state will contribute $221,600, rural transit systems will contribute $55,400 and three natural gas utilities (Minnegasco, KN Energy, Inc., and the Fremont Municipal Utilities System) will provide five refueling

Nebraska Alternative-Fueled Vehicle Sites

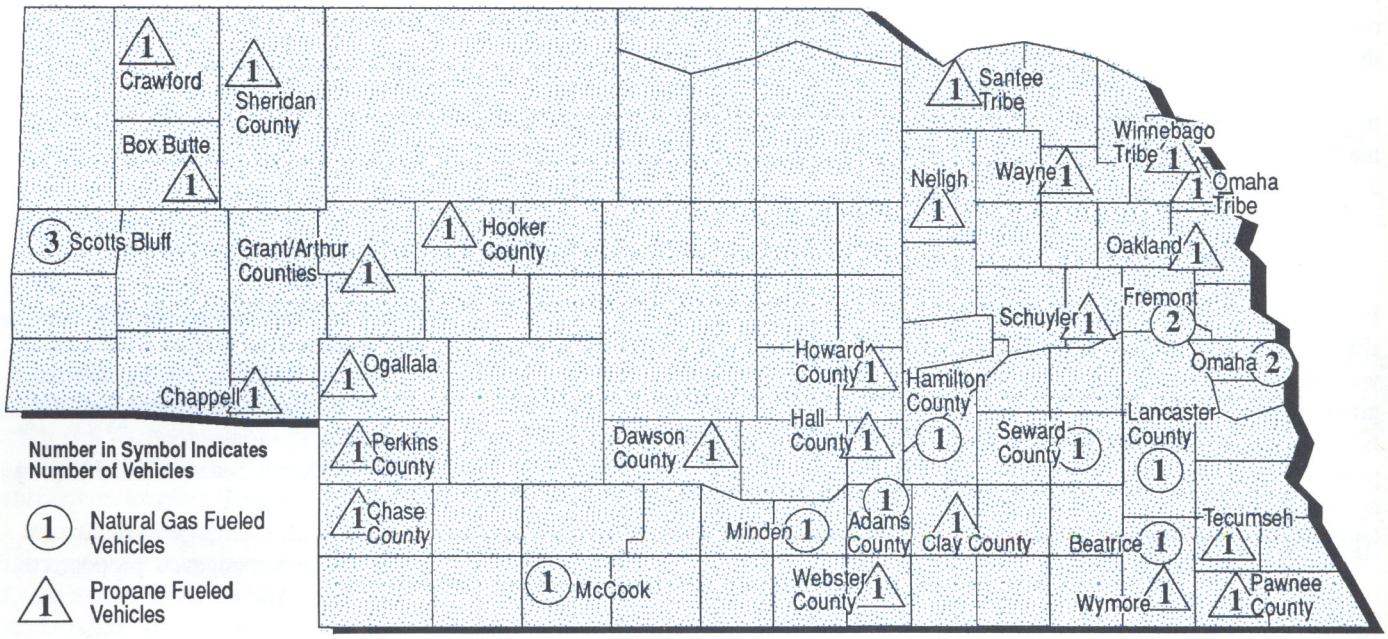


Figure 7

facilities at an estimated cost of $54,000.

The state contribution comes from $500,000 in oil overcharge funds designated for rural transportation as announced in the Governor's Oil Overcharge plan in January 1989. (See Oil Overcharge Projects starting on page 13). The state will use the balance of the overcharge funds to purchase replacement vehicles in 1991-92.

Alternate fuel vehicles will be delivered to the following agencies, transportation systems, and local governments in early 1991:

Cities, Counties, and Tribal Organizations Receiving Vehicles	No. of Vehicles
Adams County Transportation Program	1
Blue River Area Agency on Aging, Beatrice and Wymore	2
Box Butte County Handi Bus Program	1
Chappell Senior Bus	1
Chase County Transit Service	1
City of Crawford Handi Bus	1
Dawson County Handi Bus	1
Eastern Nebraska Office on Aging Transportation System, Omaha	2
City of Fremont Transit Line	2
Grant and Arthur County Handi Bus	1
Hall County Handi Bus	1
Hamilton County Handi Bus	1
Hooker County Handi Bus	1
Lancaster County Rural Transit	1
City of McCook Handi Bus	1
Midland Area Agency on Aging, Clay and Howard County Senior Services	2
Mid-Nebraska Community Services, Minden	1
City of Neligh Dial-A-Ride	1
City of Oakland Transportation System	1
City of Ogallala Handi Bus	1
Omaha Tribe of Nebraska Public Transportation System	1
Pawnee County Handi Bus	1
Perkins County Mini Bus	1
Santee Tribe Transportation System	1
Scotts Bluff County Handi Bus Service	3
City of Schuyler Handi Bus	1
Seward County Handi Bus	1
Sheridan County Public Transportation System	1
City of Tecumseh Handi Bus Prog.	1
City of Wayne Mini Bus Service	1
Webster County Transportation Service	1
Winnebago Tribe Rural Transportation System	1

DOE Grant to Monitor Propane and Heating Oil Prices

In 1990, the Nebraska Energy Office received a $2,000 grant from the U.S. Department of Energy to monitor residential propane and fuel oil prices during the winter of 1990-91.

In conjunction with DOE's Energy Information Administration (EIA), the Energy Office will conduct a telephone survey of selected sellers of propane. Twice a month from October through March 1991, an Energy Office representative will contact survey participants to ask for current sales prices and for primary stock data. This information will be forwarded to the EIA for data compilation and recommendations for technical assistance.

Federal Legislation

Clean Air Bill

In October of 1990, Congress passed amendments to the Clean Air Act —the first changes in clean air legislation since 1977. The intent of the legislation is to cut acid rain pollutants by half, sharply reduce urban smog, and eliminate most of the toxic chemical emissions from industrial plants by the year 2000. Major provisions of the Clean Air Act amendments include:

• Utilities must reduce emissions which contribute to acid rain. By the year 2000, utilities must cut annual sulfur dioxide emissions by nearly half, by installing scrubbers or switching to low-sulfur coal. They also must reduce annual nitrogen oxide emissions by two to four million tons.

• One hundred cities now considered to have unhealthy air must meet federal air quality standards within five to 15 years to reduce urban smog.

• Industries must install new pollution control equipment to cut the release of toxic chemicals by 90 percent over the next decade.

• Pollution from automobiles must be cut 30 to 60 percent through additional controls on tailpipe emissions, more stringent requirements for pollution control equipment on new cars, and phase-in of alternative fuels in motor vehicle fleets. Oil companies also must provide cleaner gasoline blends, beginning in 1992 in cities with the worst smog problems.

• Chemicals that destroy the earth's ozone layer will eventually be outlawed: Chlorofluorocarbons and carbon tetrachloride by 2000; methyl chloroform by 2002; and hydrochlorofluorocarbons by 2030.

With respect to energy production and management in Nebraska, the most significant impact of the Clean Air Act amendments will be felt by the electric utilities and the ethanol industry. Electric utilities will be most effected by requirements that coal-burning power plants reduce sulfur dioxide releases. The requirement that oil companies provide cleaner gasoline blends will give a positive boost to Nebraska's ethanol industry.

For a more detailed analysis of the effects of Clean Air Legislation in Nebraska, see page 7.

State Energy Efficiency Programs Improvement Act (S. 247 and H.R. 711)

In October 1990, Congress passed a compromise version of S. 247 and H.R. 711, amending the Energy Policy and Conservation Act to update state energy conservation programs. The legislation does not merge the State Energy Conservation Program (SECP), with the Energy Extension Service (EES) program as originally proposed. Instead, it updates SECP regulations, designating new mandatory features for SECP plans and specifying new optional SECP elements.

The legislation also makes statutory changes in the Weatherization Assistance Program and the Institutional Conservation Program. In addition, the legislation created a State Energy

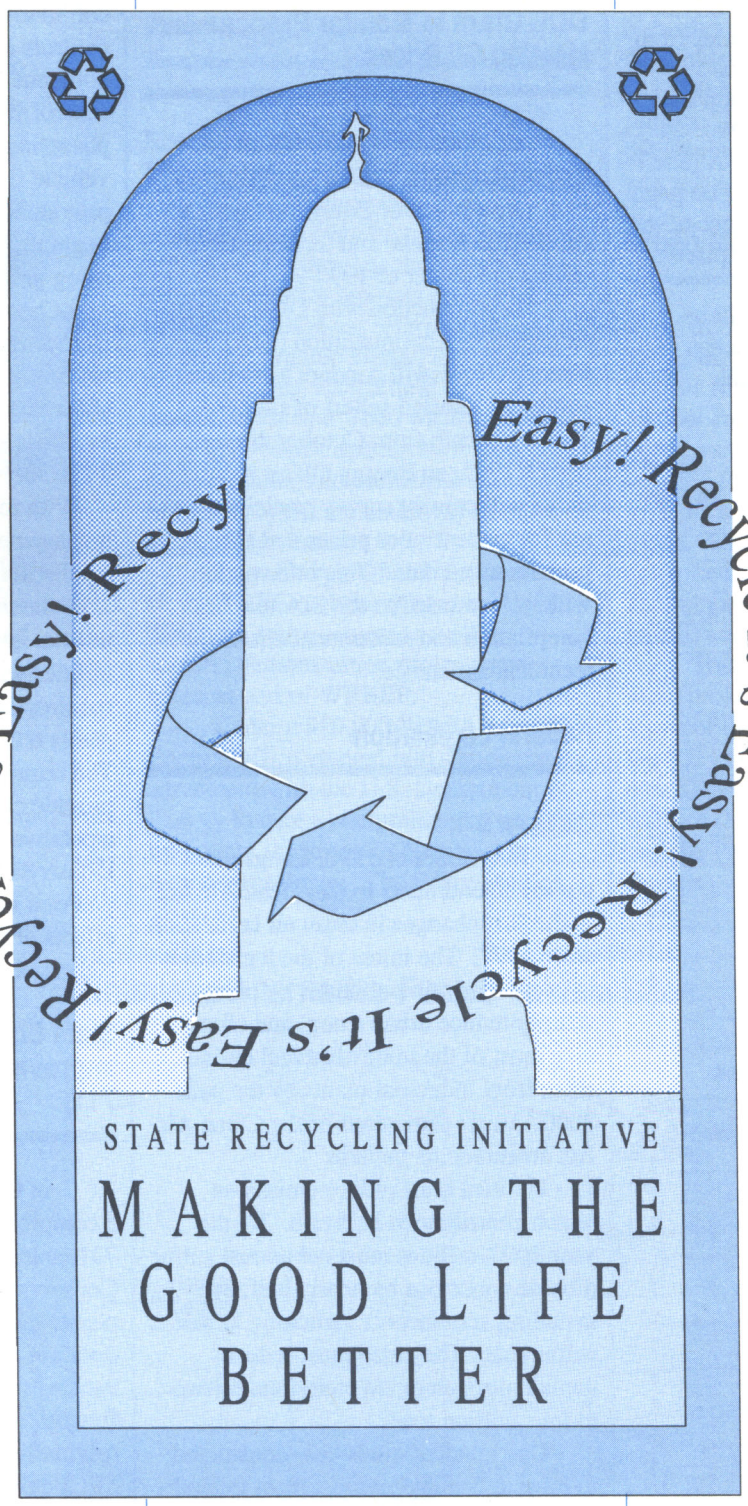
Advisory Board which will report to the Assistant Secretary for Conservation and Renewable Energy with recommendations related to energy programs.

State Legislation

LB 163: The Waste Reduction and Recycling Incentive Act

In April 1990, the Nebraska State Legislature passed LB 163, which calls for development of a solid waste management plan to stimulate recycling and eliminate unlicensed dumps in the state. The law creates a waste reduction and recycling incentive fund which will provide funds to communities to develop waste reduction, resource recovery, and recycling programs. No community that operates an unlicensed dump will be able to get a grant unless the money is used to meet license requirements and a landfill is licensed within two years of receiving the grant.

The fund will be administered by the Department of Environmental Control and financed through a levy of $1 on every new tire sold in the state beginning July 1, 1991. In addition, retail businesses with sales of at least $30,000 will be assessed an annual solid waste fee of $25 to $50, depending on volume of business.



State Recycling Poster

This recycling poster was commissioned by the Governor's Office to promote recycling in state agencies and set an example for industry.

LB 987: State Government Recycling Management Act

The Legislature passed LB 987 in 1990. It establishes the State Government Recycling Act, which coordinates collection and sales of recyclable materials generated by state agencies. It also codifies some activities of the State Government Recycling Initiative adopted through Executive Order 89-2. The Energy Office handles administration of the Act.

LB 1056: Building Code Standards to Improve Energy Efficiency

LB 1056, introduced by the Government Committee, resulted from an interim study of the Nebraska Building Energy Conservation Standards, which specifies codes to improve the energy efficiency of new and remodeled buildings.

