

Nebraska ENERGY

Q U A R T E R L Y

Nebraska Energy Office

Winter 1989

Ethanol Championed

Governor Urges Increased Federal Participation

Governor Kay Orr has called upon the federal government to play a larger role in the development of agriculturally-produced fuels, including ETBE, an ethanol-based fuel additive. Orr testified December 8th at a national energy strategy hearing in Omaha on "Agriculture as Consumer and Producer of Energy."

National Energy Strategy to be Developed

The hearing was one in a series chaired by Admiral James Watkins, Secretary of Energy. President Bush has directed



Photo by Mel Evans

Governor Orr discusses elements of the National Energy Strategy with Energy Secretary Watkins, left, and Agriculture Secretary Yvette, center.

Watkins to establish a national energy strategy plan. In his opening remarks, Watkins acknowledged that our country has been without a unified energy plan.

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Study of Nebraska Schools Released

\$24.8 Million in Building Improvements Remain to be Made

Nebraska schools which participate in the School Weatherization Program use less energy than schools which have not participated in the program. That was one conclusion reached in a study of the School Weatherization Program done by the Nebraska Energy Office. The study, requested by the Legislature last year, surveyed the current energy efficiency of Nebraska's public schools, identified remaining cost-effective opportunities, and analyzed the adequacy of current funds to accomplish the opportunities identified.

\$24 Million Invested in 8 Years

The Nebraska School Weatherization Program has operated since 1981, first providing grants and then no-interest loans to public school districts. During that time, \$24 million in state funds have been invested in energy efficiency improvements in K-12 schools resulting in an estimated annual energy savings directly attributable to the program of about \$3.4 million. This translates into a 13.8% average rate of return on the investment of state dollars since 1981.

Over the years, 810 currently existing school buildings have participated in the program. Although the past eight years have seen a gradual decline in energy use per square foot in nearly all Nebraska schools, the study shows schools participating in the program saw an energy use reduction of between 13 to 16% more than schools which did not participate.

17.7% Return on Investment

The report also concludes that approximately \$24.8 million worth of cost-effective energy improvements remain to be done. Of this, \$22 million would be eligible for loans under the current rules of the Weatherization Program. If all schools received loans for these eligible projects, the Energy Office estimates \$3.9 million per year would be saved translating into a 17.7% rate of return on the investment of state funds.

Demand Exceeds Projected Revenues

The study also finds the potential demand for financing for energy improvements far exceeds the current and future available revenues. Increases in energy prices and advances in technology will further intensify the discrepancy between potential demand and available funds.

Copies of the study are available from the Energy Office. Contact John Osterman or Allison Meyer at 402-471-2867 to obtain a copy of the report.

Life-Cycle Cost Analysis

Making the Best Buy

The choice between purchasing different appliances is not always clear. Most buying decisions are based primarily on purchase price. However, inexpensive purchases may actually result in ownership of products that are costly to operate or maintain.

Life-Cycle Cost Analysis assumes that the best buy is the product that performs the required tasks and carries the lowest lifetime costs. Most major appliances have an average life of at least fifteen years. The more energy a major appliance consumes, the more important it is to know the life-cycle costs before you make the purchase: you may be paying the operating costs for many years to come.

What You Need To Know

To compute the life-cycle costs, collect the following information:

1. The purchase price;
2. The cost of energy (obtained from your utility dealer);
3. The annual energy expense to operate the appliance (obtained from the Energy Guide Labels);
4. The estimated life of the appliance in years;
5. A discount factor, which adjusts for inflation and converts future costs to their present value. Money today is worth more than the same money will be worth in the future. The discount rate is equal to the rate of inflation plus the real rate of return on investment.

The Life-Cycle Cost Equation

$$\text{Life-Cycle Cost} = \frac{\text{Purchase Price}}{\text{Price}} + \frac{\text{Annual Energy Cost}}{\text{Cost}} \times \text{Estimated Lifetime} \times \text{Discount Rate}$$

A Dollar Saving Example

For example, consider the costs of purchasing two refrigerators, A and B. The purchase price of refrigerator A is \$800 while the price of refrigerator B is \$650. According to the Energy Guide Label on each model, the estimated annual energy cost to operate the more energy efficient refrigerator A is \$120; operating costs for refrigerator B are \$160. Assuming an estimated twenty year life and a discount rate of 0.75, the life-cycle cost for each refrigerator is computed as follows:

	Purchase Price	+	Annual Energy Cost	x	Est. Lifetime	x	Discount Rate	=	Life-Cycle Cost
A =	\$800	+	(\$120)	x	20	x	0.75	=	\$2,400
B =	\$650	+	(\$160)	x	20	x	0.75	=	\$3,050

Refrigerator B will cost \$150 less than refrigerator A today, but estimated lifetime operating costs for refrigerator B will exceed energy-efficient refrigerator A by \$750.

Life-Cycle Cost Analysis can also be applied to installation of heating or air conditioning systems. However, average lifetimes of some systems are not always comparable. Your dealer should be able to provide average life statistics.

