2009 ANNUAL REPORT
NEBRASKA ENERGY OFFICE

E•N•E•R•G•Y
STATE OF NEBRASKA

www.neo.ne.gov

The vision of the Nebraska Energy Office is for Nebraskans to have reliable and affordable sources of energy that support a cleaner environment and a more secure energy future.

The mission of the Nebraska Energy Office is to promote the efficient, economic and environmentally responsible use of energy. The agency's principles are that we value teamwork, are customer oriented, and are committed to excellence, creativity and innovation.

In support of the agency mission, the following goals have been adopted:

- ❖ Maximize the efficient use of traditional energy resources.
- ❖ Encourage Nebraskans to adopt energy efficiency through low cost financing.
- ❖ Encourage the development and use of renewable energy resources.
- ❖ Advise the executive and legislative branches of state government on energy policy and security.

T H E P R O G R A M S

The Nebraska Energy Office operates several different federal and state programs. These programs are:

- ❖ Low-income Weatherization Assistance Program,
- ❖ State Energy Program and special projects,
- ❖ Oil overcharge-funded activities, primarily Dollar and Energy Saving Loans,
- ❖ *American Recovery and Reinvestment Act of 2009* and
- ❖ Statutorily-required state activities such as data collection and reporting.

Low Income Weatherization Assistance Program

The Energy Office administers the federally-funded program for weatherizing homes to save energy and money for those with limited incomes. The agency is responsible for inspecting the homes that are weatherized and for monitoring the sub-grantees, primarily community action agencies, that are responsible for the home weatherization improvements. Community action agency staff or private contractors are responsible for completing the work on the homes. The Energy Office staff inspects approximately 20 percent of the newly weatherized homes to ensure the quality of work performed.

This program received funding from two sources: $2,962,261 from the U.S. Department of Energy's Low Income Weatherization Assistance Program and $3,387,591 from the Low-Income Home Energy Assistance Program — a total of $6,349,852. Annually, the Nebraska Department of Health and Human Services transfers a portion of the funds received to pay utility bills to the agency to weatherize homes so that the need for utility bill paying assistance is reduced or eliminated.

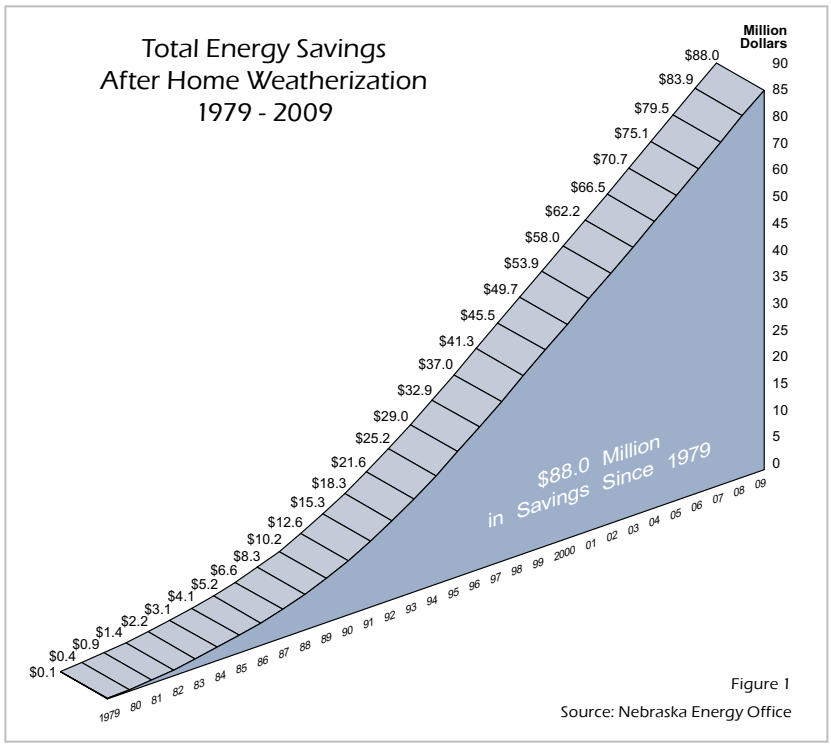


Figure 1
Source: Nebraska Energy Office

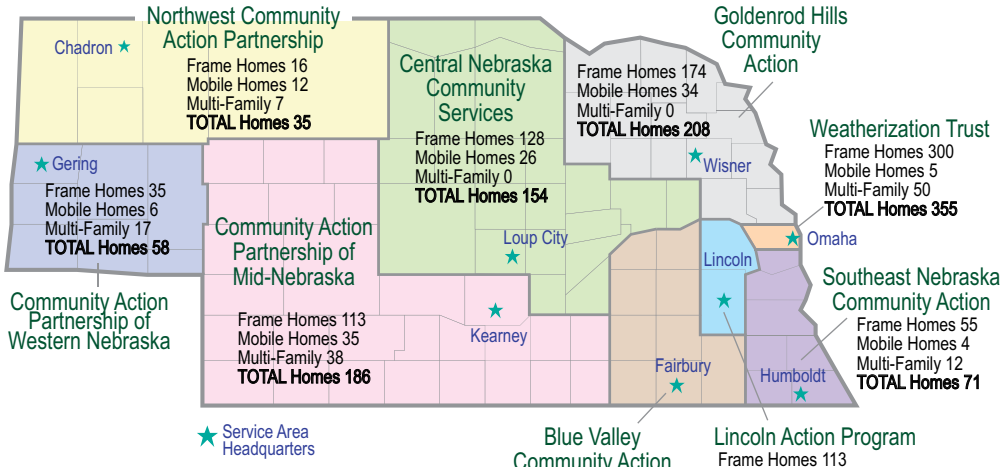
In 2008-2009, 1,284 homes were weatherized with the federal funds; 979 frame homes, 149 mobile homes and 156 multi-fam-

LOW INCOME WEATHERIZATION ASSISTANCE

"Conservatively, estimated savings for the 30 years total $88.0 million. About $4.4 million in new savings accrue annually because of the improvements made."

The Nebraska Energy Office provides administrative oversight and training for weatherization providers across the state. Home weatherization improvements save homeowners energy costs for up to 20 years.

Total Nebraska Homes Weatherized by Type and by Area Provider
July 2008 - June 2009



TOTAL 1,284 Homes Weatherized

Note: Multi-Family includes shelters and other units such as four plexes which are reported as single family rentals.

Figure 2
Source: Nebraska Energy Office

ily homes which includes three and four-plexes. The types of improvements made vary based on an analysis of the home and averages between $2,966 and $4,000 per home, excluding the cost of health and safety improvements such as a furnace replacement. The kinds of improvements made to homes vary by the home type: frame, mobile or multi-family. In a frame home, the top five improvements made were: adding insulation to attics (84%) insulating box sill areas and crawl spaces (53%), replacing the furnace (33%), adding wall insulation (32%) and replacing a primary door (24%). In mobile homes, the top five most frequent improvements were: replacing a primary door (58%), replacing a primary window (56%), replacing the furnace (38%), insulating the underbelly (32%) and replacing the water heater (16%). In multi-family homes, the two most common improvements were: adding insulation to the attic (82%) and replacing a primary window (8%). Most homes that are weatherized also receive low-cost improvements such as caulking, weatherstripping, pipe wrap and water heater jackets.

Since the Weatherization Assistance Program began in 1979, $109.47 million has been spent to make energy efficiency improvements in 62,369 homes. In 2009, maximum household income levels were revised making free home weatherization available to thousands more Nebraskans than last year. It is estimated there are at least 120,000 households in Nebraska which have not taken advantage of free weatherization.

Energy savings resulting from the energy efficiency improvements made typically last 20 years or longer. The cumulative savings since 1979 are illustrated in Figure 1. Conservatively, estimated savings for the 30 years total $88.0 million. About $4.4 million in new savings accrue annually because of the improvements made. Recent studies of Weatherization Assistance Program savings in several states have indicated a higher rate — nearly 25 percent — than studies performed earlier.

Oil Overcharge Funds

Since 1982, Nebraska has received oil overcharge – or petroleum violation escrow – funds as a result of several court actions against oil companies that overcharged their customers during the period of federal price controls form 1973 to 1981. Since direct restitution to injured consumers was not practical, the courts ordered the money be distributed to the states and used, within parameters established by the courts and a federal regulator, to fund energy assistance and efficiency programs. The final petroleum violation escrow payment from the U.S. Department of Energy to the Energy Office was received September 7, 2007.

The Legislature requires the Energy Office to annually report on the disposition of these funds. A summary of the Nebraska Energy Settlement Fund activities and expenditures is detailed in this section in Figure 3.

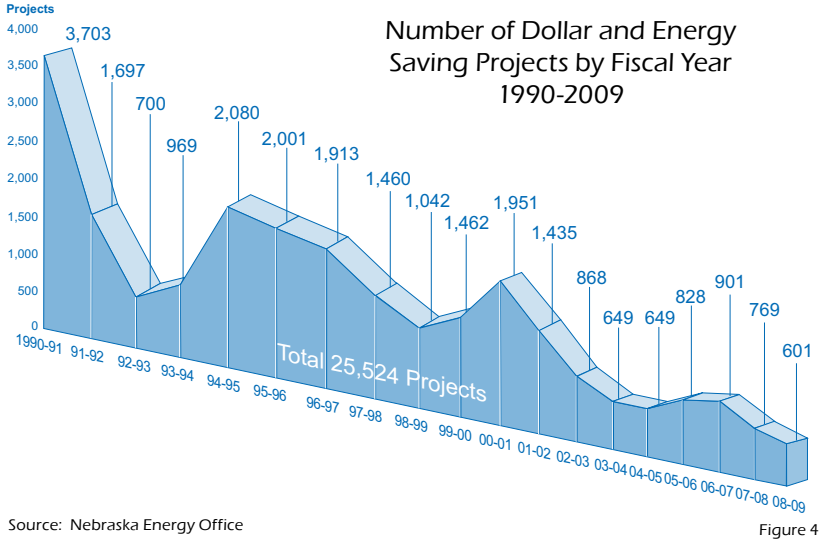
Nebraska Energy Settlement Fund
A Summary of Exxon, Stripper Well and Diamond Shamrock
Oil Overcharge Funds as of June 30, 2009

	Exxon	Stripper Well	Diamond Shamrock	Total
Funds Received	$15,504,944	$15,674,042	$359,172	$31,538,158
Interest Earned and Miscellaneous Income	$11,395,572	$9,300,292	$250,304	$20,946,168
Total	$26,900,516	$24,974,334	$609,476	$52,484,326
Funds Budgeted	$26,900,516	$24,595,312	$609,476	$52,484,326
Low Income Designated	$0	$138,255	$0	$138,255
Uncommitted Balance	$0	$240,767	$0	$240,767

Source: Nebraska Energy Office

Figure 3

"The final petroleum violation escrow payment from the U.S. Department of Energy to the Energy Office was received September 7, 2007."



Number of Dollar and Energy Saving Projects by Fiscal Year 1990-2009

Source: Nebraska Energy Office

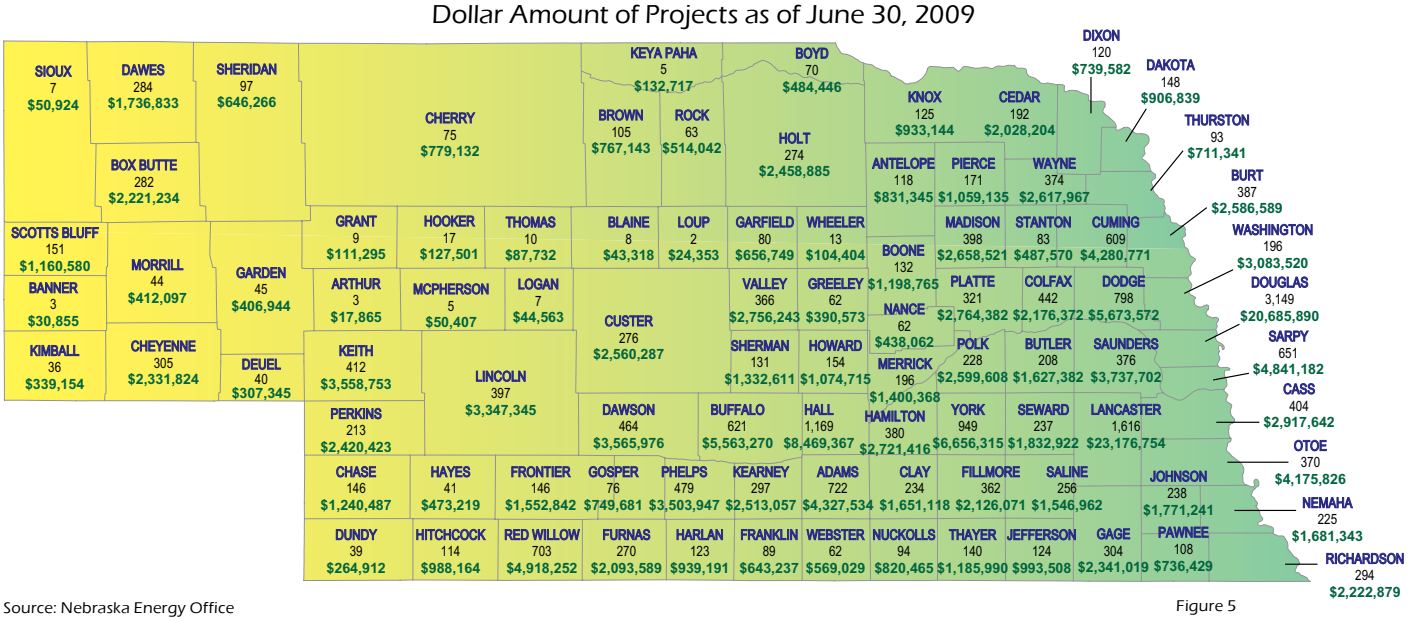
Figure 4

Dollar and Energy Saving Loans

The Dollar and Energy Saving Loan program was capitalized with oil overcharge funds and is re-charged with loan repayments from borrowers. These low-interest loans are provided to Nebraskans to finance home, building, transportation and system improvements that reduce energy use.

OIL OVERCHARGE FUNDS

Dollar and Energy Saving Loan Projects,
Number of Projects by County and Total
Dollar Amount of Projects as of June 30, 2009



Source: Nebraska Energy Office

Figure 5

In March 2009, Nebraska Public Power District added $500,000 to the agency's Dollar and Energy Saving Loan program to finance 2.5 percent loans for air source and ground water or ground coupled heat pumps, qualifying thermostats and back-up natural gas or propane furnaces with a 90 AFUE rating or higher for the utility's retail and wholesale customers. More information about these loans is at http://www.neo.ne.gov/loan/loans2.5.htm.

Nebraskans apply for Dollar and Energy Saving Loans through their local lenders. Presently, there are 317 Nebraska banks, savings and loans and credit unions at 926 locations that are eligible to provide 5 percent or less interest rate financing for up to ten years on loans for energy efficiency improvements and waste minimization projects.

From 1990 to June 30, 2009, 25,524 projects totaling more than $222.246 million have been financed with low-interest loans from the Energy Office and participating lenders and funds from borrowers for non-eligible improvements. More than $96.458 million of the 222.246 million has come from the agency's revolving loan fund. The state's participating lenders provided more than $99.123 million. The balance, more than $26.643 million, was spent by the borrowers on non-eligible related improvements.