Senator Dennis Baack asked the Energy Office to coordinate the study and make recommendations to the Government Committee. The Energy Office held three meetings in the fall of 1989 and the resulting work was introduced as LB 1056. The bill proposed to adopt the 1989 Model Energy Code as the conservation standard for Nebraska. Opposition from the Nebraska Homebuilders Association caused the Committee to withdraw its support and the bill was killed.

PETROLEUM VIOLATION ESCROW FUNDS

"As far as Nebraska is concerned, Governor Kay Orr's announcement Tuesday of a $20 million loan program to help finance energy improvements in homes, businesses, and industries is an excellent use of oil overcharge funds."

Editorial, *Kearney Hub*, July 11, 1990

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

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

The Weatherization, Energy Financing, State Energy Conservation Program, and Energy Extension Service Divisions of the Nebraska Energy Office oversee and manage projects financed by Petroleum Violation Escrow Funds.

Governor's Oil Overcharge Projects

The Nebraska Energy Settlement Fund was established by the Legislature for money paid to Nebraska since March of 1986 from awards or allocations to the State in oil overcharge cases. The balance of the fund as of December 31, 1988 (including interest), was approximately $22 million ($14.6 million in *Exxon* funds, $12.7 million in *Stripper Well* funds and $.475 million in Diamond Shamrock funds). The Governor's 1989 Plan identified twelve projects for sharing disbursements from the Nebraska Energy Settlement Fund, as well as a reserve fund. The status of each project is described here.

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,

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

(December 31,1990)

	Exxon	*Stripper Well*	*Diamond*	Total
Total Received	$15,504,944	$10,173,943	$359,172	$26,038,059
Interest Earned	6,341,011	2,616,480	119,220	9,076,711
Total	**$21,845,955**	**$12,790,423**	**$478,392**	**$35,114,770**
Less Budgeted:				
Contracts	$3,700,849	$5,375,000	$0	$9,075,849
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	238,595	0	238,595
Bank Wire Fees	0	75	0	75
Low Income Weatherization	3,680,000	1,489,584	0	5,169,584
Emergency Preparedness	95,000	0	0	95,000
Revolving Loan Program	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	685,826	340,129	0	1,025,955
Oil Overcharge Administration	0	0	459,458	459,458
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	2,049,400	1,386,199	0	3,824,058
Subtotal	$21,389,333	$12,635,485	$478,392	$34,497,572
Uncommitted Balance	**$456,622**	**$154,938**	**$0**	**$611,560**

Figure 8

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

(December 31,1990)

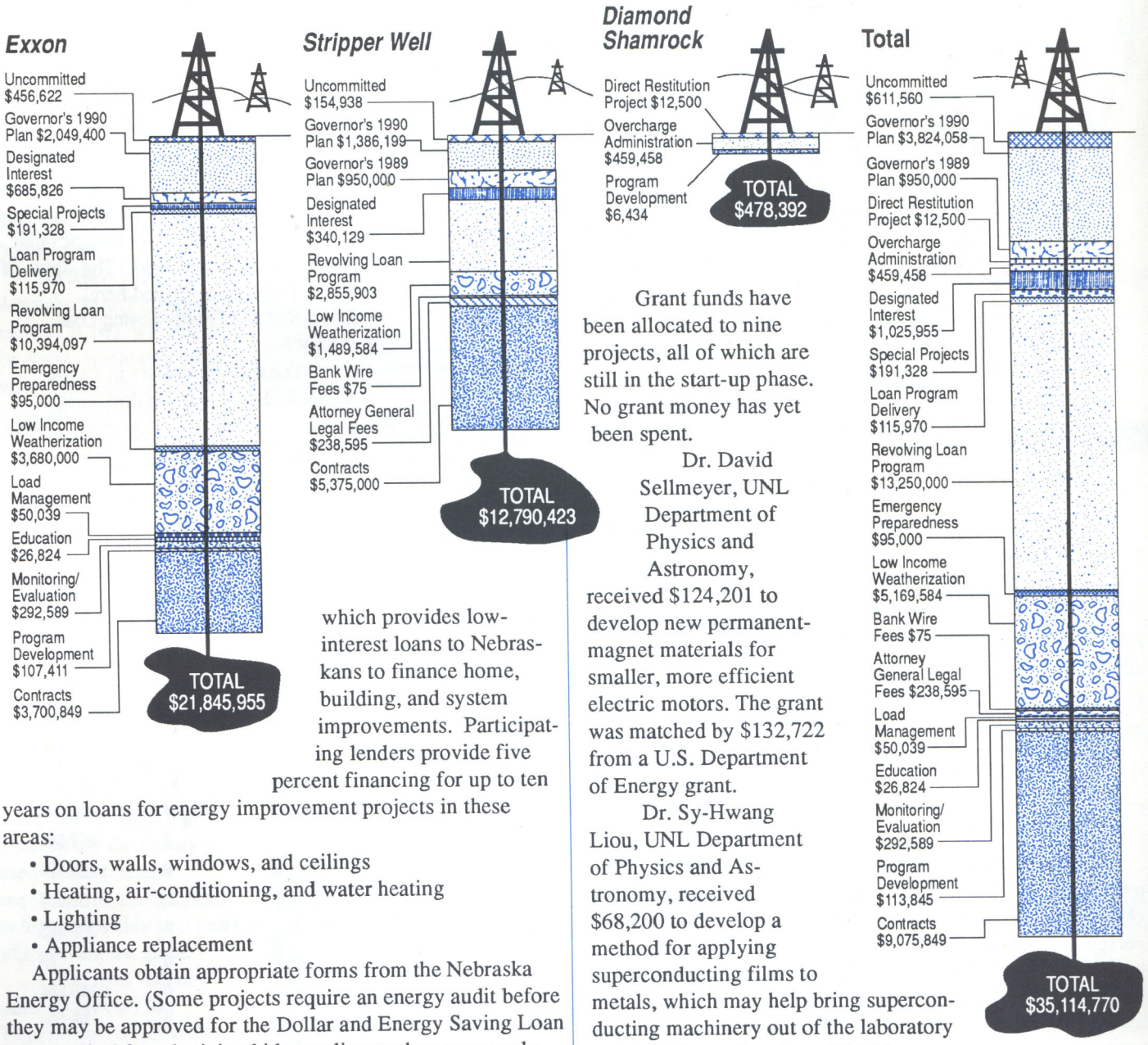


Figure 9

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 energy improvement projects in these areas:

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

Applicants obtain appropriate forms from the Nebraska Energy Office. (Some projects require an energy audit before they may be approved for the Dollar and Energy Saving Loan Program.) After obtaining bids, applicants then may 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.

Energy Related Research

The University of Nebraska received $2 million in *Stripper Well* funds to support biotechnological, solar, and conservation research. The University must match the grant with private sector or federal contributions.

Grant funds have been allocated to nine projects, all of which are still in the start-up phase. No grant money has yet been spent.

Dr. David Sellmeyer, UNL Department of Physics and Astronomy, received $124,201 to develop new permanent-magnet materials for smaller, more efficient electric motors. The grant was matched by $132,722 from a U.S. Department of Energy 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 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, UNL Department of Civil Engineering, received $88,000 to study ways of connecting

Exxon Contracts

Category	Allocated Funds	Contracts Issued	Expenditures Through 12-31-90
Energy Education	$628,056	$563,056	$529,946
Financing Demonstrations	1,100,164	1,100,164	974,157
Agriculture	327,234	327,234	250,194
Feasibility Studies	113,827	113,827	93,827
Building Improvement Demonstration	848,392	848,392	724,258
Transportation	710,000	710,000	500,000
Load Management	50,039	50,039	50,039
Residential, Farm & Ranch, Small Business, and Local Government Revolving Loan Program	10,000,000	3,809,357	3,809,357
Low Income Weatherization	3,680,000	3,680,000	1,389,753
Total *Exxon* Contracts 12-31-90	**$17,457,712**	**$11,202,069**	**$8,321,531**

Figure 10

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

Dr. George 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 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 U.S. Department of Energy research grant.

Dr. David Clements, UNL Department of Chemical Engineering, received $350,920 to study the best method of producing and using fuel derived from municipal solid waste. A local technical development firm has provided matching funds.

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. Bing Chen, University of Nebraska Omaha Department of Electronic Engineering Technology received $91,172 for development and testing of rooftop cooling ponds to reduce air-conditioning load in commercial buildings.

Low Income Weatherization 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. Over four and one half million dollars will be used over five years to supplement the existing Low-Income Weatherization Program. These oil overcharge funds will enable the Energy Office to allocate $250,000 per year, for five years to the Omaha Housing Authority for purchasing

Stripper Well Contracts

Category	Allocated Funds	Contracts Issued	Expenditures Through 12-31-90
Low Income Weatherization	$1,489,584	$1,489,584	$619,584
State Buildings Energy Team	150,000	0	0
Local Government Energy Manager Circuit Rider	400,000	$400,000	22,693
Public Transportation	800,000	525,000	424,584
Energy Related Biotechnology, Solar, and Conservation Outreach	2,000,000	2,000,000	0
Greenhouse Project	400,000	400,000	0
Innovative Energy Grants	500,000	0	0
Revolving Loan Program	2,855,093	2,260,978	2,260,978
Indian Tribal Governments	50,000	50,000	16,667
University of Nebraska Building Weatherization	500,000	500,000	0
Nebraska State College System	1,500,000	1,500,000	250,000
Total *Stripper Well* Contracts 12-31-90	**$10,644,677**	**$9,125,562**	**$3,594,506**

Figure 11

1990 Proposed Oil Overcharge Funding

Projects	*Exxon*	*Stripper Well*
NEO Administration	$0	$384,199
Low Income Weatherization	0	725,000
Native Americans	0	27,000
Energy Emergency Contingency Fund	100,000	0
Feasibility Study for Trans-Nebraska Bike Path	75,000	0
Rural Nursing Home Program	394,097	105,903
"A Hundred Points of Light" Project	250,000	0
Demonstration Lighting Project	40,000	0
Energy Component of START	75,000	0
Downtown Commuter Bike Path	97,000	0
Wood Plantation, Wood Burning, Arbor Center	562,400	0
Refuse-Derived Fuel Boiler Modifications at Kearney State College	150,000	0
Energy Conservation Loan Program	0	2,750,000
Study Controlled Residential Ventilation	500,000	0
College of Technical Agriculture at Curtis	0	250,000
Statewide Energy Education	200,000	0
UNL Greenhouse Renovation Project	0	400,000
Total Plan	**$2,443,497**	**$4,642,102**
Total Available	**$2,900,119**	**$4,802,678**
Balance of Fund 12-31-90	**$456,622**	**$160,576**

Figure 12

weatherization materials for its housing rehabilitation program.

For details on Low-Income Weatherization projects, see pages 23 and 24.

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 is administered by the Central Technical Community College Area — Platte Campus in Columbus and the Mid-Plains Technical Community College Area in North Platte. The circuit riders, located at each campus, help local governments identify needed energy improvements, make recommendations for improved energy management including tracking energy consumption, and organize training sessions for building operators.

Rural Revitalization: Public Transportation

One million dollars ($200,000 from *Exxon* and $800,000 from *Stripper Well*) support rural transportation through bus subsidies and alternate-fuel-powered vehicles. A total of $500,000 was designated to subsidize operating costs for Black Hills Stage Lines, Inc. ($360,000) and Star Transportation Services, Inc. ($140,000).

The remaining $500,000 will make alternate-fuel-powered vehicles available to rural community and county-based programs that provide transportation for the handicapped, elderly, and general public.

Both bus subsidy and alternate-fuel-powered vehicle programs are being coordinated by the Nebraska Department of Roads. (See Urban Mass Transit Authority Grant on page 10).

Planning, Evaluating, Monitoring Oil Overcharge Programs

Two hundred thousand dollars in *Exxon* funds continue to be used to meet the federal requirement for evaluating and monitoring projects supported by oil overcharge funds. The State Energy Conservation Program continued to be responsible for planning, evaluation, and monitoring Nebraska Energy Settlement Fund projects.

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.

Indian Tribal Governments

The *Stripper Well* agreement requires the state to provide an equitable share of funds to Indian Tribal Governments. Based on their representation in the general population, Native Americans have been allocated an additional $27,000 in *Stripper Well* funds for energy programs to benefit residents living on the reservation.

University of Nebraska Building Weatherization

The University of Nebraska received $500,000 in *Exxon* funds to finance ten projects in buildings at three campuses (UNL, UNO, and UMC). The projects focus on increasing energy efficiency and conservation in buildings, and generally include installation of energy management control systems, astute thermostats, and boiler economizers. The payback periods for the projects, all of which are in the early stages of construction, range from 2 to 6.8 years.

State College System

A contract between the Nebraska Energy Office and the State College Board of Trustees provides $1,000,000 for construction of a wood-fired boiler at Chadron State College scheduled for

completion in summer 1991. The Board has not yet determined how to spend the remaining $500,000 allocated to the State College system.

