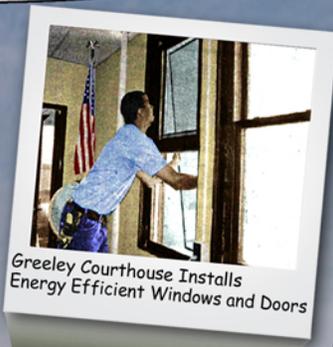


2011 ANNUAL REPORT

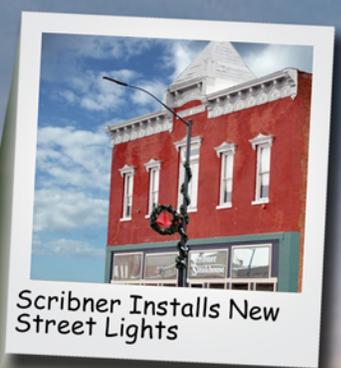
Nebraska Energy Office



Springview's New Direct-Drive Wind Turbines



Greeley Courthouse Installs Energy Efficient Windows and Doors



Scribner Installs New Street Lights



4,555 Nebraska Homes Weatherized



Tecumseh Installs New LED Street Lights



Mid-Plains Community College's New, 94% Efficient, Condensing Boiler in North Platte



LED Street Lights Installed in Superior



Saline County Courthouse Replaces 72 Windows



neo.ne.gov

T A B L E O F C O N T E N T S

This *Annual Report* is organized into three sections:

- Federal and state recurring programs, including Oil Overcharge funds
- *American Recovery and Reinvestment Act of 2009* programs
- Energy Trends and Needs

American Recovery and Reinvestment Act-funded activities are reported separately from annual federally-funded programs — some of which have the same program name — because they are reported separately, monitored and subject to compliance provisions in the *Davis-Bacon Act*, *Buy American Act*, *National Environmental Policy Act of 1969*, and *National Historical Preservation Act* and the funds cannot be co-mingled with any other programs.

The Programs

Low Income Weatherization Assistance Program.....	1
Oil Overcharge Funds	4
State Energy Program.....	7
Financial Activity	9

American Recovery and Reinvestment Act

Low Income Weatherization Assistance Program.....	11
State Energy Program.....	12
Energy Efficiency and Conservation Block Grants	20
State Energy Efficiency Appliance Rebate Program	26
Enhancing State Government Energy Assurance Capabilities and Planning for Smart Growth.....	27
Building Energy Code – Adoption, Training and Compliance	28

Trends and Needs

State-wide Energy Need and Cost.....	29
Agricultural.....	33
Commercial	37
Residential	39
Industrial	42
Transportation.....	45
Electric Utilities	48
State Energy Resources Assessment.....	52
Estimated Energy Consumption Reduction	56
Ongoing Studies.....	56



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 annually-funded federal and state programs. These programs are:

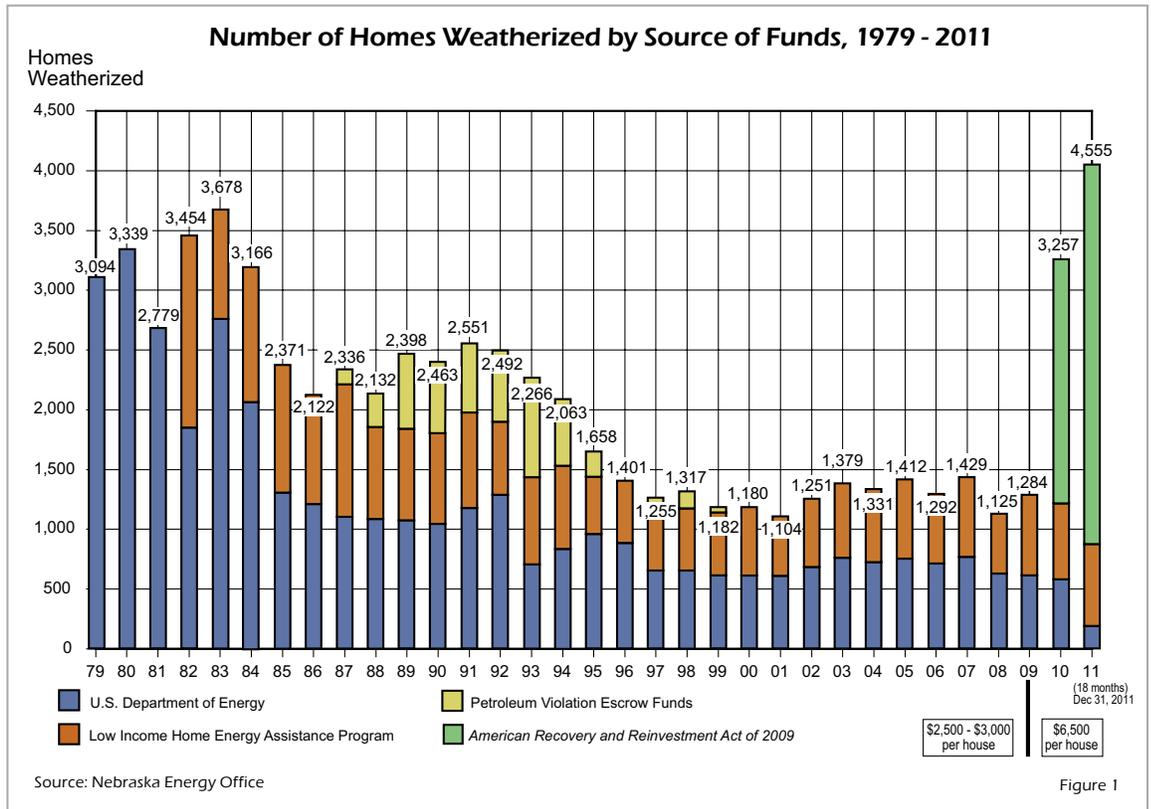
- ❖ Low-income Weatherization Assistance Program
- ❖ State Energy Program and special projects
- ❖ Oil overcharge-funded activities, primarily Dollar and Energy Saving Loans
- ❖ Statutorily-required state activities such as data collection and reporting.

An overview of the 2010-2011 financial activity appears at the end of this section. The period covered by this report is from July 1, 2010 to June 30, 2011, except where noted.

Low Income Weatherization Assistance Program

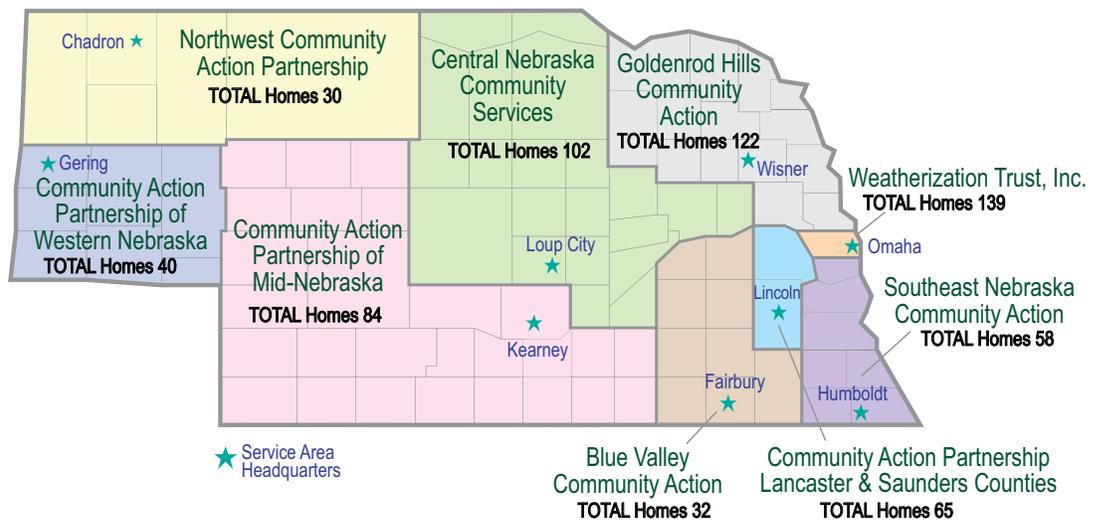
The Energy Office administers the federally-funded program for weatherizing homes to save energy and money for those with limited incomes. The agency is responsible for inspect-

ing 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 crews or private contractors are responsible for completing the work on the homes. The Energy Office staff



LOW INCOME WEATHERIZATION ASSISTANCE

**Total Nebraska Homes Weatherized by Type and by Area Provider
July 2010 - June 2011**



Source: Nebraska Energy Office

TOTAL 672 Homes Weatherized

Figure 2

“ Since the Weatherization Assistance Program began in 1979, \$123.96 million has been spent to make energy efficiency improvements in 64,441 homes. ”



A contractor installs attic insulation during weatherization work.

inspects a minimum of 30 percent of all completed homes to ensure the quality of work performed.

This program received funding from two sources: \$1,713,561 from the U.S. Department of Energy’s Low Income Weatherization Assistance Program and \$3,864,042 from the Low-Income Home Energy Assistance Program — a total of \$5,577,603. 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.

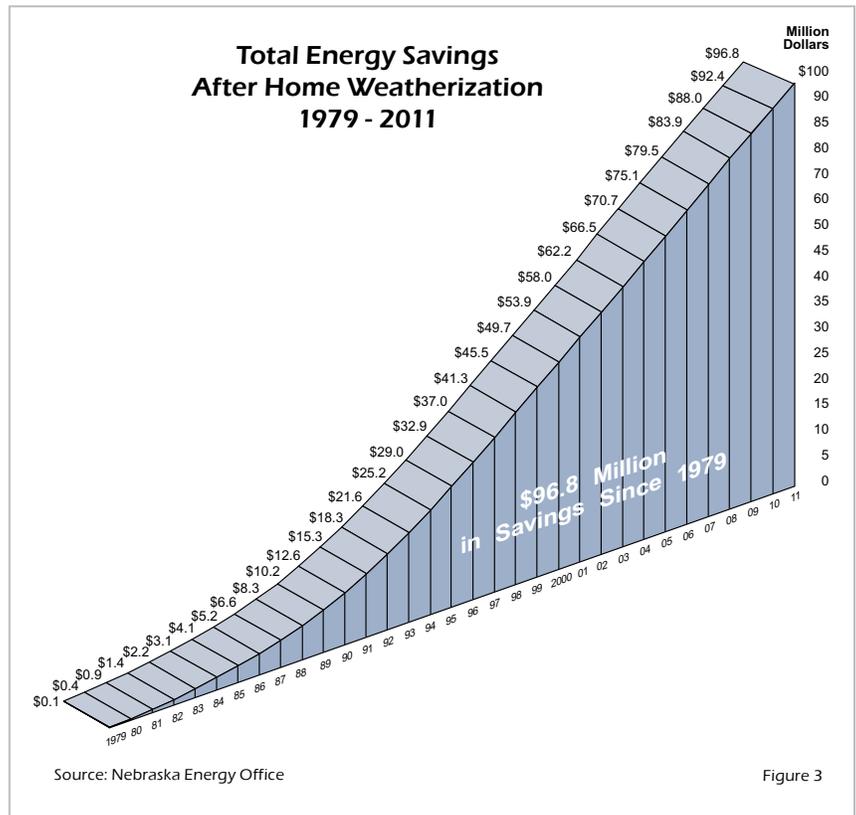
In 2010-2011, 672 homes were weatherized with the federal funds as illustrated in figure 2. The types of improvements may vary based on

an analysis of the home and averages between \$4,000 and \$6,500 per home, excluding the cost of health and safety improvements such as furnace repairs. Prior to mid-2009, the average amount spent on homes ranged from \$2,500 to \$3,000. The kinds of improvements made to homes vary by the home type: frame, mobile or multi-family. In a frame home, the most common improvements generally are: adding insulation to attics and walls, insulating box sill areas and crawl spaces, replacing or repairing the furnace, and replacing a primary door. In mobile homes, the most frequent improvements are: replacing a primary door, replacing a primary window, replacing or repairing the furnace, insulating the underbelly and

LOW INCOME WEATHERIZATION ASSISTANCE

replacing or repairing the water heater. In multi-family homes, the two most common improvements are: adding insulation to the attic and replacing a primary window. Most homes that are weatherized also receive low-cost improvements such as caulking, weatherstripping, pipe wrap and, in some instances, water heater jackets.

Since the Weatherization Assistance Program began in 1979, \$123.96 million has been spent to make energy efficiency improvements in 64,441 homes. In 2010, maximum household income levels were revised to 200 percent of the federal poverty guidelines, making free home weatherization available to thousands more Nebraskans than last year.



Energy savings resulting from the energy efficiency improvements made typically last 20 years or longer. Conservatively, estimated savings for the 30 years total \$96.8 million. About \$4.4 million in new savings accrue annually as a result of the improvements made as illustrated in Figure 3.

O I L O V E R C H A R G E F U N D S

Oil Overcharge Funds

Beginning in 1982, Nebraska 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 from 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

“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.”

**Nebraska Energy Settlement Fund
A Summary of Exxon, Stripper Well and Diamond Shamrock
Oil Overcharge Funds as of June 30, 2011**

	Exxon	Stripper Well	Diamond Shamrock	Total
Funds Received	\$15,504,944	\$15,674,042	\$359,172	\$31,538,158
Interest Earned and Miscellaneous Income	\$11,947,123	\$10,184,354	\$253,207	\$22,384,684
Total	\$27,452,067	\$25,858,396	\$612,379	\$53,922,842
Funds Budgeted	\$27,106,030	\$25,763,008	\$612,379	\$53,827,454
Low Income Designated	\$0	\$14,551	\$0	\$14,551
Uncommitted Balance	\$0	\$80,837	\$0	\$80,837

Source: Nebraska Energy Office

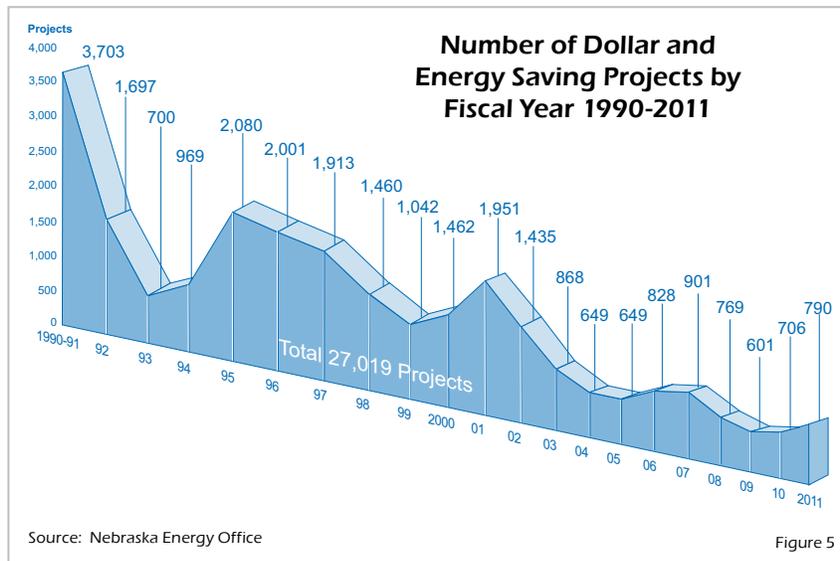
Figure 4

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 and in 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. In 2009, \$11 million in *American*



O I L O V E R C H A R G E F U N D S

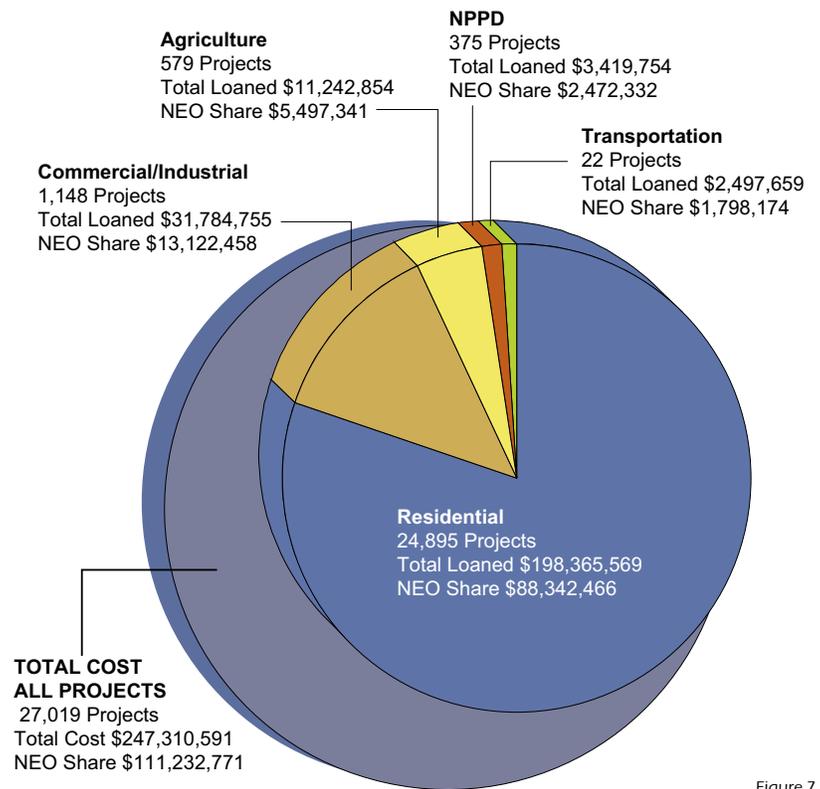
The balance, more than \$29.717 million, was spent by the borrowers on non-eligible related improvements. These totals do not include loans financed with *American Recovery and Reinvestment Act* funds.

Loans have financed projects in all of the state's 93 counties as illustrated in Figure 6. Douglas County with 3,200 projects totaling \$26.01 million tops the list with the most projects. Lancaster County co-anchors the top spot with the most dollars invested at \$33.01 million, albeit on fewer projects – only 1,789. Looking at a regional perspective, the Third Congressional District leads with 13,491 projects; First Congressional District with 9,515 projects and the Second Congressional District with 4,013 projects.

During this reporting period, 790 new projects were financed. The number of energy efficiency projects financed since 1990 are shown in Figure 5 and total 27,019.

Figure 7 quantifies loans in five different areas: residential, commercial/industrial, agriculture, transportation and Nebraska Public Power District. The number of projects by category and the total amount of the loans in each category also appear in Figure 7. Sev-

Oil Overcharge Funds Invested In Types of Dollar and Energy Saving Loan Projects as of June 30, 2011



Source: Nebraska Energy Office

Figure 7

eral of the largest categories are detailed as follows:

Residential

More than 92.0 percent of all the energy efficiency projects financed with loans from the agency are in the homes of Nebraskans. More than 80.2 percent of funds from all sources – \$198.36 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 insula-

“More than 92.0 percent of all the energy efficiency projects financed with loans from the agency are in the homes of Nebraskans.”



This Pride-built home is one of three energy efficient homes sponsored by the Nebraska Energy Office

S T A T E E N E R G Y P R O G R A M

tion of walls and ceilings. New energy efficient housing is also included in the category. Since 1990, 24,895 residential energy efficiency projects have been undertaken by Nebraskans.

Commercial/Industrial

More than 12.85 percent of funds from all sources – \$31.78 million – has been used to make building and system improvements in 1,148 projects since 1990, ranking second-highest among all loan areas. Typical improvements in this category include replacement of heating and cooling equipment, installation of insulation, lighting upgrades and replacement of doors and windows.

Agriculture

Improvements in agricultural equipment and systems rank third in the use of low-interest financing. More than 4.54 percent of all improvement funding – \$11.24 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, 579 projects have been financed with \$5.49 million from the Energy Office, \$5.36 million from participating lenders and \$384,002 from borrowers.

State Energy Program

In 2010-2011, Nebraska received \$241,000 for this federally-funded effort and supplied \$48,200 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 (www.neo.ne.gov/statshtml/

[index3c.html](#)) and agency website (www.neo.ne.gov).

These funds also provide program support for a wide array of activities that include energy shortage tracking and 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 affordable housing plans to ensure compliance with the Nebraska Energy Code. Periodically, the agency performs on-site inspections of completed homes, to verify compliance as a stipulation of the funding source.

Other Projects

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.

30% Better – Nebraska's Advanced Commercial Building Energy Code

In 2008, the Energy Office was awarded a \$303,065 State Energy Program Special Projects grant to work to establish a commercial building code that is 30 percent beyond the building and lighting requirements set forth in ASHRAE 90.1-2004 and 2006 International Energy Conservation Code and a code that meets the mechanical system requirements of the Energy Star® program or the consortium for energy Efficiency's High-Efficiency Commercial Air Conditioning and Heat Pump Initiatives. Nebraska will not develop its own commercial

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

building energy code, but will expand on existing standards and energy efficiency programs with the intent on becoming an early adopter and implementer of the advanced building proposals and design guides currently being considered by the ASHRAE and International Code Council.

The project has three primary tasks: 1) evaluate the components that would comprise a commercial code 30 percent above current standards, 2) work to adopt such a commercial building energy code that would accomplish that goal, and 3) schedule and host a regional conference that demonstrate how other states and localities can achieve similar success with upgraded codes and enhanced enforcement techniques.

In November 2009, the Energy Office released a Nebraska-specific Advanced Commercial Building Energy Code Study (on the web at www.neo.ne.gov/home_const/iecc/documents/NebraskaEnergyStudyFinalReport.pdf) that met the objectives of the first task.



2009 IECC and ASHRAE 90.1-2007: Adoption Training workshop, Lincoln, November, 2011

As part of Task Two, the agency established the 26-member Building Codes Advisory Council to provide advice on codes adoption, training and education and support for Task Three, a regional codes conference being held in the Fall of 2012.

The work on this grant continued throughout the reporting period and will conclude in 2012.

State Heating Oil and Propane Program

Between July 1, 2010 and June 30, 2011, the Energy Office began its tenth 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 website (www.neo.ne.gov/statshtml/86.html and www.neo.ne.gov/statshtml/87.html).

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.

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

Nebraska Energy Extension Partnership – Agricultural Efficiency Nexus: Energy, Water and Food

With this U.S. Department of Energy grant, the Energy Office will work cooperatively with University of Nebraska Extension in several areas:

- Expand the water management demonstration network,
- Develop methodology for an irrigation energy efficiency rating system and
- Expand building energy codes and weatherization consumer education.