Loans have financed projects in all of the state's 93 counties as illustrated in Figure 5. Douglas County with 3,149 projects totaling $23.24 million tops the list. The fewest loans – two – have been made in Loup County and total only $25,353.

During this reporting period, 601 new projects were financed. The number of energy efficiency projects financed since 1990 are shown in Figure 4.

OIL OVERCHARGE FUNDS

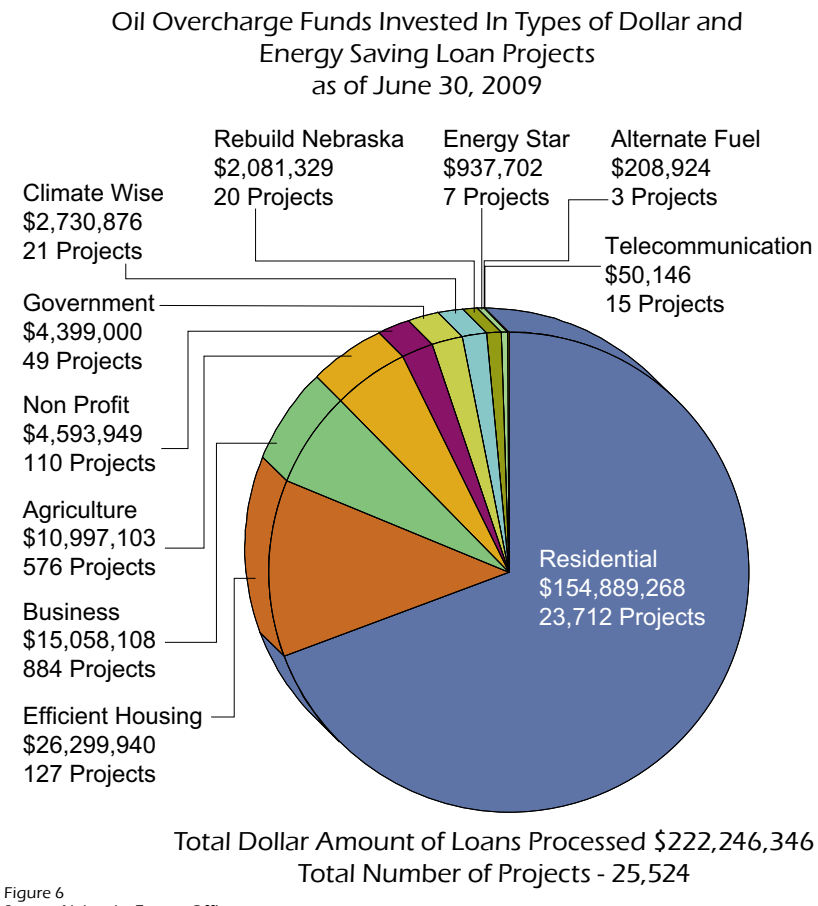


Figure 6
Source: Nebraska Energy Office

For reporting purposes, the loans are categorized into 11 different areas. More than 95.0 percent of the loan funds – from the agency and the participating lenders — have financed improvements in just four areas: residential, energy efficient housing (now closed), business and agriculture. The number of projects by category and the total amount of the loans in each category appear in Figure 6. Several of the largest categories are detailed as follows:

Residential

Nearly 93 percent of all the energy efficiency projects financed with loans from the agency are in the homes of Nebraskans. More than 69.6 percent of funds from all sources – $154.89 million – has been used to finance residential energy saving improvements such as replacement of inefficient furnaces, air conditioners and heat pumps, replacement of windows and doors and insulation of walls and ceilings. Since 1990, 23,712 residential energy efficiency projects have been undertaken by Nebraskans.

Business

More than 6.7 percent of funds from all sources – 15.05 million – has been used to make building and system improvements in 884 projects since 1990, ranking second-highest among all active loan areas. Typical business improvements include replacement of heating and cooling equipment as well as installation of insulation and replacement of doors and windows.

Agriculture

Improvements in agricultural equipment and systems rank fourth in the use of low-interest financing. More than 4.9 percent of all improvement funding – $10.99 million – has been used

to finance projects such as low-pressure irrigation systems, replacement of irrigation pumps and motors, replacement of grain dryers and well modifications. Since 1990, 576 projects – 2.25 percent of all projects – have been financed with $5.40 million from the Energy Office, $5.28 million from participating lenders and $141,514 from borrowers.

State Energy Program

In 2008-2009, Nebraska received $321,000 for this federally-funded effort and supplied $64,200 in state funds from oil and natural gas severance taxes, as required matching funds. These funds are used to provide energy efficiency services to consumers and other small energy users, and include the publication of this Annual Report and the Nebraska Energy Quarterly as well as maintenance of the state's energy database http://www.neo.ne.gov/statshtml/index3c.html#current and web site http://www.neo.ne.gov/.

These funds also provide program support for a wide array of activities that include energy shortage management and emergency preparedness, education and information, Dollar and Energy Saving Loan operations, support of renewable energy activities and residential and commercial building energy efficiency.

The Energy Office also reviews state-financed plans for affordable homes assuring compliance with the Nebraska Energy Code. Periodically, the agency performs on-site inspections of completed homes, sharing compliance findings with the funding source.

A number of activities are grouped under the State Energy Program, because the federal funds come through that U.S. Department of Energy program. The activities that occurred under each special project grant during the reporting period are documented in this section.

"The Energy Office also reviews state-financed plans for affordable homes assuring compliance with the Nebraska Energy Code. Periodically, the agency performs on-site inspections of completed homes, sharing compliance findings with the funding source."

Net Zero Energy Home, Lincoln, Nebraska

Opportunities of Improving Industrial Environmental Control Systems Energy Performance in Nebraska

In September 2008, the Energy Office received $49,767 from the U.S. Department of Energy funding opportunity, Save Energy Now: State Industrial Assessment Projects, solicitation. The Nebraska proposal partnered the agency with the University of Nebraska-Lincoln and Omaha Public Power District. This project identified 14 industrial facilities in the state (eight more than required), collected data on their systems, fuel sources and energy consumption and conducted on-site measurements of their operations. An analysis was performed on the environmental systems at six of the facilities and an energy assessment report was produced that identified energy and operations improvement saving opportunities totaling $5 million annually. Omaha Public Power District and the University of Nebraska-Lincoln received contracts under this proposal for $12,444 and $34,983, respectively. This project was completed in January 2009.

Other Projects

Some projects undertaken by the Energy Office are funded by other sources in the U.S. Department of Energy.

State Heating Oil and Propane Program

During the reporting period, the Energy Office began its eighth year of participation in the U.S. Department of Energy's State Heating Oil and Propane Program. This activity collects price information from a sampling of Nebraska suppliers selected by the Energy Information Administration from October through March which, in turn, is shared with the Energy Information Administration and then posted on the agency's web site at http://www.neo.ne.gov/statshtml/86.html and http://www.neo.ne.gov/statshtml/87.html The

U.S. Department of Energy provided a grant of $6,000 for this activity. By the end of the reporting period, all funds were expended and the project was completed.

National Renewable Energy Laboratory Wind Energy Contract

In April 2009, the Energy Office received the second part ($40,000) of a three year agreement from the National Renewable Energy Laboratory under the Department of Energy's Wind Powering America program to perform a number of activities related to fostering wind energy development in the state. The tasks required under the agreement included: provide financial support for the annual state wind conference, provide information and outreach to consumers, send Nebraska representatives to a national wind energy conference and provide updates to the state's wind energy resources on the Energy Office's web site. The Energy Office has built a database of nearly 2,350 wind energy consumers and supported the state's second annual wind energy conference that was attended by 450 Nebraskans. The agency's wind energy web site recorded nearly 50,000 hits during the reporting period.

"The initial phase of the process involved 9 comment sessions held across the state utilizing traditional public hearing processes as well as video conferencing."

Energy Plan session November 6, 2009, Mahoney, Nebraska

Nebraska Energy Plan Update

In October 2008, the Energy Office began a public participation process to update the state's 1991 Energy Plan. The initial phase of the process involved 9 comment sessions held across the state utilizing traditional public hearing processes as well as video conferencing. The agency also solicited comments on what should be in the plan via its web site, emails and letters. An estimated 300 individuals, companies and organizations submitted comments.

The second phase of the update process began in December with the release of an interim 2009 State Energy Plan which is online at http://www.neo.ne.gov/comments2/PlanDraft2009.pdf . The agency again asked Nebraskans to share their comment on the plan using letters, emails and comments at the web site. Approximately 100 comments were received in January. The Nebraska Energy Plan is expected to be completed in early 2010.

Biopower Steering Committee

Authorized by the Legislature through December 31, 2008, the Energy Office provides assistance to this 12-member group. The Committee's task is to foster the use of bio-based resources as energy production resources. Legislative Bill 246 was passed in the 2009 Unicameral session and this group was eliminated.

American Recovery and Reinvestment Act of 2009

In February, Congress passed the *American Recovery and Reinvestment Act of 2009* which included a number of federally-funded energy programs. Under the *Recovery Act*, many of the activities must comply with the *Davis-Bacon Act*, *National Environmental Policy Act* of 1969, Buy American *Recovery Act* provisions and *National Historic Preservation Act*. This section details those funds and activities through December 2009, except where noted.

Low Income Weatherization Assistance Program

Under the *Recovery Act*, Nebraska received $41,644,458 to be spent over three years. The *Act* also revised the income guidelines for eligible applicants for this program from 125 percent of the Federal Poverty Level to 200 percent. Under the revised guidelines, a family of four with an income of $44,100 or less can receive up to $6,500 worth of energy efficiency home improve-

ments (increased from $2,500 based on a statewide average).

In May 2009, the state submitted a plan for use of the Weatherization Assistance Program funds that details the estimated number of houses that will receive energy efficiency improvements and the amount each service provider will receive. The summary of that plan is at http://www.neo.ne.gov/ARRA/documents/ARRAsubgrantee2.pdf .

Through June 30, 2009, the agency received $372,316. These funds were spent by local service providers – generally community action agencies – for equipment such as vehicles, tools and insulation blowers as well as materials needed to ramp up for the increase in the number of homes being weatherized as a result of the *Act*.

State Energy Program

Under the *Recovery Act*, Nebraska received $30,910,000 to be spent over three years. The following summary encompasses the elements of the State Energy Program plan submitted to the U.S. Department of Energy for review on May 11, 2009 and approved June 10, 2009:

Dollar and Energy Saving Loans

Recovery Act Funds: $11,000,000 Leveraged Funds: $4,000,000

- Funds were added to the existing Dollar & Energy Saving Loan Program.
- $11 million for 2.5 percent loans for commercial and industrial sector building improvements, including K-12 schools; Maximum loan amount: $750,000.

Advanced Renewable Energy Projects

Recovery Act Funds: $5,000,000 Leveraged Funds: $750,000

- A solicitation for proposals for Advanced Renewable Energy Projects was issued on July 24, 2009 and Letters of Intent were due on September 3, 2009. By the deadline, 112 applicants listed projects totaling more than $135 million. On November 3, 2009, formal project applications were due. At that time, 49 of the original 112 submitted detailed information about projects totaling more than $41.06 million. Under the solicitation's guidelines, all proposed projects will be reviewed for State Energy Program compliance and suitability under the *National Environmental Policy Act* by the U.S. Department of Energy.

State Building Energy Efficiency

Recovery Act Funds: $10,000,000

- $6 million will fund energy efficiency building improvements on the University of Nebraska, State and Community College campuses.
- $4 million will fund energy efficiency improvements in state government buildings under the management of the Administrative Services State Building Division.

Building Energy Code Training and Enforcement

Recovery Act Funds: $315,000

- The Energy Office will provide information on residential and commercial building energy

codes, and conduct training and certification of city and county code officials and members of the construction industry.

• Update the state's building energy codes as appropriate.

• Upgrade the state's efforts on building energy code compliance and inspections.

Renewable Energy Curriculum

Recovery Act Funds: $1,910,000

• Under a solicitation issued in January 2010, the six community colleges will each receive up to $318,333 to develop renewable energy curricula to train Nebraskans in renewable energy technologies. Collaborative applications are encouraged.

Consumer Information on Energy Efficiency and Renewable Energy

Recovery Act Funds: $585,000

• The Energy Office will develop and distribute information on energy efficiency and renewable energy choices so that Nebraskans can make wise decisions on their energy use. The information will be distributed electronically and in written formats.

"$6 million will fund energy efficiency building improvements on the University of Nebraska, State and Community College campuses."

Administration, Evaluation, Monitoring and Reporting

Recovery Act Funds: $2,100,000

• The Energy Office will administer *Recovery Act* funds, monitor grants and report on required activities. The Energy Office will make periodic on-site inspections to funded projects to document progress and compliance with fedreral regulations and contracts. The state's Dollar and Energy Saving Loan program will also be evaluated.

Energy Efficiency and Conservation Block Grants

Under the *Recovery Act*, the Energy Office received $9,593,500. Following a plan submitted to the U.S. Department of Energy on June 19, 2009 and approved September 14, 2009, the agency on December 3, 2009 issued a request for proposals from the approximately 83 counties and 500 towns and villages in the state that did not receive a direct allocation of block grant funds. Grants of up to $250,000 for street and traffic lighting projects, building retrofits, and renewable energy projects were available. A 20 percent cash match was required. More information about this activity is at http://www.neo.ne.gov/grants/EECBG.htm .

State Energy Efficient Appliance Rebates

Under the *Recovery Act*, the state received $1.7 million to design and administer a rebate program for energy efficient appliances and other types of equipment. The state plan was submitted on October 19, 2009 and approved by the U.S. Department of Energy on December 1, 2009. More information about the rebates and how the program will operate is at http://www.neo.ne.gov/ARRA/appliancerebate.htm .

Enhancing State Government Energy Assurance Capabilities

Under the *Recovery Act*, the Energy Office received $363,635 to strengthen and expand state and local government energy assurance planning and resiliency efforts by incorporating response actions for new energy portfolios and Smart Grid applications and build in-house state and local government energy assurance expertise. A Management Plan was submitted on October 13, 2009 and was approved by the U.S. Department of Energy on November 5, 2009. A Workforce Development Plan was submitted on November 12, 2009 and was approved by the federal energy agency on November 13, 2009.

F I N A N C I A L A C T I V I T Y

Financial Activity

In 2008-2009, the expenditures for the Nebraska Energy Office totaled $11,318,442 which includes monies from federal, state, oil overcharge trust and miscellaneous state funding sources. Funding increased by $1.386 million from the previous fiscal year, primarily because of an increase in federal funding.