State Buildings Energy Team

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

Innovative Energy Grants

Stripper Well funds totaling $500,000 in have been earmarked for grants to citizens for research and or development of innovative energy-related projects. The Energy Office along with the University of Nebraska's Technical Assistance Center, have developed evaluation criteria for project review. Pre-Application forms are available from the Energy Office, and one full application has been invited. No grants have been made to date.

Uncommitted Funds

A total of $2.28 million ($380,000 from *Exxon* and $1.9 million from *Stripper Well*) remains in a reserve fund and has not been committed to any existing or new programs.

New Oil Overcharge Projects

The governor prepared a predisbursement plan for presentation to the Legislature in 1990 describing seventeen additional projects to be financed by the Nebraska Energy Settlement Fund.

Energy Emergency Contingency Fund

$100,000 in *Exxon* Funds would support an Energy Emergency Contingency Fund to be used during severe or protracted energy shortfalls. These funds would become available only after the pre-emergency phase of the Energy Shortage Management Plan had been implemented. The fund would allow the Energy Office to deal with extraordinary expenses without disrupting other programs.

Feasibility Study of Trans-Nebraska Bike Path

Exxon funds totaling $75,000 would support a study of the feasibility of building a system of trails across the state, linking existing hiker/biker trails. The study will review existing and planned trails, map the most feasible route across the state, and evaluate alternative materials for surfacing a trail.

Rural Nursing Home Loan Program

An additional $500,000 in oil overcharge funds ($394,097 from *Exxon* and $105,903 from *Stripper Well*) would be placed in the existing Dollar and Energy Saving Loan Program to finance energy conservation improvements in rural nursing homes. Low-or zero-interest energy improvement loans would be available to licensed nursing homes located in villages of 5,000 or less.

"A Hundred Points of Light" Project

Exxon funds totaling $250,000 would subsidize replacement of incandescent bulbs with compact fluorescent fixtures in commercial buildings. The Energy Office would work with Nebraska's major electric utility companies to educate people in the commercial sector about the benefits and proper use of compact fluorescent bulbs.

START Energy Component

Exxon funds totaling $75,000 would finance a project to add an energy component to the Strategic Targeting and Resource Training (START) programs in Nebraska. The Energy Office would apply for matching funds from the Western Area Power Administration.

START is an analytical and decision-making process that has been used in 1989-90 by 25 communities and three counties in Nebraska to evaluate and make decisions about economic development goals. Communities that don't participate in START would also be able to use the energy component.

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. The study will evaluate an Air Pro system which maintains constant ventilation rates in a residence, preventing the buildup of gases and protecting residents from both external pollution and inadequate ventilation.

Statewide Energy Education Initiative

Two hundred thousand dollars in *Exxon* funds would finance a project to provide a coordination of resources for energy education throughout the state. The program would promote energy conservation and target energy consumers.

Dollar and Energy Saving Loan Program

An additional $2,750,000 in *Stripper Well* funds would be placed in the Dollar and Energy Saving Loan Program established last year in the Governor's Oil Overcharge Plan. (See page 13 for a more complete description of the Dollar and Energy Saving Loan Program.)

Downtown Lincoln Commuter Bike Path

Exxon funds totaling $97,000 will 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 Detrich Trail.

Arbor Day Center Project

Exxon funds totaling $562,400 would finance 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. A wood-fuel heating plant would be constructed to heat the Education and Conference Facility to be built at the Center. A 200-acre Energy Forest

Plantation would be established to fuel the heating plant, as well as to provide experimental data on the feasibility of trees as an alternative crop and on the best silviculture and harvesting techniques.

The Arbor Day Foundation and the Nebraska State Forester's Office would cooperate in selecting trees, designing the plantation, and analyzing and disseminating data. The project is intended to be a model for other public and private institutions in the use of energy from a renewable source.

Demonstration Lighting

Forty thousand dollars in *Exxon* funds would 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 would be targeted for participation in the Lighting Project. Data on energy savings reported from the project would be used to support inclusion of lighting measures in the Weatherization Assistance Program.

Kearney State College Boiler Modification for Refuse-Derived Fuel

Exxon funds totaling $150,000 would finance a project to retrofit one of the boilers at Kearney State College to burn waste instead of natural gas. The waste fuel would derive from organic matter, except paper and cardboard, compressed into small fuel pellets by a refuse recovery system operated by the city of Kearney. Paper and cardboard would be recycled separately.

College of Technical Agriculture at Curtis Building Weatherization

The College of Agriculture at Curtis would receive $250,000 in *Stripper Well* funds to weatherize its buildings.

Planning, Evaluation, and Monitoring Oil Overcharge Programs

To comply with federal regulations, $384,199 in *Stripper Well* funds would be committed over the next several years to the State Energy Conservation Plan for monitoring and evaluating programs supported by oil overcharge funds.

Low Income Weatherization Programs

The *Stripper Well* agreement requires the state to provide an equitable share of funds to the state's low-income population. Because 18 percent of households in the state are eligible for low-income weatherization, 18 percent of the *Stripper Well* funds, or $725,000, would be available for low-income programs.

Indian Tribal Governments

The *Stripper Well* agreement requires that funds be provided to Indian Tribal Governments based on the ratio of Native Americans to the total state population. A total of $27,000 has been allocated to the three tribal governments in the state to fund contracts to provide energy programs to the Native American population.

UNL Greenhouse Renovation Project

Stripper Well funds totaling $400,000 would be used to renovate 20 greenhouses on the University of Nebraska-Lincoln's East Campus, which are used for research and teaching in the departments of Agronomy, Plant Pathology, Horticulture, and Entomology. Renovations would include individual controls for heating, cooling, and lights for each zone within the greenhouses; efficiency improvements in the cooling systems; and improved roof glazing. The project would be completed by late spring 1991.

Exxon Projects

Exxon funds are used to finance projects that promote energy education and conservation. The SECP/EES Division administers contracts and programs supported by *Exxon* funds. Figures 10 and 11 list expenditures by category of all *Exxon* and *Stripper Well* funds through December 1990. Figure

CSC Heating Plant Work Continues

Work on the wood chip boiler heating plant at Chadron State College continues in good weather. The plant, built by Ainsworth Benning Construction Company, is being funded by *Exxon* oil company overcharge money from the state of Nebraska and will use wood waste as fuel. Workers have been preparing the foundations which will support the bin where the wood waste will be stored. The $1 million project is due to be completed early this coming summer.

Scottsbluff Star-Herald,
December 20, 1990

12 indicates the groups that have been approved for *Exxon* grants and the type of projects proposed.

As of June 1990, the following *Exxon* Projects had been negotiated and were in various stages of completion.

Energy Education

Nebraska Council on Economic Education (NCEE) completed the final year of its contract to promote energy education in schools across Nebraska. NCEE made 18 presentations to teachers and students, distributed over 817 informational brochures and responded to over 256 requests for energy education materials. A biannual newsletter featuring information on current energy/economic issues and describing the services of the Office of Energy Economic Education was published and distributed to 5,900 teachers. The Council also coordinated a statewide National Energy Education Development (NEED) effort. Five circulars were published and distributed to keep member schools informed and involved in NEED activities.

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

Central Community College continued to use the MCA 3000 Sun Modular Computer Analyzer in teaching high school automotive students to improve energy efficiency in automobiles. The special diagnostic equipment was used at 17 high schools throughout the state. The college also sponsored two public vehicle demonstrations in cooperation with the AAA Motor Club.

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

Auburn Public Schools continued its residential energy audit and weatherization program for Auburn High School's industrial arts students. During 1989-90, 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 six local residences. In the summer of 1990, six students also participated in a special six-week session to weatherize seven Auburn homes.

Exxon funds awarded: $93,725. Actual funds expended to date: $64,332. Support provided by Auburn Public Schools: $1,800 cash and $96,010 in-kind match.

Community Action of Nebraska (CAN) continued to develop materials and plans to train building contractors in techniques for weatherizing mobile homes. A pilot test to determine the effectiveness of the training tools was completed. However, the project was canceled due to low interest and lack of participants.

Exxon funds awarded: $130,810. Actual funds expended: $32,815. Support provided by Community Action of Nebraska: $36,650 cash and $26,400 in-kind match.

Mid-Nebraska Community Services completed its residential weatherization contractor training program for displaced agricultural workers in central Nebraska. The training involved both classroom instruction and hands-on retrofitting experience. Five people completed the training program, auditing over seventy homes and weatherizing fourteen residences. The project was completed in 1989.

Exxon funds awarded: $126,010. Actual Funds expended: $76,506. In-kind match provided by Mid-Nebraska Community Services: $17,288.

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, seven energy loans have been completed, using loan funds totaling $62,332.

Exxon funds awarded: $138,664. Actual funds expended to date: $132,826. Support provided by South Sioux City Area Chamber of Commerce: $66,000 cash and $2,200 in-kind match.

Village of Stuart continued to provide zero-interest loan funds to finance local commercial building weatherization and waste-heat recovery projects. Twenty-two energy audits have been completed and eleven projects totaling $108,422 have been funded to date.

Exxon funds awarded: $161,500. Actual funds expended: $99,555. Matching funds provided by Stuart Electrical System: $36,000 as loan principal. In-kind match provided by the Village of Stuart: $10,087.

City of Schuyler, through the Schuyler Energy Commission, continued to lend funds at 3.6 percent interest to weatherize local commercial, non-profit, and government buildings. Local banks committed $199,500 in loan principal. Seven loans totaling $108,136 have been approved to date.

Exxon funds awarded: $200,000. Actual funds expended: $195,973. 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 $2,000, are available to eligible property owners. 149 property owners have received loans or rebates totaling $152,632 to date.

Exxon funds awarded: $350,000. Actual funds expended to date: $333,326. Support provided by the city of Lincoln: $450,000 cash (arranged through NIFA — the Nebraska Investment Finance Authority) and $90,724 in-kind match.

Neighborhood Housing Services, Inc. began a revolving loan

program to provide low-interest weatherization funds to property owners unable to obtain credit from conventional lending sources. Loan funds are available at a variable interest rate based on the borrower's income and monthly debt to income ratio. The financing mechanisms have been developed and approved. A local utility company has agreed to provide energy auditing services.

Exxon funds awarded: $250,000. In-kind match to be provided by Neighborhood Housing Services, Inc.: $22,953.

Agricultural Projects

University of Nebraska — West Central Research and Extension Center replaced greenhouse corrugated fiberglass roofing with a twin wall polycarbonate Lexan outer casing, which is less opaque and has a higher R-value. The new roof increased the amount of available light and reduced furnace use. Increased light availability enabled growers to complete a third growing cycle in a breeding year, substantially improving research productivity. Since the improvements have been made, 35.4 percent less natural gas is required for supplemental heat than in the previous five years. Assuming an average cost of 37 cents per thousand cubic feet of natural gas, project officials anticipate a seven to eight year payback on the initial investment.

Exxon funds awarded: $13,000. Actual funds expended: $13,000. Support provided by contractor: $9,100 cash and $17,436 in-kind match.

University of Nebraska's Department of Agronomy continued a strip and relay cropping project to demonstrate the energy savings potential of alternating crop types in a field from year to year and growing more than one type of crop in a field at the same time. Alternating grasses and legumes with crops such as corn increases the amount of nitrogen in the soil and reduces the need to apply additional nitrogen.

Twenty-five farmers throughout Nebraska maintained demonstration

Courthouse Trails Project

Berggren and Woll, AIA, continued the Courthouse Trails project to demonstrate the savings potential of energy efficiency improvements in historically significant courthouses. An inefficient steam heating system, including corroded pipes, boilers, and cooling sources was replaced at the Hamilton County Courthouse. A coordinated heating and cooling system utilizing appropriate existing cooling equipment, a new high efficiency hot water heating source, new piping, and new control system was installed at a cost of $193,434. The Hamilton County Courthouse, built in 1895, is listed in the National Register of Historic Places.

Hamilton County Courthouse in Aurora, received a replacement heating, ventilation, and air-conditioning system.

fields during the 1989 growing season. Initial soil sample analyses have shown that increased productivity occurs within a short period of time and that soil nutrients increase as well. In addition, soil erosion decreased as a result of cover cropping.

Thirty-three farmers planted demonstration fields during the 1990 growing season. The Neighbor-to-Neighbor Conservation Tour Program continued.

Exxon funds awarded: $40,000. In-kind match planned by UNL: $71,540.

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

Twenty-three Nebraska farmers maintained demonstration fields during the 1989 growing season. Agronomic analysis showed that crops grown in rotation with legumes achieve better yields and require less nitrogen fertilizer than crops grown without rotation. Extrapolations based on standard nitrogen usage rates in dryland Nebraska suggest that planting corn and sorghum in rotation with legumes could result in energy savings of 1.59 to 1.79 million Btus per acre. This savings is equivalent to 12.7-14.3 gallons of gasoline per acre.