This competitive State Energy Project Special Projects funded grant was awarded \$186,195 in September 2011. This project is scheduled to be completed in 2013.

Financial Activity

Funds Received

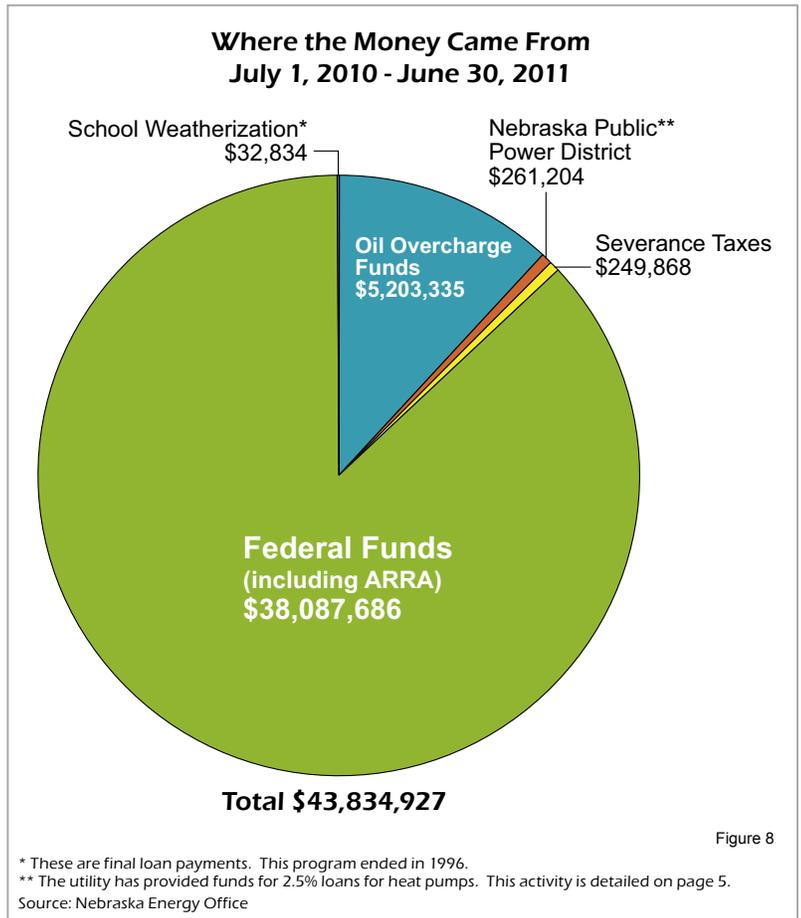
In 2010-2011, funds received by the Nebraska Energy Office totaled \$43,834,927 which includes monies from federal, state, oil overcharge trust and miscellaneous funding sources. Funding increased by \$21.97 million from the previous fiscal year, primarily because of receipt of *American Recovery and Reinvestment Act* funds.

The sources of funding for the agency are illustrated in Figure 8. More

than 86.8 percent of all funds, \$38,087,686, came from federal sources:

- Low-Income Weatherization Assistance Program
- Low-Income Home Energy Assistance Program
- State Energy Program and
- *American Recovery and Reinvestment Act* including additional funding for the Weatherization Assistance and State Energy Programs, Energy Efficiency, Conservation Block Grants and Appliance Rebates.

Oil Overcharge trust funds declined as a percentage of all funds from 16.7 percent in 2010, to 11.8 percent in 2011.



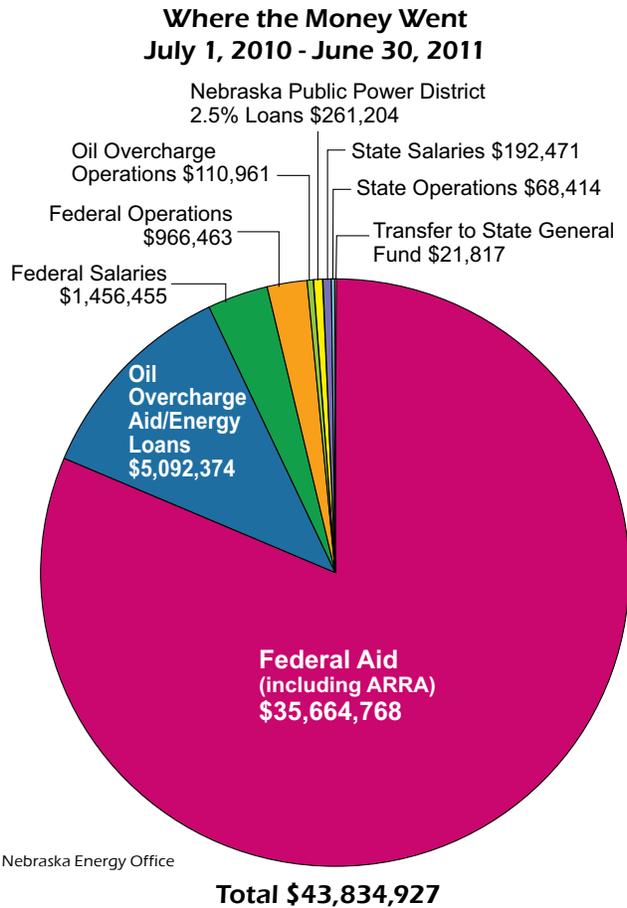
F I N A N C I A L A C T I V I T Y

Funds Spent

More than 81.3 percent of all agency funds were spent as federal aid under the Weatherization Assistance Program as grants to nine local agencies, Dollar and Energy Saving Loans paid to local banks for eligible projects, State Energy Program projects, Energy Efficiency and Conservation Block Grants and Appliance Rebates using *Recovery Act* funds. Federal aid expenditures were 72.4 percent in 2010. Federal aid received by the agency is spent for federal program-specific activities.

A complete listing of expenditures by category is illustrated in Figure 9.

Oil overcharge fund activity during the reporting period is located on page 4 of this report. *American Recovery and Reinvestment Act* fund activity during the reporting period begins on page 11.



Source: Nebraska Energy Office

Figure 9



AMERICAN REINVESTMENT AND RECOVERY ACT

In 2009, Congress passed the *American Recovery and Reinvestment Act* providing the largest single increase for energy efficiency programs. Funding under *the Recovery Act* was directed to five programs totalling \$84,222,593. Below is a breakdown of funds in the five programs:

- Low Income Weatherization Assistance Program \$41,644,458
- State Energy Program \$30,910,000
- Energy Efficiency and Conservation Block Grants \$ 9,593,500
- State Energy Efficiency Appliance Rebate Program \$ 1,711,000
- Energy Assurance Capabilities and Planning for Smart Grid \$ 363,635

In November 2010, another *American Recovery and Reinvestment Act* grant was received:

- Building energy code assistance for designers, builders and code officials \$276,417

The activities in each program from receipt of the grant through February 1, 2012, (except where noted otherwise) are detailed below. The U.S. Department of Energy has oversight of the funds and issued regulations and guidelines for the states to follow.



Low Income Weatherization Assistance Program

The Low Income Weatherization Assistance Program, as a part of the *Recovery Act*, received \$41.6 million from April 2009 to March 2012. The *Recovery Act* funding is to scale-up existing

Subgrantee Allocations May 19, 2009		Subgrantee Progress as of December, 2011 Updated February 6, 2012		
Subgrantee	Contract Amount	Minimum Number of Homes to be Weatherized	Number of Homes Weatherized	Dollars Spent*
Blue Valley Community Action	\$2,155,007	249	216	\$1,782,975.76
Central Nebraska Community Services	\$4,537,623	536	484	\$3,715,273.74
Goldenrod Hills Community Action	\$4,531,004	535	508	\$2,870,524.92
Community Action Partnership of Lancaster and Saunders	\$4,378,781	517	242	\$2,028,550.82
Community Action Partnership of Mid Nebraska	\$5,077,021	601	575	\$4,239,725.40
Northwest Community Action Partnership	\$1,254,907	140	177	\$1,050,681.02
Community Action Partnership of Western Nebraska	\$1,777,758	203	215	\$1,723,181.76
Southeast Nebraska Community Action Council	\$2,082,204	240	265	\$1,939,424.99
Weatherization Trust Inc.	\$8,197,586	979	1,052	\$6,996,956.62
Energy Office Administration	\$1,233,141			\$416,079.95
Training, Evaluation and Technical Assistance	\$4,567,183			\$1,026,505.06
• Weatherization Training Development and Delivery, Metropolitan Community College \$565,626 plus \$36,000 cost share	\$565,626			\$124,500.07
• Weatherization Training Development and Delivery, Central Community College \$787,148	\$787,148			
• Evaluation of Weatherization Assistance Program, University of Nebraska-Lincoln \$499,469	\$499,469			\$177,646.44
TOTAL	\$41,644,458	4,000	3,734	\$28,092,026.55

* Weatherization providers submit requests for reimbursement for the previous month's production. Reimbursement requests are reviewed by agency staff for program compliance and allowable costs for materials and equipment in each unit.

AMERICAN REINVESTMENT AND RECOVERY ACT

weatherization efforts in the state, create jobs, reduce carbon emissions and save money for low-income families by improving energy efficiencies. Nebraska's plan is to weatherize 4,000 homes across the state. Households with annual income at or below 200 percent of the federal the poverty level are eligible for assistance.

In May 2009, the state submitted a plan for use of the Weatherization Assistance Program funds that projects the estimated number of houses that will receive energy efficiency improvements and the amount of funding each service provider will receive. A summary of that plan is available on the agency website (www.neo.ne.gov/ARRA/documents/ARRAsubgrantee2.pdf).

The table on page 11 depicts the subgrantees' progress. Updated data appears monthly on the agency website showing total production and funds expended by each provider.



State Energy Program

Under the *Recovery Act*, Nebraska received \$30,910,000 in State Energy Program funds to be spent from 2009 through April 2012. 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

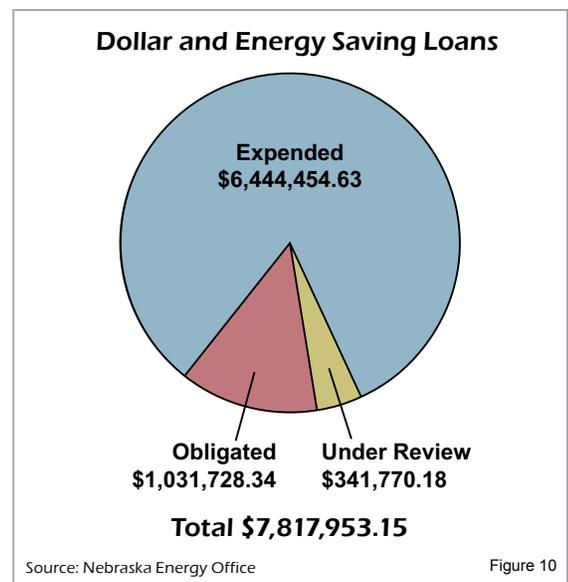
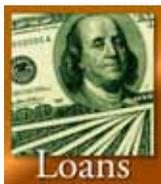
Recovery Act Funds: \$11,000,000 Leveraged Funds: \$4,000,000

The Nebraska Energy Office operates the Dollar and Energy Saving Loan program, a revolving loan program for Nebraskans to make energy efficient improvements in homes, farms, ranches, business, industrial, alternative fuel vehicles, schools and others. The loan program is operated with the state's financial institutions. The Energy Office invests in these loans by purchasing 50 to 75 percent of the loan at zero interest, which lowers the interest rate to the borrower to 5 to 2.5 percent, respectively, and leverages lender funds of 25 to 50 percent of each loan. Loans are available at more than 914 lending sites across the state.

With \$11 million in existing funds, the Energy Office raised the existing loan pool to \$36 million. The interest rate was lowered to 2.5 percent and the loan limit on a case-by-case basis has been lifted from the \$750,000 cap.

As of February 1, 2012, \$6,444,454.63 was expended for loans, \$1,031,728.34 was obligated to projects and another \$341,770.18 was pending review by agency staff. Total of all obligated and committed loan funds is \$7,817,953.15. Eligible loans must meet the following requirements:

- *Buy American*
- *Davis-Bacon Act*
- *National Environmental Policy Act of 1969*
- *National Historic Preservation Act*



AMERICAN REINVESTMENT AND RECOVERY ACT

Advanced Renewable Energy Projects

Recovery Act Funds: \$3,508,095.13 Leveraged Funds: \$4,560,697.07

The objectives of the Advanced Renewable Energy Project are to:

- Increase renewable energy generation in Nebraska
- Demonstrate the use of renewable energy technology in new ways
- Deploy cutting edge renewable technologies
- Generate energy from renewable resources on or before March 2012
- Avoid greenhouse gas emissions
- Leverage funds and create jobs.

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 were reviewed for State Energy Program compliance and suitability under the *National Environmental Policy Act* by the U.S. Department of Energy. The projects listed below were selected for funding after technical review and federal approval was received.

Advanced Renewable Energy Project Grants						
Applicant	Renewable Energy Type	Project Location	Contract Amount	Match Amount	Total Project Cost	Funds Expended as of February 1, 2012* Updated February 6, 2012*
AGP Corn Processing, Inc.	Biomass	Hastings/Adams County	\$275,000	\$50,000	\$325,000	\$247,500.00
Allen Fleischman	Solar	Tekamah/Washington County	\$106,250	\$17,000	\$123,250	\$95,625.00
Bluestem LLC	Wind	Springview/Platte County	\$2,300,000	\$4,338,000	\$6,638,000	\$2,300,000.00
David DeBoer	Solar	Ft. Calhoun/Washington County	\$11,223	\$1,981	\$13,204	\$10,611.60
Design Plastics, Inc.	Wind	Omaha - Fremont/Douglas - Dodge Counties	\$148,000	\$26,800	\$174,800	\$79,526.38
Ho-Chunk CDC	Solar	Winnebago/Thurston County	\$249,780	\$43,400	\$293,180	\$202,599.87
Morrissey Engineering	Solar	Omaha/Douglas County	\$72,884	\$12,862	\$85,746	\$72,883.60
NE Public Power District	Solar	Norfolk/Pierce County	\$344,958.13	\$70,654.07	\$415,612.20	\$344,958.13
TOTALS			\$3,508,095.13	\$4,560,697.07	\$8,068,792.20	\$3,353,704.58

** Some of these projects are complete, but payment claims have not been submitted to the agency. Some projects are awaiting shipment of materials to begin construction. Total expenses indicated in the chart are based on a cost-reimbursement basis. For each project, five percent is withheld until all contractual obligations, including monitoring of the project by agency staff, have been completed.*

AMERICAN REINVESTMENT AND RECOVERY ACT

Renewable Energy Curriculum

Recovery Act Funds: \$1,910,000

The objectives are to:

- Develop renewable energy curricula for use at Nebraska technical community colleges
- Create new jobs and increase productivity to spur economic growth and community development by providing training and instruction in renewable energy methods and technologies
- Implement renewable energy curricula that will result in increased energy generation from renewable technologies in Nebraska
- Evaluate and assess the outcomes and impact of the renewable energy climate.

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. As shown in the table, five community colleges — Central, Mid-Plains, Northeast, Southeast and Western — combined their curricula efforts. Current course offerings are listed at <http://www.neo.ne.gov/careers/energycareers.htm>

Renewable Energy Curricula				
Eligible Entities	Contract Amount	Cost-Share and other Amount	Total Project Cost	Funds Expended as of February 1, 2012* Updated February 6, 2012
Central Community College	\$1,591,665	(cost-share) \$47,369 (other) \$205,876	\$1,844,910	\$348,463.66
Mid-Plains Community College				
Northeast Community College				
Southeast Community College				
Western Community College				
Metropolitan Community College	\$318,333	\$76,000	\$394,333	\$135,861.24
TOTALS	\$1,909,998	\$329,245	\$2,239,243	\$484,324.90

** Payment for each project's costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.*

Building Energy Code Training and Enforcement

Recovery Act Funds: \$199,838.20 Expended: \$75,496.12 as of January 31, 2012

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.

AMERICAN REINVESTMENT AND RECOVERY ACT

State Building Energy Efficiency

Recovery Act Funds: \$ 11,491,904.87

- \$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.
- \$452,800 for EPA ENERGY STAR® benchmarking of up to 1,000 public school buildings and investment grade audits for a selected portion of participating schools.

Projects listed below and on the next pages have been selected for funding and detail the amount allocated and spent.

University of Nebraska Campuses					
Applicant	Project Location	Project Details	Contract Amount	Total Project Cost	Funds Expended as of February 1, 2012* Updated February 6, 2012
University of Nebraska Medical Center	Energy Efficient Building Retrofits	Upgrade Chilled Water and Heating, Ventilating and Cooling Systems	\$860,000	\$4,750,000	\$771,977.26
University of Nebraska Lincoln	Energy Efficient Building Retrofits	Install Occupancy Sensors to Control Lights and Heating Ventilating and Cooling Systems in 12 UNL Buildings	\$339,050	\$686,100	\$94,566.24
	Hamilton Hall Energy Efficient Retrofits	Replace 16 Constant-Volume Lab Hoods with Variable-Volume Hoods	\$92,240	\$186,900	
	Scott Engineering Center	Convert Constant-Volume Dual Duct System to Variable-Volume	\$319,918	\$629,830	\$53,189.50
	Othmer Hall	Room Occupancy Sensors and Room Controls Upgrade	\$145,990	\$295,800	\$5,832.31
	Beadle Center, Bessey Hall and Home Economics Buildings	Upgrade Fluorescent Lights	\$80,261	\$164,629	\$80,260.80
Nebraska College of Technical Agriculture Curtis	Biomass Boiler	Install New Biomass Boiler and Steam Lines to Campus Buildings	\$400,000	\$1,530,700	\$114,436.45
University of Nebraska at Omaha	Allwine Hall. Replace Windows	Replace Windows	\$308,300	\$440,300	\$246,897.81
	Eppley Administration Building	Replace Windows	\$334,000	\$454,000	\$252,665.95
University of Nebraska at Kearney	Mantor Hall	Replace Windows	\$216,000	\$486,200	\$154,170.93
	Randall Hall	Replace Windows	\$120,001	\$256,192	\$87,755.31
	Cushing/Ryan Library	Replace Lighting in Cushing Coliseum and Ryan Library	\$75,040	\$95,040	\$32,150.00
	Chilled Water Controls	Install Chilled Water Controls in Various Buildings	\$282,000	\$679,200	\$45,325.00
\$3,600,000 Available			TOTALS	\$3,557,341	\$10,654,891
<p><i>* Projects in governmental and educational buildings are more complex and generally lengthy in duration. Payment for project costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.</i></p>					

AMERICAN REINVESTMENT AND RECOVERY ACT

State College Campuses**					
Applicant	Project Location	Project Details	Contract Amount	Total Project Cost	Funds Expended as of February 1, 2012* Updated February 6, 2012
Peru State	Library/Student Center	ECO 24/7 Study and Implementation of Recommended Projects	\$197,259	\$197,259	
Wayne State	Bowen Hall	ECO 24/7 Study and Implementation of Recommended Projects	\$300,000	\$300,000	\$10,200
\$500,000 Available			TOTALS	\$497,259	\$497,259
<p><i>* Projects in governmental and educational buildings are more complex and generally lengthy in duration. Payment for project costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.</i></p> <p><i>** Chadron State College declined to use its allocated funding of \$200,000. Those funds were offered to the other two state colleges for use in eligible activities.</i></p>					

Community College Campuses**					
Applicant	Project Location	Project Details	Contract Amount	Total Project Cost	Funds Expended as of February 1, 2012* Updated February 6, 2012
Mid-Plains Community College	McDonald Belton Building	Retrofits to Increase Energy Efficiency in McDonald Belton Building at North Platte Community College	\$450,000	\$471,071	\$379,273.30
Metropolitan Community College Omaha	South Campus – Mahoney Building Ft. Omaha Campus – Building 10 Elkhorn Valley Campus	Perform and Implement Comprehensive Energy Studies for Two Campus Buildings	\$449,922.79	\$449,922.79	\$110,000
Southeast Community College	Energy Square Building	Replace existing HVAC system with energy efficient system	\$450,000	\$841,097	\$450,000
Western Nebraska Community College	Main building and Pioneer Hall on the WNCC campus	Retrofits to Increase Energy Efficiency in main building and Pioneer Hall on the WNCC campus by retrofitting the HVAC system and installing controls	\$450,000	\$480,000	
\$1,800,000 Available			TOTALS	\$1,799,922.79	\$2,242,090.79
<p><i>* Projects in governmental and educational buildings are more complex and generally lengthy in duration. Payment for project costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.</i></p> <p><i>** Central Community College declined to use its allocated funding of \$360,000. Those funds were offered to the other community colleges for use in eligible activities.</i></p>					

AMERICAN REINVESTMENT AND RECOVERY ACT

State Government Buildings (updated February 6, 2012)					
Applicant	Project Location	Project Details	Contract Amount	Total Project Cost	Funds Expended as of February 1, 2012*
Nebraska State Patrol Norfolk	Troop B Building	Replace Heating/Cooling System With Geothermal Heat Pump and Replace Windows	\$426,202	\$426,202	\$360,137.89
Nebraska State Patrol Grand Island	Troop C Building	Replace Heating/Cooling System With Geothermal Heat Pump and Replace Windows	\$426,313	\$426,313	\$349,614.00
Nebraska State Patrol North Platte	Troop D Building	Replace Heating/Cooling System With Geothermal Heat Pump and Replace Windows	\$547,643	\$547,643	\$457,078.50
Youth Rehabilitation and Treatment Center Geneva	Burroughs Cottage	Replace Heating/Cooling System With Geothermal Heat Pump	\$270,437	\$270,437	\$248,649.56
Youth Rehabilitation and Treatment Center Geneva	Sandoz Cottage	Upgrade Heating/Cooling System With Geothermal Heat Pump Using ECO 24/7 Process	\$277,635	\$277,635	\$262,132.85
Youth Rehabilitation and Treatment Center Geneva	Sacajawea Cottage	Replace Heating/Cooling System With Geothermal Heat Pump	\$302,992	\$302,992	\$295,594.85
Youth Rehabilitation and Treatment Center Geneva	Central Plant	Replace Boilers	\$1,490,625	\$1,490,625	\$1,266,714.65
Administrative Services, Building Division	Executive Building - Lincoln	Add Lighting Control Panels and Upgrade Light Fixtures	\$71,765	\$71,765	\$65,615.47
Administrative Services, Building Division	Executive Building - Lincoln	Replace Heating/Cooling Equipment and Install Programmable Thermostats	\$104,650	\$104,650	\$95,731.80
Administrative Services, Building Division	State Office Building - Omaha	Design of Upgraded Lighting System	\$27,200	\$27,200	\$27,200.00
Administrative Services, Building Division	State Office Building - Lincoln	Add lighting Control Panels Throughout the Building	\$81,736	\$106,355	\$78,990.15
\$4 Million Available			TOTALS	\$4,027,198	\$4,051,810
<i>* Projects in governmental and educational buildings are more complex and generally lengthy in duration. Payment for project costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.</i>					

Public School Audits (updated February 6, 2012)				
Applicant	Project Details	Contract Amount	Total Project Cost	Funds Expended as of February 1, 2012*
Waldinger Corporation and Schemmer Associates	Benchmark and Evaluate Energy Performance and Perform Investment Grade Energy Audits for school districts in Nebraska. As of December 2011, nearly 60 percent of the school districts with 606 buildings had data entered into Portfolio Manager. Sixty-two schools with low rankings on energy use have been given investment grade energy audits that identify energy saving improvements that could be made. A total of 5.875 million sq. ft. in school buildings have already been audited for energy use.	\$452,800	\$452,800	\$407,520.00
\$500,000 Available		TOTALS	\$452,800	\$407,520.00

AMERICAN REINVESTMENT AND RECOVERY ACT

Consumer Information on Energy Efficiency and Renewable Energy

Recovery Act funds: \$700,161.80 Expended: \$414,616.78 as of January 31, 2012

Energy Detective Kits for 5th Grade Students

After a competitive solicitation, the Energy Office awarded a contract to design, produce and administer an educational based program that features a blend of innovative education, comprehensive implementation services and hands-on activities to put energy efficiency knowledge to work in the classrooms of Nebraska fifth grade students. The curriculum includes Energy Detective Kits containing high-quality efficiency devices to be installed as part of the science and math-based educational program.