The sources of funding for the agency are illustrated in Figure 7. Nearly 60 percent of the funds came from federal resources such as Low-Income Weatherization Assistance Program, Low-Income Home Energy Assistance Program and the State Energy Program. Only $372,316 in American Recovery and Reinvestment Act funds had been received by the end of the reporting period. About 36.4 percent of the funding for the agency was provided from oil overcharge trust accounts, specifically funds used for financing

Where the Money Came From
as of June 30, 2009

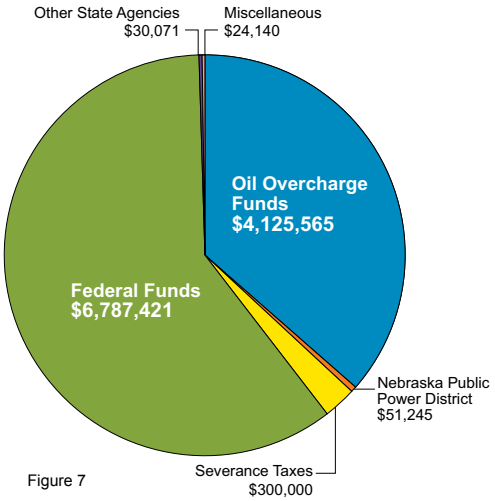


Figure 7

Total $11,318,442

Where the Money Went
as of June 30, 2009

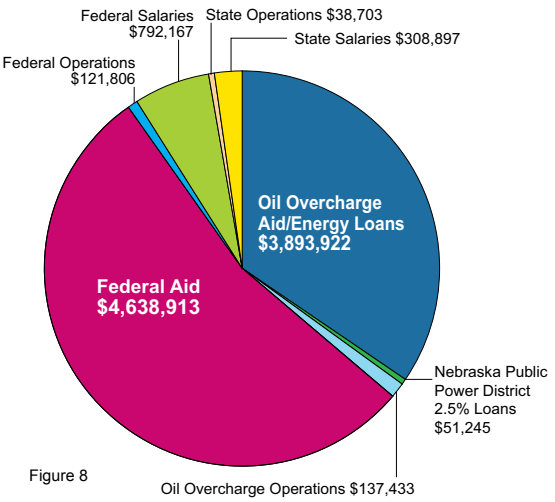


Figure 8

Total $11,318,442

Dollar and Energy Saving Loans. Nebraska Public Power District provided the agency with $500,000 for specific Dollar and Energy Saving Loans, of which $51,245 was obligated during the reporting period.

More than 53 percent of all agency funds were spent as federal aid under the Low-Income Weatherization Assistance Program. More than 33.8 percent of the agency funds were expended for Dollar and Energy Saving Loans to Nebraskans and weatherization aid. Oil overcharge fund activity during the reporting period is located on page 3 of this report. American Recovery and Reinvestment Act fund activity during the reporting period appears on page 8.

A more complete listing of expenditures by category is illustrated in Figure 8.

(1) In February each year, the Director of the State Energy Office shall transmit to the Governor and the Clerk of the Legislature a comprehensive report designed to identify emerging trends related to energy supply, demand, and conservation and to specify the level of statewide energy need within the following sectors: Agricultural, commercial, residential, industrial, transportation, utilities, government, and any other sector that the director determines to be useful.

(2) The report shall include, but not be limited to:

(a) An assessment of the state's energy resources, including examination of the current energy supplies and any feasible alternative sources;

(b) The estimated reduction in annual energy consumption resulting from various energy conservation measures;

(c) The status of the office's ongoing studies;

(d) Recommendations to the Governor and the Legislature for administrative and legislative actions to accomplish the purposes of sections 70-625, 70-704, 81-161, 81-1602, 81-1606, and 81-1607; and

(e) The use of funds disbursed during the previous year under sections 81-1635 and 81-1641. The use of such funds shall be reported each year until the funds are completely disbursed and all contractual obligations have expired or otherwise terminated.

Nebraska Revised Statutes 81-1607

TRENDS AND NEEDS

The Nebraska Energy Office tracks trends in different energy sectors as part of its mission. These trends can portend future energy use. In all cases, the most current energy data has been used in the *Annual Report*. Energy statistical data required by statute to be maintained by the Energy Office can be found on the agency's web site at: http://www.neo.ne.gov/statshtml/index3c.html

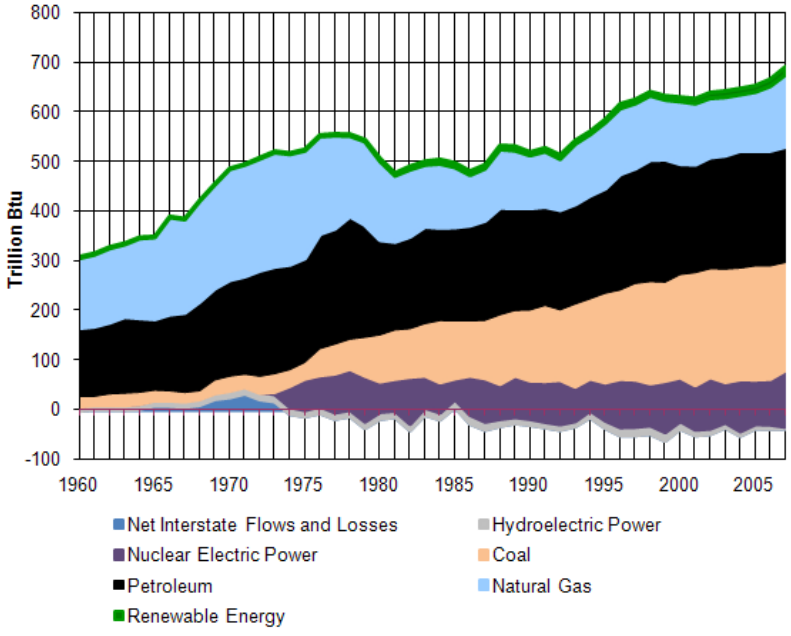
STATE-WIDE ENERGY NEED AND COST

Need

2007. Nebraska's total energy consumption was 692.9 trillion British thermal units (Btus), an increase of 24.8 trillion Btus — 3.7 percent — over 2006 and the highest since recordkeeping began in 1960, and one of the highest percentage increases in years. A British thermal unit is a standard measure of heat energy. It takes one Btu to raise the temperature of one pound of water by one degree Fahrenheit at sea level. The use of coal, petroleum and hydro declined while and natural gas and nuclear increased. Among all the states, Nebraska ranked 39th in total energy consumption.

1960-2007. Energy use over the past 46 years has changed markedly. Overall, consumption has more than doubled from 308.3 trillion Btus in 1960 to 692.9 trillion Btus in 2007.

- Coal use has increased more than tenfold from 20 trillion Btus to 216.8 trillion Btus between 1960 and 2007. Peak use of coal was reached in 2005 at 228.7 trillion. Virtually all of this growth is attributable to coal used to generate electricity.
- Natural gas consumption has both increased and declined during the 47 years from 140.4 Trillion Btus in 1960 to 146.4 Trillion Btus in 2007. Natural gas consumption peaked in 1972 at 226.4 Trillion Btus. The rise and fall and recent rise in consumption of natural gas is a result of increased equipment efficiency, fewer homes using natural gas as a primary heating source



Sources: State Energy Data Report. Energy Information Administration, Washington, DC.
Nebraska Energy Office, Lincoln, NE.

and electric utilities using natural gas for peak power production.

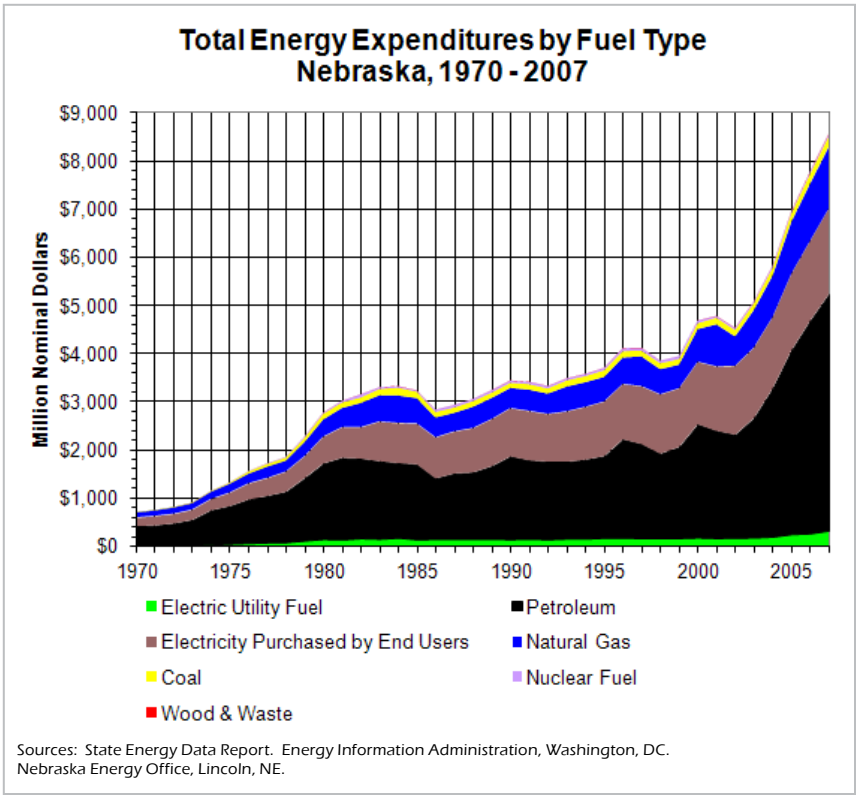
- Use of refined petroleum products nearly doubled over the past 47 years from 136.5 Trillion Btus in 1960 to 232.1 Trillion Btus in 2007. Gasoline and distillate fuel oil – primarily diesel fuel – comprise the bulk of refined petroleum products consumed. Both types increased between 1960 and 2007. Diesel fuel consumption quadrupled from 24.2 Trillion Btus in 1960 to 100.4 Trillion Btus in 2007. This increase is attributable to increased trucking and agricultural use. Gasoline consumption only increased by a quarter during the period from 78.8 Trillion Btus in 1960 to 106.1 Trillion Btus in 2007. Changes in gasoline consumption can be traced to increased fuel efficiency of vehicles, relative lack of population growth and marginal growth in miles traveled annually. Petroleum consumption peaked in 1999 at 248.2 Trillion Btus.
- Nuclear power was not generated commercially in the state until 1973-1974. Nuclear consumption has increased significantly over the period, rising from 6.5 (1973) and 44.6 (1974) Trillion Btus to 115.8 Trillion Btus in 2007. Nuclear consumption peaked in 2007, surpassing the previous 2003 record of 106.8 Trillion Btus.
- Hydroelectric consumption from 1960 to 2007 both increased and declined from 10.3 Trillion Btus in 1960 to 3.4 Trillion Btus in 2007, a new record low. Hydro production peaked in 1999 at 17.6 Trillion Btus. Fluctuations in hydro consumption are generally attributed to drought conditions which result in reduced hydropower production.

Cost

2007. Nebraska's total energy expenditures increased 9.2 percent to $7.876.6 Billion in 2007, an increase of $662.1 Million over 2006. Petroleum products – primarily gasoline and diesel – accounted for $490.7 Million of the increase and natural gas accounted for an increase of $91.4 Million. Among the states, Nebraska ranked 38th in energy expenditures in 2007. Expenditures for petroleum products in 2007 accounted for 62.3 percent of all energy expenditures, retail electricity, 22.5 percent and natural gas, 16.1 percent. On a per capita basis, Nebraska ranked 20th in energy

"Among the states, Nebraska ranked 38th in energy expenditures in 2007. Expenditures for petroleum products in 2007 accounted for about 62.3 percent of all energy expenditures, retail electricity, 22.5 percent and natural gas, 16.1 percent."

Oil drilling in Cheyenne County, Nebraska



Sources: State Energy Data Report. Energy Information Administration, Washington, DC.
Nebraska Energy Office, Lincoln, NE.

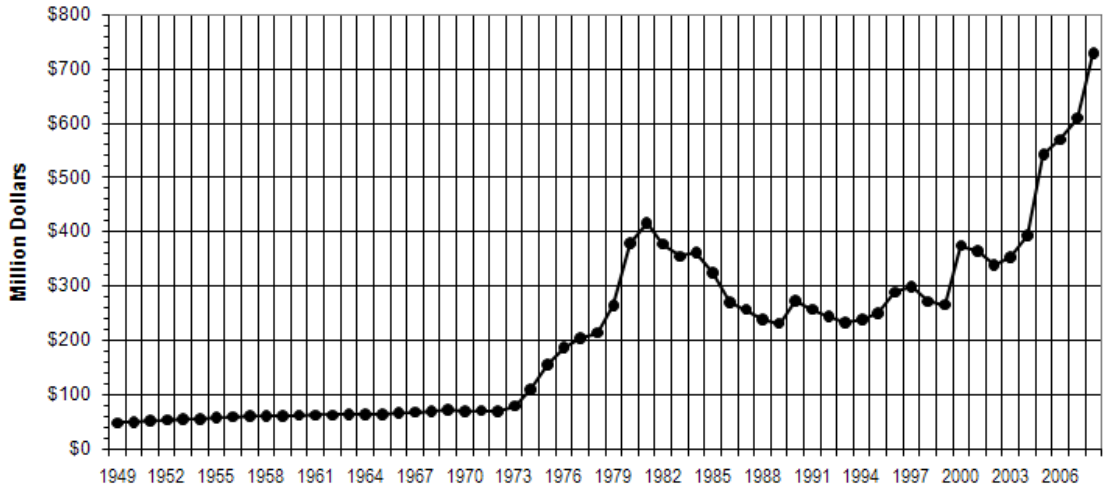
expenditures among the states at $4,451 in 2007. Alaska ranked first with a per capita expenditure of $9, 191. Arizona ranked last with a per capita energy expenditure of $3,179. The United States' average of energy expenditures per capita was $4,093.

2007 prices for different types of energy, as compared to the other 49 states and the District of Columbia, shows that Nebraskans paid the lowest price for coal in nation at 92 cents (measured in nominal dollars per million British thermal units). At the other extreme, Nebraskans paid the 7th highest price for petroleum at $20.84 in nominal dollars per million British thermal units. Prices for natural gas in Nebraska at $9.03 in nominal dollars per million British thermal units ranked 36th when compared to other states. Retail electricity prices in the state at $18.42 in nominal dollars per million British thermal units were the fifth lowest, ranking 47th. Prices for motor gasoline in Nebraska at $22.34 in nominal dollars per million British thermal units placed the state at 19th highest among the states.

"Nebraskans paid the 7th highest price for petroleum at $20.84 in nominal dollars per million British thermal units. Prices for natural gas in Nebraska at $9.03 in nominal dollars per million British thermal units ranked 36th when compared to other states."

1970-2007. Total energy expenditures in 1970 were $666.9 Million and had increased by more than ten-fold 47 years later in 2007 to $7.876 Billion. The peak in expenditures by fuel type was reached in 2007 for all types listed below, except nuclear which was $63.4 Million in 1996. Nebraskans spent nearly 11 times the amount on energy in 2007 as was spent in 1970. However, the percentage share of personnel income has not varied as much: In 1970, 11.8 percent was spent on energy and in 2007, 11.7 percent was spent on energy. The peak percentage occurred in 1980 at 17.0 percent.

- Coal expenditures increased from $9.8 Million in 1970 to $200.5 Million in 2007.
- Natural gas expenditures increased more than 12-fold from $104.1 Million in 1970 to $1.271 Billion in 2007.
- Petroleum expenditures also increased more than 12-fold from $404.8 Million in 1970 to $4.903.4 Billion in 2007.
- Nuclear expenditures soared from $1.1 Million in 1973 – the first partial year of operation of one of the state's two nuclear plants – to $53.2 Million in 2007.
- Electricity purchased by end users totaled $170.3 Million in 1970 and rose to $1.775.3 Billion in 2007.