Twenty-four farmers planted demonstration fields during the 1990 growing season. The Neighbor-to-Neighbor Conservation Tour continued.

Exxon funds awarded: $40,000. Support planned by UNL: $500 cash and $71,440 in-kind match.

47 Ranch Company continued to use photovoltaic-powered electric fencing to manage cattle grazing patterns and optimize range use. Problems continued to plague the solar water pumps, despite consultation with photovoltaic experts. However, the solar powered electric fencing continued to work well, allowing the contractor to save energy that would have been required from fossil fuel sources.

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

University of Nebraska Departments of Biological Systems Engineering and Horticulture developed a computerized greenhouse management system. The system includes equations for computing optimal energy/temperature controls and structural design, and a database that Nebraska greenhouses can use to minimize energy use and increase plant production. In addition, the program uses degree-day technology to predict annual fuel requirements and a present-value equation to analyze cost savings.

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

The software package was used in over 85 design consultations throughout the United States and has been demonstrated at numerous industry and academic meetings.

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

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 equipment has been installed but programming difficulties have significantly slowed down the project. Those difficulties have been resolved and data collection and analysis resumed.

Exxon funds awarded: $20,000. In-kind match provided by the city of Kimball: $20,000.

Public and Nonprofit Building Improvement Demonstrations

Northern Natural Gas 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 in Omaha. Results of data being monitored at both installations should be available next year.

Exxon funds awarded: $200,000. 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. Construction was completed at all sites. Data collection to determine actual energy savings will continue for one year following completion of the improvements.

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

Northeast Nebraska Area Agency on Aging completed a project to demonstrate the energy savings potential of high-efficiency furnaces and air conditioners. Replacement of inefficient equipment in the Senior Centers in Randolph, Pierce, Stanton and Decatur Counties resulted in an overall average energy reduction of 21 percent. The average savings of $589 per year, based on an average investment of $4,776, will result in an average payback period of 8.1 years.

Exxon funds awarded: $16,307. Actual funds expended: $15,695. Cash match provided by the senior centers:

$3,850. In-kind match provided by the Northeast Area Agency on Aging: $1,000.

Miscellaneous Projects

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.

The program has been idle during the past fiscal year, with the original contract between the agency and BERT Inc. expiring in January 1990. Energy Office staff have been working with members of two Benson neighborhood community groups, the Benson Commercial Club and Benson Inc., and the Douglas County Bank and Trust Company of Omaha, to negotiate a new contract covering the operations of a commercial and residential energy conservation loan program for a period of three years. It is hoped the program will be resurrected and operated in the early part of FY 90-91.

Mid-Plains Community College

Mid-Plains Community College completed a project to coordinate the computerized energy management system training program for maintenance personnel. The program provided energy management information and simulated applications by combining instructional curriculum with portable automated building control models. Training courses were offered at six community colleges throughout the state.

The project was financed by an *Amoco* oil overcharge fund award of $91,244 and $7,062 in Section 155 funds. In-kind match provided by Mid-Plains: $2,134. Actual funds expended: $93,934.

Direct Restitution

Consumers who purchased oil products between August 13, 1973, and January 27, 1981, were eligible to apply for a share of the $80 million set aside to provide direct restitution to those injured by overcharges. DOE established a refund standard of $8 for each 10,000 gallons of petroleum products purchased during the overcharge period. The Nebraska Energy Office provided information through newspaper, television, and radio publicity detailing how and where to file claims with the Department of Energy before the December 31, 1987, deadline.

Nebraska led the nation with 5,824 refund claims, documenting purchases of nearly 3.225 billion gallons of petroleum products and representing a total of $2,580,000 in restitution payments.

As of August 23, 1990, DOE had granted 5,653, or 97 percent, of the claims filed in Nebraska. These claims cover 1.78 billion gallons of petroleum products — 55.2 percent of the total volume of documented purchases. Refunds to date have totaled $1,424,847. Forty-one claims, representing purchases of almost 130 million gallons of petroleum products, have been denied. The remaining 130 claims still being processed represent 40.8 percent of the total documented purchases of petroleum products — more than 1.3 billion gallons.

Claims in process include the claim filed by the Energy Office in March 1988, on behalf of the state of Nebraska, requesting a $204,000 refund for purchases of 255,589,981 gallons of petroleum products. The DOE has contested all such claims filed by state governments. Also pending are claims filed by 41 school districts through a Tennessee firm which is handling the filing process for a $25 fee plus 20 percent of the settlement. The remaining claims in process include early claims filed in 1987, claims for restitution on purchases of fewer than 36,000 gallons, and claims made by co-ops.

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

Governor's Oil Overcharge Project Management

This is mentioned in the State Energy Conservation Program & Energy Extension Service Division section on page 28.

Reserve Fund

A total of $617,198 of oil overcharge funds are currently in the reserve account. These funds are available to the Governor for energy projects that comply with the respective court orders.

WEATHERIZATION DIVISION

"We look at ourselves as a business and our business is serving people. But if we can bring in the funds that have been allocated at the federal or state level to our communities, we are helping with the economic development of our communities."

Joan Cromer, Director, Panhandle Community Services, *Scottsbluff Star-Herald*, December 7, 1990

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 homes that are weatherized and for monitoring and auditing the subgrantees — primarily community action agencies which actually make the home weatherization improvements.

In 1989-90, total funding for the program was $3,875,971. The Department of Energy's Low Income Weatherization Assistance Program provided a total of $1,867,515 and the Low Income Home Energy Assistance Program, administered through the Nebraska Department of Social Services, supplied a total of $1,119,789 and $888,667 came from *Exxon* Petroleum Violation Escrow Funds.

Blower Door Pilot Projects

Three subgrantees have completed blower door pilot projects: Central Nebraska Community Services, Lincoln Action Program and Panhandle Community Services. The projects were developed to help the Energy Office devise implementation strategies for incorporating blower door technology into the 1990 Weatherization Assistance Program.

A blower door is a large fan set within a frame that can be fitted snugly into an outside doorway to artificially create conditions under which air filtration normally occurs in a house. The fan blows air outward, reducing air pressure inside the house and allowing outside air to infiltrate through cracks and holes. The blower door can locate air movements and pinpoint the locations and amount of air leaks in the building shell.

Results of the blower door projects helped the Energy Office draft weatherization priority measures for the 1990 program year. In addition, the Energy Office established minimum sealing standards and identified and deleted measures that were not cost effective. The project also made weatherization personnel aware of the capabilities of blower door technology and provided excellent training for subgrantee crews and private contractors.

Number of Homes Weatherized

A total of 2,286 homes were weatherized in fiscal year 1989-90. In keeping with the agency's priority to serve Nebraska's elderly community through the Low Income Weatherization Assistance Program, the Weatherization Division weatherized 707 elderly households, or 30.9 percent of all the homes weatherized during that period.

The map of Nebraska on page 24 shows the ten Weatherization Assistance program Service Areas, and the number of homes weatherized in each area from July 1, 1989 through June 30, 1990.

Home improvements made through the program saved Nebraskans a total of $274,320 in avoided energy costs during 1989-90. That translates

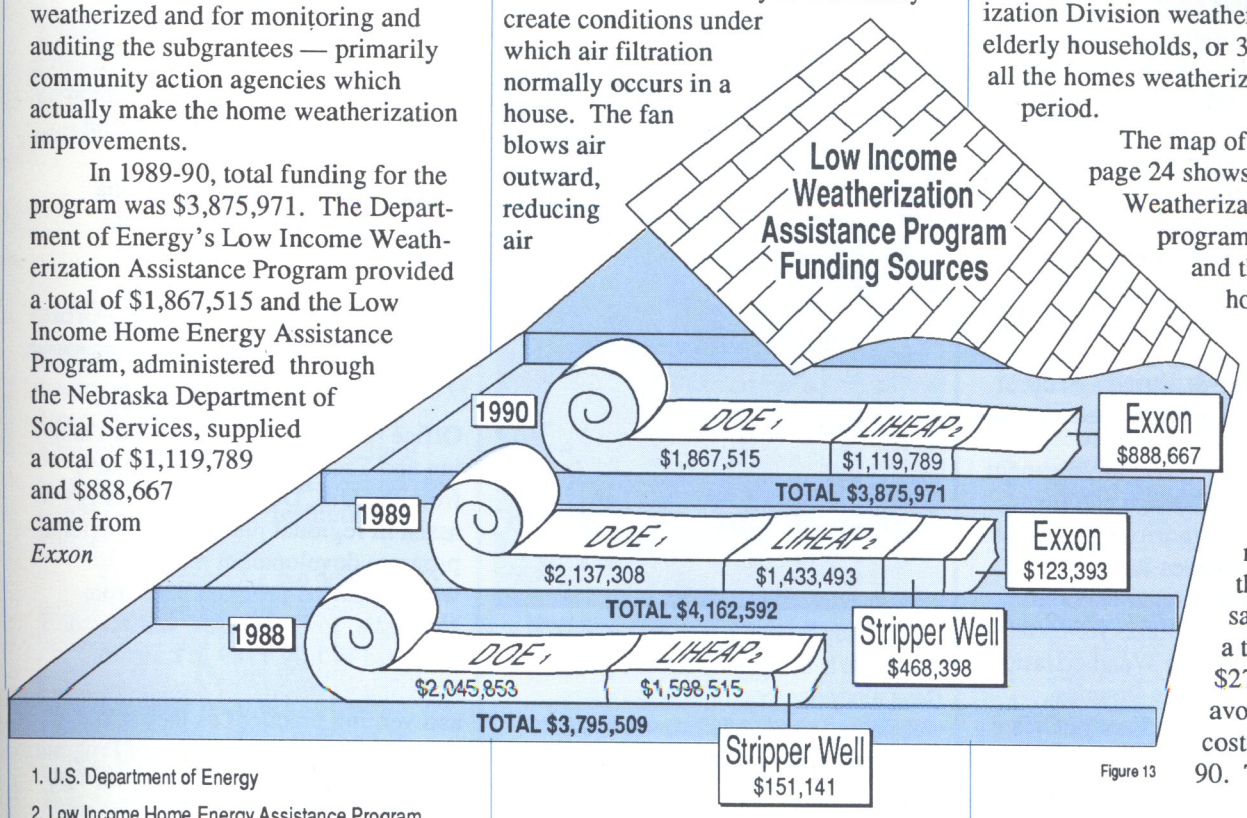


Figure 13

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

Nebraska Weatherization Assistance Program Service Areas and Homes Weatherized

July 1, 1989 through June 30, 1990

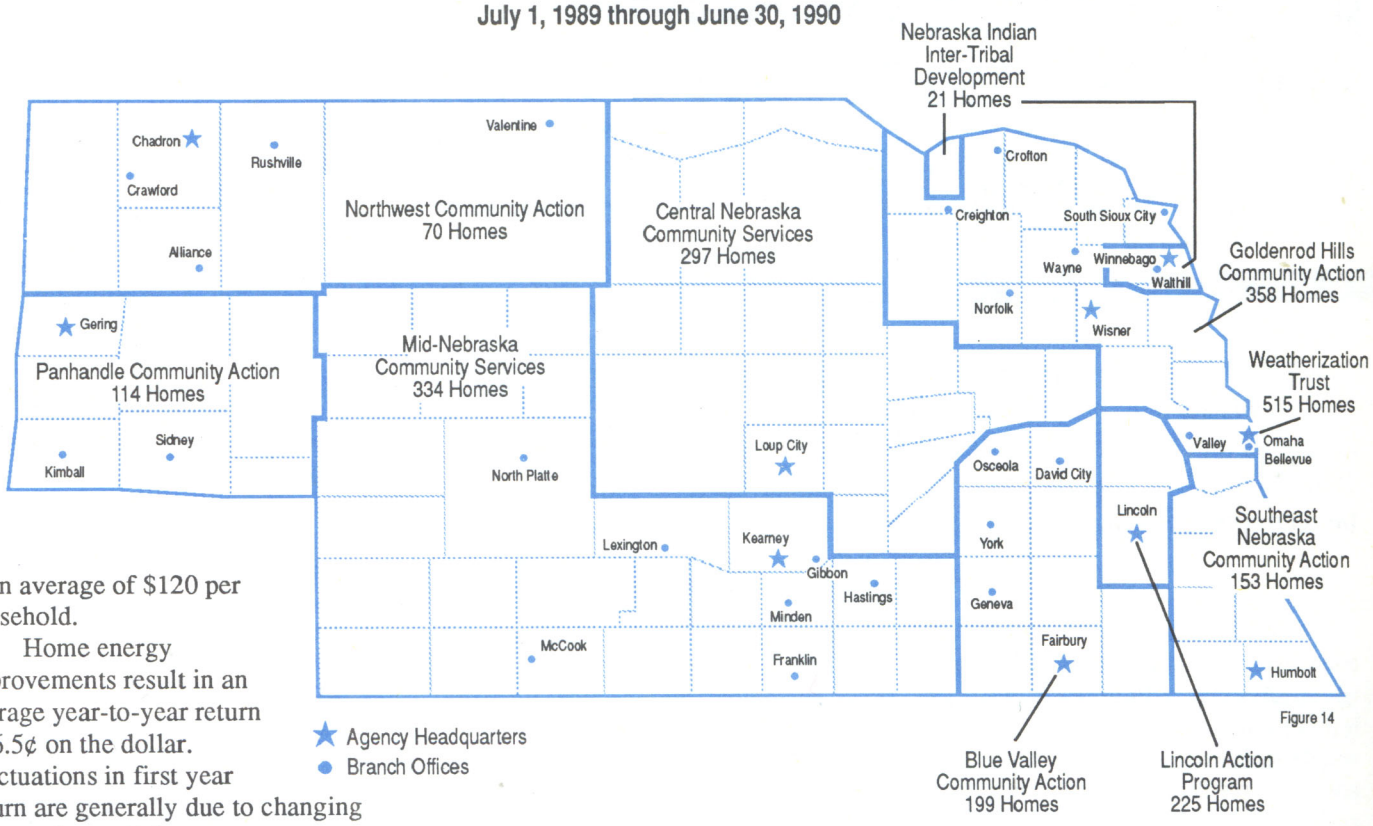


Figure 14

to an average of $120 per household.