Elementary students learn about energy conservation through the eyes of an "Energy Detective"

The program began in August 2010. In school year 2010-2011, 19,810 students in the state participated in this voluntary program. The effort is a cost-shared activity between the Energy Office and a number of electric utilities and one natural gas utility in the state and up to \$377,577 has been allocated. As of February 4, 2012: 13,186 student and teacher kits had been reserved for use in school year 2011-2012.

Wind for Schools

The Nebraska Energy Office has issued contracts using SEP *Recovery Act* funds to eight public school districts in Nebraska for \$5,000 each. The funds will be used to pay for part of the cost of a 2.5KWH wind turbine in conjunction with the Wind for Schools projects. A total of \$50,000 is available for a total of 10 schools.

Wind for Schools				
Applicant	Contract Approved	Contract Amount	Total Project Cost	Funds Expended as of February 1, 2012* Updated February 7, 2012
Bancroft/Rosalie Public Schools	December 29, 2009	\$5,000	\$16,140.35	\$5,000
Norris Public Schools	December 29, 2009	\$5,000	\$14,211.00	\$5,000
Papillion/LaVista South School District	May 20, 2010	\$5,000	\$15,000.00	\$5,000
West Holt Public School	January 3, 2011	\$5,000	\$18,634.00	\$5,000
Creighton Community Schools**	January 10, 2011	\$5,000	\$16,252.00	\$4,897
Norfolk High School	July 12, 2011	\$5,000	\$9,019.00	
Ainsworth Community School	December 21, 2011	\$5,000	\$20,000.00	
Hastings Public School	December 21, 2011	\$5,000	\$17,000.00	
\$50,000 Available for 10 Schools	TOTALS	\$40,000	\$126,256.35	\$24,897
* Projects in governmental and educational buildings are more complex and generally lengthy in duration. Payment for project costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.				
** Creighton Community Schools declined to use all of its allocated funding of \$5,000.				

AMERICAN REINVESTMENT AND RECOVERY ACT

Administration, Evaluation, Monitoring and Reporting

Recovery Act Funds: \$2,100,000 Expended: \$1,019,729.91 as of January 31, 2012

The Energy Office will administer *Recovery Act* funds, monitor grants and report on required activities. The Energy Office will make on-site inspections to funded projects to document progress and compliance with federal regulations and contracts.

- The University of Nebraska-Lincoln will measure the impact of the Dollar and Energy Saving Loan Program to quantify economic impacts and energy and greenhouse gas emission savings under a \$453,514 contract. As of February 1, 2012, \$178,902.93 had been spent.



Energy Efficiency and Conservation Block Grants

The Energy Efficiency and Conservation Block Grant program provides funding to eligible entities that implement strategies that:

- Reduce fossil fuel emissions in a manner that is environmentally sustainable and maximizes benefits for local and regional communities
- Reduce the total energy use of eligible entities
- Improve energy efficiency in the building sector and other appropriate sectors

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 by the grantee was required.

The Energy Office received 121 applications proposing 208 individual projects, and was able to fund 87 percent of the municipalities and 76 percent of the counties that applied. The award of \$8,799,052 in grant funds was announced on June 8, 2010, to 96 city and county governments with 176 individual projects, varying in size and scope from \$198 up to \$250,000. More than \$3.968 million in matching funds were committed to these projects which were to be completed by December 31, 2011. Nearly all projects are in varied stages of close-out. Several projects have received short extensions to complete the work

Of the projects receiving EECBG funds, 19 will replace inefficient traffic signals and street lighting, with the remainder being energy efficiency retrofits for replacing outdated and inefficient windows, doors, interior lighting, insulation and heating and cooling systems.

Two recipients, Randolph and Banner County declined grants. Those funds were used for projects in Brown County. Currently, there are 95 grants for 175 projects. Funds spent as of February 1, 2012, are listed below and on subsequent pages.

AMERICAN REINVESTMENT AND RECOVERY ACT

2011 Energy Efficiency and Conservation Block Grant (EECBG) Funded Projects					
Applicant Name	Project Details	Amount Awarded June 8, 2010 Revised Amount Awarded After August 31, 2011	Original Match June 8, 2010 Revised Match After August 31, 2011	Total Project Cost June 8, 2010 Revised Cost After August 31, 2011	Subgrantee Progress as of February 1, 2012 (Updated February 6, 2012)
Adams County	Courthouse Lighting, Window Seals, HVAC Flex Connectors, T-stat	Original-\$71,216.00 Revised-\$103,900.80	Original-\$17,804.00 Revised-\$25,975.20	Original-\$89,020.00 Revised-\$129,876.00	\$4,720.00
	Office Building Lighting, T-stat, & Storms	Original-\$71,702.40 Revised-\$39,017.20	Original-\$17,925.60 Revised-\$9,754.80	Original-\$89,628.00 Revised-\$48,772.00	\$4,480.00
Alma	City Auditorium Boiler & Insulation	\$41,515.00	\$10,379.00	\$51,894.00	\$539.78
Arthur County	County Courthouse Lighting, Water Heater, T-stats, Windows & Solid Panels	\$34,800.00	Original-\$10,000.00 Revised-\$8,700.00	\$43,500.00	\$20,432.00
Atkinson	Old Library Lights, Insulation, & Water Heater	Original-\$3,087.20 Revised-\$2,254.92	Original-\$771.80 Revised-\$563.73	Original-\$3,859.00 Revised-\$2,818.65	\$2,029.43
Auburn	Street Lighting	\$12,415.20	\$3,103.80	\$15,519.00	\$11,173.68
Aurora	Library Lighting & Exit Signs	\$29,027.00	\$7,257.00	\$36,284.00	
	Fire Hall Heaters & Lighting	\$23,024.00	\$5,756.00	\$28,780.00	
	City Maintenance Shop Heaters & Lighting	\$21,136.00	\$5,284.00	\$26,420.00	
	Parks Garage Bldg. Heaters & Lighting	\$10,741.00	\$2,686.00	\$13,427.00	
	Cemetery Shop Heater & Lighting	\$9,852.00	\$2,464.00	\$12,316.00	
	Wastewater Treatment Plant Lighting	\$2,462.00	\$616.00	\$3,078.00	
Bassett	Fire Hall HVAC, Overhead Door, Lighting, & Fans	\$13,198.40	Original-\$1,964.00 Revised-\$3,299.60	\$16,498.00	\$4,888.80
	City Hall HVAC, Insulation, & Lighting	\$6,955.20	\$1,738.80	\$8,694.00	\$6,259.20
	Business Incubator HVAC	\$6,250.40	\$1,562.60	\$7,813.00	\$5,625.36
Beatrice	Municipal Auditorium Lighting & Exit Signs, Roof & Insulation	\$157,170.00	\$60,000.00	\$217,170.00	\$111,278.43
Blair	Street Lighting	Original-\$248,686.21 Revised-\$248,696.21	Original-\$74,285.00 Revised-\$80,165.79	Original-\$322,972.10 Revised-\$328,862.00	\$223,826.59
Broadwater	Village Hall HVAC & Insulation	\$60,360.00	Original-\$15,090.00 Revised-\$17,490.00	Original-\$75,450.00 Revised-\$77,850.00	\$14,796.47
Broken Bow	Street Lighting	\$151,664.00	\$37,916.00	\$189,580.00	\$136,497.60

* Projects in governmental buildings are more complex and generally lengthy in duration. Some projects may involve construction which can encounter delays. Required local procurement policies and Buy American provisions also impacts project time lines and payment requests. Payment for project costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.

2011 Energy Efficiency and Conservation Block Grant Funded Projects (Continued on next page).

Applicant Name	Project Details	Amount Awarded June 8, 2010 Revised Amount Awarded After August 31, 2011	Original Match June 8, 2010 Revised Match After August 31, 2011	Total Project Cost June 8, 2010 Revised Cost After August 31, 2011	Subgrantee Progress as of February 1, 2012 (Updated February 6, 2012)
Brown County	Courthouse HVAC	\$73,200.00	Original-\$18,300.00 Revised- \$25,620.00	Original-\$91,500.00 Revised- \$98,820.00	\$65,880.00
	Jail HVAC	\$11,040.00	Original-\$2,760.00 Revised- \$3,860.00	Original-\$13,800.00 Revised- \$14,900.00	\$9,936.00
Burt County	Courthouse Boiler, Lighting & Exit Signs, Insulation, Window, & Door	\$150,542.40	\$37,635.60	\$188,178.00	\$135,488.16
Butler County	Courthouse Windows, Wall Panels, & HVAC	\$118,645.00	\$80,000.00	\$198,645.00	\$64,950.31
Callaway	Village Office/Shop Lighting, Heat Pump, & T-stat	\$24,328.80	\$6,082.20	\$30,411.00	\$21,895.92
Cambridge	City Hall Refrigerators	Original-\$1,792.00 Revised- \$1,530.37	Original-\$448.00 Revised- \$382.60	Original-\$2,240.00 Revised- \$1,912.97	\$1,530.37
	Senior Center Lighting, Insulation, & Windows	\$8,075.00 Revised- \$6,827.12	\$2,019.00 Revised- \$1,706.78	\$10,094.00 Revised- \$8,533.90	\$2,926.32
	Hospital Boilers & Chiller	Original-\$236,415.00 Revised- \$241,642.51	\$148,330.00	Original-\$384,745.00 Revised- \$389,972.51	\$216,355.17
Central City	Street Lighting	\$179,088.00	\$56,748.00	\$235,836.00	\$77,618.31
Chadron	City Hall Lighting	Original-\$6,071.00 Revised- \$3,467.00	Original-\$1,518.00 Revised- \$867.00	Original-\$7,589.00 Revised- \$4,334.00	
	Street Shop Lighting	\$2,566.00	\$642.00	\$3,208.00	
	Fire Hall Furnace & Lighting	\$8,395.00	\$2,099.00	\$10,494.00	
	Water Department Lighting	Original-\$1,838.00 Revised- \$1,945.00	Original-\$460.00 Revised- \$487.00	Original-\$2,298.00 Revised- \$2,432.00	
Chadron	Police Department Lighting	\$4,382.00	\$1,095.00	\$5,477.00	
	Library Lighting	Original-\$3,556.00 Revised- \$1,340.00	Original-\$889.00 Revised- \$336.00	Original-\$4,445.00 Revised- \$1,676.00	
	Cemetery Shop Heating, Insulation, & Lighting	Original-\$10,168.00 Revised- \$11,184.00	Original-\$2,542.00 Revised- \$2,797.00	Original-\$12,710.00 Revised- \$13,981.00	
	Airport FBO Bldg Insulation & Lighting	\$22,078.00	\$5,519.00	\$27,597.00	
Clarks	Village/Fire Hall Lighting, HVAC, & T-stats	\$16,464.00	\$4,116.00	\$20,580.00	\$13,989.00
	Library Lighting	\$674.00	\$169.00	\$843.00	
	Villa Apartments Lighting & Exit Signs	\$756.00	\$189.00	\$945.00	
Clay County	Courthouse Lighting	\$6,298.40	\$1,574.60	\$7,873.00	
	Roads Department Lighting	\$2,672.00	\$668.00	\$3,340.00	
	Service Building Lighting	\$3,267.20	\$816.80	\$4,084.00	
	Weed Control Building Lighting	\$198.40	\$49.60	\$248.00	
	Jail & Sheriff's Department Lighting	\$851.20	\$212.80	\$1,064.00	
Coleridge	Nursing Home Insulation	\$59,560.00	\$14,890.00	\$74,450.00	\$53,604.00
Colfax County	Courthouse Windows	\$39,194.00	\$9,799.00	\$48,993.00	\$35,274.60
Cortland	Community Center Windows & Doors	\$6,000.00	\$1,500.00	\$7,500.00	\$5,400.00
Cuming County	County Courthouse HVAC, Lighting & Exit Signs	\$250,000.00	Original-\$114,378.00 Revised- \$383,182.34	Original-\$364,378.00 Revised- \$633,182.34	\$225,000.00
Dakota City	Fire Hall Lighting, HVAC, Windows	\$11,264.00	\$2,816.00	\$14,080.00	
	Water Treatment Plant Lighting	\$1,835.20	\$458.80	\$2,294.00	

* Projects in governmental buildings are more complex and generally lengthy in duration. Some projects may involve construction which can encounter delays. Required local procurement policies and Buy American provisions also impacts project timelines and payment requests. Payment for project costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.

2011 Energy Efficiency and Conservation Block Grant Funded Projects (Continued on next page).

Applicant Name	Project Details	Amount Awarded June 8, 2010 Revised Amount Awarded After August 31, 2011	Original Match June 8, 2010 Revised Match After August 31, 2011	Total Project Cost June 8, 2010 Revised Cost After August 31, 2011	Subgrantee Progress as of February 1, 2012 (Updated February 6, 2012)
Dawes County	County Courthouse Windows	\$180,000.00	\$80,000.00	\$260,000.00	\$140,225.53
Diller	Community Bldg/Fire Hall HVAC & T-stats	\$19,556.00	\$4,889.00	\$24,445.00	\$19,556.00
Dodge County	Judicial Center HVAC & Building Automation	\$152,834.40	Original-\$39,809.00 Revised-\$38,208.60	\$191,043.00	\$35,904.56
Elwood	Village Office HVAC & Lighting	\$7,369.00	Original-\$4,535.00 Revised-\$5,287.36	Original-\$11,904.00 Revised-\$12,656.36	\$6,632.10
Fairfield	City Hall Lighting	\$3,111.00	\$778.00	\$3,889.00	\$2,799.90
	Fire Hall Lighting & Exit Signs	\$3,173.00	\$794.00	\$3,967.00	\$2,855.70
	Maintenance Shop Overhead Door & Lighting	\$4,093.00	\$1,024.00	\$5,117.00	\$3,683.70
	Library Lighting	\$1,364.00	\$342.00	\$1,706.00	\$1,227.60
	Auditorium Lighting	\$1,692.00	\$424.00	\$2,116.00	\$1,522.80
Fairmont	Nursing Home Lighting & Exit Signs, Doors, & Windows	Original-\$41,232.80 Revised-\$38,612.80	\$9,653.20	Original-\$51,541.00 Revised-\$48,266.60	\$29,174.40
Franklin	Senior Center Lighting, Insulation & Ceiling	\$22,297.60	Original-\$5,575.00 Revised-\$5,574.40	\$27,872.00	
Frontier County	County Jail Window, Door, Appliances, & Insulation	\$7,276.96	\$1,819.24	\$9,096.20	
	Curtis Shop Furnaces	\$7,832.00	\$1,958.00	\$9,790.00	\$7,048.80
	Eustis Shop Furnace	\$2,604.00	\$651.00	\$3,255.00	\$2,343.60
Frontier County	Courthouses Furnace	\$7,092.00	\$1,773.00	\$8,865.00	\$6,382.80
	Maywood Shop Furnaces	\$4,868.00	\$1,217.00	\$6,085.00	\$3,569.23
Garden County	Treasurer's Office Heat Pump	\$4,444.44	\$1,111.11	\$5,555.55	\$4,000.00
	Courthouse Annex Heat Pump	\$5,239.08	\$1,309.77	\$6,548.85	\$4,715.17
Giltner	Fire Station HVAC & Lighting	Original-\$9,116.00 Revised-\$9,018.42	Original-\$2,279.00 Revised-\$2,254.61	Original-\$11,395.00 Revised-\$11,273.03	\$8,082.43
	Ball Field Lighting	\$14,028.00	Original-\$3,507.00 Revised-\$3,768.00	Original-\$17,535.00 Revised-\$17,796.00	\$12,625.20
Gordon	Auditorium Lighting, Windows, & Insulation	\$93,206.00	\$23,301.00	\$116,507.00	\$50,287.00
Gothenburg	Street Lighting	\$206,080.00	Original-\$51,520.00 Revised-\$58,858.70	Original-\$257,600.00 Revised-\$264,938.70	\$185,472.00
Greeley County	County Courthouse Windows & Doors	\$68,451.20	\$17,112.80	\$85,564.00	\$68,198.55
Hamilton County	Courthouse HVAC & Lighting	\$116,208.00	\$29,052.00	\$145,260.00	\$82,423.00
	Roads Maintenance Shop Lighting	\$3,821.00	\$956.00	\$4,777.00	
Harlan County	Courthouse Boiler & Chiller	\$250,000.00	\$89,500.00	\$339,500.00	\$205,497.27
Hartington	City Hall Lighting, Windows & Doors	\$46,567.20	\$11,641.80	\$58,209.00	
	City Auditorium Windows	\$19,088.00	\$4,772.00	\$23,860.00	
Hayes County	County Courthouse HVAC, Lighting, Windows & Doors	Original-\$55,500.00 Revised-\$53,669.28	Original-\$15,000.00 Revised-\$13,417.32	Original-\$70,500.00 Revised-\$67,086.60	\$49,950.00
Hazard	Community Building Heating, Insulation, Windows, & Doors	\$13,340.00	\$3,335.00	\$16,675.00	\$10,016.00

* Projects in governmental buildings are more complex and generally lengthy in duration. Some projects may involve construction which can encounter delays. Required local procurement policies and Buy American provisions also impacts project timelines and payment requests. Payment for project costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.

2011 Energy Efficiency and Conservation Block Grant Funded Projects (Continued on next page).

Applicant Name	Project Details	Amount Awarded June 8, 2010 Revised Amount Awarded After August 31, 2011	Original Match June 8, 2010 Revised Match After August 31, 2011	Total Project Cost June 8, 2010 Revised Cost After August 31, 2011	Subgrantee Progress as of February 1, 2012 (Updated February 6, 2012)
Hemingford	Village Office Lighting, Insulation, & Windows	\$28,497.00	\$7,719.00	\$36,216.00	
	Street Lighting	\$165,238.00	\$44,762.00	\$210,000.00	\$93,429.82
	Nursing Home Lighting & Exit Signs	\$24,202.00	\$6,556.00	\$30,758.00	
	Shop Door	\$3,553.00	\$962.00	\$4,515.00	
Holdrege	Street Lighting	\$250,000.00	Original-\$93,029.00 Revised-\$73,312.28	Original-\$343,029.00 Revised-\$323,312.28	\$225,000.00
Hooker County	Nursing Home Boiler, Windows & Doors	\$47,200.00	\$11,800.00	\$59,000.00	\$14,798.20
Humboldt	Nursing Home Lighting, Windows & Doors, HVAC	\$54,488.42	\$13,622.11	\$68,110.53	\$45,001.59
	Library Windows	\$4,210.53	\$1,052.63	\$5,263.16	\$3,789.48
	City Hall Windows & Door	\$5,473.68	\$1,368.42	\$6,842.10	
	City Auditorium Windows & Lighting	\$13,952.56	\$3,488.16	\$17,440.72	
Kimball	City Hall HVAC, Doors & Windows	\$53,716.74	Original-\$13,147.71 Revised-\$13,429.19	\$67,145.93	\$34,711.42
La Vista	Traffic Signals	\$40,154.00	\$10,039.00	\$50,193.00	\$25,499.80
Lexington	Opportunity Center Roof & Insulation	\$250,000.00	\$102,500.00	\$352,500.00	\$225,000.00
Malmo	Well House Windows & Doors	\$1,920.00	\$480.00	\$2,400.00	
McCook	Library Boiler & Chiller	\$64,400.00	\$16,100.00	\$80,500.00	\$840.00
	City Shop Lighting, Insulation, & Windows	\$20,326.00	\$5,081.00	\$25,407.00	\$3,400.00
McCool Junction	Village Hall HVAC, Doors & Windows	\$19,846.40	\$4,961.60	\$24,808.00	\$12,115.00
Mead	Community Bldg. HVAC & Lighting	\$18,315.20	Original-\$4,765.20 Revised-\$5,012.80	\$23,328.00	\$16,483.68
Mitchell	City Office HVAC & Insulation	\$80,000.00	\$25,000.00	\$105,000.00	\$72,000.00
Mullen	Street Lighting	\$5,959.52	Original-\$1,489.88 Revised- \$1,633.48	\$7,449.40 Revised- \$7,593.00	
Nebraska City	City Hall Lighting, HVAC, & Windows	\$17,723.40	\$4,430.60	\$22,154.00	\$13,282.29
	Public Restroom A/C	\$4,035.20	\$1,008.80	\$5,044.00	
	Public Properties HVAC	\$4,154.40	\$1,038.60	\$5,193.00	\$3,738.96
	Wastewater Treatment Plant HVAC	\$9,527.20	\$2,381.80	\$11,909.00	\$8,574.48
	Street Lighting	\$66,464.80	\$16,616.20	\$83,081.00	
Nelson	Street Lighting	\$5,364.00	\$1,341.00	\$6,705.00	\$3,890.00
	City/Fire Hall Lighting	\$6,179.00 Revised-\$6,421.00	Original-\$1,753.00 Revised-\$1,672.00	Original-\$1,546.00 Revised-\$8,093.00	\$5,561.10
	City Auditorium Lighting & Exit Signs	\$7,257.00 Revised-\$7,034.00	Original-\$1,463.00 Revised-\$3,823.00	\$11,200.00 Revised-\$10,857.00	\$6,531.30
	City Library Lighting	\$3,047.00 Revised-\$3,028.00	Original-\$906.00 Revised-\$759.00	\$3,810.00 Revised-\$3,787.00	\$2,742.30
Nemaha County	County Courthouse Lighting & Windows	\$133,326.32	\$33,331.57	\$166,657.89	\$119,993.69
	Law Enforcement Lighting & Exit Signs	\$2,510.32	\$627.58	\$3,137.90	\$2,259.29
	HHS Building Lighting	\$1,237.89	\$309.47	\$1,547.36	\$1,114.10

* Projects in governmental buildings are more complex and generally lengthy in duration. Some projects may involve construction which can encounter delays. Required local procurement policies and Buy American provisions also impacts project timelines and payment requests. Payment for project costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.