Sources: United States Department of Agriculture.
Nebraska Energy Office, Lincoln, NE.

Agricultural

National Agricultural Statistics Service, there were 47,712 farms and ranches on 45.48 million acres in Nebraska in 2007, encompassing about 93 percent of the state's total land area. The average operation contains 953 acres. In 2007, 17,128 farms irrigated 8.558 million acres. Agricultural energy data is aggregated

A G R I C U L T U R A L

"The Energy Office provides low-cost financing for irrigation efficiency projects that demonstrate energy savings such as low-pressure pivots and replacement pumps and motors."

Center pivot irrigation system in central Nebraska

with other data in the Industrial sector. As such, separate agricultural energy data is not always available on a consistent or annual basis.

Energy Supply

Energy supplies for the state's agricultural sector have been met. Over the years, any energy supply problems have been limited to infrequent shortfalls of petroleum products or fertilizer – reliant on energy inputs – usually during periods of peak demand or energy shortfalls because of worldwide demand.

Demand

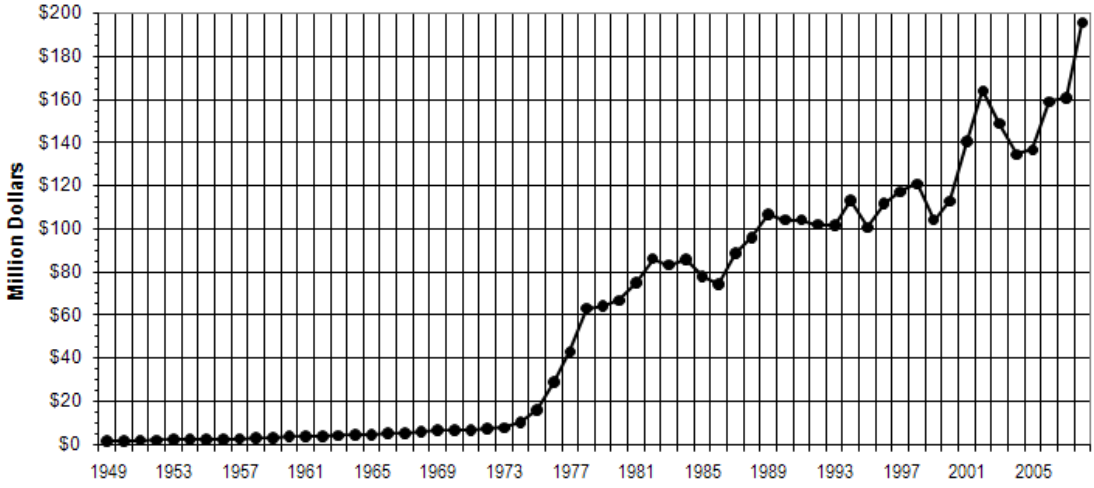
As indicated earlier in this section, energy demand information for the agricultural sector is not available on a consistent or annual basis. One of the primary tracking tools, the Census of Agriculture, is only conducted every five years. National energy databases commingle agricultural demand with data from the industrial sector.

Conservation

As with most consumer behavior, high fuel costs or limited availability of energy resources induces demand for efficiency practices in this sector. For example, record high prices for natural gas have caused farmers to alter practices such as when and how much anhydrous ammonia fertilizer – a natural gas product – is used. High diesel prices have motivated farmers to adopt conservation tillage practices, resulting in reduced cultivation on crop land, and to switch from using diesel to power irrigation systems.

As energy costs have increased, the state's agricultural producers – with assistance from the agricultural extension agents and research as well as others – have adopted a variety of practices that have reduced energy use: conservation tillage and irrigation pump efficiency testing, scheduling and load management practices. For example, the Energy Office provides low-cost financing for irrigation efficiency projects that demonstrate energy savings such as low-pressure pivots and replacement pumps and motors. Low-interest loans have also been used to finance grain dryers, no-till equipment, dairy vacuum pumps and similar equipment. Over the past several years, U.S. Department of Agriculture 9007 grants have partially financed hundreds of irrigation efficiency improvements that also included switching fuel sources from diesel and natural gas to electricity. As long as federal funding remains available and diesel prices remain high, this trend in irrigation is likely to continue.

In 2007, the U.S. Department of Agriculture issued a report that found farmers have adopted energy conservation practices: Since the 1970s, farm energy



Sources: United States Department of Agriculture.
Nebraska Energy Office, Lincoln, NE.

consumption has fallen 26 percent as farm output has increased 63 percent.

Energy Need

Energy need in the ag sector can be influenced by the cost of inputs such as energy, which are a significant factor in modern farming. Over the decades as farms have increased in size, energy has replaced labor, allowing fewer people to produce larger harvests of agricultural goods. Another long-term trend has been the increase in irrigation. In 1966, only 3.1 million acres were irrigated, but by 2007, 8.558 million acres were under irrigation on 17,128 farms. The fuel used to power the irrigation pumps in 2008 was diverse (2003 figures in parentheses): electricity, 54.17 percent (45 percent); diesel, 28.68 percent (27 percent); natural gas, 10.55 percent (16 percent); propane, 6.56 percent (12 percent) and gasoline/ethanol, .03 percent (less than 1 percent). The fuel changes over the past five years shows the near ten percent increase in electricity came at the expense of natural gas and propane.

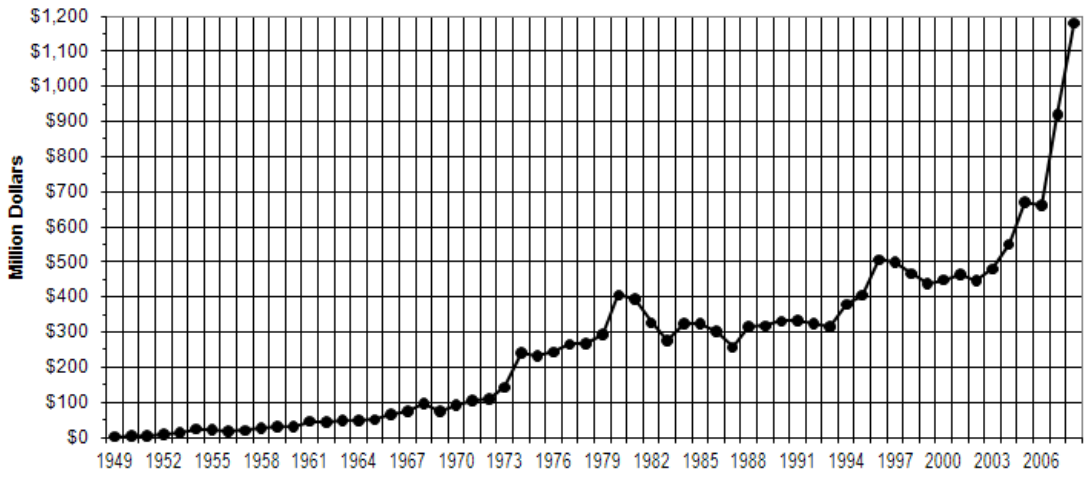
In 2006 (the latest information available), direct energy expenditures in agriculture accounted for between five to seven percent of farm expenditures. That year, the ag sector's energy consumption by fuel type was: diesel, more than 50 percent; gasoline, 16 percent; electricity, 13 percent; natural gas, 9 percent; propane, 9 percent; and other fuels, 2 percent. Indirect energy consumption from fertilizers and pesticides accounted for 9-10 percent of farm expenditures. According to the U.S. Department of Agriculture, Nebraska farm expenditures in 2007 totaled $460 million for agricultural chemicals, $900 million for fertilizer, lime and soil conditioners and $580 million for fuel.

Since 1949, Nebraska's fuel and oil, electricity and fertilizer expenditures by the agricultural sector have been tracked. Between 1949 and 1973-1974, energy prices were stable and showed mostly marginal increases over time. However, after the impact of the first oil price shock in the early 1970s, agricultural energy expenditures deviated markedly from historic patterns, becoming far more erratic and costlier.

- Fertilizer expenditures in the state have shown the most substantial change between 1949 and 2008, rising from $2.1 million to $1.18 billion. The increase in the cost of fertilizer and the impact of oil prices is illustrated between 1973 and 1974 when expenditures in 1973 totaled $142.6 million and a only a year later totaled $239.9 million. Since 2004, fertilizer expenditures have increased at least $100 million a year, and between 2006 and 2007 increased $260 million.
- Fuel and oil expenditures have also shown a dramatic increase, peaking in 2008. In 1949, fuel and

" Since 2004, fertilizer expenditures have increased at least $100 million a year, and between 2006 and 2007 increased $260 million. "

Applying fertilizer near Broken Bow, Nebraska



Sources: United States Department of Agriculture.
Nebraska Energy Office, Lincoln, NE.

oil expenditures totaled $47.5 million. By 2008, those expenditures had risen to $730 million.

- Electricity expenditures in the agricultural sector in the state peaked in 2008 at $195.7 million. In 1949, electricity expenditures only totaled $1.6 million.
- Two widely used fuels in the ag sector, propane and diesel, have increased markedly. Bulk delivery prices for propane in the Northern Plains rose from 47 cents a gallon in 1990 to $1.43 a gallon in 2009, down from a record high of $1.97 a gallon in 2008. Bulk delivery price of diesel fuel in the Northern Plains rose from 78 cents a gallon in 1990 to $1.66 a gallon in 2009, down from a record high of $3.54 a gallon in 2008.

The energy needs of the state's agricultural producers can fluctuate substantially from one growing season to another. For example in 2001, a 30 percent increase in petroleum use was primarily due to increased irrigation use because of drought conditions in parts of the state.

Fuel substitution, or conversion to other types of fuel, is very difficult for this sector to utilize without costly changes in equipment.

COMMERCIAL

Commercial

The commercial sector, which includes non-manufacturing business establishments, closely parallels consumer energy use and economic activity in the state. Energy use by local, state and federal governments is also included in this sector.

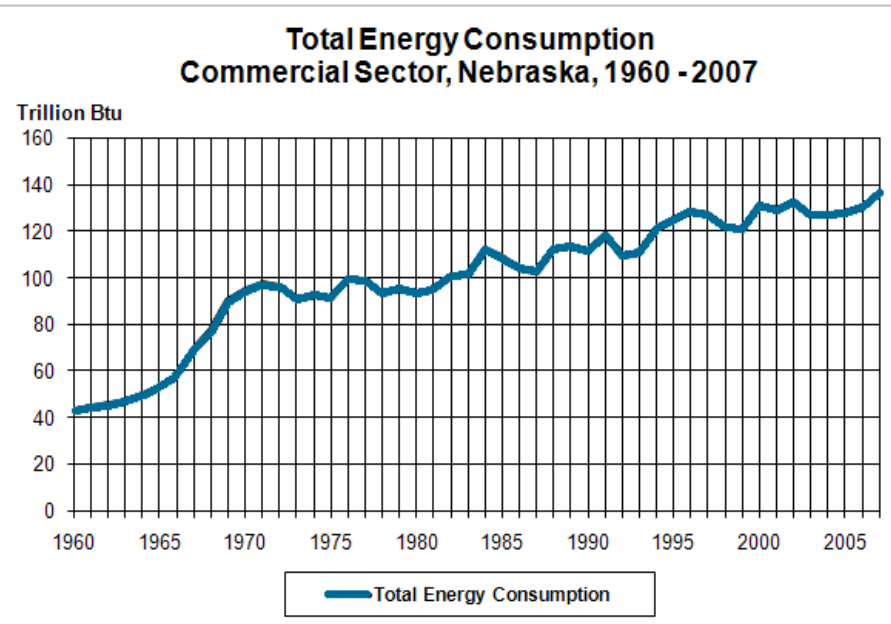
Energy Supply

2007. In 2007, nearly 94 percent of the energy used in the commercial sector came from only two sources: natural gas and electricity, after accounting for electric system energy losses. Supplies of both energy resources have been sufficient with only brief periods of supply tightness, primarily due to weather or damaged transmission lines.

1960-2007. Supply trends over time indicate a continued dominance of these two fuel sources in this energy use sector.

"...energy use in this sector declined by almost 10 Trillion British thermal units from 1991-1992, which paralleled a national recession. The economic decline in late 2008 and 2009 are likely to show a similar decline in energy use in this sector."

Historic Commercial District, Fremont, Nebraska



Sources: State Energy Data Report. Energy Information Administration, Washington, DC.
Nebraska Energy Office, Lincoln, NE

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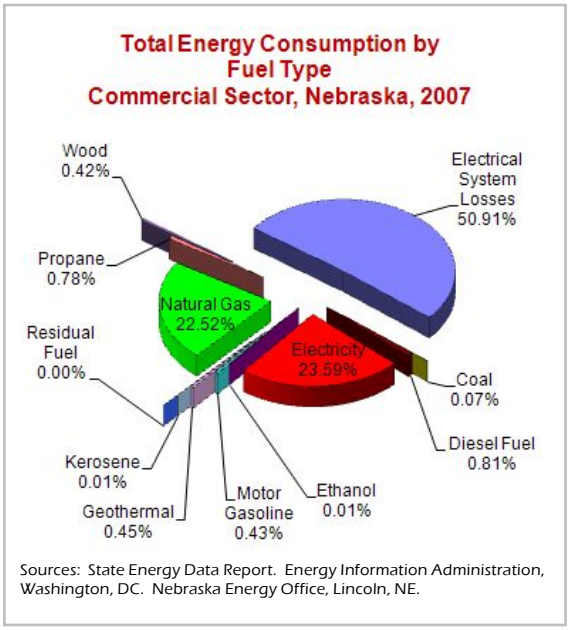
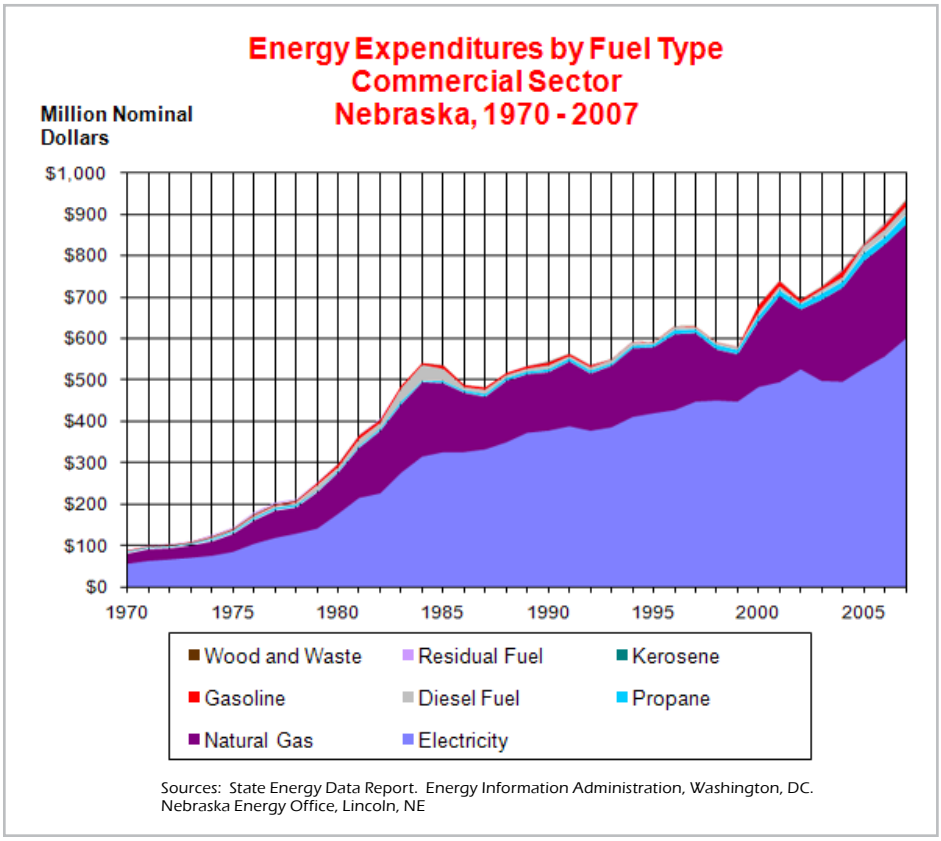


Sources: State Energy Data Report. Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE.