Low-Interest Loans in Capital City

Energy Saving Loans Offered to Lincoln Neighborhoods

Two low-interest loan programs are being made available to Lincoln residents who wish to decrease their energy consumption and lower their fuel bills.

The City of Lincoln's Department of Urban Development, with assistance from FirstTier Bank, the Lincoln Electric System, the Nebraska Investment Finance Authority (NIFA) and the Energy Office, is operating the Year 'round Energy Savings (YES) Loan Program, which provides low-interest residential weatherization loans to owners of single- or multi-family structures.

3% Fixed Interest

The loan funds are being offered at a 3% fixed interest rate to Lincoln homeowners interested in implementing approved energy efficiency improvements, including furnace replacement, insulation, caulking and weatherstripping, window glazing and lighting replacement. To qualify, building structures must have been constructed prior to 1976 and improvements must have a combined energy savings payback period of no more than ten years.

Principal funds for the loan project are provided by NIFA. Interest rates are being bought down with Exxon Oil Overcharge funds provided by a grant from the Energy Office.

For more information and complete program guidelines, contact Nancy Kay at the Department of Urban Development, (402) 471-7855.

Loans For Credit Risks

Neighborhood Housing Services (NHS) of Lincoln will operate a revolving weatherization loan program for poor credit risk borrowers owning property in any NHS-affiliated neighborhood. Those neighborhoods are Woods Park, Malone and Hartley.

Based on the assumption that poor-risk homeowners can repay properly structured loans from the financial savings realized in energy efficient homes, the program is being offered to property owners unable to obtain credit from a conventional lending source. Loan funds will be made available at a variable interest rate based on income and monthly debt-to-income ratios. Approved weatherization improvements include furnace replacement, insulation, caulking and weatherstripping, window glazing and replacement and lighting replacement. To qualify, building structures must have been constructed prior to 1980 and improvements must have a combined energy savings payback period of no more than ten years.

Funding for the project is provided by an Exxon Oil Overcharge grant from the Energy Office.

How to Find Out More

For more information and complete program guidelines, contact Brian Kamler at Neighborhood Housing Services of Lincoln, (402) 477-7181.

The Blower Door Test

How to Detect Home Energy Loss

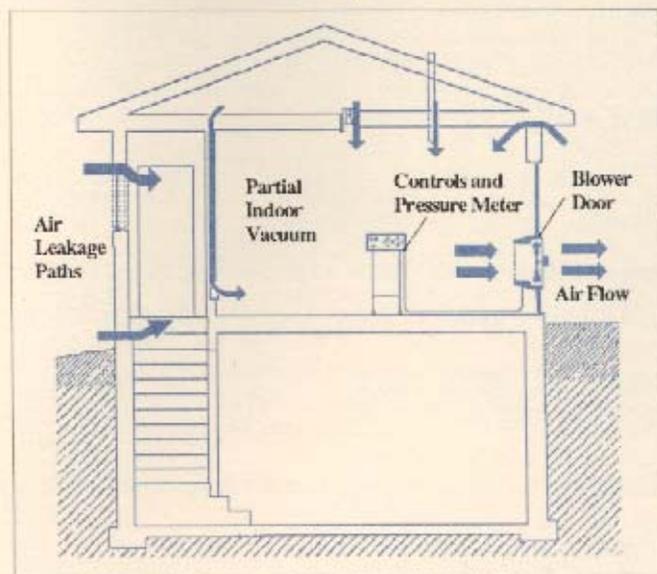
Your home is made up of thousands of components that are nailed, glued, caulked, taped or otherwise assembled to form a protective envelope around the internal living space. An airtight barrier is created to reduce energy consumption and eliminate drafts and moisture problems caused by air leakage. A blower door is a useful tool for locating air leaks in buildings and determining how much air is flowing through unsealed openings.

Locate Air Leaks with Ease

After closing all intentional openings, such as windows, doors and vents, the blower door unit is temporarily mounted in a door frame. A powerful fan is used to draw air out of the house, creating a vacuum within the structure. The air drawn out is replaced by air rushing in through the unsealed cracks and openings in the building's shell. These exaggerated air leaks are easy to locate simply by running your hand over walls and near windows, or by using a smoke pencil. Identified air leaks can then be reduced by weatherizing the structure. Insulation, caulking, weatherstripping and window glazing are all effective methods of reducing air infiltration.

Effective in New and Existing Homes

The ventilation or leakage rate of your home can also be determined by comparing the internal and external air pressure difference to the air flow rate through the fan. A well-sealed



Schematic of blower door depressurization test

building requires less air flow through the fan to maintain a given pressure difference. During the blower door test, fan speed is varied in increments and the corresponding house pressure and airflow rate are measured to determine air changes, infiltration rates and leakage ratios. Average infiltration is useful for projecting annual energy consumption information which can be used to assess the energy efficiency of both new construction and existing structures.

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Secretary Watkins estimates that currently unused agricultural land has the potential to produce more than ten percent of the energy used in the United States and believes that ability should be integrated into the comprehensive plan. "Within the next decade, energy crops may become as important to farmers as the more familiar grain and forage crops," Watkins said.