2011 Energy Efficiency and Conservation Block Grant Funded Projects (Continued on next page).

Applicant Name	Project Details	Amount Awarded June 8, 2010 Revised Amount Awarded After August 31, 2011	Original Match June 8, 2010 Revised Match After August 31, 2011	Total Project Cost June 8, 2010 Revised Cost After August 31, 2011	Subgrantee Progress as of February 1, 2012 (Updated February 6, 2012)
Ogallala	City Hall HVAC, Windows, & Insulation	\$21,110.08	Original-\$5343.72 Revised-\$5,277.52	\$26,387.60	
	Fire Hall Lighting	\$3,067.87	\$766.97	\$3,834.84	
	Library Lighting	\$15,998.50	\$3,999.62	\$19,998.12	
	Water Department HVAC, Lights, & Insulation	\$41,782.11	\$10,445.53	\$52,227.64	
Orleans	Fire Hall Furnace, Insulation, & Lighting	Original-\$18,920.80 Revised-\$20,340.00	Original-\$4,731.00 Revised-\$5,085.00	Original-\$23,652.00 Revised-\$25,425.00	\$18,306.00
Osceola	City Shop Lighting, HVAC, Door	\$7,200.00	\$1,800.00	\$9,000.00	\$6,480.00
	Fire Hall Lighting & Exit Sign	\$1,920.00	\$480.00	\$2,400.00	
Otoe County	Courthouse Boilers	\$101,053.00	\$25,263.00	\$126,316.00	\$50,000.00
Pawnee County	Courthouse Lighting	\$2,442.11	\$610.53	\$3,052.64	\$2,197.90
	Maintenance Building Lighting	\$2,557.47	\$639.37	\$3,196.84	\$2,301.72
Paxton	Community Center Bldg. HVAC, Windows & Doors, Insulation	\$14,554.00	Original-\$3,639.00 Revised-\$8,436.00	Original-\$18,193.00 Revised-\$22,990.00	\$13,098.60
Perkins County	County Hospital Lighting, Windows & Doors	\$230,832.00	Original-\$57,708.00 Revised-\$142,379.00	Original-\$288,540.00 Revised-\$373,211.00	
Petersburg	Fire Hall Door & Insulation	Original-\$7,670.27 Revised-\$7,598.00	Original-\$1,917.57 Revised-\$1,900.00	Original-\$9,587.84 Revised-\$9,498.00	\$6,838.20
	Maintenance Building Windows, Overhead Door, & Insulation	Original-\$13,543.36 Revised-\$13,615.90	Original-\$3,385.84 Revised-\$3,404.41	Original-\$16,929.20 Revised-\$17,020.31	\$12,254.45
Phelps County	Courthouse Lighting & Windows	\$53,815.64	\$13,453.60	\$67,269.24	\$38,951.16
Pilger	Village Clerk's Office HVAC & Lighting	\$4,349.50	\$1,087.38	\$5,436.88	\$3,914.55
	Library Lighting & Exit Signs	\$896.26	\$224.06	\$1,120.32	\$806.63
	Fire Hall Lighting	\$1,448.99	Original-\$362.25 Revised-\$1,492.64	Original-\$1,811.24 Revised-\$2,941.63	\$1,304.09
	Filter Plant Lighting	\$425.52	\$106.38	\$531.90	\$382.97
	Street Lighting	\$29,522.81	Original-\$9,017.15 Revised-\$20,226.10	Original-\$38,539.96 Revised-\$49,748.91	\$26,570.53
Polk	Housing Authority Apts. HVAC & Storm Doors	\$67,536.00	\$16,884.00	\$84,420.00	\$48,369.84
Potter	Municipal Building Insulation, Heaters, & Lighting	\$28,455.20	Original-\$7,113.80 Revised-\$11,290.88	Original-\$35,569.00 Revised-\$39,746.08	\$25,609.68
Prague	Street Lighting	\$46,579.20	Original-\$11,644.80 Revised-\$11,902.80	Original-\$58,224.00 Revised-\$58,482.00	\$41,921.28
Red Willow County	Nursing Home HVAC	\$250,000.00	\$507,900.00	\$757,900.00	\$14,330.92
Rock County	County Hospital Windows, HVAC, Water Heater, Lighting	\$162,937.00	Original-\$48,425.00 Revised-\$54,313.00	\$217,250.00	
Saline County	County Courthouse Boiler & Windows	\$249,972.00	\$395,950.00	\$645,922.00	\$76,083.42
Scribner	Street Lighting	\$225,189.00	\$56,297.00	\$281,486.00	\$66,719.20

* Projects in governmental buildings are more complex and generally lengthy in duration. Some projects may involve construction which can encounter delays. Required local procurement policies and Buy American provisions also impacts project timelines and payment requests. Payment for project costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.

2011 Energy Efficiency and Conservation Block Grant Funded Projects (Continued on next page).

Applicant Name	Project Details	Amount Awarded June 8, 2010 Revised Amount Awarded After August 31, 2011	Original Match June 8, 2010 Revised Match After August 31, 2011	Total Project Cost June 8, 2010 Revised Cost After August 31, 2011	Subgrantee Progress as of February 1, 2012 (Updated February 6, 2012)
Seward	Wastewater Treatment Plant Roof & Insulation, HVAC, Windows, Man Doors, Overhead Doors, Lighting, Digester	\$185,467.38	Original-\$246,371.24 Revised-\$255,838.62	Original-\$441,589.00 Revised-\$441,306.00	\$9,853.43
	City Hall Lighting, Window Sealing, & Insulation	\$12,207.00	\$5,679.00	\$17,886.00	
	Various Building Lights	\$49,234.00	\$22,120.00	\$71,354.00	
Shelton	Offices/Community Bldg. Windows & HVAC	\$16,873.65	\$4,218.42	\$21,092.07	\$7,686.31
	Health Center Windows & HVAC	\$18,893.52	\$4,723.38	\$23,616.90	\$13,803.11
Sherman County	Courthouse Windows	\$79,070.00	\$19,767.00	\$98,837.00	\$64,844.00
Silver Creek	Fire Station Windows & Doors, Insulation & Ceiling	\$52,793.60	\$13,198.40	\$65,992.00	\$33,599.62
South Sioux City	Badger Building Lighting & Insulation	\$239,802.00	Original-\$80,853.00 Revised-\$147,610.00	\$387,412.00	\$142,370.00
	Public Works Lighting	\$2,165.00	Original-\$3,276.00 Revised-\$771.00	\$2,936.00	
	Fire House North Lighting	\$1,454.00	Original-\$901.00 Revised-\$518.00	\$1,972.00	
	Fire House South Lighting	\$851.00	Original-\$122.00 Revised-\$303.00	\$1,154.00	
	Riverview Facility Lighting	\$1,558.00	Original-\$2,929.00 Revised-\$554.00	\$2,112.00	
	Maintenance Shop Lighting	\$1,439.00	Original-\$165.00 Revised-\$512.00	\$1,951.00	
	Sign & Bus Shop Lighting	\$635.00	Original-\$306.00 Revised-\$226.00	\$861.00	
	Gas Shop Lighting & T-stats	\$918.00	Original-\$85.00 Revised-\$326.00	\$1,244.00	
	Water Shop Lighting	\$1,178.00	Original-\$341.00 Revised-\$419.00	\$1,597.00	
Springfield	City Hall Windows & HVAC	\$27,200.00	Original-\$6,200.00 Revised-\$6,800.00	\$34,000.00	
Stromsburg	Fire Hall Insulation	Original-\$18,880.00 Revised-\$19,123.97	Original-\$3,600.00 Revised-\$4,781.00	Original-\$23,600.00 Revised-\$23,904.97	\$17,211.57
	Senior Center Windows	Original-\$10,400.00 Revised-\$10,156.03	Original-\$2,600.00 Revised-\$2,539.01	Original-\$13,000.00 Revised-\$12,695.04	\$9,360.00
Superior	Street Lighting	\$246,240.00	Original-\$67,800.00 Revised-\$61,560.00	\$307,800.00	\$163,507.50
Tecumseh	Community Center Lighting, Furnaces, & Insulation	\$74,527.00	\$31,940.00	\$106,467.00	\$55,254.93
	Street Lighting	Original-\$149,563.00 Revised-\$153,563.00	Original-\$37,391.00 Revised-\$38,390.75	Original-\$186,954.00 Revised-\$191,953.75	\$122,563.75
Utica	Village Shop Door	\$3,200.00	\$800.00	\$4,000.00	\$2,880.00
Valentine	Community Center/Gymnasium Lighting, Windows, Doors, & Boiler Steam Traps	\$174,400.00	\$43,600.00	\$218,000.00	\$61,720.59
Verdigre	Village Office HVAC, Windows, Lighting & Insulation	\$10,000.00	\$2,515.00	\$12,515.00	
Wahoo	City Hall Heat Pumps	\$78,800.00	\$19,700.00	\$98,500.00	

* Projects in governmental buildings are more complex and generally lengthy in duration. Some projects may involve construction which can encounter delays. Required local procurement policies and Buy American provisions also impact project timelines and payment requests. Payment for project costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.

2011 Energy Efficiency and Conservation Block Grant Funded Projects (Continued on next page).

Applicant Name	Project Details	Amount Awarded June 8, 2010 Revised Amount Awarded After August 31, 2011	Original Match June 8, 2010 Revised Match After August 31, 2011	Total Project Cost June 8, 2010 Revised Cost After August 31, 2011	Subgrantee Progress as of February 1, 2012 (Updated February 6, 2012)
Wakefield	City Hall HVAC	\$3,748.00	\$937.00	\$4,685.00	
	Fire Hall HVAC	\$5,152.00	\$1,288.00	\$6,440.00	
Walthill	Street Lighting	\$132,846.00	\$33,211.00	\$166,057.00	\$72,685.12
	Village Office Bldg. Windows & Weather Stripping	\$7,662.40	\$1,915.60	\$9,578.00	
Waverly	Public Works Bldg. Insulation & Windows	\$35,641.60	\$8,910.40	\$44,552.00	\$32,077.44
Wayne	Municipal Power Plant Cooling Tower	\$250,000.00	\$383,596.00	\$633,596.00	\$20,039.43
Wilber	Street Lighting	\$122,145.40	Original-\$30,536.00 Revised-\$30,536.60	\$152,682.00	\$14,208.31
York County	Courthouse Boiler & Lighting	\$158,611.00	\$52,870.00	\$211,481.00	\$6,260.82
	Supervisor's Office Lighting	\$5,255.00	\$1,751.00	\$7,006.00	
	Maintenance Shop Lighting	\$4,618.00	\$1,538.00	\$6,156.00	
TOTALS		Original-\$8,810,715.31 Revised-\$8,807,517.60	Original-\$3,968,305.15 Revised-\$4,417,941.61	Original-\$12,858,842.75 Revised-\$13,225,459.81	\$4,666,685.41

* Projects in governmental buildings are more complex and generally lengthy in duration. Some projects may involve construction which can encounter delays. Required local procurement policies and Buy American provisions also impact project timelines and payment requests. Payment for project costs are based on a cost-reimbursement basis and five percent is withheld until all contractual obligations, including monitoring by agency staff, have been completed.

State Energy Efficiency Appliance Rebate Program

In August 2009, the Energy Office submitted a pre-application under the *Recovery Act's State Energy Efficiency Appliance Rebate Program*. In October 2009, the agency submitted a plan that detailed how the state would implement an appliance rebate program. On December 14, 2009, the U.S. Department of Energy approved the plan for \$1.711 million and \$205,320 in state matching funds.

The program was structured to provide rebate claims after an eligible appliance had been purchased from six appliance categories: dishwashers, clothes washers, refrigerators, heat pumps, furnaces and central air conditioners. Rebates ranged from \$100 to \$250 for each appliance with a limit of two per household.

In May 2010, the agency selected a contractor to assist the agency in providing information to consumers and sellers, verifying rebate claims and issuing payment to Nebraskans.

On July 6, 2010, the Nebraska Appliance Rebate program opened. By noon on July 10, 2010, all rebate funds had been obligated, pending submission of documentation by the purchasers. By December 31, 2010, a total of 9,019 rebates had been approved and payment issued in the following categories:

- Air source heat pumps 159
- Central air conditioners 89
- Clothes washers 2,251
- Dishwashers 2,725
- Natural gas furnaces 334
- Refrigerators 3,461

As of December 31, 2010, all federal funds had been spent and this program was closed in February 2011.

AMERICAN REINVESTMENT AND RECOVERY ACT

Enhancing State Government Energy Assurance Capabilities and Planning for Smart Grid Resiliency

Under the *Recovery Act*, the Energy Office received \$363,635 over three years 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.

During the reporting period, the Energy Office and its contractor continued development of the State Energy Assurance Plan. The Assurance Plan will include primary state energy use, information pertaining to vulnerability and risk and identification of impending energy problems. The Assurance Plan was submitted to the U.S. Department of Energy in February 2011 and received approval of the Plan in April 2011.

The Energy Office hosted three roundtables with stakeholders during the reporting period and received feedback from the energy industry to build energy assurance awareness.

The Energy Office prepared the *State of Nebraska Energy Supply Tracking Process and Energy Supply Disruption Tracking Process* and submitted the document to the U.S. Department of Energy in August 2010. The document outlines a process for tracking the duration, response, restoration and recovery time of energy supply disruption events.

In September 2010, the Energy Office hosted a winter fuels summit to discuss fuel supply and energy assurance for the upcoming winter. Also in September, the Energy Office and the Nebraska Emergency Management Agency conducted a statewide exercise focused on an earthquake causing a pipeline leak and included players from state agencies, local governments and industry and federal partners.

Under this activity are two contracts: \$244,995 with AMEC Earth and Environmental and \$10,000 with Nebraska Emergency Management. As of December 31, 2011, \$300,613.96 out of \$363,635 had been spent.

2009 IECC and ASHRAE 90.1-2007: Adoption, Training and Compliance

On September 30, 2010, the Energy Office submitted a competitive proposal for *Recovery Act* Building Energy Code funding to Pacific Northwest National Laboratory. Under the proposal, the Energy Office would perform a number of tasks related to increasing the state's building energy codes:

- Assess code compliance,
- Measure the economic value of code compliance,
- Gather information on current building codes in comparison to Nebraska,
- Provide code training to professionals, builders and code officials and
- Develop code compliance strategies.

AMERICAN REINVESTMENT AND RECOVERY ACT

Under this U.S. Department of Energy funded award, the agency was able to further a number of building energy code tasks including an evaluation of existing code compliance, providing for training opportunities for Nebraska target groups, conducting an assessment of current code practices and knowledge and developing strategies for enforcement and adoption of codes.

As a part of this activity, nearly 700 professionals attended 11 workshops on aspects of the new 2009 IECC and ASHRAE code updates; hundreds of 2009 IECC code books were distributed for free; and 100 recently built homes across the state were assessed for code compliance.

This competitive cooperative agreement from the Pacific Northwest National Laboratory for \$276,451 was received in November 2010 and completed by June 30, 2011.



West Legislative Chamber doors

(1) On or before February 15 of 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 to 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 forecast 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 website at <http://www.neo.ne.gov/statshtml/index3c.html>

STATE-WIDE ENERGY NEED AND COST

Need

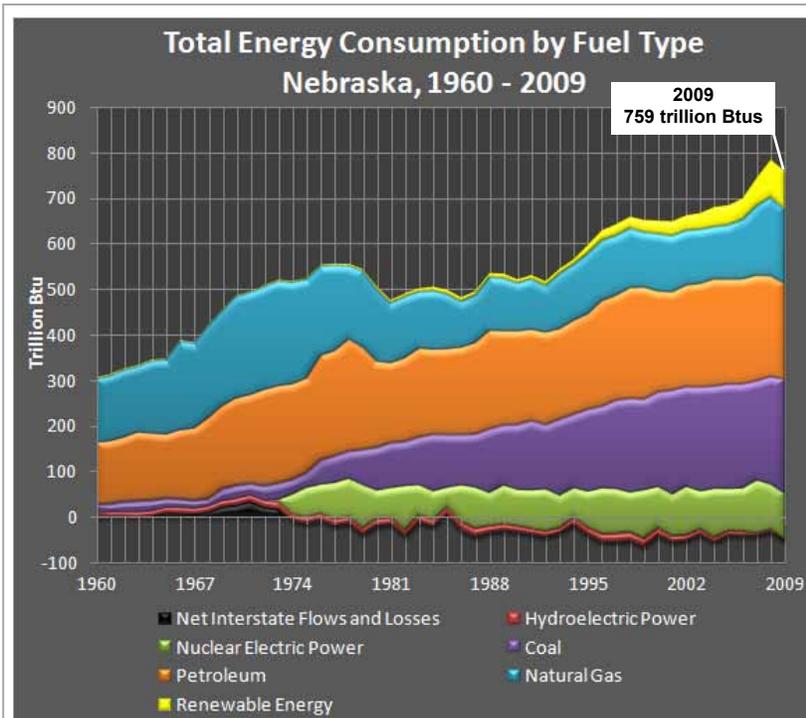
2009. Nebraska's total energy consumption was 759 trillion British thermal units (Btus), a decrease of 24.45 trillion Btus — 3.1 percent — over 2008. The third largest decline — 1980 and 1981 rank first and second — since recordkeeping began in 1960. A British thermal unit is a standard measure of heat energy. It takes one Btu to raise the temperature of one pound of water by one degree Fahrenheit at sea level. Overall,

the use of natural gas, petroleum and nuclear declined while coal and renewable energy increased. Among all the states, Nebraska ranked 18th lowest in total energy consumption in the nation.

1960-2009. Energy use over the past 49 years has changed markedly. Overall, total energy consumption has more than doubled from 308.3 trillion Btus in 1960 to 759.1 trillion Btus in 2009.

- Coal use has increased more than twelvefold from 20 trillion Btus to 249.6 trillion Btus between 1960 and 2009. Peak use of coal was reached in 2009, surpassing the high set in 2008. Virtually all of this growth is attributable to coal used to generate electricity.

- Natural gas consumption has both increased and declined during the 49 years from 140.4 trillion Btus in 1960 to 164.9 trillion Btus in 2009. Natural gas consumption peaked in 1973 at 230.7 trillion Btus. The rise, fall and recent rise in consumption of natural gas is a result of increased equipment efficiency,



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

STATE - W I D E E N E R G Y N E E D A N D C O S T

“ Nebraska’s total energy expenditures decreased 23.3 percent to \$6.97 billion in 2009, a decrease of \$2.15 billion over 2008. ”



fewer homes using natural gas as a primary heating source and electric utilities using natural gas for peak power production.

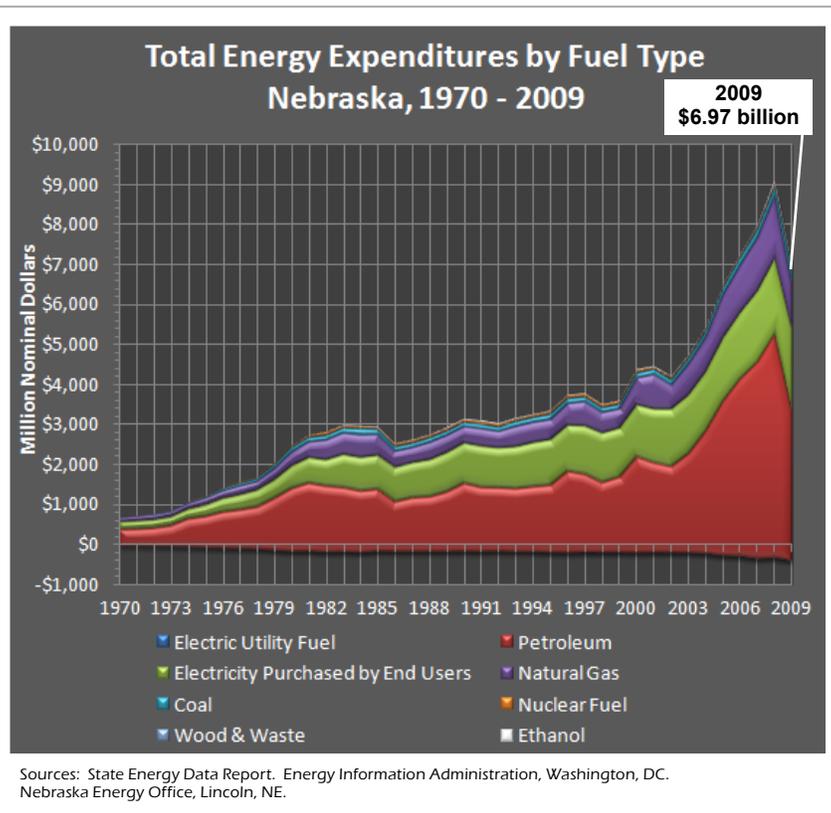
- Use of refined petroleum products nearly doubled over the past 49 years from 136.5 trillion Btus in 1960 to 210.2 trillion Btus in 2009. Gasoline and distillate fuel oil – primarily diesel fuel – comprise the bulk of refined petroleum products consumed. Both types of refined petroleum products increased between 1960 and 2009. Diesel fuel consumption quadrupled from 24.2 trillion Btus in 1960 to 85.9 trillion Btus in 2009. This increase is attributable to increased trucking and agricultural use. Gasoline consumption only increased by less than a quarter during the period from 78.8 trillion Btus in 1960 to 99.3 trillion Btus in 2009. Gasoline consumption peaked in 1978 at 115.9 trillion Btus, just before the second

Oil Price Shock. Changes in gasoline consumption can be traced to increased fuel efficiency of vehicles, relative lack of population growth and marginal changes in miles traveled annually. Motor vehicle miles traveled increased from 12.0 billion miles a year in 1978 to 19.5 billion miles a year in 2010. Overall, petroleum consumption peaked in 1978 at 246.2 trillion Btus.