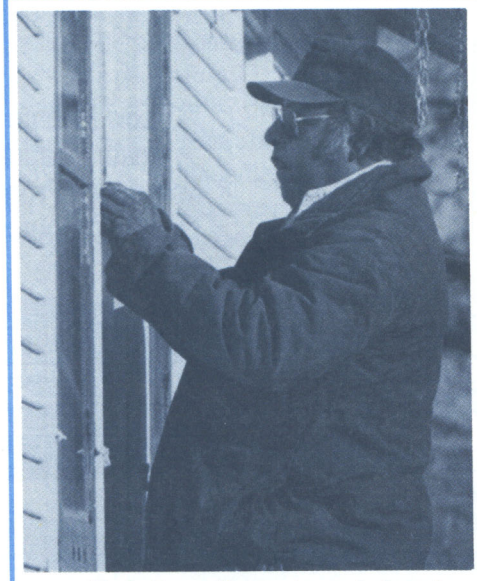
Home energy improvements result in an average year-to-year return of 6.5¢ on the dollar. Fluctuations in first year return are generally due to changing labor and materials costs.

The home improvements represent a one-time investment that most likely will yield a rate of return for at least twenty years. Thus, the rate of return on an investment made in 1989 or 1990 would return over 130 percent for the functional lifespan of the improvements. If either energy process or the value of money increases, the rate of return also will increase.

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 1989-90, 73 Omaha Housing Authority units in north Omaha were weatherized.



Rudy Escamilla repairs a window at a home that is being weatherized by Panhandle Community Services. The agency has weatherized nearly 2,500 homes in seven counties in the last 15 years.

Scottsbluff Star-Herald
December 7, 1990

Regional Technical Working Group

In August 1989, the Energy Office received a third $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 1989 in Lincoln. Participants discussed moisture control and venting practices as they relate to the Weatherization Assistance Program. Another meeting was planned for July 1990 in Lincoln.

ENERGY FINANCING DIVISION

"Our federal and state governments sometimes seem so large that it's hard to see where their programs have a positive effect on ordinary, working-class people — particularly the residents of out-state Nebraska. The School Weatherization Program appears to be a governmental program that works."

Editorial, *Scottsbluff Star-Herald*, December 27, 1989

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

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 1989-90 fiscal year,

School Weatherization Program Technical Assistance Study Grants, July 1, 1989 - June 30, 1990

School Name	Grant Amount
Ainsworth City Schools	$10,000
Allen Public Schools	$5,000
Alliance City Schools	$5,000
Beemer Public Schools	$5,000
Cody-Kilgore Unified Schools	$5,000
Crookston School	$2,500
Culbertson Public Schools	$2,500
Doniphan Public Schools	$2,500
Elwood Public Schools	$2,500
Falls City Public Schools	$7,500
Filley Consolidated Schools	$2,500
Hall School, Lincoln County	$2,500
Homer Community Schools	$12,500
Hyannis Elementary School	$2,500
Johnstown Public Schools	$2,500
Minatare Public Schools	$5,000
Ogallala Public Schools	$10,000
Oxford Community Schools	$5,000
Portal School, Sarpy County	$2,500
Shickley Public Schools	$5,000
St. Edward Public Schools	$2,500
Venango Public School	$7,500
TOTAL	**$107,500**

Figure 15

School Weatherization Program Energy Improvement Loans, July 1, 1989 - June 30, 1990

No. of Buildings	School Name	Loan Amount
1	Adams Public School	$16,282
5	Alliance Public Schools	$41,373
1	Ashland-Greenwood	$40,635
3	Auburn Public Schools	$23,977
1	Bertrand Comm. School	$72,951
2	Cambridge Public Schools	$103,331
1	Central City Public	$6,125
1	Coleridge Community School	$24,009
1	Colfax County Dist. 24	$3,416
1	Culbertson Public Schools	$25,431
1	Davenport Comm. Schools	$19,660
1	Dundy County Public School	$31,220
1	Fairmont Public School	$10,651
1	Filley Consolidated School	$10,945
1	Franklin Public School	$17,976
1	Garden County School	$63,819
1	Gibbon Public School	$11,446
2	Gordon Public Schools	$6,842
1	Gretna Public Schools	$8,932
1	Holbrook Public School	$34,190
1	Howells Public School	$4,998
1	Juniata Elementary	$22,575
1	Laurel-Concord School	$21,895
5	Loup Co.Public School	$25,884
4	Millard Public Schools	$30,652
2	Neligh-Oakdale Public Schools	$12,728
1	North Loup-Scotia Public	$15,832
1	Niobrara Public Schools	$16,037
1	Norfolk Public Schools	$20,109
1	Oakland-Craig Public Schools	$14,077
9	Omaha Public Schools	$1,332,852
1	Orleans Public School	$12,947
2	Oxford Community Schools	$88,240
1	Palisade Public School	$19,458
1	Papillion-LaVista	$368,557
2	Rushville Public Schools	$13,378
1	Shelton Public School	$18,234
1	Sheridan Co. Dist. 30	$20,783
3	So. Sioux City School & Pool	$439,661
1	Stuart Public Schools	$5,148
3	Wisner-Pilger Public Schools	$12,397
	TOTAL	**$3,089,656**

Figure 16

$3,089,656 in energy improvement loan funds were approved for projects in 46 buildings in 41 school districts, resulting in a projected annual dollar savings of $481,338.

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

As of June 30, 1990, the Program's loan pool contained $12.7 million, of which $5.18 million was still available for loans and $133,782 for Technical Assistance Grants. Currently, 74 school districts have 133 loans in repayment, totaling three million dollars. Approved loans for energy improvements in 52 buildings in 27 districts amount to $1.3 million. Another $653,690 has been set aside for 28 accepted project inquiries in 17 school districts. Applications and inquiries currently under review for three buildings in three school districts amount to $153,757.

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

Figure 16 lists the school districts receiving loan funds in 1989-90.

Technical Assistance Grants

The Technical Assistance Grant

Scottsbluff

Wednesday
December 27, 1988
Scottsbluff, Neb.

Star-Herald

1 section
25¢
Less by carrier

THE STAR-HERALD'S VIEW

School energy program saving taxpayers money

Some basic energy-related improvements made at Mitchell High School with a no-interest loan from the state of Nebraska are saving Mitchell taxpayers money.

Certainly other schools in the Panhandle could and should take advantage of the School Weatherization Program operated by the Nebraska Energy Office.

THE IMPROVEMENTS — the installation of a suspended ceiling and insulation and automatic temperature setbacks, and the replacement of five windows — cost $15,270 and have saved the district $1,901 in energy costs since the work was done in August 1988, according to Gary Rex, director of the Energy Office.

The office also has technical analysis grants available to help districts determine what improvements can result in savings. Interested school district officials should contact Lynn Chamberlin in the Energy Office in the State Capitol for more information.

OUR FEDERAL AND state governments sometimes seem so large that it's hard to see where their programs have a positive effect on ordinary, working-class people — particularly the residents of "outstate" Nebraska.

The School Weatherization Program appears to be a government program that works.

School Weatherization Grants and Loans by County, 1989-90

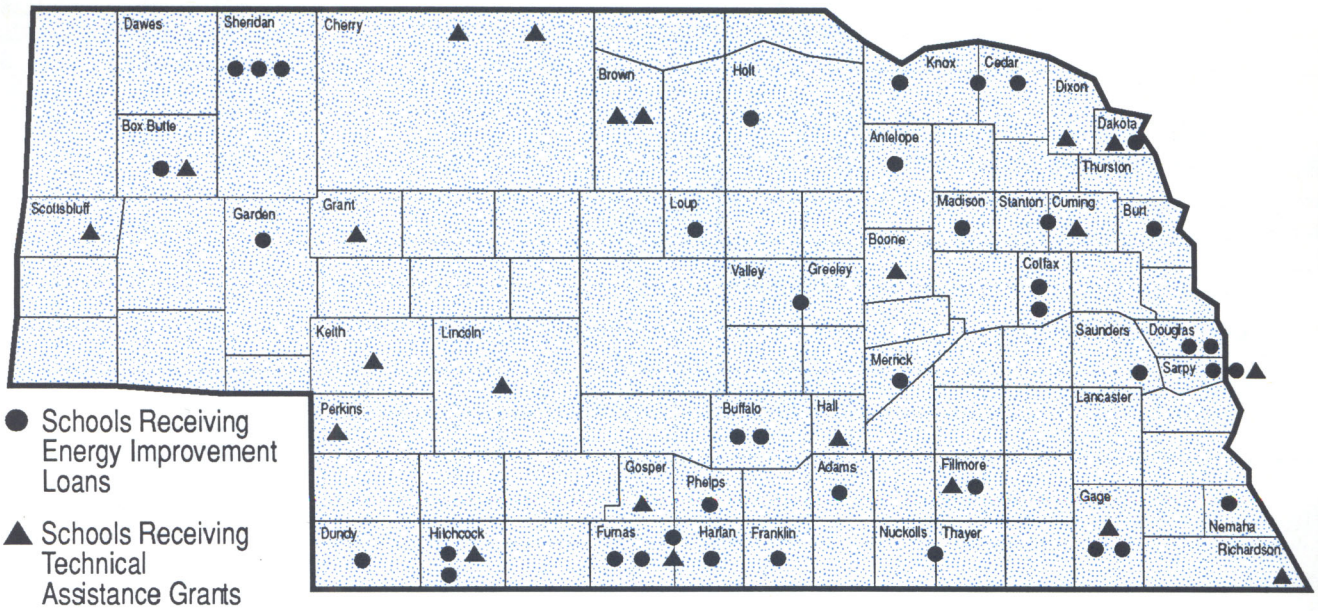


Figure 17

ICP Cycle XI Grants by County

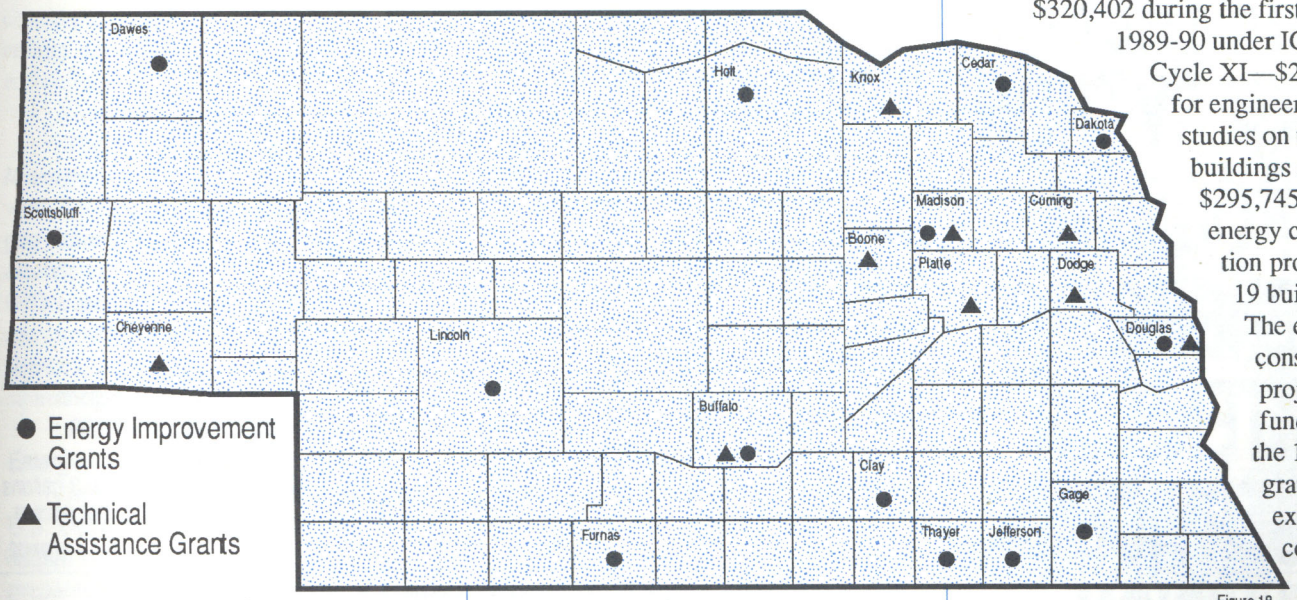


Figure 18

Institutional Conservation Program Cycle XI
Technical Assistance Grants

Institution Name	Study Cost	Grant Amount
Archbishop Bergan School	$6,900	$3,450
Kearney State College	$5,600	$2,800
Marian High School	$10,000	$9,000
Nebraska Christian College	$1,240	$1,116
St. John the Baptist School	$3,068	$2,761
St. Ludger Elementary School	$1,500	$1,350
St. Paul Lutheran School	$1,200	$1,080
Scotus Central Catholic	$5,000	$2,500
Western NE Comm. College	$1,200	$600
TOTALS	**$35,708**	**$24,657**