Sources: State Energy Data Report. Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE

Demand

2007. Just 19.62 percent – 136.0 Trillion British thermal units – of the state's total energy demand was consumed by the commercial sector in 2007. The increase in demand from 2006 to 2007 was 6.2 Trillion British thermal units, the largest increase since 2000.

1960-2007. When data collection began in 1960, the commercial sector demand was 42.8 Trillion British thermal units, less than one-third of the amount of energy used in 2007. The peak year of demand in this sector, 2007, surpassing the 132.8 Trillion British thermal units of energy were used in 2002.

Conservation

Changes or reductions in energy use in the commercial sector closely parallel those patterns found in the residential sector. Efforts to conserve energy use tend to be economically driven, especially when fuel prices rise above historic levels. Reduced energy use often results from economic downturns in the larger economy. For example, energy use in this sector declined by almost 10 Trillion British thermal units from 1991-1992, which paralleled a national recession. The economic decline in late 2008 and 2009 are likely to show a similar decline in energy use in this sector.

Energy Need

Since the primary needs of the commercial sector are confined to readily available supplies of natural gas and electricity, no issues relating to energy need are foreseen since supplies of both fuel types are ample.

2007. Energy prices for the two primary fuel sources – natural gas and electricity – moved in different directions in 2007. Natural gas

decreased from $9.49 (measured in nominal dollars per million British thermal units) in 2006 to $9.00 in 2007. Electricity increased from $18.15 (measured in nominal dollars per million British thermal units) in 2006 to $18.73 in 2007. The annual average increased from $14.07 (measured in nominal dollars per million British thermal units) in 2006 to $14.17 in 2007.

1960-2007. One factor of need is price. A commercial business' need for energy can differ markedly, if the price of energy doubles in a short period of time. Expenditures in the commercial sector have changed markedly over the 37-year period. In 1970, the commercial sector's energy expenditures totaled $89.9 million (in nominal dollars). The peak year for expenditures in this sector occurred in 2007 at $932.6 million (in nominal dollars), more than a ten-fold increase over the decades-long reporting period.

Residential

"In the 37 years since records have been kept, residential electricity prices have increased from $6.21 in 1970 to $22.25 in nominal dollars per million British thermal units in 2007, more than tripling in price."

Energy Supply

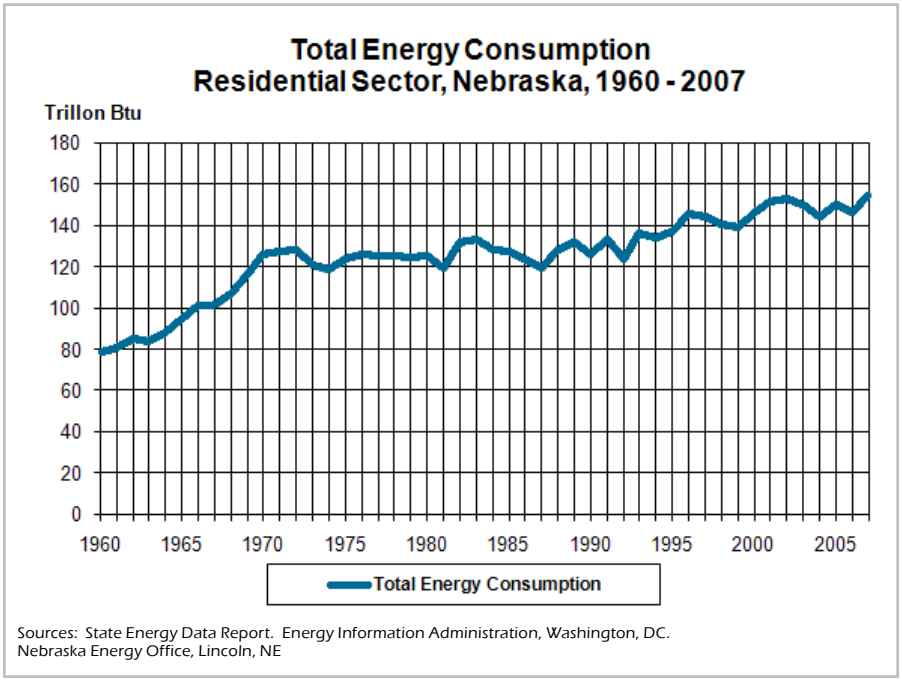
2007. Nearly 88 percent of the energy used in the residential sector in 2007 came from only two sources: natural gas and electricity. Nearly half the energy used – 47.5 percent – in this sector comes from natural gas. Natural gas use in this sector is used primarily for home heating and minor household uses such as water heating, clothes drying and cooking. Electricity is used throughout the home for heating, cooling, water heating, appliances, lighting and miscellaneous activities and equipment. Supplies of both natural gas and electricity are readily available.

1960-2007. Supply trends and fuel types used in the residential sector have not changed substantially over 37 years of data collection, with the exception of a slow decline in natural gas and an equally slow rise in electricity use.

Demand

2007. More than 22 percent – 154.5 trillion British thermal units – of the state's total energy demand was consumed in the residential sector in 2007. The increase in demand from 2006 to 2007 was 9.0 Trillion British thermal units and increases occurred in renewable energy (17 percent), petroleum (12.4 percent), natural gas (8.0 percent) and electricity (4.9 percent.

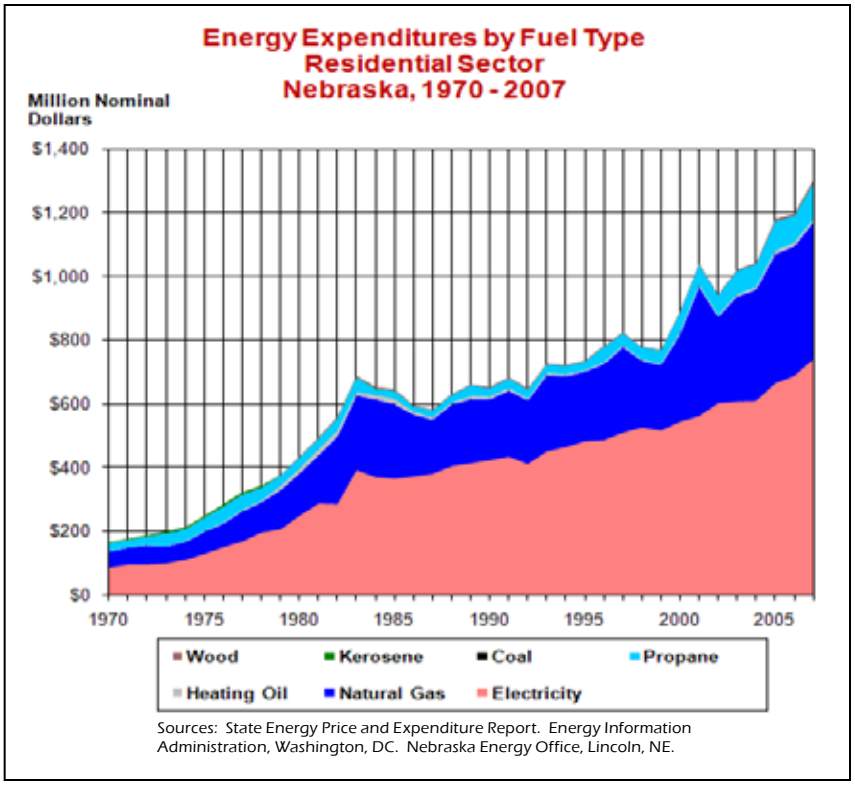
1960-2007. Total energy consumption in 1960 in the residential sector was 78.22 trillion British thermal units, of which slightly more than half – 40.87 trillion British thermal units came from natural gas. By 2007, the total energy consump-



Sources: State Energy Data Report. Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE

tion in this sector had almost doubled to 154.5 trillion British thermal units.

Changes in how and how much this sector uses becomes clear over the 47-year span. In 1960, electricity use only totaled 6.5 trillion British thermal units, but by 2007, electricity demand totaled 33.2 trillion British thermal units, a historical peak. Natural gas demand was 40.8 trillion British thermal units in 1960, peaked at 60.86 trillion British thermal units in 1972 and has generally declined by about a third since then, clocking in at 39.2 trillion British thermal units in 2007,. Propane demand in 1960 was 7.18 trillion British thermal units, peaked in 1972 at 15.0 trillion British thermal units and has declined to 5.98 trillion British thermal units in 2007. Electric system line losses are accounting for a larger share of the energy used in this sector as electrical use increases. In 1960, electrical line losses accounted for 16.0 trillion British thermal units, but by 2007 amounted to 71.7 trillion British thermal units, approximately 46 percent of all the energy used in this sector in 2007.



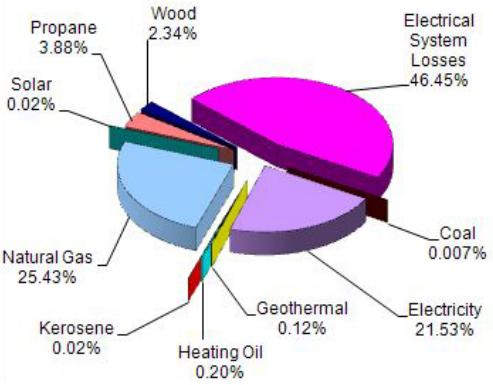
Sources: State Energy Price and Expenditure Report. Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE.

Conservation

Conservation in the residential sector is influenced by price, weather and environmentalism. Like most sectors, residential users are extremely responsive to dramatic price rises. Increases in the price of natural gas, at various times over the decades, have resulted in reduced average annual consumption. Higher than normal heating bills have propelled homeowners to make energy saving improvements such as replacing aged furnaces with new efficient models or efficient electric heat pumps, adding insulation and replacing windows and doors with more energy efficient ones.

Energy Need

2007. In 2007, energy prices for the two primary fuel types in the residential sector, natural gas and electricity, moved in different directions compared to 2006 levels. Specifically, natural gas fell from $11.15 in nominal dollars per million British thermal units in 2006 to $10.95 in 2007 and electricity increased from $21.72 in nominal dollars



Sources: State Energy Data Report. Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE.

per million British thermal units in 2006 to $22.25 in 2007. The annual average also increased from $$16.03 in nominal dollars per million British thermal units in 2006 to $16.27 in 2007. Among the states, Nebraska ranked 36th lowest in residential natural gas prices in 2007 at $9.03 measured in nominal dollars per million British thermal units.

1970-2007.

Price is a factor determining energy need. A household's energy needs can differ considerably if the price of a necessary fuel increases dramatically in a short period of time. The energy needs of the residential sector come from two major fuel types: natural gas and electricity. Those needs are likely to be determined in predictable ways: severity of winter and summer weather conditions and price volatility. In several of the first years of the 21st century, winter weather that was colder than the norm, combined with high gas prices to lower demand by residential users. In 2000-2001, residential natural gas prices rose from $6.40 to $8.57 in nominal dollars per million British thermal units. A similar situation happened in 2002-2003 when residential natural gas prices rose from $6.17 to $7.83 in nominal dollars per million British thermal units. Similar rises were recorded in 2004 ($9.09) and in 2005 ($10.56). As a result, consumers replaced inefficient heating equipment with high-efficiency models reducing energy consumption and switch fuels from natural gas to electricity by installing an efficient heat pump.

In the 37 years since records have been kept, residential electricity prices have increased from $6.21 in 1970 to $22.25 in nominal dollars per million British thermal units in 2007, more than tripling in price. Residential natural gas prices have risen from 84 cents in 1970 to $10.95 in nominal dollars per million British thermal units in 2007, a more than 13-fold increase in 37 years far outstripping the price rise in electricity prices. The annual average has also risen from $1.84 in 1970 to $16.27 in nominal dollars per million British thermal units in 2007.

Industrial

The industrial sector includes manufacturing, construction, mining, agriculture and forestry operations. This sector relies on more diverse fuel types than the other sectors of the economy. Natural gas, electricity, coal and a variety of petroleum products – gasoline, asphalt, road oil, propane and diesel – are the primary fuel types utilized in industrial sector operations.

Energy Supply

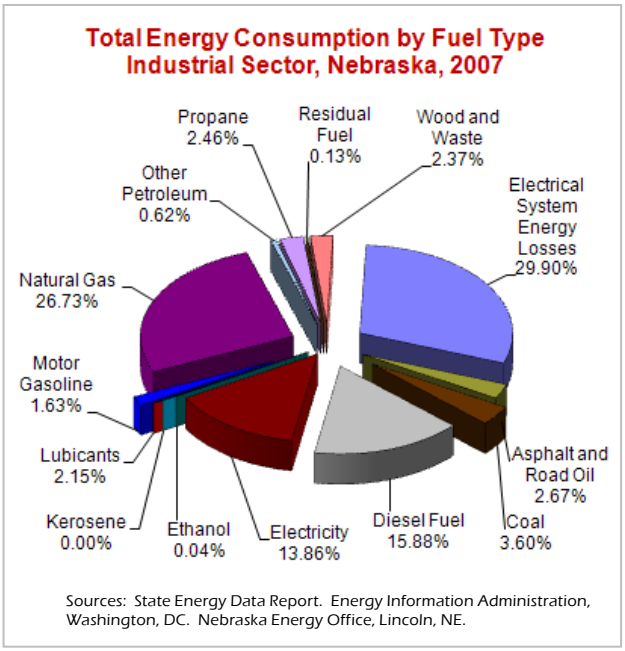
2007. In 2007, natural gas supplanted petroleum products as the most consumed energy type, accounting for 38.1 percent of net energy consumption. Exactly one-third of energy used in the industrial sector was in the form of petroleum products, especially diesel fuel. The next three primary fuel types used: electricity (19.77%) coal (5.1 percent) and wood and wood waste (3.3 percent).

Generally, supplies of these fuel types have been readily available to industrial users.