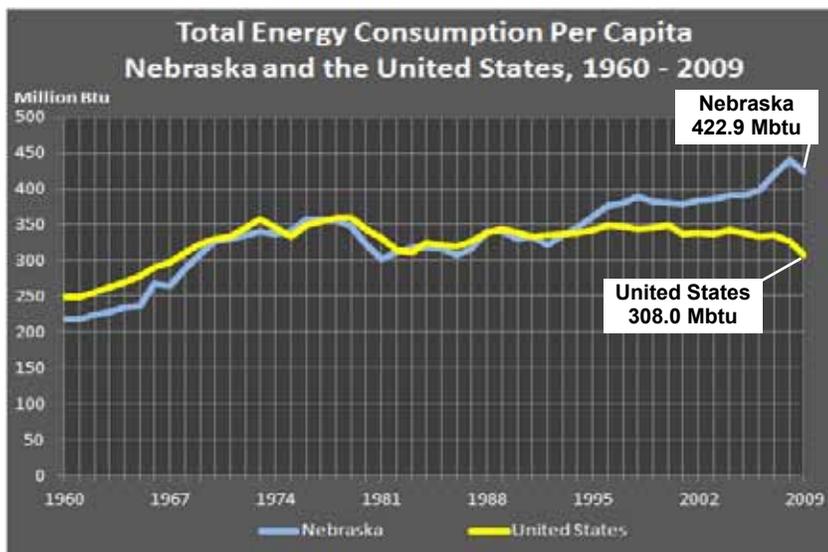
- Nuclear power was not generated commercially in the state until 1973-1974. Nuclear consumption

has increased significantly over the period, rising from 6.5 (1973) and 44.6 (1974) trillion Btus to 98.6 trillion Btus in 2009. Nuclear consumption peaked in 2007 at 115.7 trillion Btus.

- Renewable energy consumption from 1960 to 2009, rose and fell over the decades from 13.4 trillion Btus in 1960 to 87.5 trillion Btus in 2009. Energy production from renewables peaked in 2009. By far the largest category is losses and co-products from ethanol production within the biomass sector, 66.3 trillion Btus. Losses and co-products are calculated as ethanol feedstock minus fuel ethanol production excluding denaturant. The next highest sources of production in 2009 were: wood and wood waste, 7.5 trillion Btus; ethanol, 4.6 trillion Btus; hydropower, 4.2 trillion Btus and geothermal, 1.0 trillion Btus.



STATE - W I D E E N E R G Y N E E D A N D C O S T



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

average of energy expenditures per capita in 2009 was \$3,461.

2009 prices for different types of energy, as compared to the other 49 states and the District of Columbia, shows that Nebraskans paid the 48th lowest price for coal in the nation at \$1.35 (measured in nominal dollars per million British thermal units). New Jersey paid the highest at \$4.01 per million Btus. At the other extreme, Nebraskans paid the 16th highest price for petroleum at \$17.72 in nominal dollars per million British thermal units. Prices in 2009 for natural gas in Nebraska were \$7.05 in nominal dollars per million British thermal units ranked 38th when compared to other states. Retail electricity prices in the state were \$21.12 in nominal dollars per million British thermal units, ranking 42nd. Prices for motor gasoline in Nebraska, which include ethanol-blended fuels, at \$18.57 in nominal dollars per million British thermal units placed the state at 25th among the states.

Looking at the prices differently and in more common units of measurement, in September 2011 the state ranked accordingly by fuel type:

- Residential electricity: 35th, at 10.97 cents/kilowatt-hour; U.S. average was 12.25 cents/kilowatt-hour
- Residential natural gas: 26th, at \$15.06 per thousand cubic feet; U.S. average was \$15.05 per thousand cubic feet.

1970-2009. Total energy expenditures in 1970 were \$667.8 million and increased by more than ten-fold 39 years later in 2009 to \$6.976 billion. The peak in expenditures by fuel type was reached in 2008 at \$9.077 billion for all types listed below, except nuclear which was \$63.4 million in 1996 and coal which was \$338.0 million in 2008. However, the percentage share of personal income has not varied as much: In 1970, 11.8 percent was spent on energy and in 2009, 10.0 percent was spent on energy. The peak percentage occurred in 1980 at 17.1 percent.

Cost

2009. Nebraska's total energy expenditures decreased 23.3 percent to \$6.97 billion in 2009, a decrease of \$2.15 billion over 2008. The decline in expenditures in 2009 was the largest on record. A decline of \$1.843 billion occurred in petroleum, with another \$1.0 billion coming from diesel expenditures.

Among the states, Nebraska ranked 37th in energy expenditures in 2009, unchanged from 2008. Expenditures for petroleum products in 2009 accounted for 53.3 percent of all energy expenditures. Sixteen percent of expenditures in 2009 went for natural gas, 4.8 percent for coal, 1.4 percent for renewable energy and less than one percent on nuclear fuel. On a per capita basis, Nebraska ranked 16th in energy expenditures per person among the states at \$3,887 in 2009. Alaska ranked first with a per capita expenditure of \$7,684. Utah ranked last with a per capita energy expenditure of \$2,646. The United States'

STATE - W I D E E N E R G Y N E E D A N D C O S T

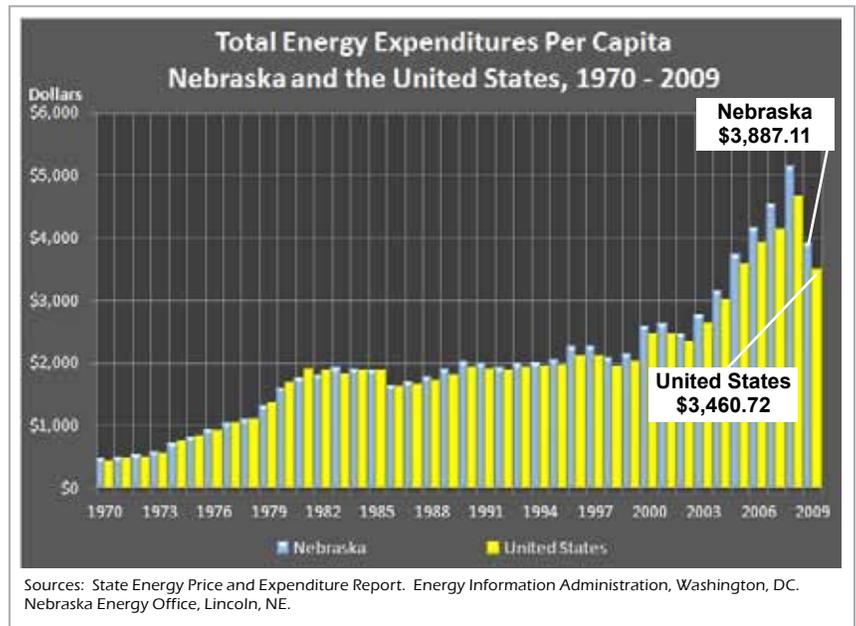
- Coal expenditures increased from \$9.8 million in 1970 to \$338.0 million in 2009.
- Natural gas expenditures increased more than ten-fold from \$104.1 million in 1970 to \$1.113 billion in 2009.
- Petroleum expenditures also increased more than nine-fold from \$405.7 million in 1970 to \$3.720 billion in 2009.
- 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 \$54.4 million in 2009.
- Electricity purchased by end users totaled \$170.3 million in 1970 and rose to \$2.050 billion in 2009.

In comparing total energy consumption per capita between Nebraska and the United States between 1960 and 2009 shows that during the first decade, Nebraska’s per capita energy consumption was considerably less than the nation’s. Over

the next several decades and prior to 1994, Nebraska and the nation were generally identical in per capita energy consumption. After 1994, and through 2008, a chasm opened and widened as the state’s per capita energy consumption vastly outpaced that of the nation. Why? For the most part, the state’s population showed little growth during this period. Nebraskans’ individual energy use likely paralleled that of other Americans. What happened in Nebraska beginning in

1994 that sparked a growing increase in per capita energy consumption? Looking deeper into the data, one finds a surge of energy consumption in the Industrial sector. In Nebraska, that sector includes agriculture. Looking at ethanol production in 1994, only 78.9 million gallons of ethanol were produced. By 2007, 1.282 billion gallons of ethanol were being produced in the state. Ethanol facilities use both electricity and natural

“ Total energy expenditures in 1970 were \$667.8 million and increased by more than ten-fold 39 years later in 2009 to \$6.976 billion. The peak in expenditures by fuel type was reached in 2008 at \$9.077 billion... ”



gas in considerable volumes. The state’s agricultural producers also changed what was planted. For the past nine years, Nebraska growers have routinely surpassed the billion bushel mark for corn harvested, reaching more than 1.469 billion bushels of corn for grain production in 2010. Corn under irrigation is a more energy intensive crop than soybeans, wheat or grain sorghum as several recent studies have noted.

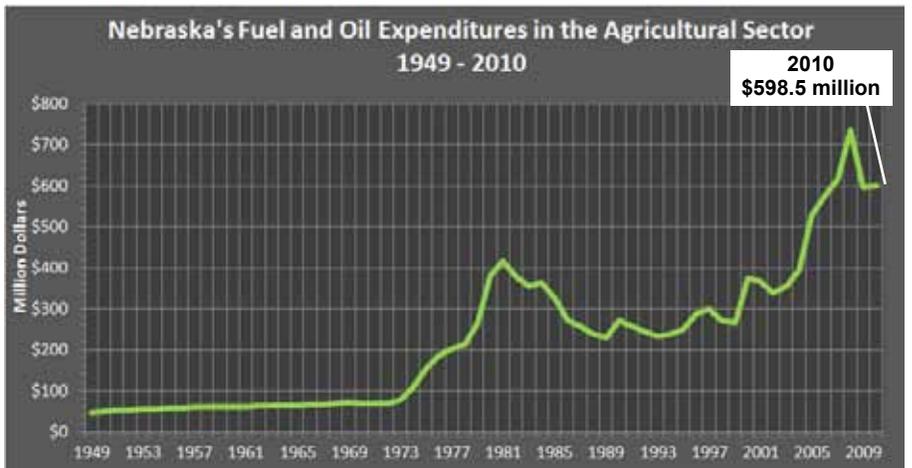
A G R I C U L T U R A L

Agricultural

According to the U.S. Department of Agriculture National Agricultural Statistics Service, there were 47,200 farms and ranches on 45.6 million acres in Nebraska in 2009 encompassing about 93 percent of the state's total land area. The average

farm size contained 966 acres. In 2009, Nebraska had 92,685 active irrigation wells supplying water to more than 8.5 million acres of cropland and pasture. Approximately forty-six percent of total cropland in Nebraska was irrigated.

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



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

Energy Supply

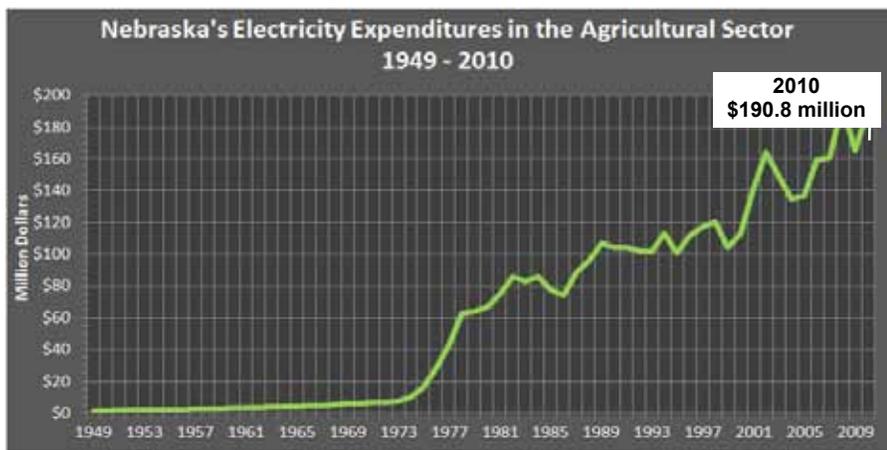
Energy supplies for the state's agricultural sector have been met. Over the years, any energy supply problems have been limited to infrequent shortfalls of petroleum products or fertilizer – reliant on energy inputs – usually during periods of peak demand or energy shortfalls because of worldwide demand.

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. Historically, when natural gas prices have reached record highs, farmers alter practices such as when



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

“...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.”



Irrigation system near Hastings, Nebraska

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

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 natural gas, diesel and propane to electricity to power irrigation systems.

As energy costs have increased, the state’s agricultural producers – with assistance from the agricultural extension agents and research – have adopted a variety of practices that have reduced energy use: conservation tillage and irrigation pump efficiency testing, scheduling and load management practices, and soil moisture measurement 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’s Rural Energy for America Program grants have partially financed hundreds

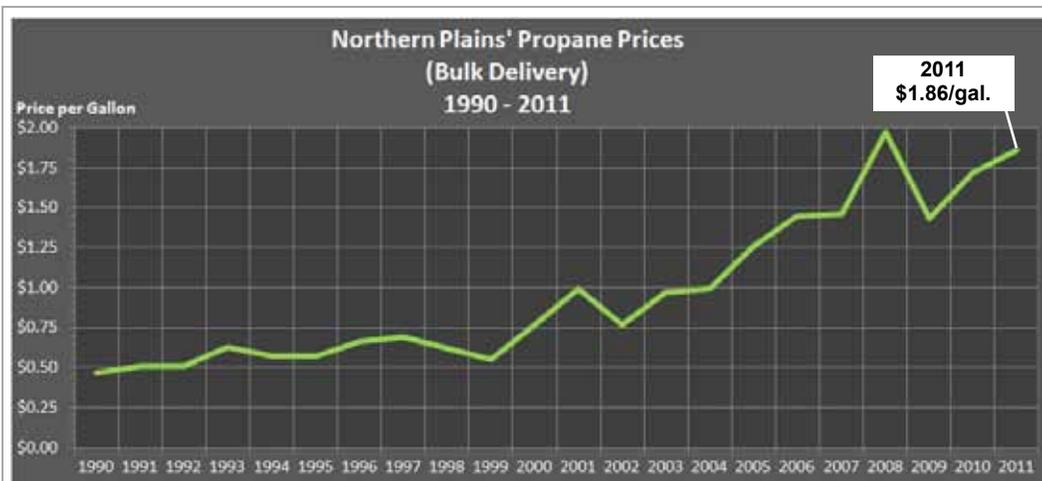
of irrigation efficiency improvements that also included switching fuel sources from diesel, propane and natural gas to electricity. As long as federal funding remains available and fossil fuel prices remain high, this trend in irrigation is likely to continue.

In 2008, the U.S. Department of Agriculture issued a report that found farmers have adopted energy conservation practices: Since the 1970s, farm energy 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 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 2009, more than 8.5 million acres were under irrigation. As ethanol production in the state has grown, so has the

amount of corn needed as a feedstock. In 2010, more than 40 percent of the corn crop was utilized in ethanol production. Corn requires ten inches of evapotranspiration to produce the first bushel – the highest of all the other crops grown in the state. As a result, any rainfall shortage is made up from irrigation which requires an energy input. The fuel used to power irrigation pumps in 2008 was diverse (2003 figures in parentheses): electricity, 54.17 percent (45 percent); diesel, 28.68 percent (27 percent);



Sources: "Nebraska Agri-Facts". United States Department of Agriculture. Nebraska Energy Office, Lincoln, NE.

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

natural gas, 10.55 percent (16 percent); propane, 6.56 percent (12 percent) and gasoline/ethanol, .03 percent (less than 1 percent). The fuel shifts over the past five years show 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 all 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 2010 were as follows:

- \$1.18 billion for fertilizer, a 2.5 percent decrease from 2009. Peak expenditures for fertilizers used in agriculture occurred in 2009 and totaled \$1.21 billion.
- \$598.5 million for fuel and oil, a less than one percent increase from 2009. Peak

expenditures for fuel and oil used in agriculture occurred in 2008 and totaled \$735.9 million.

Electricity expenditures in 2010 totaled \$190.8 million, a 15 percent increase from 2009. Record expenditures of \$194.3 million for electricity in agriculture occurred in 2008.

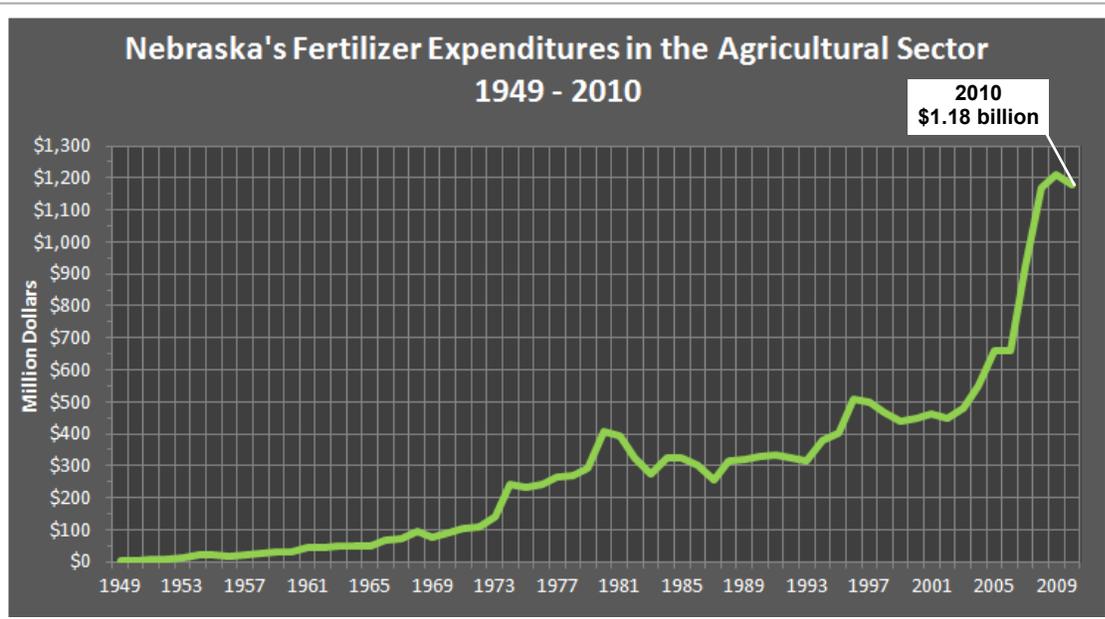
Since 1949, Nebraska's fuel and oil, electricity and fertilizer expenditures by the agricultural sector have been tracked. Between 1949 and 1973-1974, energy prices were stable and showed mostly marginal increases over time. However, after the impact of the first Oil Price Shock in the early 1970s, agricultural 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 2009, 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 only a year later totaled \$239.9 million. Since 2004, except for 2008-2009, fertilizer expenditures have increased at

“Fertilizer expenditures in the state have shown the most substantial change between 1949 and 2009, rising from \$2.1 million to \$1.18 billion.”



Precision placing fertilizing in a field with 7 to 15 percent slopes near Broken Bow.



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

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

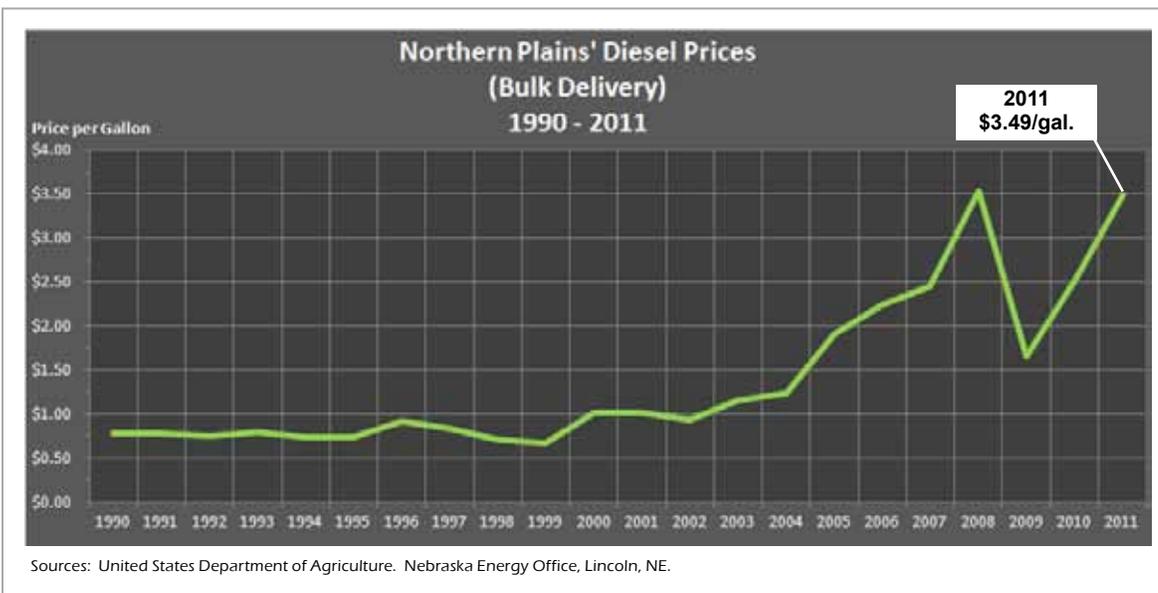
least \$100 million a year, and between 2006 and 2008 increased \$260 million. Only in 2010, did fertilizer prices decline.