Figure 19

Institutional Conservation Program Cycle XI
Energy Improvement Grants

Institution Name	Project Cost	Grant Amount
Chadron State College	$149,464	$70,080
Coleridge Public School	$31,391	$16,945
Diller Community Schools	$20,631	$15,795
Emerson-Hubbard Schools	$39,891	$18,373
Grace Bible College	$33,421	$9,000
Grt. Plains Reg. Med. Center	$43,350	$23,175
Holbrook Public Schools	$820	$410
Kearney Catholic High School	$2,100	$1,890
Nebraska Christian College	$10,212	$5,106
Regional West Med. Center	$154,760	$70,080
Sandy Creek Schools	$20,704	$17,036
Southern School Dist. No. 6	$12,860	$11,574
Stuart Public School	$3,505	$1,752
Thayer Co. Mem. Hospital	$46,583	$34,529
TOTALS	**$569,692**	**$295,745**

Figure 20

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. Figure 15 identifies school districts receiving grants in 1989-90.

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.

1989 and 1990 Grants

In August 1989, the U.S. Department of Energy distributed a total of $320,402 during the first half of 1989-90 under ICP's Cycle XI—$24,657 for engineering studies on ten buildings and $295,745 for energy conservation projects in 19 buildings. The energy conservation projects funded by the 1989 grants are expected to cost $569,692, but are expected to save $132,594 annually in avoided energy costs. Figures 19 and 20 list Cycle XI recipients of both technical assistance grants and energy improvement grants.

Under ICP's Cycle XII, eight schools and hospitals applied for engineering study grants in 13 buildings estimated to cost $42,886. Twenty-two schools and hospitals applied for grants to fund energy-saving building improvement projects estimated to cost $677,128 in 24 buildings. Only $354,900 is available for grants in ICP's Cycle XII. Grants are expected to be awarded in July* and August, 1990.

Return on Investment

The first year rate of return on the investment for 1989 is 23 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 1989 will yield more than a 349 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.

* TA grants of $22,717 for cycle XII were awarded on July 20, 1990.

STATE ENERGY CONSERVATION PROGRAM ENERGY EXTENSION SERVICE DIVISION

"The United States can reduce its total energy consumption by anywhere from 20 percent to 50 percent in the next 15 years by using energy efficiency technologies that already exist. By taking such actions ... the United States could save $75 billion a year by the turn of the century."

Safe Energy Communication Council
Editorial, *Norfolk Daily News*, Nov. 20, 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 and for overseeing oil overcharge programs such as the Dollar and Energy Saving Loan Program (see page 13) and the Rural Revitalization: Public Transportation Program (see page 16).

During calendar year 1989, SECP/EES Programs produced an estimated annual energy savings of 3.67 trillion Btus, which is equivalent to 29.4 million gallons of gasoline. Figures 19 and 20 show savings over the past five years as a result of various SECP/EES projects. The graphic shows the gasoline equivalent saved per person.

Energy Saved Through Energy Office Programs 1985 - 1989

Each Symbol Represents Energy Equivalent of Five Gallons of Gasoline Per Nebraskan

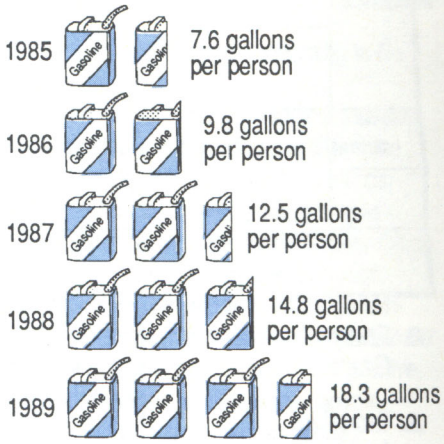


Figure 19

Gasoline Saved in Millions of Gallons

Project Type	1985	1986	1987	1988	1989
Thermal & Lighting Standards	11.312	14.696	18.720	22.192	25.968
Nebraska Community Energy Management Program	0.248	0.336	0.384	0.384	0.392
Agricultural Energy Management	0.504	0.774	0.992	1.240	1.240
Omaha Traffic Light Program	0	0	0	0	0.225
Total Gallons of Gasoline Saved (in millions)	12.264	15.776	20.096	23.816	29.400

Figure 20

State Energy Conservation Program (SECP)

In 1989-90, SECP projects included:

- Federally Mandated Projects
- Oil Overcharge Projects
- Energy Shortage Management and Energy Preparedness

Federally-Mandated Projects

According to the Energy Policy Conservation Act, the Energy Office must undertake projects in the specific areas of 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 Unicameral 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

Some Oil Overcharge Projects are managed as SECP projects. See pages 13 through 22 for a full description of projects financed by Petroleum Violation Escrow Funds.

Energy Shortage Management and Emergency Preparedness

During 1989-90, Nebraska continued contingency planning and energy emergency preparedness activities.

Contingency Planning

The Nebraska's *Energy Shortage Management Plan* provides a framework for disruptions in the supply of petroleum products, natural gas, and electricity. In 1989-90, the Energy Office developed a plan based on recommendations from a variety of sources, for setting aside petroleum stemming from shortages.

Federal-State Coordination of Emergency Preparedness Activities

In July 1989, Nebraska hosted the U.S. Department of Energy's (DOE's) annual regional seminar on emergency preparedness for Iowa, Kansas, Minnesota, Missouri, North, and South Dakota. The annual seminars foster federal and state cooperation in case of an energy emergency.

Technical Assistance Grant

During 1988-89, the Department of Energy awarded the Nebraska Energy Office a $10,180 technical assistance grant to plan and sponsor two seminars on energy emergencies with other states in the DOE Region VII (Iowa, Kansas, and Missouri). The first seminar was held in November, 1988.

The second seminar was held in July 1989. It focused on several issues: energy management in the transportation sector, recent fuel shortages in the midwest, the effects of drought on energy supplies, coordination with other agencies, and the implementation of contingency plans following the Exxon Valdez oil spill.

Emergency Preparedness Activities

During 1989-90, intermittent severe weather required more intensive monitoring than usual. Drought conditions in summer 1989 lead to heavy fuel demand for irrigation, resulting in spot fuel outages throughout the summer.

The early arrival of severe winter weather in December 1989 placed heavy demands on the supply of heating fuel, particularly propane. Although some outages occurred at the wholesale level, propane remained available to retail customers, but at record high prices.

Severe weather, ranging from ice to floods to tornados, ravaged portions of the state from March through June resulting in disruption of electrical service. During these outages, the Energy Office coordinated with the state Civil Defence Agency and continued to monitor the adequacy of energy supplies to affected communities.

Energy Extension Service (EES)

In 1989-90, EES was responsible for:

- Electrical Load Management Resource Fund
- Education and Public Information
- 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,

Cumulative Savings

Year	Member	Savings
1983	South Sioux City	$663,500
1983	Wood River	$199,800
1983	Beaver City	$42,800
1984	Benkelman	$85,900
1984	West Point	$189,900
1984	Broken Bow	$175,100
1985	Lexington	$234,900
1985	North Platte	$1,229,300
1985	Sutton	$28,300
1986	Bridgeport	$68,100
1986	Oxford	$52,500
1986	Pierce	$47,300
1986	Wilcox	$18,200
1987	Callaway	$15,300
1987	Wauneta	$9,300
1988	Arnold	$37,800
1988	Greenwood	$4,300
1988	Burwell	$21,700
1988	Lyons	$29,700
1989	Kimball	$2,700
1990	Seward	$21,500
1990	Gering	$17,100
TOTAL		**$3,720,200**

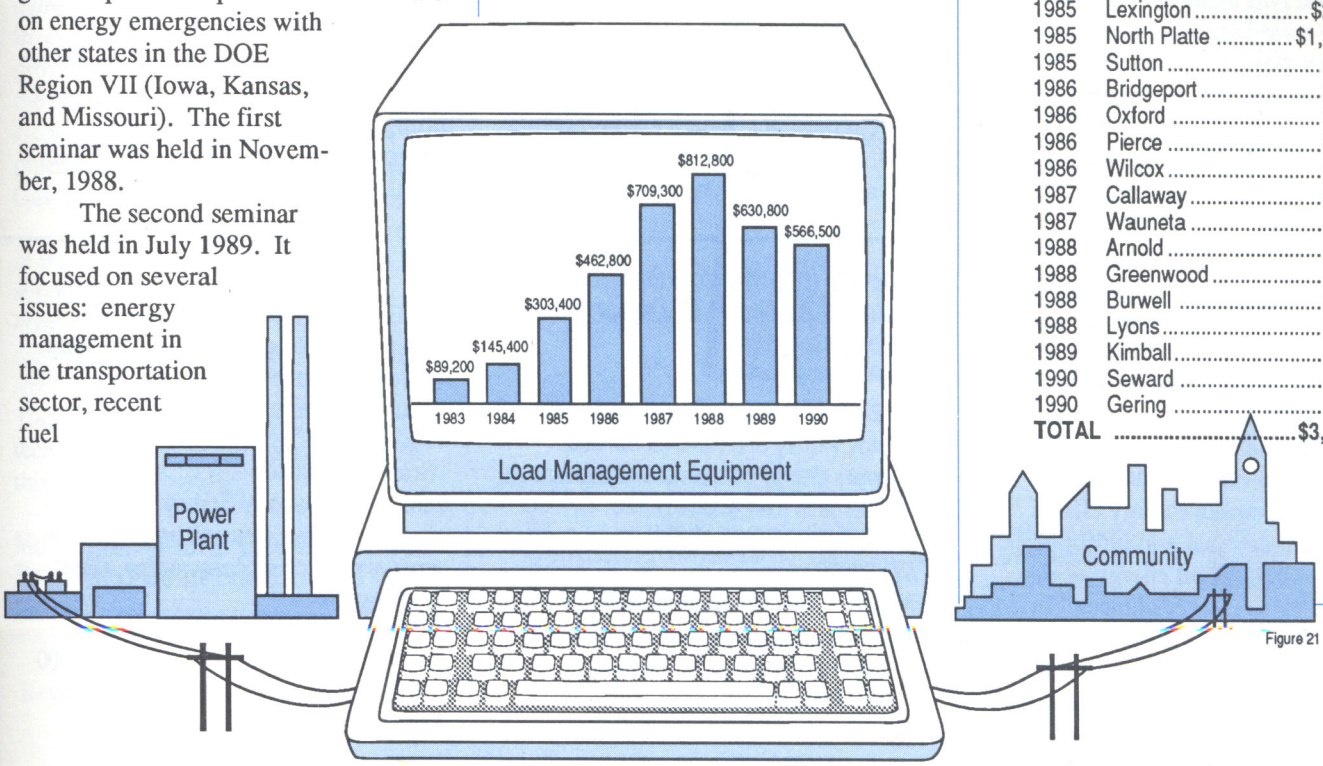


Figure 21

Bertrand High School Auto Mechanic Students Perform Computerized Engine Tune Ups

Students in Dean Dahlke's Auto Mechanics classes analyzed 20 vehicle engines using the Sun Modular Computer Analyzer (MCA), a sophisticated computer used to analyze major engine systems. The MCA was loaned to the Bertrand Community Schools from November 21 through December 1. The project is sponsored by Central Community College of Grand Island and the Nebraska Energy Office. The MCA was financed partly through a $40,000 energy grant received by the Nebraska Energy Office.

The MCA compares each engine to its factory specifications with regard to energy efficiency and emissions control. An engine test takes about 30 minutes to complete. The MCA is user friendly and leads the student through the various steps of the testing process by information given on the computer screen. Mr. Dahlke indicated that the analyzer's printout on the problems of one vehicle's engine could range from three to 10 pages in length. Most of the computer's diagnostic messages were easy for the students to understand. However, some of the technical data within the report needs some clarification.