1960-2007. Trends in fuel types used in the

I N D U S T R I A L

industrial sector illustrate the dynamic needs of this sector and how industries can switch fuel types over time. The emergence of new industries such as ethanol plants can also alter fuel use patterns. For example, natural gas use in 1960 was 38.3 trillion British thermal units and soared in 1975 to 73.5 trillion British thermal units. Subsequent energy price spikes and other factors reduced natural gas consumption to 24.8 trillion British thermal units by 1990. Natural gas has fluctuated considerably over the past 17 years. The nadir in consumption was in 1991 at 23.9 trillion British thermal units in 1991, peaking in 2007 at 59.9 trillion British thermal units. Consumption of distillate fuel more than doubled from 1960 to 2007, rising from 14.0 trillion British thermal units to 35.6 trillion British thermal units. Motor gasoline consumption dropped by two-thirds between 1960 and 2007, from



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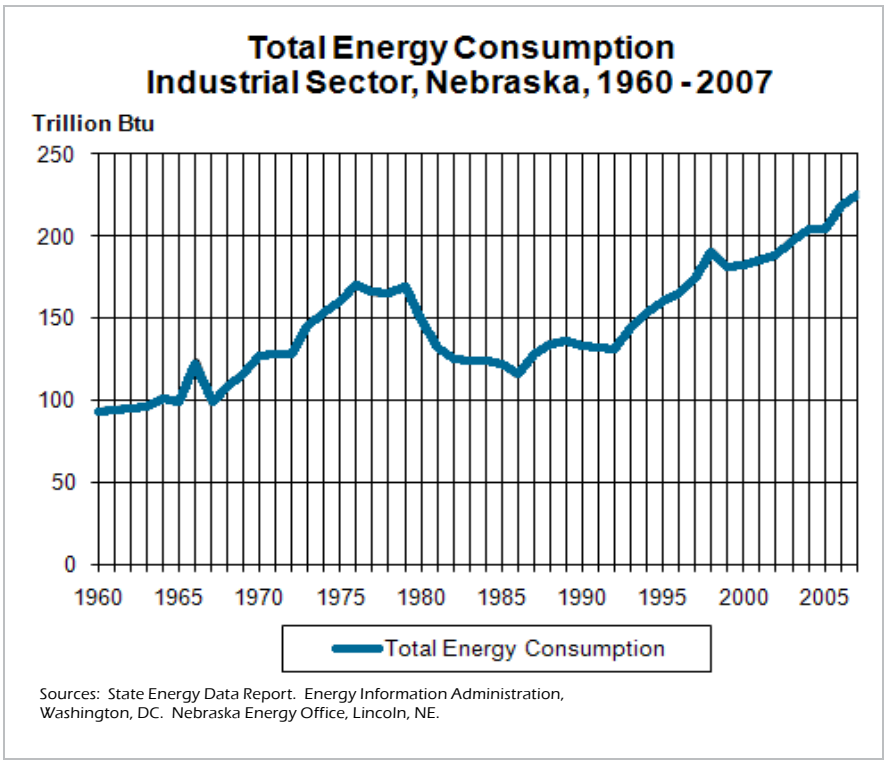


Sources: State Energy Data Report. Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE.

11.3 trillion British thermal units in 1960 to 3.6 trillion British thermal units. The growing use of electricity in this sector is demonstrated by the ten-fold increase from 3.0 trillion British thermal units in 1960 to 31.0 in 2007.

Demand

2007. More than 32.3 percent of the state's total energy consumption – 224.2 trillion British thermal units – was used in the industrial sector in 2007. The 3.2 percent increase in demand from 2006 to 2007 totaled 6.9 trillion British thermal units, larger than the increase from 2005 to 2006.

1960-2007. In 1960, the industrial sector was the second largest energy user after transportation, 93.0 trillion British thermal units to 94.2 trillion British thermal units, respectively. By 2007, the industrial sector was the largest energy

INDUSTRIAL

using sector at 224.2 trillion British thermal units, surpassing the transportation sector by 45.9 trillion British thermal units.

Conservation

The industrial sector is more pre-disposed to making energy efficient system, lighting and building improvements than other sectors. If energy costs are a significant factor – and rising – industrial sector users are likely to find ways to reduce the costs and impacts of energy on their operations. The roller coaster consumption of natural gas over the past 47 years noted in the energy supply section is an indicator of the impact of conservation of use, fuel switching or a combination of both..

"The industrial sector is more pre-disposed to making energy efficient system, lighting and building improvements than other sectors."

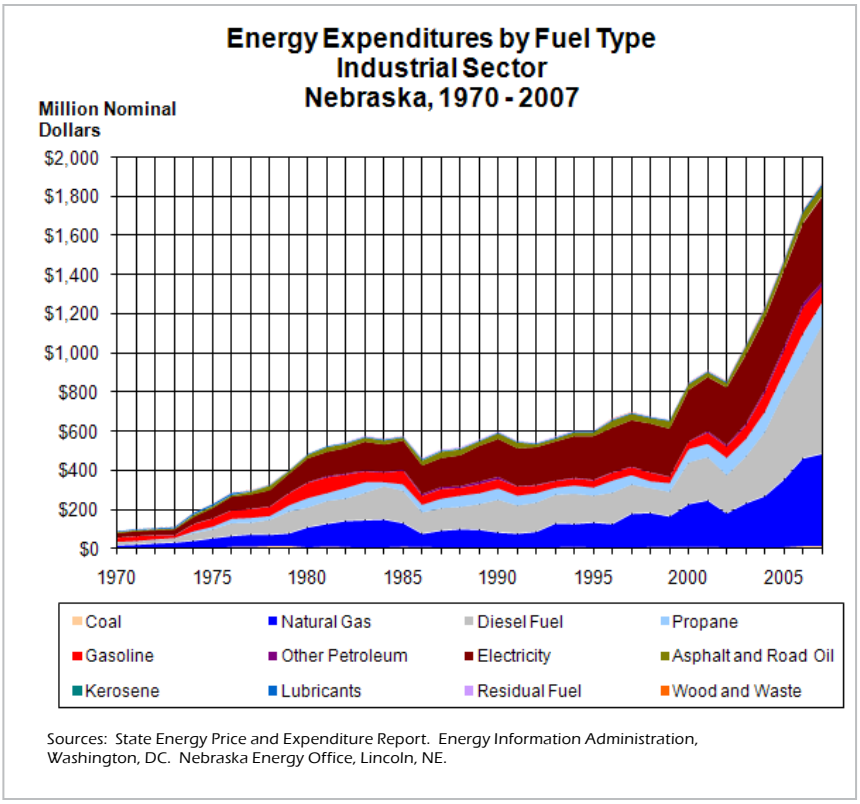
Katana Summit's wind tower plant in Columbus, Nebraska

Energy Need

Energy need in the industrial sector is subject to the ebb and flow of business cycle and national, regional and local economic trends which can cause a spike or reduction in energy need and demand. As noted earlier, the surge in ethanol industry growth in the state added to this sector's energy needs for electricity and natural gas. The slowdown in ethanol production which began in 2008 will also be reflected when that data becomes available.

2007. Price can be a need-altering factor in the industrial sector, which is more adept at fuel switching and conservation practices than other sectors. In 2007, the industrial sector spent $1.865.9 billion in nominal dollars for energy, an increase of $135 million in nominal dollars over 2006.

1970-2007. In 1970, the industrial sector spent $92.4 million in nominal dollars, less than 14 percent of total energy expenditures for all sectors. In 1970, industrial sector energy spending ranked third among the four sectors. By 2007, industrial sector expenditures of $1.865.9 billion in nominal dollars had risen to 23.7 percent among all sectors, and now ranked second after transportation among energy-using sectors.



Sources: State Energy Price and Expenditure Report. Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE.

Just nine years ago in 1999, expenditures in the industrial sector totaled only $659 million in nominal dollars. In those nine years, spending the industrial sector has increased by more than $1.2 billion in nominal dollars. The most dramatic price increases in those eight years were in refined petroleum products: propane prices more than doubled, gasoline prices tripled and diesel prices more than tripled. Natural gas prices also more than doubled during that period while electricity prices

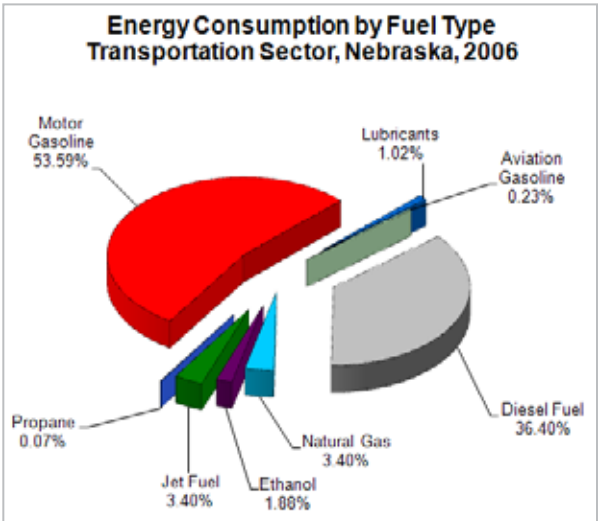
increased about 35 percent. Annual average prices between 1999 and 2007 rose from $5.31 in nominal dollars per million British thermal units in 1999 to $12.23 in 2007.

Transportation

Traditional methods of transportation such as public and private vehicles, railroads, aircraft and boats are included in the transportation sector as well as energy used to transport oil and natural gas through pipelines.

Energy Supply

2007. In 2007, more than 95 percent of energy used – 170.1 trillion British thermal units out of 178.3 trillion British thermal units – in the transportation sector was in the form of petroleum products, especially distillate oil (e.g. diesel) and gasoline. The next two fuel types of any consequence were natural gas at 5.5 trillion British thermal units and ethanol at 2.6 trillion British thermal units.



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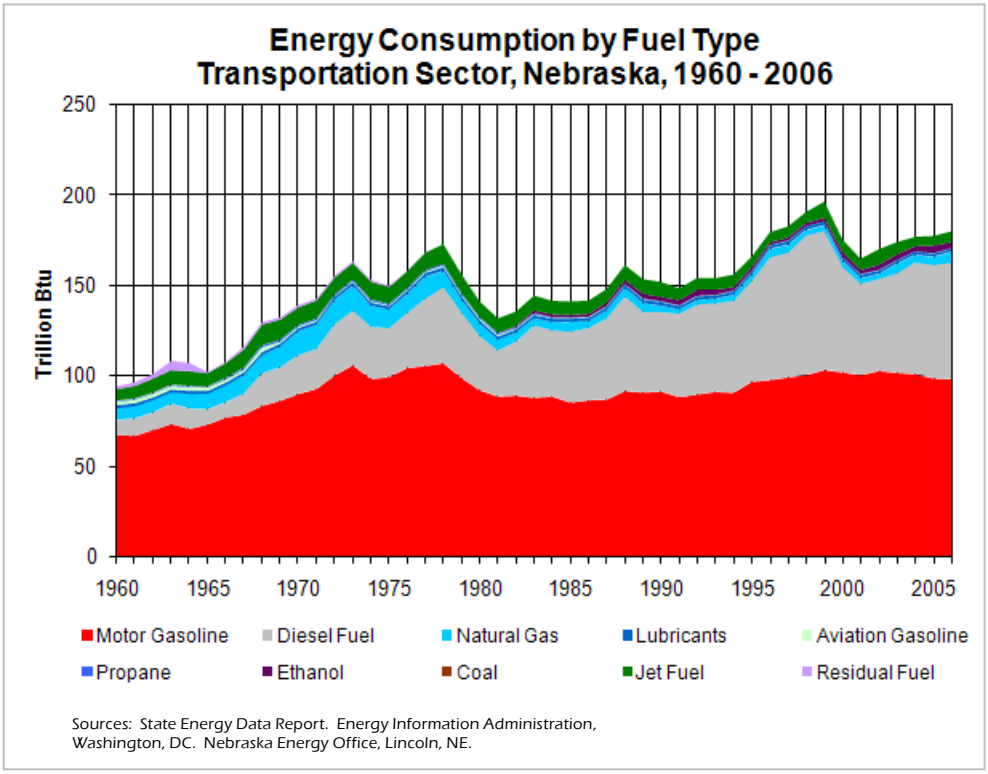


Sources: State Energy Data Report. Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE.

Generally, supplies of these fuel types have been readily available to transportation users.

1960-2007. Trends in fuel types used in the transportation sector illustrate the static nature of this sector and how modes of transportation have changed little since 1960. The transportation sector was nearly totally dependent upon petroleum-based fuels in

TRANSPORTATION

"More than a quarter – specifically 25.73 percent of the state's total energy consumption – 178.3 trillion British thermal units – was used in the transportation sector in 2007."

Interstate-80 Omaha, Nebraska

1960, and remained just as dependent in 2007. The changes that occurred in the 47-year period primarily related to increased use. Renewable fuel, specifically ethanol, use began marginally in 1981 at .28 trillion British thermal units, and rose to a peak of 3.0 trillion British thermal units in 2003 before declining to 2.6 trillion British thermal units in 2007. Diesel fuel use in 1960 was 8.16 trillion British thermal units, peaked in 1998 at 77.19 trillion British thermal units and then declined to 63.1 trillion British thermal units in 2007. Motor gasoline use in 1960 was 67.07 trillion British thermal units, peaked in 1978 at 106.77 trillion British thermal units, and by 2007 had declined to 99.1 trillion British thermal units.

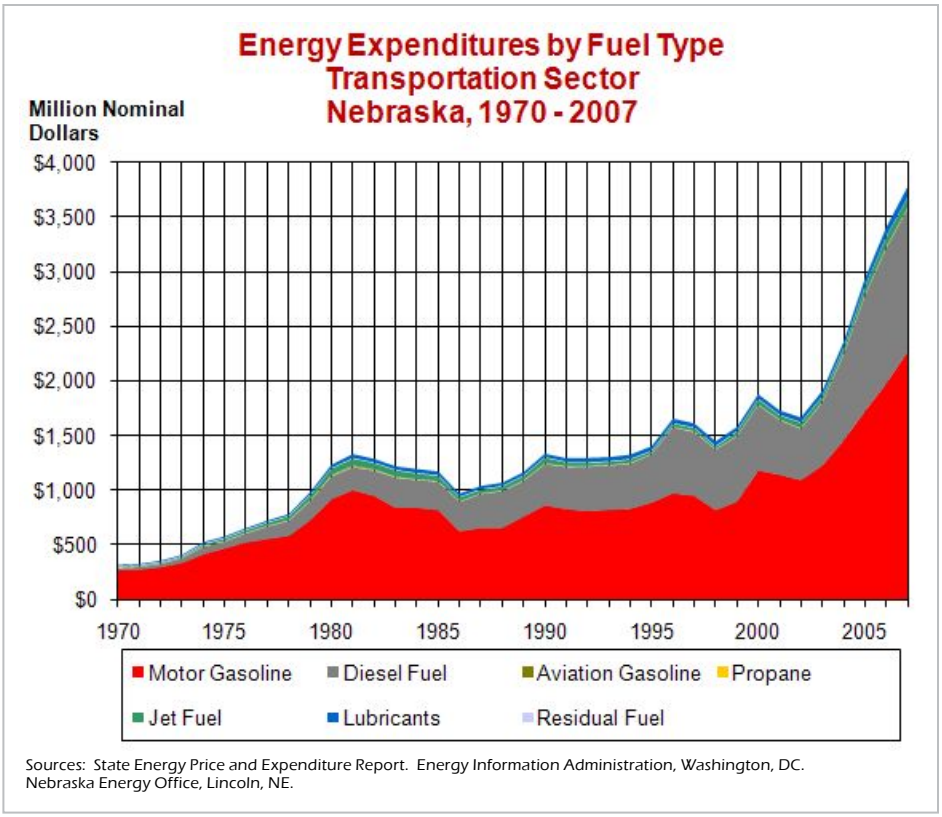
Demand

2007. More than a quarter – specifically 25.73 percent of the state's total energy consumption – 178.3 trillion British thermal units – was used in the transportation sector in 2007. The increase in demand from 2006 to 2007 totaled 3.1 trillion British thermal units.