- Fuel and oil expenditures have also shown a dramatic increase, peaking in 2008 at \$735.9 million. In 1949, fuel and oil expenditures totaled only \$47.5 million. Between 1973 and 1975, fuel and oil expenditures nearly doubled from \$78.5 million to \$155.8 million, and increased more than two and half times by 1981 when expenditures totaled \$416.7 million. What followed was a two decades long period of declines with periods of stability. That changed in 2000 when expenditures leaped more than \$110 million in one year. After that expenses soared dramatically peaking in 2008 at more than \$735 million.
- Electricity expenditures in agriculture are marginal, compared to petroleum-based inputs. Its primary use is for irrigation, and the trend is for less fossil fuel driven irrigation. An increasing number of growers who use irrigation are fuel

switching from diesel, propane and natural gas to electricity, in part, because of its price stability and favorable cost structure. In 1949, only \$1.6 million was spent for electricity. The peak year for expenditures occurred in 2008 when \$194.3 million was spent. The impact of timely and sufficient rainfall – negating the need for irrigation – can be seen in the dramatic decline in expenditures from 2008 to 2009, a drop of nearly 15 percent. In 2010, the return of more normal weather resulted in a 15 percent increase from 2009, rising from \$165.5 million to \$190.8 million.

- Diesel fuel, the workhorse of the petroleum-based inputs in agriculture, illustrates the volatility of the petroleum fuel prices. Records since 1990 for "Agricultural Prices for Bulk Delivery of Diesel Fuel in the Northern Plains" tell the story of a cheap fuel that increasingly became more expensive. In 1990, diesel prices were just \$0.78 a gallon (excluding federal and state excise taxes and road taxes). From

1990 to 2002, prices were very uniform, fluctuating within a narrow price band of \$0.67 to \$1.02 a gallon. Between 2003 and 2008, prices rose inexorably from \$1.16 to \$3.54 a gallon, trebling in price in six years. Prices in 2009, 2010 and 2011 have illustrated the extreme price volatility of the fuel: \$1.66 a gallon, \$2.50, and \$3.49, respectively.



C O M M E R C I A L

“Efforts to conserve energy use tend to be economically driven, especially when fuel prices rise above historic levels.”



Historic District, Hooper, Nebraska

Records in the “Agricultural Prices for Bulk Delivery of Propane in the Northern Plains” show a relatively inexpensive fuel priced at \$0.47 a gallon (excluding state road taxes) in 1990 quadrupling in price to \$1.86 a gallon in 2011, a 22-year period. Prices for propane in agriculture peaked in 2008 at \$1.97 a gallon.

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. Agricultural and residential sectors may be the least able to engage in fuel substitution.

While fuel switching is not an option in the agricultural sector, it is an option if equipment such as irrigation systems are being replaced or modified. A close look at irrigation pumps by fuel type between 1994 and 2005 documents the shift in fuel use over a 15 year period:

- Electricity: 54.17 percent (2008); 44.08 percent (1994)
- Diesel: 28.68 percent (2008); 22.62 percent (1994)
- Natural gas: 10.55 percent (2008); 17.85 percent (1994)
- Propane: 6.56 percent (2008); 15.01 percent (1994)
- Gasoline/ethanol: 0.03 percent (2008); 0.44 percent (1994)

The ten percent growth in electricity shift came at the expense of propane, natural gas and diesel, respectively.

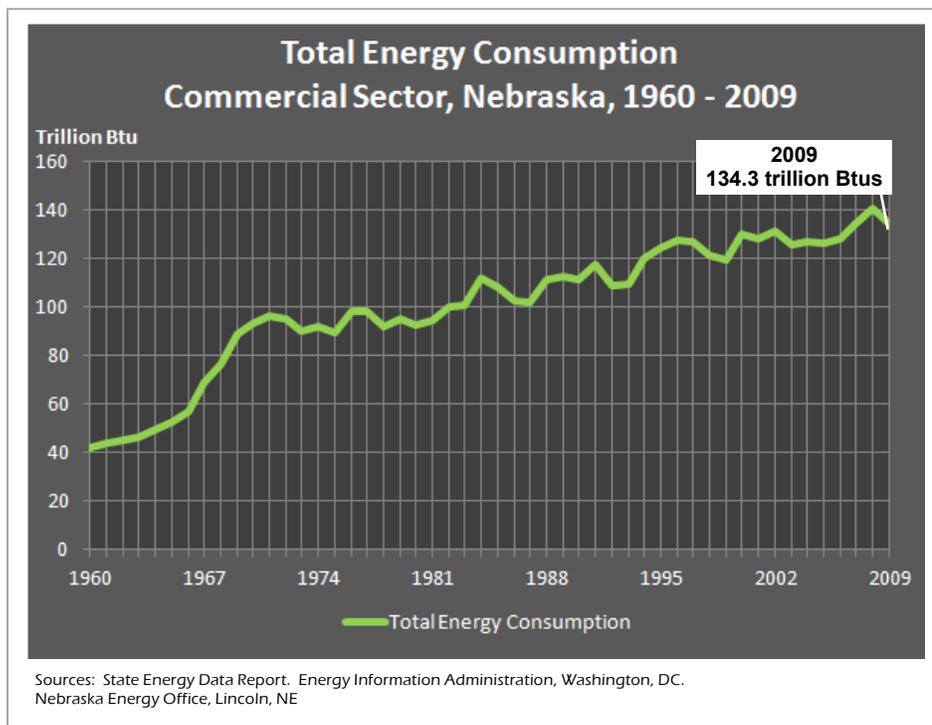
Commercial

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.

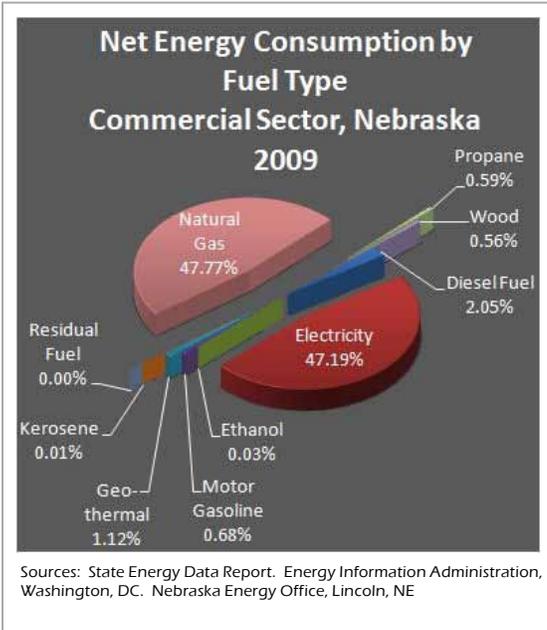
Energy Supply

2009. In 2009, nearly 95 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.

1960-2009. Supply trends over time indicate a continued dominance of natural gas and electricity in this energy use sector.



C O M M E R C I A L



sector demand was 42.16 trillion British thermal units, less than one-third of the amount of energy used in 2009. The peak year of demand in this sector was 2008, surpassing the 134.8 trillion British thermal units of energy used in 2007.

Conservation

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

Demand

2009. Just 18 percent – 134.3 trillion British thermal units – of the state’s total energy demand was consumed by the commercial sector in 2009. The decrease in demand from 2008 to 2009 was 6.8 trillion British thermal units, a decrease of 5.8 percent.

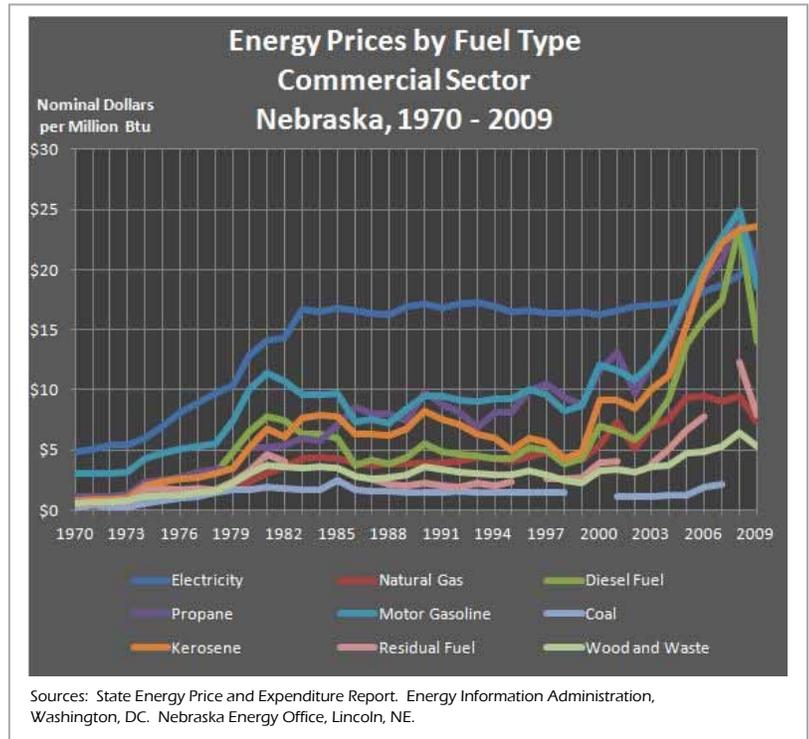
1960-2009. When data collection began in 1960, the commercial

declined by almost 10 trillion British thermal units from 1991-1992, which paralleled a national recession. The economic decline that started in late 2008 and continued in 2009, shows a similar decline in energy use in this sector.

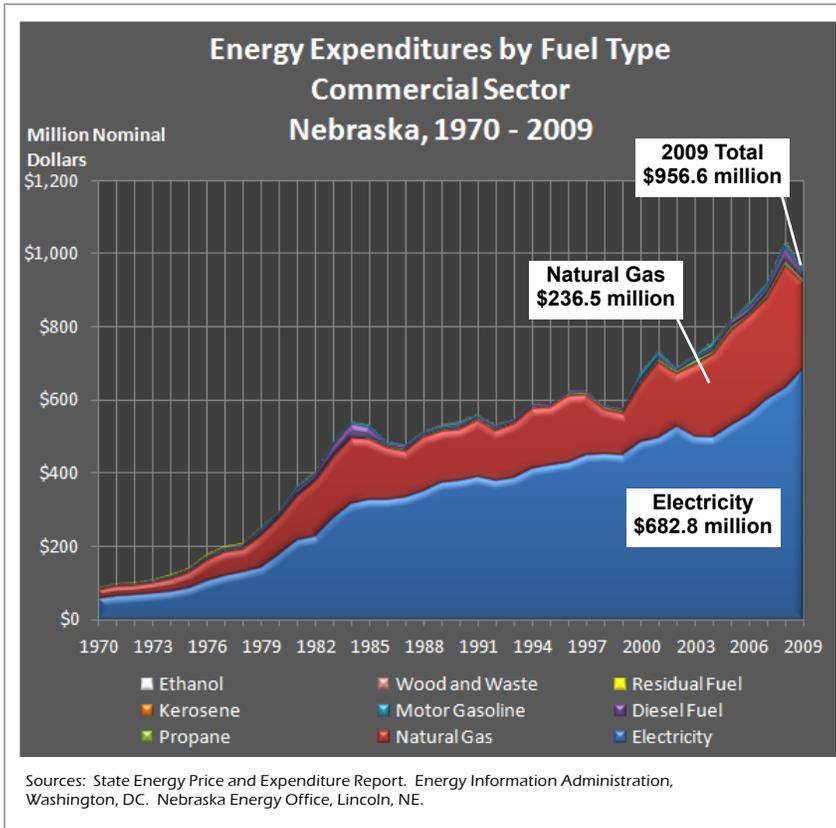
Energy Need

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.

2009. Energy prices for the two primary fuel sources – natural gas and electricity – moved in different directions in 2009. Natural gas decreased from \$9.51 (measured in nominal dollars per million British thermal units) in 2008 to



R E S I D E N T I A L



\$7.35 in 2009. Electricity increased from \$19.59 (measured in nominal dollars per million British thermal units) in 2008 to \$21.49 in 2009. The annual average decreased from \$14.67 (measured in nominal dollars per million British thermal units) in 2008 to \$14.40 in 2009.

1970-2009. 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 38-year period. In 1970, the commercial sector's energy expenditures totaled \$88.4 million (in nominal dollars). The peak year for expenditures in this sector occurred in 2008 at \$1.036 billion (in nomi-

nal dollars), nearly a 12-fold increase over the decades-long reporting period.

Historical expenditure trends for the two primary fuels used in this sector have followed a predictable upward path: electricity expenditures totaled \$58.6 million in nominal dollars in 1970 and increased to \$682.8 million in 2009; natural gas expenditures totaled \$24.7 million in nominal dollars in 1970 and increased to \$236.5 million in 2009. Electricity expenditures in 2009 were nearly three-quarters of all money spent in this sector in 2009, with natural gas comprising about 25 percent.

Residential

Energy Supply

2009. More than 87 percent of the energy used in the residential sector in 2009 came from only two sources: natural gas and electricity. Nearly half the energy used – 48.4 percent – in this sector came from natural gas in 2009. Natural gas use in this sector is used primarily for home heating and minor household uses such as water heating, clothes drying and cooking. Residential electricity use in 2009 was 39.1 percent of all energy used in Nebraska. 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.

1960-2009. Supply trends and fuel types used in the residential sector have not changed substantially over 49 years of data collection, with the exception of a slow decline in natural gas and an equally slow rise in electricity use.

Demand

2009. More than 20.1 percent – 153.1 trillion British thermal units – of the state's total energy demand was consumed in the residential sector in 2009. The decrease in demand from 2008

R E S I D E N T I A L

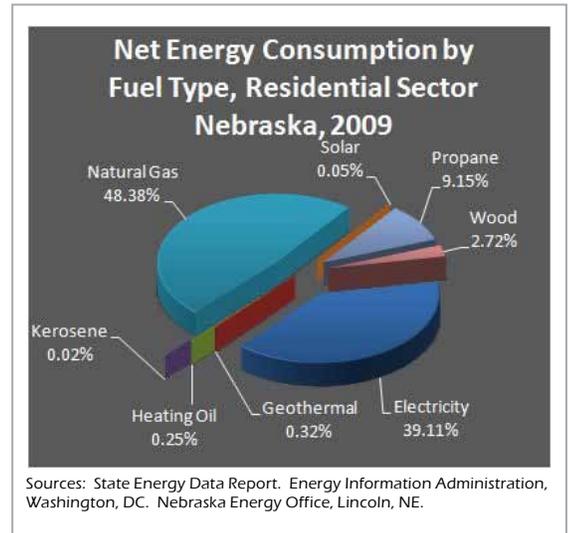
“In 1960, electricity use totaled only 6.51 trillion British thermal units, but by 2009 electricity demand totaled 32.84 trillion British thermal units.”



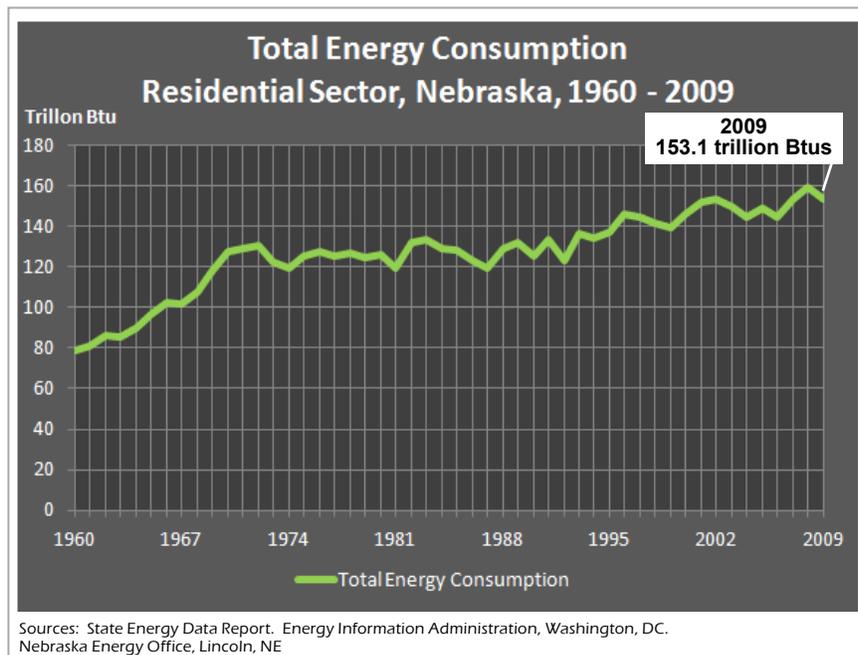
to 2009 was 5.9 trillion British thermal units — almost identical to the increase in 2008 — and a decline of 3.9 percent. All fuel types used in 2009 declined from 2008: renewable energy (1.9 percent), petroleum (13.0 percent), natural gas (5.1 percent) and electricity (1.3 percent).

1960-2009. Total energy consumption in 1960 in the residential sector was 78.88 trillion British thermal units, of which slightly more than half — 40.87 trillion British thermal units came from natural gas. By 2009, the total energy consumption in this sector had nearly doubled to 153.1 trillion British thermal units, yet natural gas consumption had barely changed over the 49-year period.

Changes in how and how much this sector uses energy becomes clear over the 49-year span. In 1960, electricity use totaled only 6.51 trillion British thermal units, but by 2009 electricity demand totaled 32.84 trillion British thermal units. Natural gas demand was 40.87 trillion British thermal units in 1960, peaked at 60.86 trillion British

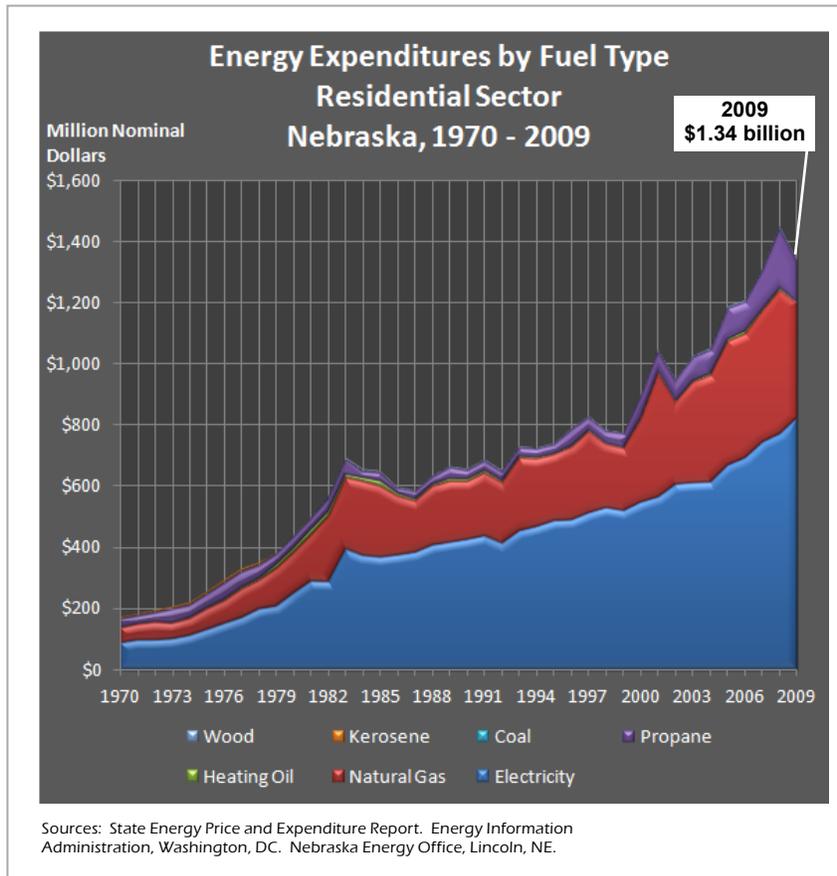


thermal units in 1972 and has generally declined by about a third since then, and was 40.6 trillion British thermal units in 2009. Propane demand in 1960 was 7.84 trillion British thermal units, peaked in 1972 at 16.37 trillion British thermal



units and declined to 7.68 trillion British thermal units in 2009. 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 16.09 trillion British thermal units, but by 2009 amounted to 69.12 trillion British thermal units, approximately 45.1 percent of all the energy used in this sector in 2009.

R E S I D E N T I A L



efficient electric heat pumps, adding insulation and replacing windows and doors with more energy efficient ones.

Energy Need

2009. In 2009, prices for the two primary fuel types in the residential sector, natural gas and electricity, both rose and declined compared to 2008 levels. Specifically, natural gas decreased from \$10.99 in nominal dollars per million British thermal units in 2008 to \$9.23 in 2009 and electricity increased from \$23.06 in nominal dollars per million British thermal units in 2008 to \$24.97 in 2009. The annual average also decreased from \$16.86 in nominal dollars per million British thermal units in 2008

Conservation

Conservation in the residential sector is influenced by price, weather and efficiency actions. 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

to \$16.32 in 2009. Among the states, Nebraska ranked 38th lowest in natural gas prices in 2009 at \$7.05 measured in nominal dollars per million British thermal units and 42nd lowest in retail electricity prices at \$21.12 in nominal dollars per million British thermal units.

Using more common measurements, residential natural gas prices in September 2011 were \$15.06 a thousand cubic foot and ranked 26th among the states. Residential electricity prices in September 2011 were \$10.97 cents a kilowatt-hour, ranking 35th among all states.

I N D U S T R I A L

1970-2009. 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 normal, 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. Between 2002 and 2008 natural gas prices in the residential sector rose dramatically — from \$6.13 in nominal dollars per British thermal unit to \$10.99 in 2008 — a rise of 45 percent in six years. As a result, consumers replaced inefficient heating equipment with high-efficiency models reducing energy consumption and switched fuels from natural gas to electricity by installing an efficient heat pump.

dollars per million British thermal units in 2009, a more than ten-fold increase in 39 years, far surpassing the price rise in electricity prices. The annual average has also risen from \$1.83 in 1970 to \$16.32 in nominal dollars per million British thermal units in 2009.