The auto mechanics students at the Bertrand community school are becoming familiar with this quick, economical way to determine engine problems using the computerized Sun Modular Computer Analyzer. This will allow these students to be tuned up to endless computer aided solutions to increasingly more mechanical problems.

Students involved in the project were: Eric Hagan, Roy Fisher, Robert Renken, Jeremy Hansen, John Vaughn, Byron Upthagrove, Jared Dugan, Chris Johnson, Ross Boggs, Shon Gilliand, Robert Kugler, and Adam Leibhart.

Bertrand Herald,
December 7, 1989

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 Nebraska-based NMPP-member communities to help them purchase and install electrical load monitoring and management systems. Load management systems allow utilities to reduce peak demand, thus saving energy and avoiding demand charges.

The Nebraska Municipal Power Pool made two loans in 1989-90. The City of Seward received $21,500 and the city of Gering received $17,100 for load monitoring and management systems.

Figure 21 shows the annual estimated 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 Public Information

The Nebraska Energy Office provides educational and informational services to help small energy users make informed energy choices. In 1989-90, agency staff responded to numerous requests for information by providing printed materials, making presentations at a variety of meetings and workshops, and referring people to energy information services available through the United States Department of Energy.

The Energy Office also published and distributed the *Nebraska Energy Quarterly*, a newsletter for energy users. The publication received a BEEP (Best Energy Education Publication) award at the 1990 National Energy Program Managers Conference.

The Energy Office resumed a program to deliver energy education materials targeted for grades K-12. The program had previously been managed by the University of Nebraska under a six-year contract, which expired in 1990. The library of classroom materials was returned to the Energy Office. Materials are loaned or distributed to schools upon request.

The Energy Office cooperated with the Nebraska Department of Education in sponsoring a three-day energy education workshop as part of the Cadre Project for science and math teachers. The workshop, held in the summer of 1990, included trips and presentations about alternate fuels for transportation, recycling, energy efficient lighting and home weatherization.

Oil Overcharge Project Management

Some Oil Overcharge Projects are managed as EES projects. See pages 13 through 22 for a full description of projects financed by Petroleum Violation Escrow Funds.

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

SERI/TIS — The Solar Energy Research Institute/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., EI-22, Room 1F048, 1000 Independence Ave., S.W., Washington, D.C. 20585

NATURAL GAS TECHNICAL ASSISTANCE

"...Community officials who understand the Act's regulatory process and use it skillfully will benefit not only natural gas consumers but natural gas suppliers as well."

Nebraska Energy Office,
October 19, 1987

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.

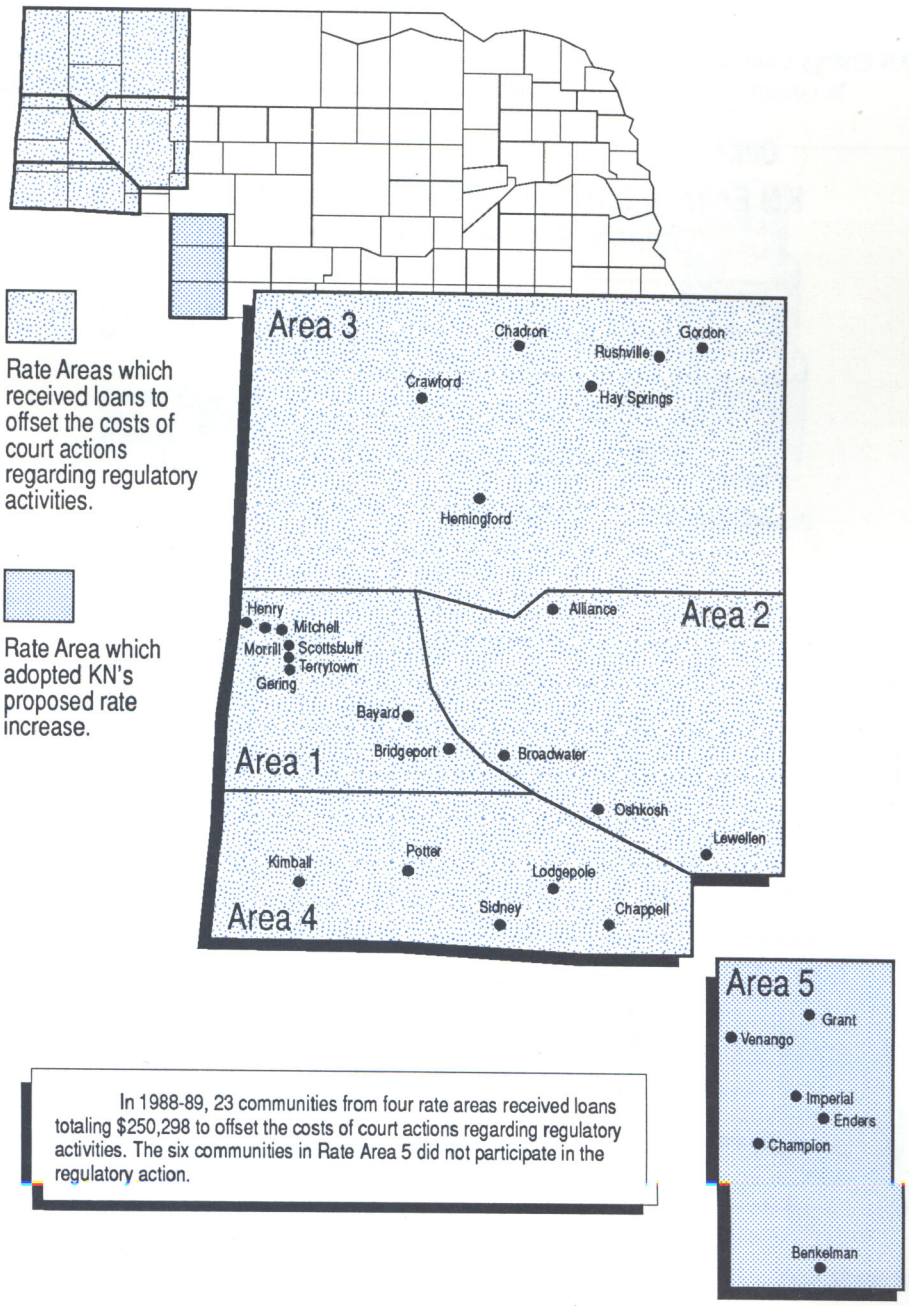
Nebraska is one of only two states in the nation to regulate natural gas suppliers at the local level. Village boards and city councils review rate requests under Nebraska's *Municipal Natural Gas Regulation Act* of 1987. The Energy Office also provides technical assistance to communities in this area.

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 1988-89, four rate areas representing 23 communities received loans totaling $250,298 to offset the costs of court actions regarding regula-

KN Energy, Inc. Rate Areas Receiving Notice of a General Rate Increase in September 1987



In 1988-89, 23 communities from four rate areas received loans totaling $250,298 to offset the costs of court actions regarding regulatory activities. The six communities in Rate Area 5 did not participate in the regulatory action.

Figure 22

tory activities. The Lancaster County District Court ruled in favor of the communities' adoption of lower rates. That decision was appealed to the Nebraska Supreme Court.

At issue in the case was the content of the information provided to a municipality for use in analyzing rate requests. In October 1989, the Supreme Court reversed that decision, finding that the district court erred in refusing to consider information first offered at the district court level by the natural gas supplier.

KN Energy General Rate Filing

In compliance with state statute, the Energy Office assists municipalities which exercise regulatory responsibilities under the *Municipal Natural Gas Regulation Act*.

In June, 1990, KN Energy notified 147 communities in five rate areas that it would file a notice to change rates. In response to KN Energy's notice, the Energy Office offered two natural gas regulation workshops for municipal officials and city attorneys. The purpose of these regional workshops was to help officials review general rate regulation principles and the provisions of the *Municipal Natural Gas Regulation Act*.

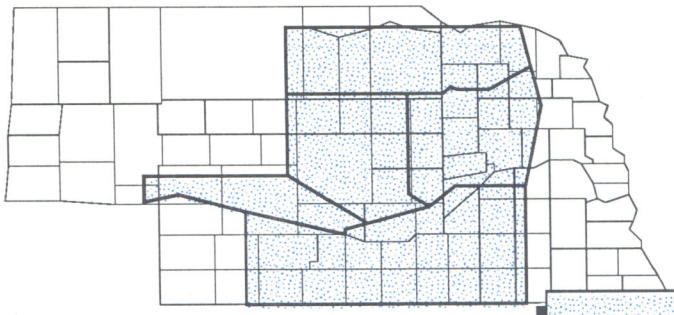
Following the general rate increase filing the last week of June, the Energy Office held an additional training workshop for members of the rate area committees. This workshop provided a more detailed discussion of the principles of rate regulation.

Informational Resources

During 1989-90, the Energy Office also updated *The Public Officials' Handbook on Natural Gas Regulation* and developed and distributed a 20-minute videotaped overview of the *Municipal Natural Gas Regulation Act* for municipal officials.

In addition, the Energy Office continues to offer a one-and-a-half day workshop, as needed to advise local officials after a notice of general rate increase is filed in one or more rate areas. Staff from the National Association of Regulatory Utility Commissions cover the key issues in ratesetting, including current trends. To date, city officials from over 100 communities have participated in the workshop.

KN Energy, Inc. Rate Areas Receiving Notice of a General Rate Increase, June, 1990



In June, 1990, KN Energy notified 147 communities in rate areas 6 through 10 that it would file a notice to increase natural gas rates. In response to KN Energy's notice, the Energy Office offered two regional natural gas regulation workshops for municipal officials and city attorneys to help officials review general rate regulation principles and the provisions of the *Municipal Natural Gas Regulation Act*.

Following the general rate increase filing the last week of June, the Energy Office held an additional training workshop for members of the rate area committees. This workshop provided a more detailed discussion of the principles of rate regulation.

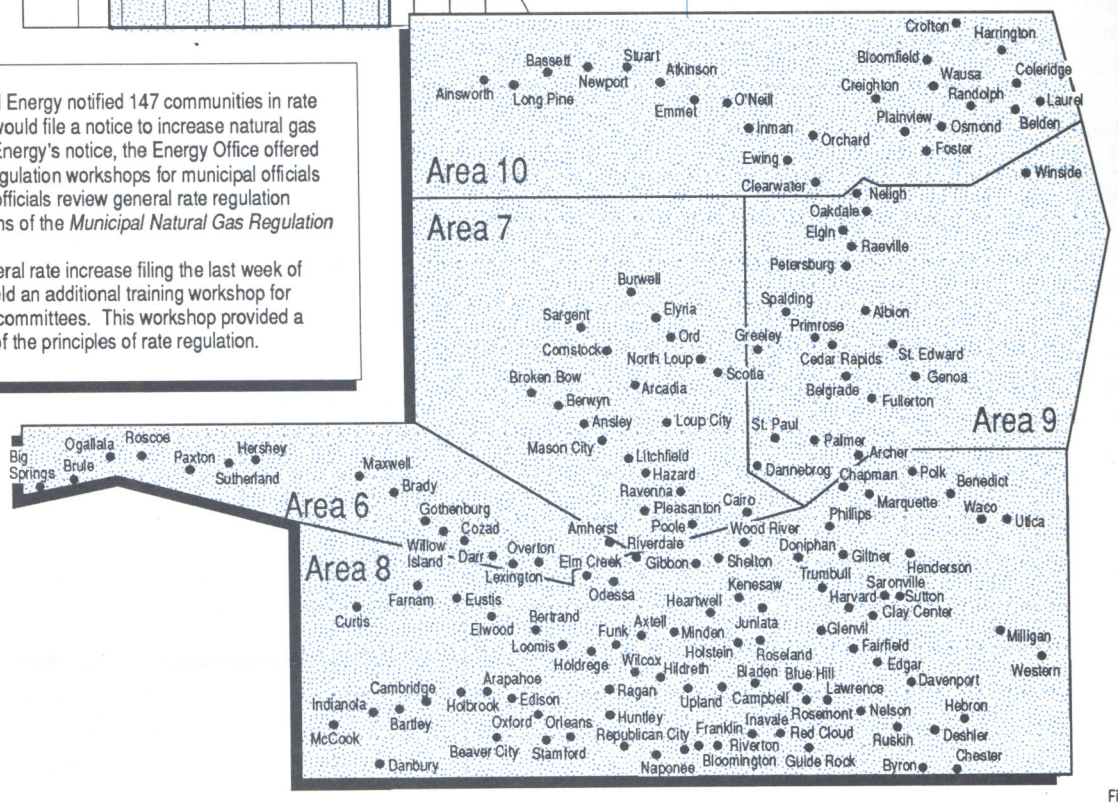


Figure 23

FISCAL & ORGANIZATIONAL NOTES

"During the 1980s, federal funding of the (U.S.) Department of Energy's Civilian Research and Development Program on solar and renewable resources plunged by nearly 90 percent. Research on energy conservation declined by 61 percent".