1960-2007. In 1960, the transportation sector was the largest energy using sector at 94.2 trillion British thermal units. By 2007, the transportation sector had been eclipsed as the largest energy using sector by the industrial sector, 178.3 trillion British thermal units compared to 224.2 trillion British thermal units, respectively.

Conservation

The transportation sector is particularly resistant to conservation efforts. Over the decades, a variety of approaches by the state and federal governments have been tried to make this sector less dependent upon petroleum products: mandated Corporate Average Fuel Efficiency standards, reduced highway speed limits, introduction of efficiency technology in vehicles and driving modifications such as right-turn-on-red light and carpooling/ridesharing.



Sources: State Energy Price and Expenditure Report. Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE.

Recent trends in this sector have thwarted conservation efforts. However, fuel price rises can induce conservation behavior. The price rise in petroleum-based fuels since 1999 has had an impact on demand. Peak total energy consumption in this sector was reached in 1999 at 194.4 trillion British thermal units. The precipitous decline in transportation sector use from 1999 to 2000 – from 194.4 trillion British thermal units to 172.8 trillion British thermal units continued into the following year. Since 2001 when demand was 162.6 trillion British thermal units, demand has marginally inched upwards nearly every year.

Energy Need

Trends in price and vehicle technology as well as federal government initiatives such as more efficient vehicles are expected to have an impact on energy use in this sector in the near term, leading to declines in consumption. An offsetting trend has been the gradual increase in the number of motor vehicle miles traveled each year since 1979 when the annual total was 11.53 billion miles. By 2007, that figure was 19.2 billion miles traveled.

2007. In 2007, the transportation sector spent $3.77 billion in nominal dollars for energy, an increase of $369 million in nominal dollars over 2006.

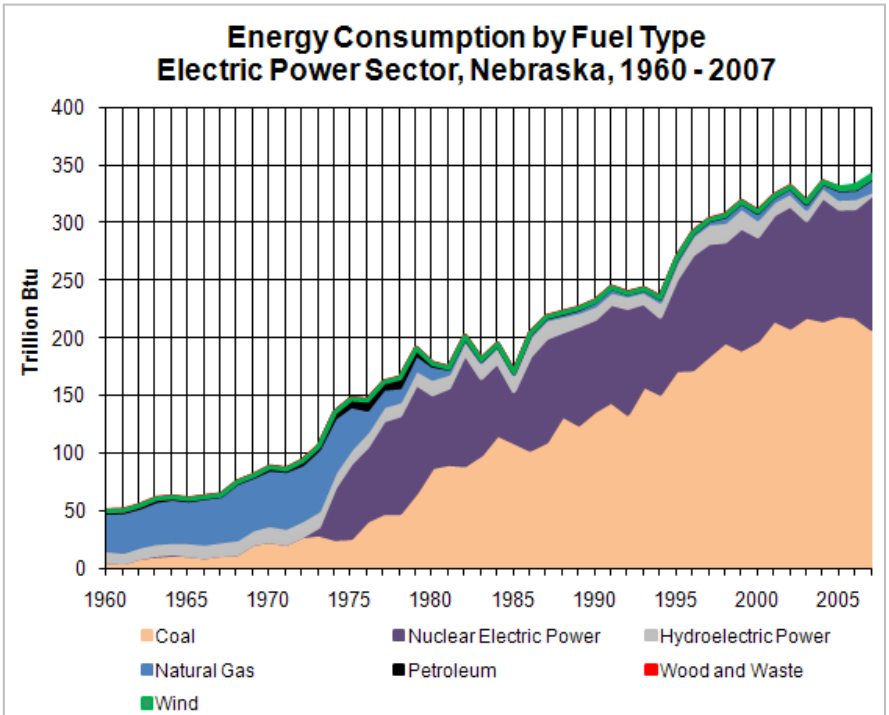
1970-2007. In 1970, the transportation sector spent $317.0 million in nominal dollars, more than 47.5 percent of total energy expenditures for all four end-use sectors, and ranked first. By 2007, transportation sector expenditures of $3.775 billion in nominal dollars had risen to 52.1 percent among all sectors, and it still ranked first among the four end-use sectors.

Electric Utilities

Information in this section consists exclusively of supply, demand, conservation and need by the state's electric utilities.

Energy Supply

2007. In 2007, 60.98 percent of the electric



Sources: State Energy Data Report. Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE.

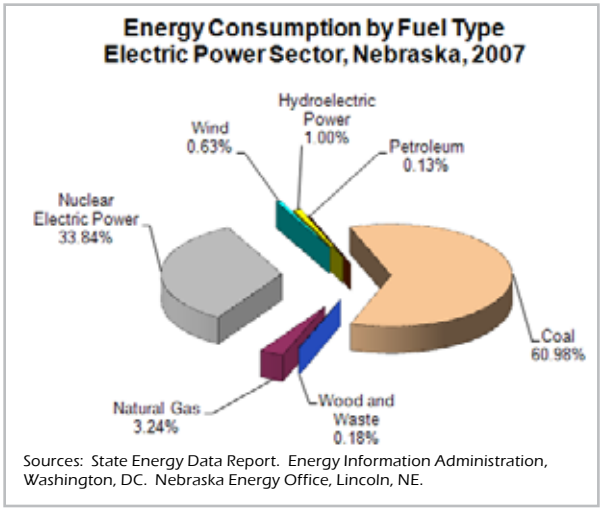
"One knowledgeable utility board member predicted that smart grid technology could save up to half of the energy currently wasted because of outdated transmission infrastructure."

Western Nebraska transmission line.

utilities energy supplies came from coal, 208.6 trillion British thermal units out of a total of 342. trillion British thermal units. The second most used fuel in this sector, nuclear, supplied 33.8 percent, or 115.8 trillion British thermal units. Three lesser fuel sources supplied nearly all the balance: hydropower, 1.0 percent, or 3.4 trillion British thermal units; natural gas, 3.2 percent, or 11.0 trillion British thermal units; and wind, approximately 0.63 percent, or 2.1 trillion British thermal units.

Generally, supplies of these fuel types have been readily available to consumers served by the state's electric utilities.

1960-2007. Trends in fuel types used by the state's electric utilities illustrate how the industry has evolved over 46 years. In 1960, more than 63 percent of the electricity generated came from natural gas, with hydropower and coal supplying most of the balance. The experimental nuclear reactor that was located at Hallam only operated between 1963-1964 and generated only marginal amounts of power before being deactivated. Coal use in this sector peaked in 2005 at 220.7 trillion British thermal units, natural gas used peaked in 1973 at 53.1 trillion British thermal units, nuclear power use peaked in 2007 at 115.8 trillion British thermal units, hydropower peaked in 1999 at 17.5 trillion British thermal units and wind use peaked in 2006 at 2.6 trillion British thermal units.



Sources: State Energy Data Report. Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE.

Demand

2007. The demand in the state's electric utility sector in 2007 totaled 342.2 trillion British thermal units, an increase of 2.7 percent, or 9.0 trillion British thermal units, over 2006 demand.

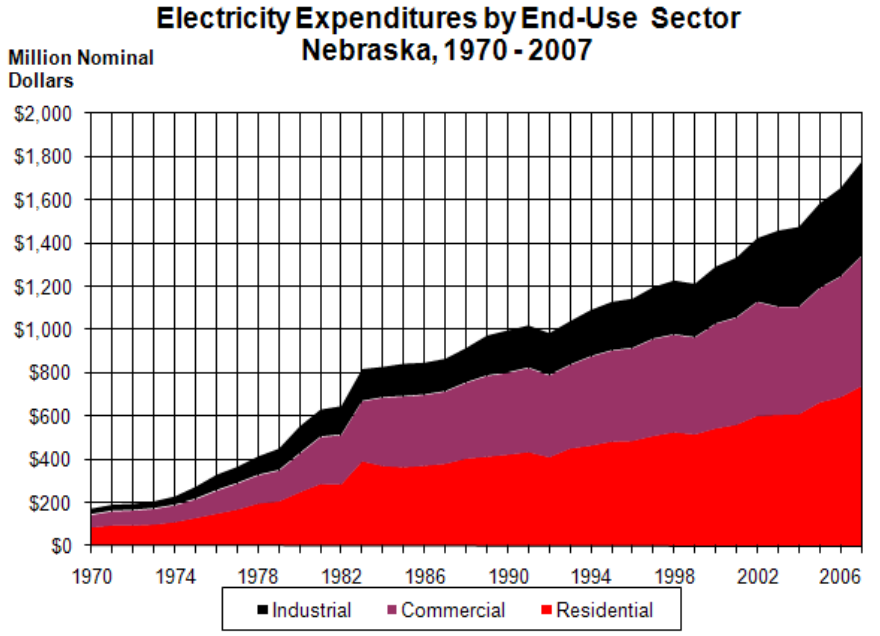
Electricity purchases generated by hydropower for Nebraska utilities from the Western Area Power Administration in 2008 totaled 2.035 million megawatt hours at an average price of .0298 cents per kilowatt hour. The total cost of the power purchased in 2008 was $60.6 million. In 2007, the amount of power provided from Western Area Power Administration met seven percent of the electricity demand in the state

1960-2007. In 1960, the state's electric utilities demand was 50.2 trillion British thermal units. By 2007, the demand in this sector had increased to nearly seven-fold to 342.2 trillion British thermal units.

Conservation

Energy efficiency efforts in the electric utility sector generally result from technological advances in the generation and transmission of power.

One on-going target of efficiency improvements is reducing electricity transmission line losses. While technological breakthroughs can lessen the problem, other improvements can be made. Local utilities estimate standard line loss at seven percent, but in some cases actual losses can be considerably higher — more than double the



Sources: State Energy Price and Expenditure Report. Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE.

seven percent – if preventative maintenance is not performed on a regular basis on utility lines. An example of future technologies being developed: The copper wires used in typical transmission lines lose a percentage of the electricity passing through them because of resistance, which causes the wires to heat up. But "superconductive" materials have no resistance, and if they are used to transmit electricity in the future, very little of the electricity will be lost.

Another transmission technology in development by the U.S. Department of Energy's Office of Electric Delivery and Energy Reliability is overhead conductors. Research is underway on a high-strength, high temperature overhead conductor, called the Aluminum Conductor Composite Reinforced, which can increase the current-carrying capacity of a transmission line by 1.5-3 times over that of conventional conductors now in use without the need for tower modification or re-permitting. Adoption of ACCR technology would lessen the need for new transmission lines in Nebraska needed to export wind generated electricity.

Smart grid technology has garnered a great deal of attention. Smart electrical grids and accompanying communications infrastructures enable end-use efficiency, and deployment of this technology in Nebraska is just getting underway, in part, because of several American Reinvestment and Recovery Act funded rural electric utility projects. One knowledgeable utility board member predicted that smart grid technology could save up to half of the energy currently wasted because of outdated transmission infrastructure. Consumer behavior, also known as demand side management, can be a source of conservation from which the electric utility sector will benefit since the cheapest kilowatt is the one that doesn't have to be produced.

Energy Need

Nebraska's electric utilities more than met its customers' needs, remaining net electricity exporters. Between 1992 and 2007, electricity exports varied from a low of 9.4 percent of generation in 1994 to a high of 23.9 percent in 1999. In 2007, 12.8 percent of the electricity generated in Nebraska was sold for use outside the state's borders, a decline of 4 percent from 2006.

Trends in price as well as efficiency gains — offset by fuel switching by customers — are expected to have an impact on energy use in this sector in the near term. If growth continues in this sector, additional generation will be needed. New base load plants — primarily coal — are currently being constructed or planned. Smaller generation asset options have also been identified, especially those using wind.

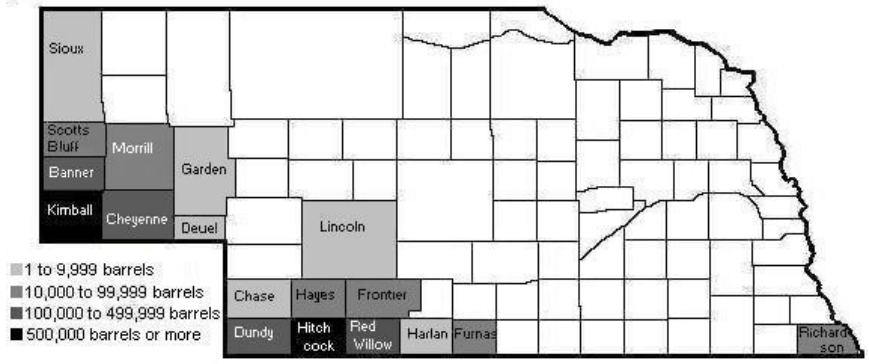
2007. In 2007, the electrical utility sector expenditures totaled $342.6 million in nominal dollars for energy, an increase of 22 percent over

2006. This increase was primarily due to an increase in the cost of natural gas. In the past five years, electric utility sector expenditures have increased by nearly $150 million in nominal dollars.

As of August 2009, the Nebraska statewide average price for all sectors from all electric utilities was the 14th lowest rate in the country at 7.83 cents per kilowatt hour. Nationally, average electricity costs 10.40 cents per kilowatt hour, about 25 percent more than it does in Nebraska.

1970-2007. In 1970, the electric utility sector spent $22.27 million in nominal dollars, less than 6.5 percent of what was spent in 2007, $342.6 million in nominal dollars. In the 37 years since 1970, coal expenditures increased from $8.47 million in nominal dollars to $183.3 million in nominal dollars in 2007, natural gas from $12.77 million in nominal dollars to $97.8 million in nominal dollars in 2007 and nuclear fuel from nothing in 1970 to $53.2 million in nominal dollars in 2007. Minimal expenditures were made for petroleum and wood and waste wood fuels.

Crude Oil Production By County in Nebraska, 2008



Sources: "Nebraska Oil Activity Summary." Nebraska Oil and Gas Conservation Commission, Sidney, NE. Nebraska Energy Office, Lincoln, NE.

"In 2008, crude oil production increased for the second year in a row by 2.5 percent over 2007 to 2.393 million barrels from 2.335 million barrels."