Annual residential energy expenditures totaled \$170.0 million in 1970. By 2009, total expenditures had risen to \$1.340 billion, a more than seven-fold increase.

Industrial

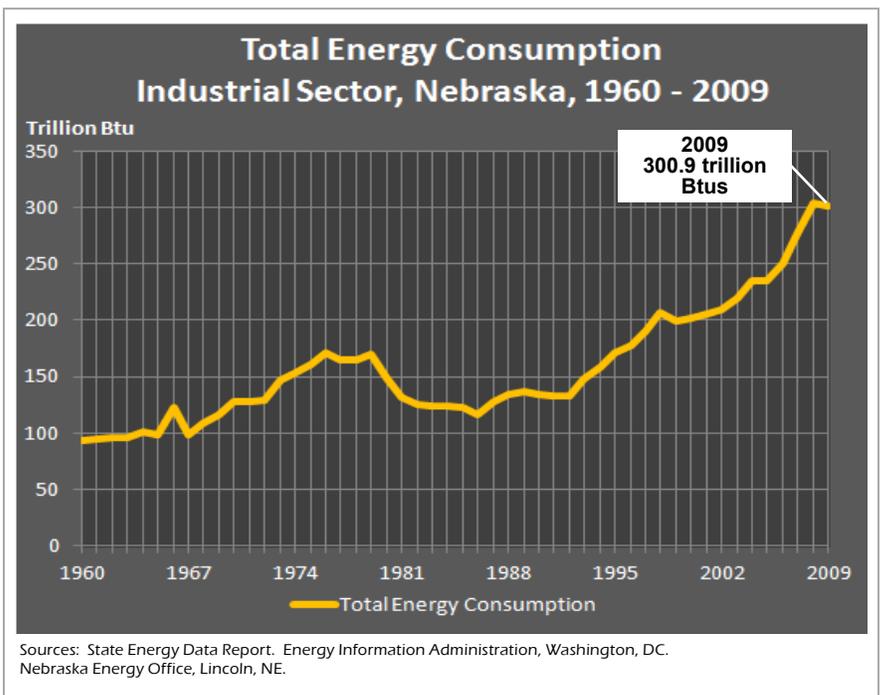
The industrial sector includes manufacturing, construction, mining, agriculture and forestry operations. This sector relies on more diverse fuel types than the other sectors of the economy. Natural gas, renewable energy, electricity, coal and a variety of petroleum products — gasoline, asphalt, road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

“More than 39.6 percent of the state's total energy consumption — 301.0 trillion British thermal units — was used in the industrial sector in 2009.”



Nucor Steel upgrades its plant in Norfolk, Nebraska

In the 39 years since records have been kept, residential electricity prices have increased from \$6.21 in 1970 to \$24.97 in nominal dollars per million British thermal units in 2009, quadrupling in price. Residential natural gas prices have risen from 84 cents in 1970 to \$9.23 in nominal



I N D U S T R I A L

Energy Supply

2009. In 2009, natural gas continued to be the dominant fuel consumed in the industrial sector. More than 35 percent of net energy consumption came from natural gas, followed by renewable energy – including losses and coproducts – at 31 percent, petroleum products at 19 percent and electricity at 14 percent.

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

1960-2009. Trends in fuel types used in the 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 38.27 trillion British thermal units and soared in 1973 to 73.72 trillion British thermal units. Subsequent energy price spikes and other factors reduced natural gas consumption to 19.88 trillion British thermal units by 1986. Natural gas has fluctuated considerably over the past 20 years. A new historical peak occurred in 2009 at 82.22 trillion British thermal units. Consumption of distillate fuel nearly doubled from 1960 to 2009, rising from 14.01 trillion British thermal units to 26.84 trillion British thermal units. Motor gasoline consumption dropped by nearly 80 percent between 1960 and 2009 from 11.27 trillion British thermal units in 1960 to 2.45 trillion British thermal units. The growing use of electricity in this sector is demonstrated by the more than ten-fold increase from 3.03 trillion British thermal units in 1960 to 32.45 in 2009.

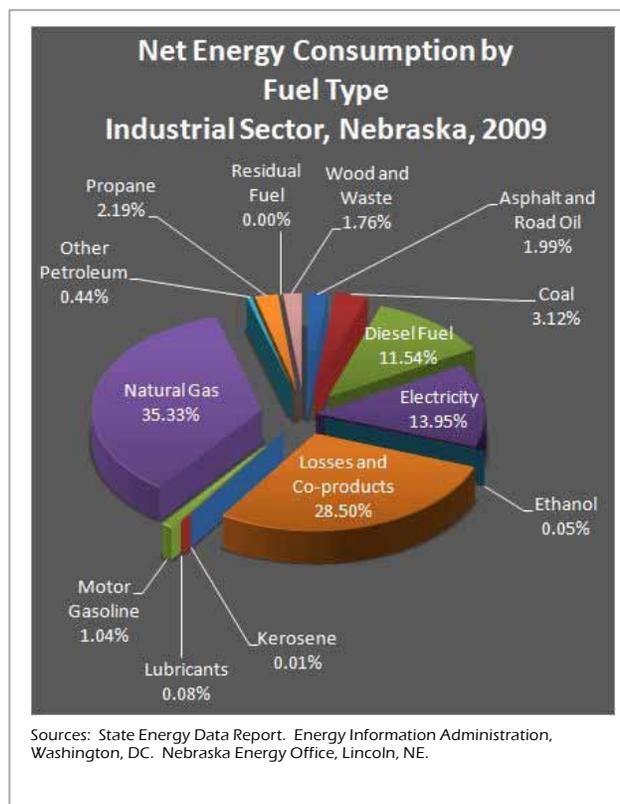
Demand

2009. More than 39.6 percent of the state's total energy consumption – 300.9 trillion British thermal units – was used in the industrial sector in 2009. The 0.01 percent decrease in demand from 2007 to 2009 totaled 2.8 trillion British thermal units.

1960-2009. 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 2009, the industrial sector was the largest energy using sector at 300.9 trillion British thermal units, surpassing the transportation sector by 130.2 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



I N D U S T R I A L

of energy on their operations. The roller coaster consumption of natural gas over the past 49 years noted in the energy supply section is an indicator of the impact of conservation of use, fuel switching or a combination of both.

Energy Need

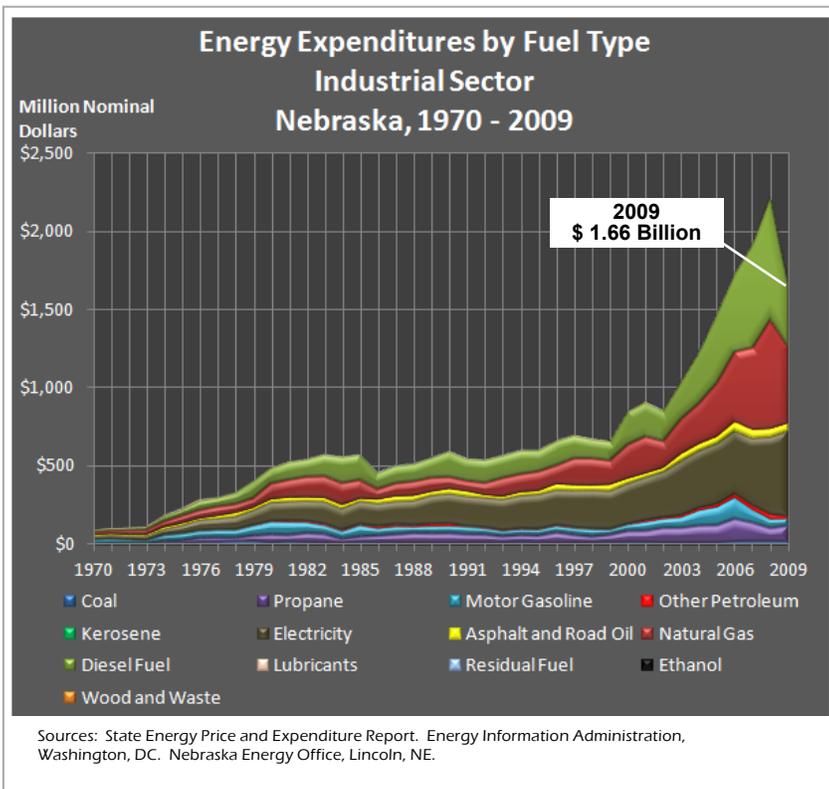
Energy need in the industrial sector is subject to the ebb and flow of the business cycle and national, regional and local economic trends which can cause a spike or reduction in energy need and demand. As noted earlier, the surge in ethanol industry growth in the state added to this sector's energy needs for electricity and natural gas. The phenomenal growth in the renewable energy category – which includes ethanol, losses and coproducts, and wood and wood waste – is the story of the rise of ethanol produc-

tion in Nebraska. In 1985, losses and coproducts accounted for 0.58 trillion British thermal units. By 2009, losses and coproducts had soared to 66.31 trillion British thermal units, third only to natural gas and electric system energy losses in this sector. "Losses and coproducts" are measurements of ethanol feedstock minus fuel ethanol production, excluding denaturant.

2009. 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 2009, the industrial sector spent \$1.660 billion in nominal dollars for energy, a decrease of \$594.7 million in nominal dollars over 2008 and a 25.3 percent decline.

1970-2009. In 1970, the industrial sector spent \$92.4 million in nominal dollars, 13.8 percent of total energy expenditures for all sectors. In 1970, industrial sector energy spending ranked third among the four sectors. By 2009, industrial sector expenditures of \$1.660 billion in nominal dollars had risen to 23.8 percent among all sectors, and now ranked second after transportation among energy-using sectors.

Just 11 years ago in 1999, expenditures in the industrial sector totaled only \$659 million in nominal dollars. Since then, spending in the industrial sector has increased by more than \$1.01 billion in nominal dollars in the past 11 years. The dramatic decline in expenditures from 2008 to 2009 was attributable entirely to declines in expenditures for natural gas and diesel fuel. The most dramatic price increases were in refined petroleum products: propane and gasoline prices more than doubled and diesel prices nearly tripled. Natural gas prices nearly doubled during that period while electricity prices increased by more than 50 percent. Annual average prices between 1999 and 2009 rose from \$5.31 in nominal dollars per million British thermal units to \$10.23 in 2009.



“The decrease in demand from 2008 to 2009, totaled 9.6 trillion British thermal units, a decrease of 5.3 percent.”



Union Pacific Railroad, Omaha, Nebraska

T R A N S P O R T A T I O N

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

2009. In 2009, nearly 94 percent of energy used – 159.29 trillion British thermal units out of 170.70 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 6.57 trillion British thermal units and ethanol at 4.52 trillion British thermal units.

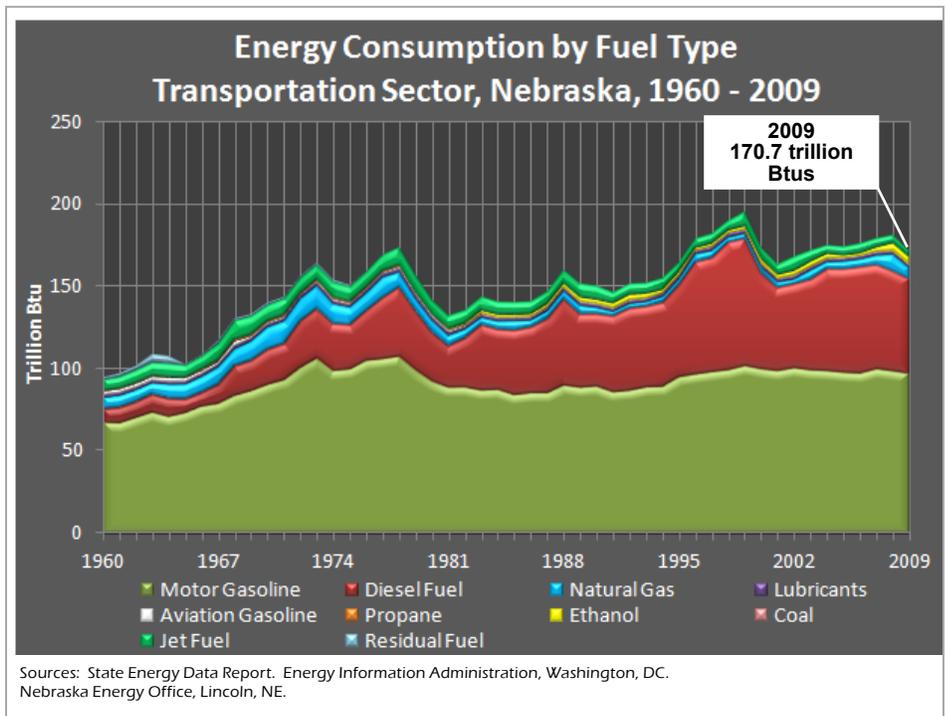
Generally, supplies of these fuel types have been readily available to transportation users.

1960-2009. 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 record-keeping began in 1960. The transportation sector was nearly totally dependent upon petroleum-

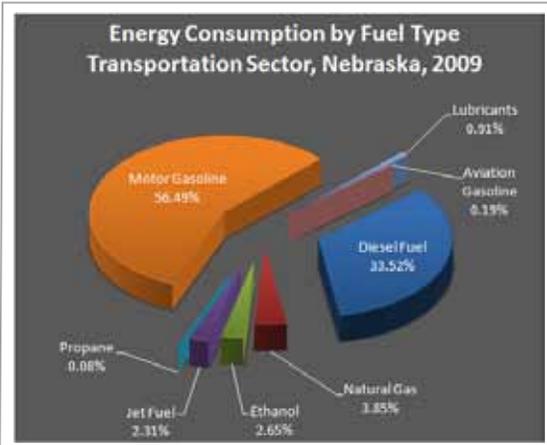
based fuels in 1960 and remained nearly as dependent in 2009. The changes that occurred in the 49-year period primarily related to increased use. Renewable fuel, specifically ethanol, use began marginally in 1981 at 0.27 trillion British thermal units and hit a new historical peak of 4.64 trillion British thermal units in 2008. Ethanol use in 2009 declined by 2.5 percent to 4.52 trillion British thermal units. 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 57.21 trillion British thermal units in 2009. Motor gasoline use in 1960 was 67.07 trillion British thermal units, peaked in 1978 at 106.77 trillion British thermal units and by 2009 had declined to 96.43 trillion British thermal units.

Demand

2009. More than a fifth – specifically 22.48 percent of the state’s total energy consumption –



T R A N S P O R T A T I O N



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

170.7 trillion British thermal units – was used in the transportation sector in 2009. The decrease in demand from 2008 to 2009 totaled 9.6 trillion British thermal units, a decrease of 5.3 percent.

1960-2009. In 1960, the transportation sector was the largest energy using sector at 94.2 trillion British thermal units, 30.5 percent of consumption in all sectors. By 2009, the transportation sector had 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.

Trends in this sector – such as sport utility vehicles and large trucks used for personal transportation – have thwarted conservation efforts. However, fuel price rises can induce conservation behavior.

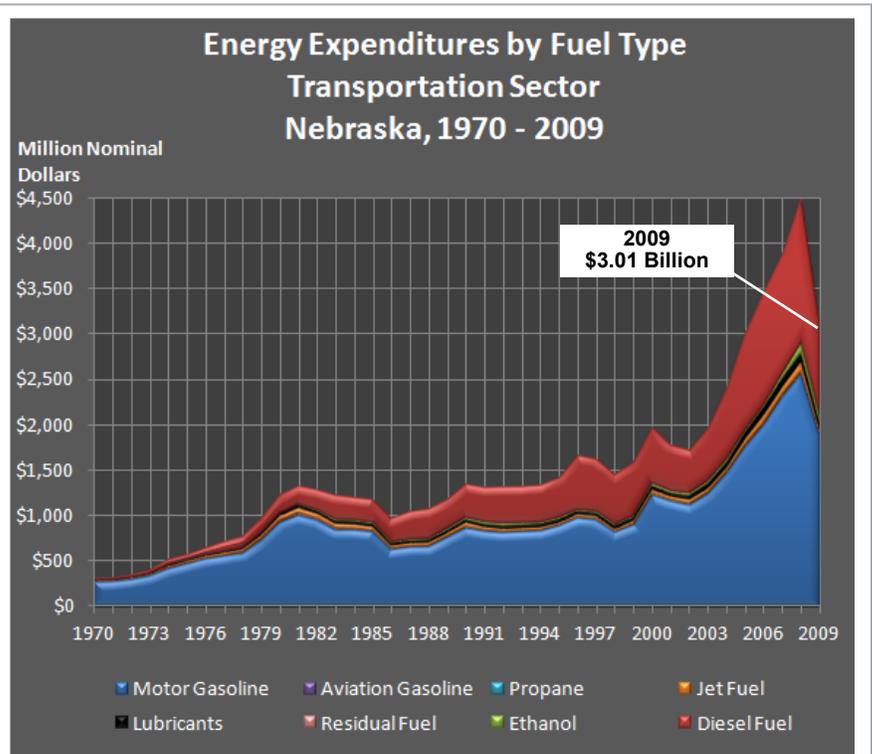
Rising pump prices for petroleum-based fuels since 1999 have had an impact on demand. Peak total energy consumption in this sector was reached in 1999 at 194.4 trillion British thermal units. The precipitous decline in transportation sector use from 1999 to 2000 – from 194.4 trillion British thermal units to 172.8 trillion British ther-

eclipsed as the largest energy using sector by the industrial sector.

The state’s Ethanol Board reported in January 2012 that ethanol sales in 2011 topped 10 billion gallons after 34 years of being sold in the state. Only four percent of ethanol produced in Nebraska is consumed in the state.

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



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

T R A N S P O R T A T I O N

“The 39-year span of energy prices in this sector provides dramatic illustrations of the financial impact of petroleum dependency on Nebraskans’ wallets.”



Rush hour traffic jam at 84th and “O” Streets in Lincoln.

mal units — continued into 2001 and was caused by dramatic price increases. Since 2001 when demand was 162.6 trillion British thermal units, demand marginally inched upwards nearly every year until 2009.

Energy Need

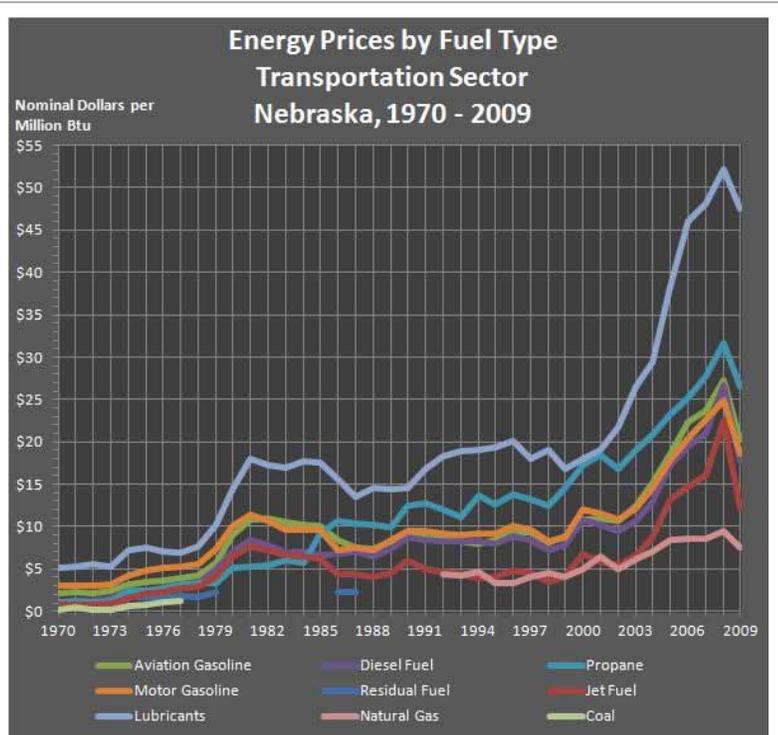
Trends in price and vehicle technology as well as federal government initiatives such as more efficient vehicles are expected to have an impact on energy use in this sector in the future, leading to declines in consumption. An offsetting trend has been the gradual increase in the number of motor vehicle miles traveled nearly every year since 1979, when the annual total was 11.53 billion miles. By 2010, that figure was 19.5 billion miles traveled. The impact of hybrid, compressed natural gas and electric vehicles is marginal at this time, but could have a significant impact if consumer acceptance of the technologies is high.

2009. In 2009, the transportation sector spent \$3.018 billion in nominal dollars for energy, a decrease of \$1.369 billion — 31 percent — in nominal dollars over 2008.

1970-2009. 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 2009, transportation sector expen-

ditures of \$3.018 billion in nominal dollars had fallen to 43.2 percent among all sectors, and still ranked first among the four end-use sectors.

The 39-year span of energy prices in this sector provides dramatic illustrations of the financial impact of petroleum dependency on Nebraskans’ wallets. In 1970, diesel fuel was \$1.14 in nominal dollars per million British thermal units, but by 2009 diesel fuel was \$17.68, rising an eye-popping \$5.69 between 2007 and 2008. Motor gasoline was \$3.03 in nominal dollars per million British thermal units in 1970 and \$18.57 in 2009. The most dramatic rise occurred in propane: \$1.09 in nominal dollars per million British thermal units in 1970 and \$26.61 in 2009.



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

“In 2009, 68.61 percent of the electric utilities energy supplies came from coal, 242.32 trillion British thermal units out of a total of 353.21 trillion British thermal units.”



Sheldon Station is a coal-fired generating plant located near Hallam

E L E C T R I C U T I L I T I E S Electric Utilities

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

Energy Supply

2009. In 2009, 68.61 percent of the electric utilities energy supplies came from coal, 242.32 trillion British thermal units out of a total of 353.21 trillion British thermal units. The second most used fuel in this sector, nuclear, supplied 27.94 percent, or 98.69 trillion British thermal units. Three lesser fuel sources supplied nearly all the balance: hydropower, 1.2 percent, or 4.23 trillion British thermal units; natural gas, 0.94 percent, or 3.32 trillion British thermal units; and wind, approximately 1.06 percent, or 3.73 trillion British thermal units.