David L. Morrison, Chair, National Research Council Subcommittee on Energy Strategies, Editorial, *Norfolk Daily News*, Sept. 14, 1990

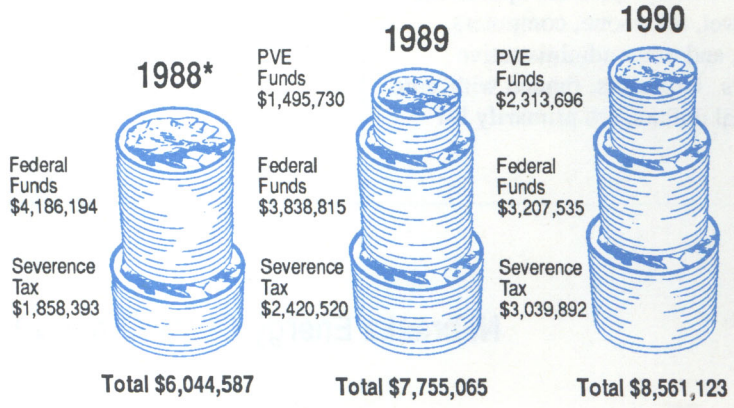
This description of Energy Office Operations reviews the agency's finances and its organization.

Financial Review

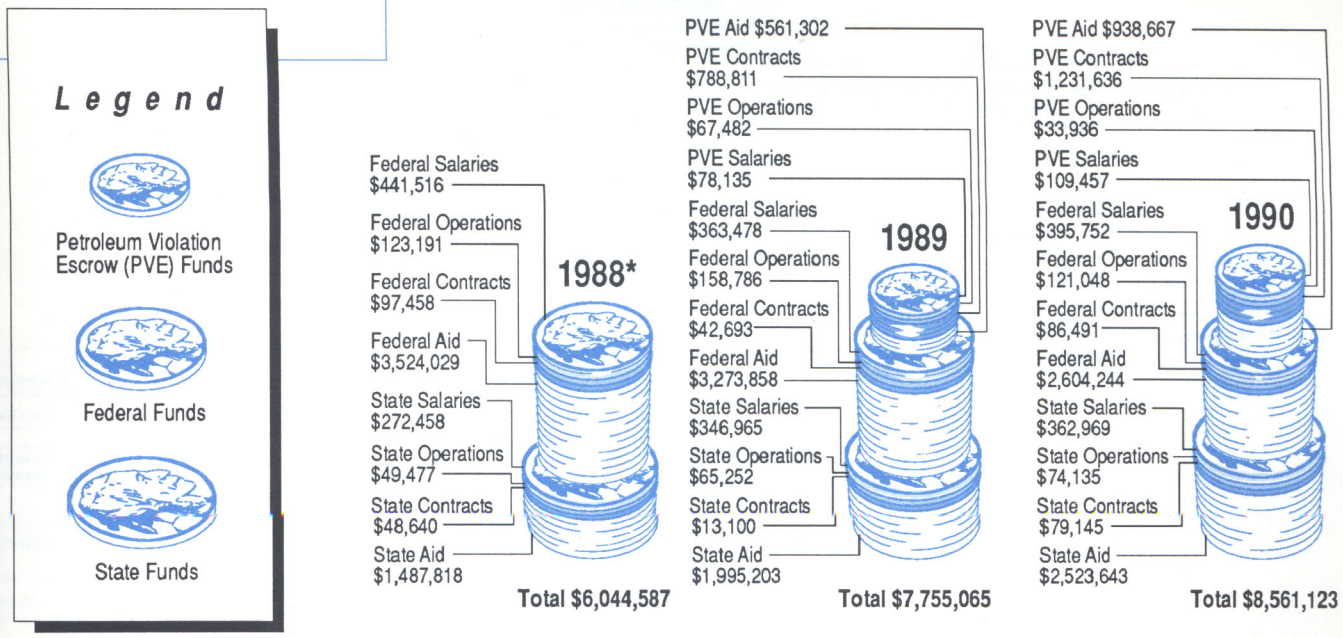
The accompanying graphic illustrates the Energy Office's budget from July 1, 1989, through June 30,1990, which amounted to $8,561,123 and includes federal funds, state funds, and petroleum violation funds.

Approximately 51 percent of the agency's funding, or $3,207,535, came from federal sources. Almost 93 percent of federal funds were used for Low-Income Weatherization Assistance.

Where The Money Came From



Where The Money Went



* Does not include Petroleum Violation Escrow Funds

Figure 24

The Energy Office received $3,039,892 in state funds for Agency operations and grants. State funds came almost exclusively from severance taxes. No General Funds have been appropriated to the Energy Office since 1983.

As Figure 24 shows, the Energy Office spent state and federal dollars in eight different ways. Aid, which makes up the largest portion of the agency's expenditures, consists of federal or state money which the agency receives and passes on either to delegate agencies or directly to beneficiaries such as schools. Money spent for operations pays travel, telephone, computers, salaries, and other administrative expenses. Contracts, funded with state or federal dollars, are primarily for projects to aid low income schools and hospitals. Petroleum violation escrow funds account for 27 percent of the agency's annual budget. A full accounting of those funds appears on pages 13-22.

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

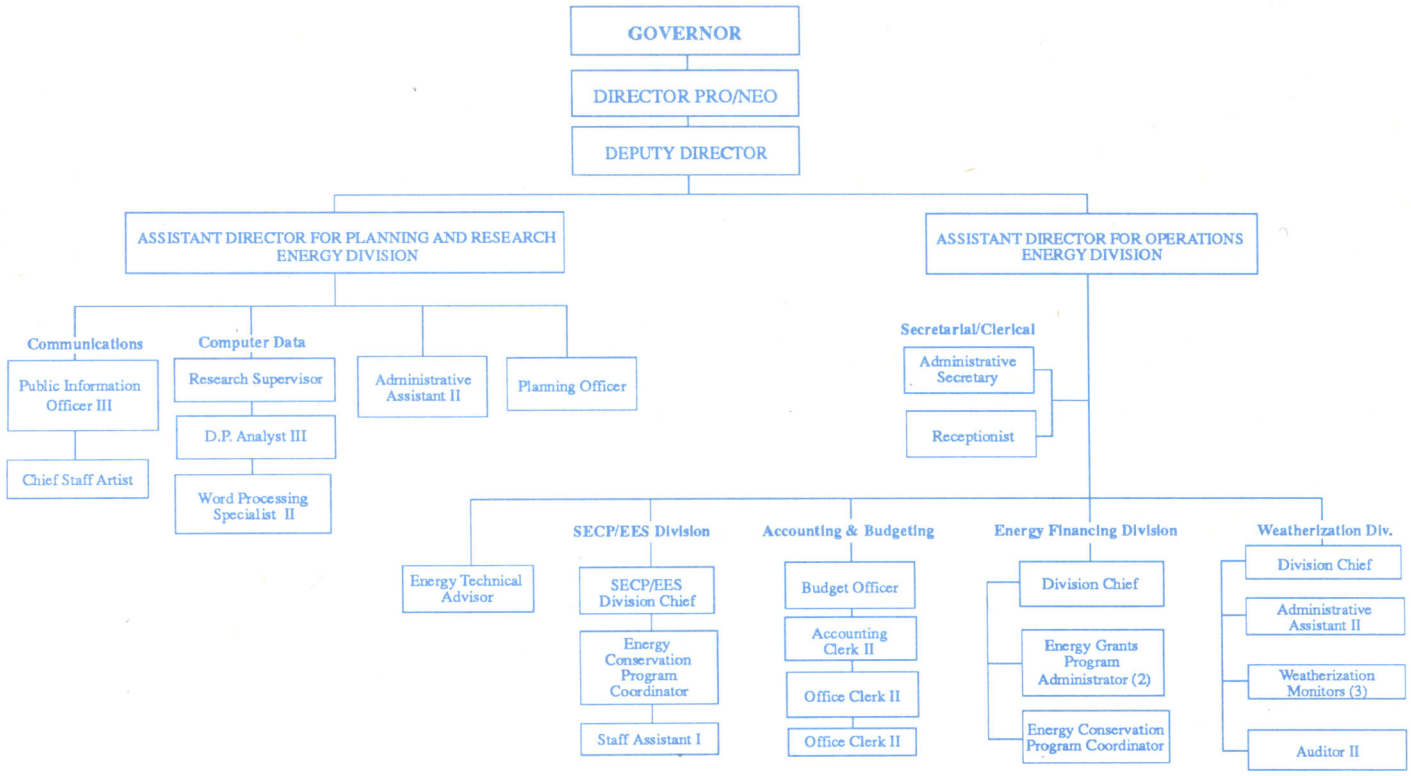


Figure 25

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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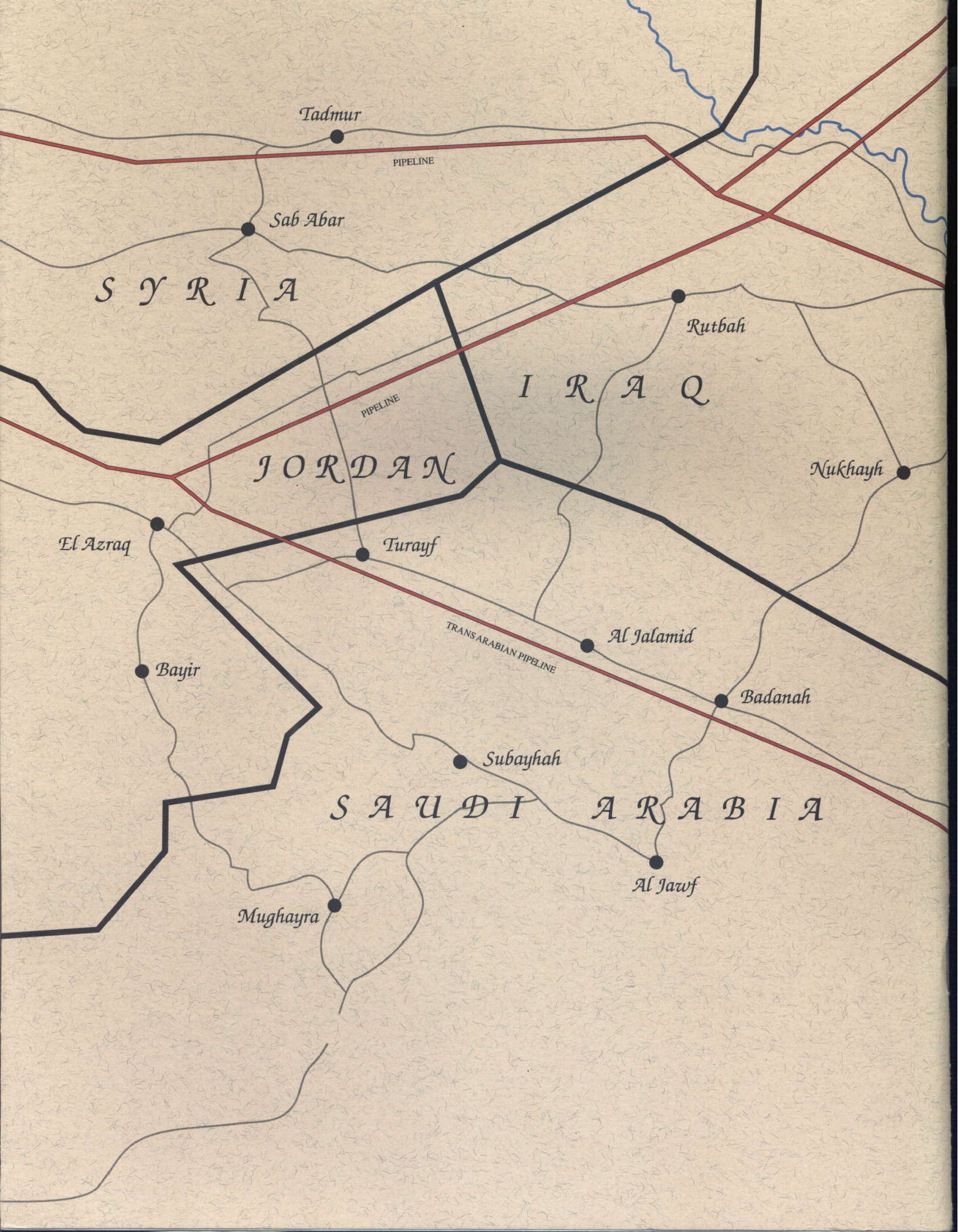
Tadmur
PIPELINE
Sab Abar
SYRIA
Rutbah
IRAQ
PIPELINE
JORDAN
Nukhayh
El Azraq
Turayf
TRANS ARABIAN PIPELINE
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