Oil well near Cheyenne, Nebraska

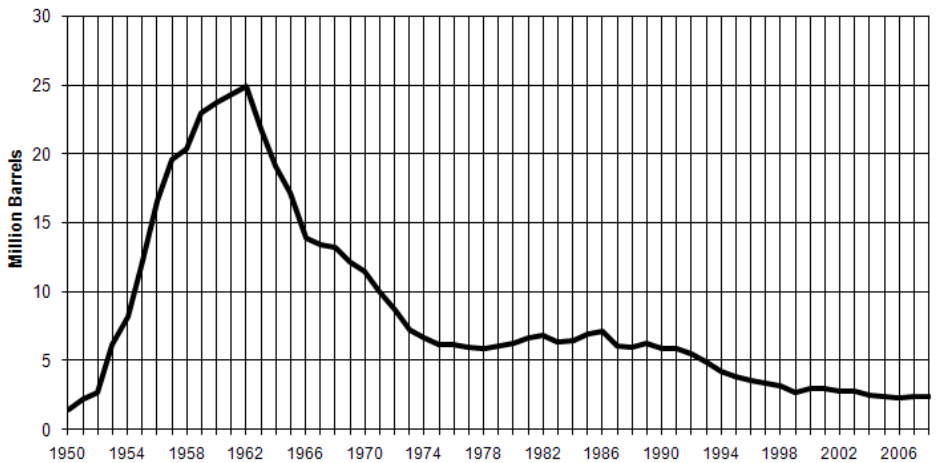
State Energy Resources Assessment

Nebraska is not a state rich in traditional fossil fuel resources.

Oil

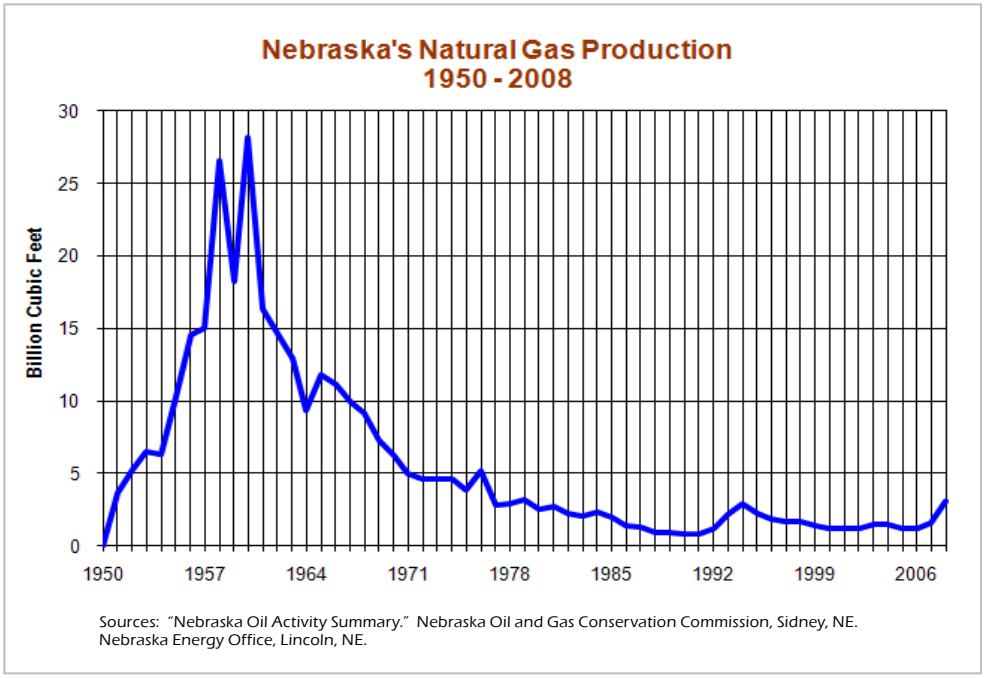
Oil has been produced in the state since 1939. Oil production peaked in 1962 at 24.893 million barrels, and has declined precipitously since that time. In 2008, crude oil production increased for the second year in a row by 2.5 percent over 2007 to 2.393 million barrels from 2.335 million

Crude Oil Production in Nebraska, 1950 - 2008



Sources: "Nebraska Oil Activity Summary." Nebraska Oil and Gas Conservation Commission, Sidney, NE. Nebraska Energy Office, Lincoln, NE.

barrels. In 2007, the Energy Information Administration estimated the state's crude oil reserves – an economic calculation – at 12 million barrels, about 1/10th of one percent of the nation's total crude oil reserves. In 2008, there were 1,123 active oil producing wells in the state. Drilling permits issued for exploratory wells (both oil and natural gas) nearly doubled from 2008 over 2007. Drilling permits for development wells increased 13 percent from 2007 to 2008.



Sources: "Nebraska Oil Activity Summary." Nebraska Oil and Gas Conservation Commission, Sidney, NE. Nebraska Energy Office, Lincoln, NE.

Production of oil in the state is concentrated in two areas: the southwest, particularly Hitchcock and county and in the Panhandle, especially in Kimball county. In 2008, these two counties produced more than half the oil mined in the state. The top five producing counties in 2008 (in rank production order: Kimball, Hitchcock, Red Willow, Dundy and Cheyenne.

In 2007, Nebraska's crude oil production represented about 5.3 percent of the petroleum products used in the state that year.

Natural Gas

Natural gas has been produced in Nebraska since 1950. Natural gas production peaked in the state in 1960 at 28.189 billion cubic feet and has declined since that time. There have been several infrequent, yet minor, increases in production over the years. In 2008, natural gas production topped 3.08 billion cubic feet, an increase of 98 percent above 2007 when only 1.559 billion cubic feet were produced. This was the largest percentage increase since 1976.

In 2007, Nebraska's natural gas production represented only one percent of the natural gas consumed in the state in that year.

Coal

The state's coal resources are insignificant and not economical to mine. However, the state's proximity to low-sulfur coal beds in the Powder River Basin in Wyoming allows Nebraska ready

access to coal resources used in the production of electricity.

Uranium

Uranium has been mined in the state since 1991 at a site near Crawford, but must be sent outside the state's boundaries for processing.

Alternatives

In Nebraska, there are five viable alternate energy sources available in the state: biomass, geothermal, hydropower, solar and wind. The U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy provides a brief overview of the state's electricity and renewable energy historical data and trends at http://apps1.eere.energy.gov/states/electricity.cfm/state=NE .

In 2007, 2.78 percent of the state's energy consumption – 19.29 trillion British thermal units out of 692.95 trillion British thermal units – was met using renewable resources according to the Energy Information Administration. This was a decline from 2006 due to a 37 percent decrease in hydroelectric power consumption.

Each year, alternative energy resources and the energy generation provided by that resource are detailed.

Biomass

In 2007, wood and wood waste, landfill gas, methane, and ethanol provided 12.88 trillion British thermal units, primarily from wood and waste which accounted for nearly 80 percent of the generation in this category. This renewable energy category increased by about 17 percent over 2006, due to growth in both wood, waste and ethanol consumption.

Biodiesel

Commercial scale biodiesel production began in Nebraska in 2006 and production was estimated to be around 2.4 million gallons in 2007. However, the price of soybeans used for feedstock seriously damaged this budding industry in the state in 2008 and both commercial scale plants in Beatrice and Scribner are closed.

Ethanol

The growing biomass energy resource in the Nebraska continues to be ethanol that is produced from corn and grain sorghum. Ethanol production began in Nebraska in 1985 when 8.5 million gallons were produced at the state's first ethanol facility in Hastings. According to the Renewable Fuels Association, as of December 2009 Nebraska has the second largest ethanol nameplate capacity (1.532 billion gallons) and the third largest ethanol operating production (1.311 billion gallons) in the nation. While ethanol production was projected to increase to 1.596 billion gallons in 2008, rising feedstock prices and unfavorable ethanol price factors made that projection attainable, but ever so briefly. Monthly production capacity data throughout 2007 and 2008 illustrate the impact on Nebraska ethanol production: March 2007, 1.345 billion gallons; July 2007, 1.460 billion gallons; August 2007, 1.745 billion gallons; January 2008, 1.765 billion gallons; December 2008, 1.583 billion gallons; January 2009, 947 billion gallons; and May 2009, 1.161 billion gallons. At one point in the cycle, ethanol production in the state was reduced by nearly half.

The state's Ethanol Board estimated that 30 percent of Nebraska's corn crop and the equivalent of three-quarters of the state's grain sorghum crop are used in the production of ethanol.

Ethanol consumption in the state comes mainly in the form of E10 blended gasoline – 10 percent ethanol and 90 percent gasoline. Smaller quantities of E85 – 85 percent ethanol and 15 percent

"Ethanol-blended fuel consumption in 2008 was 603.7 million gallons, a new historic high. Ethanol's share of the fuel market in 2008 also reached a new high: more than 73 percent of all fuel sold was an ethanol blend."

Blended Ethanol pump, Grand Island, Nebraska

gasoline – are also sold. Ethanol-blended fuel consumption in 2008 was 603.7 million gallons, a new historic high. Ethanol's share of the fuel market in 2008 also reached a new high: more than 73 percent of all fuel sold was an ethanol blend. The previous high of more than 65.5 percent was set in 2007.

Landfill Gas and Methane

A small, but slowly increasing amount of electricity is being generated from methane at former landfills, currently operating wastewater sewage plants and one livestock anaerobic digester in Butler County. Energy production from biogas resources has been tracked since 1995 when 1.06 million kilowatt hours was produced. In 2008, reporting Nebraska production facilities produced 68.46 million kilowatt hours of electricity.

Geothermal

There are two types of geothermal resources that can be utilized for energy: hydrothermal fluid resources and earth energy. According to the Energy Information Administration, there are two pockets of high-temperature hydrothermal fluid resources in the north central and northern Panhandle of the state. The Geo-Heat Center at the Oregon Institute of Technology has identified nine collocated communities in the state. A collocated community is one being within eight kilometers of a geothermal resource with a temperature of at least 50 degrees Celsius. In Nebraska, the nine towns meeting that standard are located in just four counties: Cheyenne – Brownson, Huntsman, Lodgepole, Ordville, Potter and Sidney; Keya Paha – Burton; Kimball – Kimball; and Scottsbluff – Gering. These resources might be suitable for development, but that prognosis appears unlikely in the near term.

Earth energy can be used directly to provide heat in a variety of applications, such as geothermal heat pumps and appears to offer Nebraskans the most economical and practical way to utilize this resource. Growth in the use of geothermal heat pumps that can discharge waste heat into the ground in hot weather and extract heat from the ground in cold weather appears strong and is a technology that is being promoted by the state's larger electric utilities.

In 2007, 0.115 percent of the state's total renewable energy consumption – 0.79 trillion British thermal units – came from geothermal resources and an historic high. That was a slight increase over the 0.73 trillion British thermal units in 2006.

Hydropower

The electricity consumed in Nebraska from hydropower resources came from two sources: the 11 dams in or on the border of the state and from purchases of Western Area Power Administration electricity. Usually the amount of electricity produced is relatively constant from year to year, unless affected by drought conditions or a facility is off line. As the state's energy need continues to grow, less and less of the need will be met by the relative constant amount of hydropower produced.

In 2007, 3.43 trillion British thermal units of hydropower were consumed in Nebraska which accounted for 0.496 percent of all renewable energy consumed that year, and was the lowest since recordkeeping began in 1960. The precipitous decline in hydroelectric consumption was attributed to drought conditions during that period of time. In 2006, 8.86 trillion British thermal units came from hydropower and represented 38.7 percent of the all renewable energy consumed that year.

Studies of the state's hydropower resources were conducted in 1981 and again in 1997. For the most part the studies concluded that nearly all of the potential hydro resources had been developed, and that even under the most optimistic scenarios, less than 150 MW of additional power

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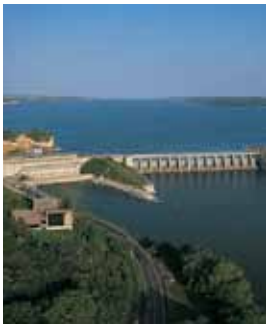

Gavins Point Dam in Northeastern Nebraska.

could be produced from existing or new hydro resources. It is appears unlikely that any additional hydropower resources will be developed within the foreseeable future.

Solar

According to an assessment by the Energy Information Administration, Nebraska has "good" solar resources, especially in the western part of the state. Nebraska is ranked 19th among the states with the greatest energy potential from solar power, according to the National Renewable Energy Laboratory.

There are two types of solar collectors: concentrating collectors and flat panels. Solar collectors are simply flat panels that can be mounted on a roof or on the ground. Called flat plate collectors, these are typically fixed in a tilted position correlated to the latitude of the location. This allows the collector to best capture the sun. These collectors can use both the direct rays from the sun and reflected light that comes through a cloud or off the ground. Because they use all available sunlight, flat plate collectors are the best choice for many northern states such as Nebraska. For flat plate collectors, Nebraska has good, useful resources throughout the state. For concentrating collectors, Nebraska has useful resources for many technologies, especially in the western region of the state.

Presently, solar technologies are marginally deployed in great part because it is difficult for solar technologies to be cost competitive with the state's low electric rates. Where solar does make sense economically are in meeting the needs of cattle ranchers in remote regions where photovoltaic systems are less expensive than installing new transmission lines. Omaha Public Power District has operated two solar photovoltaic panels at its Elkhorn facility since 2002. In 2007-2008, 5,899 kilowatt hours were produced from these panels.

In 2007, solar energy accounted for .03 trillion British thermal units of all renewable energy consumed in the state, the same amount as in 2006.

Wind

The U.S. Department of Energy's Wind Powering America program indicates that Nebraska has wind resources consistent with utility-scale production of electricity. Maps of the state's wind resources at different heights are located at http://www.neo.ne.gov/renew/wind.htm as well as a wealth of other wind informational tools. Other wind energy assessments have suggested the state could produce as much as 7,800 MW of new electricity from wind resources annually. The American Wind Energy Association ranks the state 6th in the nation with the greatest wind energy potential. Another study has placed Nebraska 3rd in wind energy potential.

In 2009, 384.5 million kilowatt hours were generated by wind energy in Nebraska. The increase in generation is attributable to the opening of Elkhorn Ridge at Bloomfield in March 2009. Nebraska has 73 operational turbines with a total capacity of 71.88 megawatts. The average annual output from the turbines is sufficient to provide power to about 46,500 homes for a year. A complete list of sites and generation is available at http://www.neo.ne.gov/statshtml/89.htm .

Omaha Public Power District and Nebraska Public Power District have each selected wind projects in Richardson County (60 megawatts) and Petersburg (80 megawatts), respectively. Both projects would likely begin operation in 2011. Nebraska Public Power District is also considering an 80 megawatt project near Broken Bow that would become operational in 2012.

"In 2009, 384.5 million kilowatt hours were generated by wind energy in Nebraska. The increase in generation is attributable to the opening of Elkhorn Ridge at Bloomfield in March 2009."

Wind turbine near Springview, Nebraska.

ESTIMATED ENERGY CONSUMPTION REDUCTION

In 2007, wind energy produced 2.14 trillion British thermal units, less than one-half of one percent of all energy consumed in Nebraska and slightly less than produced in 2006.

As of December 2009, the state ranked 24st among all states in installed wind energy capacity with 153 megawatts and 42 megawatts under construction according to the American Wind Energy Association.

Estimated Energy Consumption Reduction

Several evaluations have been conducted by the Energy Office that quantified energy consumption reductions that resulted from activities sponsored by the agency:

- A typical home weatherized under the agency's federally-funded program achieves a 25 percent or greater reduction in space heating needs, and saves an estimated $152 a year in energy costs.
- Replacement natural gas fueled furnaces installed and financed with Dollar and Energy Saving Loans from the agency realized a 10.7 percent reduction in energy use for 80 percent efficient furnaces and a 19.2 percent reduction in energy use for 90 percent efficient furnaces.

Status of Ongoing Studies

The Nebraska Energy Office had no ongoing studies underway during this period.

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