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

1960-2009. Trends in fuel types used by the state’s electric utilities illustrate how the industry has evolved over 49 years. In 1960, 63.8 percent of the electricity generated came from natural gas, with hydropower (20.54 percent) and coal (21.61 percent) supplying most of the balance. An experimental nuclear reactor was located at Hallam and operated between 1963-1964 but generated only marginal amounts of power before being deactivated. Coal use in this sector peaked in 2009 at 242.32 trillion British thermal units, natural gas used peaked in 1973 at 53.11 trillion British thermal units, nuclear power — which began in 1973 — peaked in 2007 at 115.77 trillion British ther-

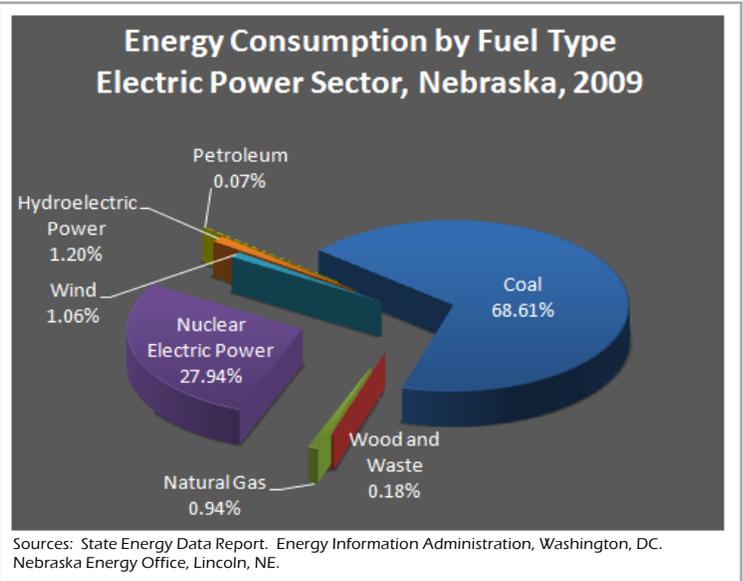
mal units, hydropower peaked in 1999 at 17.57 trillion British thermal units and wind use peaked in 2009 at 3.73 trillion British thermal units.

Demand

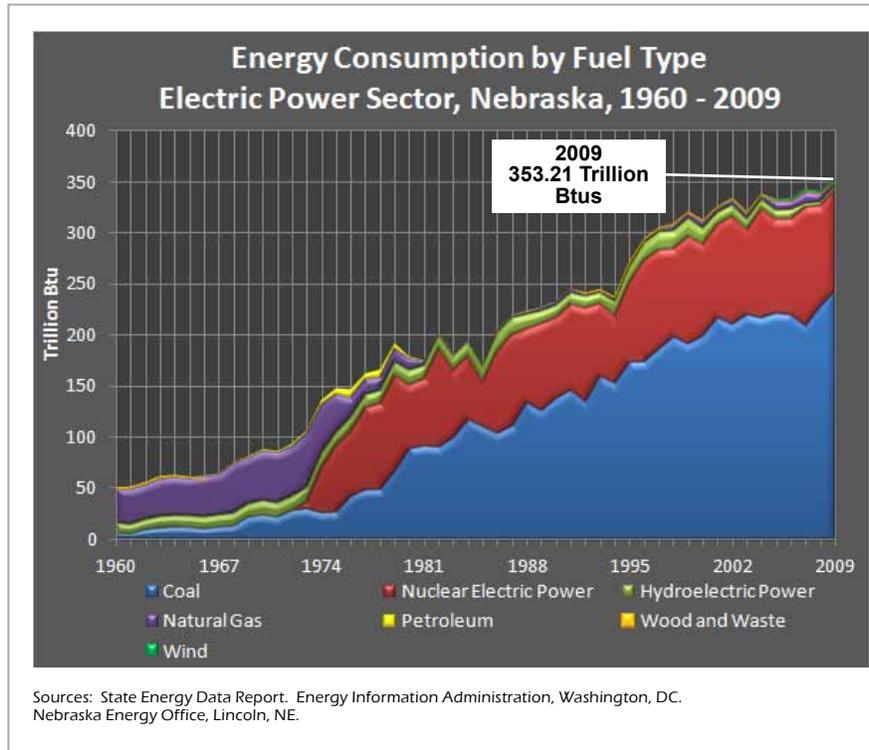
2009. The demand in the state’s electric utility sector in 2009 totaled 353.21 trillion British thermal units, an increase of 4.0 percent, or 13.46 trillion British thermal units, over 2008 demand. Among the changes in fuel used to generate electricity in 2008 were increased use of coal, hydro and wind and reductions in petroleum, natural gas and nuclear.

Electricity purchases generated by hydropower for use by Nebraska utilities from the Western Area Power Administration in 2010 totaled 2.062 billion megawatt hours at an average price of 0.0399 cents per kilowatt hour. The total cost of the power purchased in 2010 was \$82.27 million. In 2009, the amount of power provided from Western Area Power Administration met 7.3 percent of the electricity demand in the state

1960-2009. In 1960, the state’s electric utili-



E L E C T R I C U T I L I T I E S



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 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

ties' demand was 50.2 trillion British thermal units. By 2009, the demand in this sector had increased nearly seven-fold to 353.21 trillion British thermal units.

Over the 49 year period, only 13 years recorded declines in demand. A number of these declines were marginal; however, larger declines in demand paralleled economic cycles as well as favorable climate periods which affected irrigation and air conditioning use.

Conservation

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

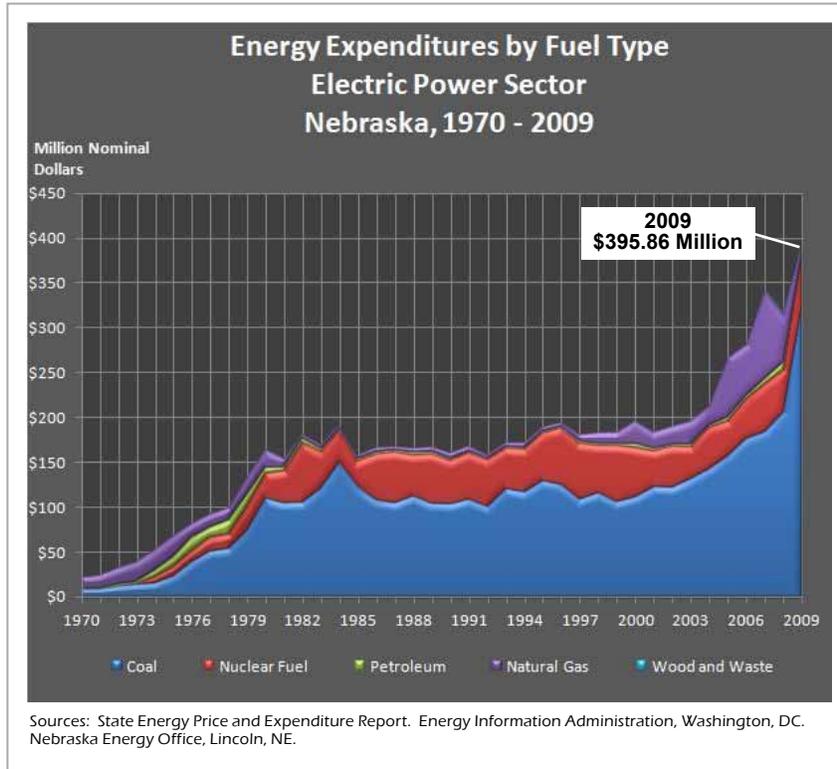
One on-going target of efficiency improvements is reducing electricity transmission line losses. While technological breakthroughs can

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 that could be used to export traditional and renewable generated electricity.

E L E C T R I C U T I L I T I E S

“Nebraska’s electric utilities more than met their customers’ needs, continuing to export electricity to customers outside the state.”



In late 2011, the Nebraska Power Association, with the support of the Nebraska Energy Office and others, issued the *2010 Research & Conservation Report* which documented research, energy efficiency and sustainability efforts of the state’s electric utilities and the Energy Office. The *Report* quantified approximately 24 megawatts and 80,000 megawatt-hours that were reduced because of utility and agency activities and programs in 2010. A copy of the *Report* is at <http://www.neo.ne.gov/reports/2010-NPA-Report.pdf>.

Energy Need

Nebraska’s electric utilities more than met their customers’ needs, continuing to export electricity to customers outside the state. Between 1990 and 2008, electricity exports varied from a low of 9.4 percent of generation in 1994 to a high of 23.9 percent in 1999. In 2010, 18.5 percent of the electricity generated in Nebraska was sold for use outside the state’s borders, an increase of 22.2 percent from 2009 and the highest percentage of net generation since 2004.

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 — have recently become operational. Smaller generation asset options have also been identified, especially those using wind.

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.

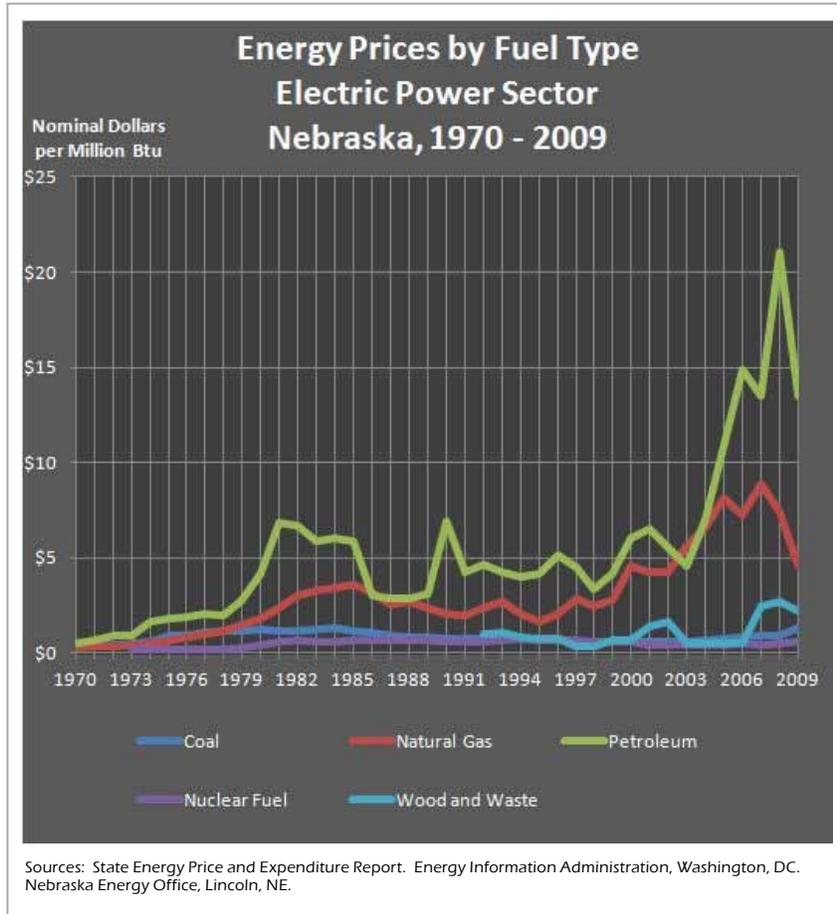
Consumer behavior, also known as demand side management, can be a source of conservation from which the electric utility sector will benefit since the cheapest kilowatt is the one that doesn’t have to be produced. For example, Nebraska utilities have been very proactive in the past several years in encouraging Nebraskans to utilize new lighting technologies, especially compact fluorescents and light emitting diodes. Some electric utilities have provided discount coupons, free light bulbs or financial incentives for larger commercial, industrial or governmental operations.



Omaha Public Power District's Nebraska City Station

E L E C T R I C U T I L I T I E S

“Nationally in 2009, the statewide average price for all sectors from all electric utilities in Nebraska was the ninth lowest rate in the country.”



From a different and more recent perspective, residential electricity rates in Nebraska in September 2011 were 10.97 cents a kilowatt-hour in Nebraska, ranking 35th among all states.

Between 2008 and 2009, two substantial changes occurred in electric utility expenditures: coal rose dramatically from \$204.94 million nominal dollars to \$321.45, a rise of 36.3 percent and natural gas plummeted from \$54.11 million nominal dollars to \$15.05, a drop of 73 percent.

1970-2009. In 1970, the electric utility sector spent \$22.27 million in nominal dollars, less than 5.6 percent of what was spent in 2009, \$395.86 million in nominal dollars. In the

2009. In 2009, electrical utility sector expenditures totaled \$395.86 million in nominal dollars for energy, an increase of 2.5 percent over 2008.

Nationally in 2009, the statewide average price for all sectors from all electric utilities in Nebraska was the ninth lowest rate in the country at 7.52 cents a kilowatt-hour. Nationally, the average price for electricity is 9.83 cents, 21.6 percent more than it costs in Nebraska. Hawaii at 25.12 cents pays the highest, while Wyoming pays the lowest, 6.20 cents.

39 years since 1970, coal expenditures increased from \$8.47 million nominal dollars to \$321.45 million nominal dollars in 2009, natural gas from \$12.77 million nominal dollars to \$15.05 million nominal dollars in 2009, and nuclear fuel from nothing in 1970 to \$54.45 million nominal dollars in 2009. Minimal expenditures were made for petroleum and wood and waste wood fuels.



Nebraska Public Power District's Cooper nuclear power plant near Brownville

STATE ENERGY RESOURCES ASSESSMENT

“In 2010, crude oil production decreased slightly from 2009 to 2.207 million barrels, returning to a slow decline after several years of small increases in production.”



Oil well in Cheyenne County western Nebraska

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 2010, natural gas production was 2.253 billion cubic feet, a decrease of about 22 percent from 2009.

In 2009, Nebraska's natural gas production represented only two percent of the natural gas consumed in the state in that year.

In 2010, Nebraska natural gas production ranked 26th among the states, just ahead of South Dakota.

Dry natural gas proven reserves are included with a number of states – Arizona, Indiana, Maryland, Missouri, Nevada, Oregon, South Dakota and Tennessee. Estimates for this group of states reached an all-time peak in 2009 at 349 billion cubic feet, an increase of 29.2 percent over 2008.

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 generation of electricity.

Uranium

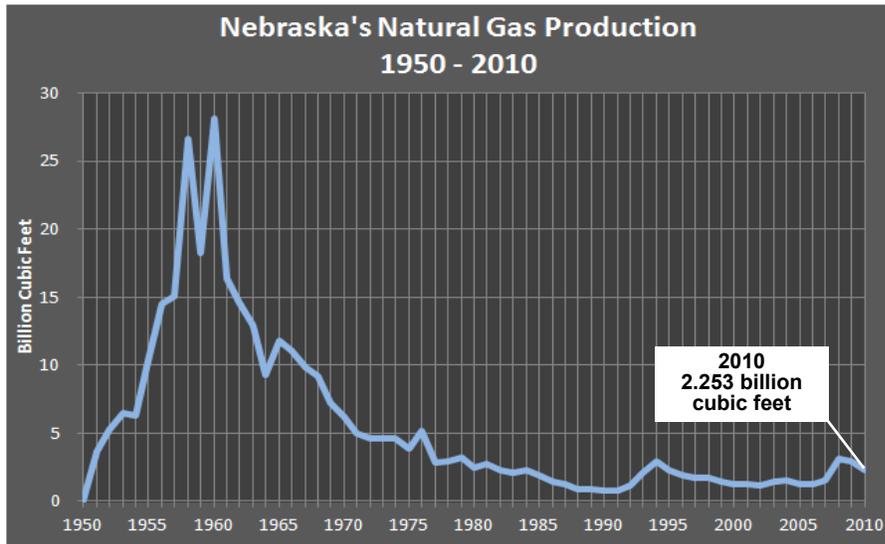
Uranium has been mined in the state since 1991 at a site near Crawford, but must be sent outside the state's boundaries for processing.

Alternatives

In Nebraska, there are five viable alternate energy sources available: biomass, geothermal, hydropower, solar and wind.

In 2009, 10.79 percent of the state's energy consumption – 87.51 trillion British thermal units out of 810.98 trillion British thermal units – was met using renewable resources according to the Energy Information Administration.

Renewable energy use reached a new peak in 2009 at 87.51 trillion British thermal units, 10.79 percent of total energy consumption that year, surpassing the previous high in 2008.



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

STATE ENERGY RESOURCES ASSESSMENT

Biomass

Biomass includes biodiesel, ethanol, landfill gas, methane and wood and wood waste. Biofuels and biomass accounted for 78.49 trillion British thermal units in 2009 out of 87.51 trillion British thermal units for all renewable energy types.

In 2009, wood and wood waste provided 7.51 trillion British thermal units, a slight increase over 2008.

Biodiesel

Commercial scale biodiesel production began in Nebraska in 2006 and production was estimated to be around 2.4 million gallons in 2008. However, the price of soybeans used for feedstock seriously damaged this budding industry in the state in 2008 and both commercial scale plants in Arlington and Scribner are closed. If both plants would reopen, production capacity is estimated at 5.4 million gallons a year.

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 October 2011, Nebraska has the second largest ethanol nameplate capacity (1.989 billion gallons) and the second largest ethanol operating production (1.964 billion gallons) in the nation. Approximately 13 percent of the nation's ethanol capacity is in Nebraska's 25 plants.

Ninety-one percent of Nebraska's ethanol production goes to U.S. domestic markets, five percent is exported to other countries and four percent is used by Nebraskans.

The state's Ethanol Board estimates that 40 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 gasoline – are also sold. Ethanol-blended fuel consumption in 2010 was 641.52 million gallons, a new record. Ethanol's share of the fuel market in 2010 increased from 2009 to 76.0 percent in which all fuel sold was an ethanol blend, also a new record. The previous high of more than 73.2 percent was set in 2008.

Landfill Gas and Methane

A small, but slowly increasing amount of electricity is being generated from methane at former landfills: OPPD's Elk City Station; and wastewater sewage facilities: Lincoln's Teresa Street Treatment Plant and Omaha's Missouri River and Papillion Creek Treatment Plants. Other sources include a commercial processor in Butler County and one livestock anaerobic digester in Colfax County. Energy production from biogas resources has been tracked since 1995 when 1.06 million kilowatt hours was produced. In 2009, reporting Nebraska production facilities produced 70 million kilowatt hours of electricity.

Wood and Wood Waste

In 2009, wood and wood waste provided 7.51 trillion British thermal units, a slight increase over 2008.

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

“The state's Ethanol Board estimates that 40 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 plant near Mead, Nebraska

STATE ENERGY RESOURCES ASSESSMENT

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. Resources in these areas 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 2009, 0.25 percent of the state's total renewable energy consumption – 1.02 trillion British thermal units – came from geothermal resources and a historic high. That was a slight increase over the 0.88 trillion British thermal units in 2008.

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 2009, 4.23 trillion British thermal units of hydropower were consumed in Nebraska which accounted for 0.52 percent of 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 could be produced from existing or new hydro resources. It appears unlikely that any additional conventional hydropower resources will be developed within the foreseeable future. However, there are indications that micro-hydroelectric dams would be feasible in a number of settings across the state.

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 among the states with great 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 solar resources, 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 photovol-

“Nebraska is ranked among the states with great energy potential from solar power, according to the National Renewable Energy Laboratory.”



A solar power class at MCC in Omaha

“In 2011, 1.082 billion kilowatt hours were generated by utility-scale wind energy in Nebraska. Nebraska has 196 operational turbines with a total capacity of 337.38 megawatts.”



Wind turbines near Springview, Nebraska

ESTIMATED ENERGY CONSUMPTION REDUCTION

taic 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 the fall of 2010, Nebraska Public Power District, with a *Recovery Act* grant from the Energy Office, constructed a 45 kilowatt photovoltaic array at its Norfolk Operations Center. Four other smaller solar installations were also funded with *Recovery Act* grants.

In 2009, solar energy accounted for 0.04 trillion British thermal units of all renewable energy consumed in the state, the same amount as in 2008.

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 resources. 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 4th in the nation with the greatest wind energy potential. Another study has placed Nebraska 3rd in wind energy potential.

In 2011, 1.082 billion kilowatt hours were generated by utility-scale wind energy in Nebraska. Nebraska has 196 operational turbines with a total capacity of 337.38 megawatts. The average annual output from the turbines is sufficient to provide power to about 103,880 homes for a year. A complete list of sites and generation is available at <http://www.neo.ne.gov/statshtml/89.htm>.

Wind turbine facilities that should become operational in 2012 include:

- A 50 turbine wind farm near Broken Bow with 80 megawatts of capacity and
- A 14 turbine wind farm near Crofton with a 42 megawatt capacity.

In 2009, wind energy produced 3.73 trillion British thermal units, less than one-half of one percent of all energy consumed in Nebraska.

At the end of 2011, the state ranked 24th among all states with 337 megawatts installed wind energy capacity. 122 megawatts are under construction according to the American Wind Energy Association.

Estimated Energy Consumption Reduction

Several evaluations have been conducted in the past 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

Loan and Weatherization Program Evaluations

In 2010, the agency began two separate *Recovery Act*-funded evaluations on energy savings resulting from program activities in the Low-Income Weatherization Assistance Pro-

ESTIMATED ENERGY CONSUMPTION REDUCTION

gram and on Dollar and Energy Saving Loans. These studies are expected to be completed in 2012.

Code Compliance

During the reporting period, the agency conducted a study of code compliance of newly built homes. The evaluation was funded with a building energy codes contract from the Pacific Northwest National Laboratory. The study evaluated 100 homes built in 2010 in 18 counties. The analysis of those findings should be completed in early 2012.

School Building Energy Audits

With *American Recovery and Reinvestment Act* funds, the agency conducted energy audits for public school buildings. As of December 2010, 152 districts out of 254 participated which included 606 buildings out of a potential 979. In phase one, energy use data was supplied by the schools for entry in ENERGY STAR® Portfolio Manager. In phase two, 62 buildings that had Energy Star ratings indicating significant energy savings were selected for a walk through investment-grade audit. In early 2012, the findings of those audits, along with financing options, will be shared with school district officials.

*Nebraska Energy Office
Box 95085
1111 "O" Street, Suite 223
Lincoln, NE 68509
Phone: 402-471-2867 Fax: 402-471-3064
Email: energy@nebraska.gov
Website: <http://www.neo.ne.gov>*