Clayton Yuetter, Secretary of Agriculture, co-chaired the assembly. Yuetter, a Nebraska native, is especially interested in demand-side agricultural production and agreed that the development of ETBE and other alternative fuels offers new markets for agricultural products.

Develop ETBE

Governor Orr and Nebraska Gasohol Committee Administrator Todd Sneller requested that the federal government cooperate with local government and private industry to develop ETBE and other commercial fuels. Sneller believes that ETBE has exceptional potential in the alternative fuels market because of its low volatility and because it contains oxygen. The federal government has offered tax incentives to encourage private investment in alternative fuel production. The tax incentives are scheduled to end in 1992.

Orr also emphasized the bond between energy consumption and agriculture. Nearly every facet of agriculture is energy intensive, from fertilizers to transportation fuel. A shortage of diesel fuel just last summer created a problem for Nebraska farmers. "An entire production season could be lost if we do not have the fuel to power our tractors," stated the Governor.

Plan Due in April

Sixteen individuals from various interests were invited to testify at the hearing and written testimony was openly accepted. A preliminary draft of the strategy plan should be available in April.

What's the Right Size?

Water Heaters

Are you in the market for a new hot water heater? Before purchasing, calculate the right size for your household.

Hot water needs for a family of two persons with one bathroom and an automatic clothes washer typically require a thirty-gallon water heater. For each additional person or bathroom, add 3.5 gallons. Automatic dishwashers require an additional 5.0 gallons.

Also consider the recovery rate: how much of its water capacity the unit can reheat in one hour. Minimum recommended recovery rate is 75%.

Insulate the Water Heater, Too

To increase the energy efficiency of your water heater, wrap insulation around the pipes coming out of the water heater and the heater itself. Be careful not to insulate the top or bottom of a gas or oil operated heater because it may interfere with venting.

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To obtain more information about blower door testing, contact a home weatherization specialist or insulation contractor in your area (consult your Yellow Pages Directory under Insulation).

Getting to Know Space Heaters

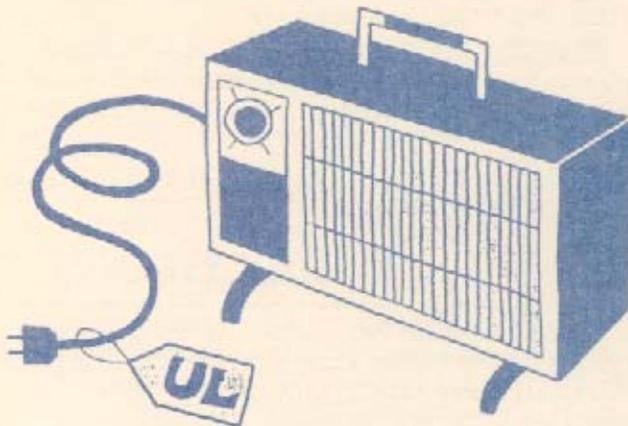
During the coldest months of winter, space heaters provide a popular method of warming a chilly room.

Natural Gas

• Natural gas room heaters are good for space-heating an add-on room, a workshop or garage without adding ductwork. They feature automatic thermostats and the convenience and economy of a cost-effective fuel source. Available in several sizes, natural gas heaters are designed for stability and safety; they vent by-products harmlessly outdoors.

Kerosene

• Once considered unsafe for indoor use, kerosene heaters have again become popular in American homes. Kerosene heaters should be used only with water-clear kerosene; be careful when handling the fuel. Because these heaters are not vented, a window may have to be opened to guarantee safe and adequate ventilation. Never leave a kerosene heater burning unattended at night.



Quartz

• Quartz heaters use fragile rods of the mineral quartz as a heating element, while ordinary heaters use coil wires. Purchase heaters that have an automatic shutoff if the unit is tipped over. Be sure that the outside of the unit stays comparatively cool to reduce fire and burn hazards. Never run a quartz or electric heater unattended at night.

Caution and Common Sense

With any space heater, keep the unit away from drapes, furniture and other flammable materials. Look for a UL listing or approval from another recognized testing authority and make sure your insurance covers the use of the heater you choose.

Did You Know that...

Fast Facts

- According to the Washington Utilities and Transportation Commission, the United States uses twice the amount of energy to produce a dollar of gross national product as does Japan, and 87% more than West Germany.
- The U.S. D.O.E. estimates that 20% of all electricity generated in the U.S. is used for homes and businesses.
- According to John Javna, author of **Fifty Things You Can Do to Save the Earth**, if Americans recycled all of their Sunday newspapers, it would save more than 500,000 trees a week.
- The U.S. Department of Energy estimates that it will cost \$150 billion to clean up contamination at the nation's fifteen nuclear power plants.
- The energy saved by recycling one aluminum can is enough to keep a 100-watt light bulb burning for 3 1/2 hours. Making new aluminum from used cans will save 95% of the energy required to produce aluminum from bauxite ore. (Colorado Office of Energy Conservation)
- Motor gasoline demand increased for the sixth year in a row to 7.3 million barrels per day in 1988. (New Hampshire Energy Office)
- A fluorescent lamp can last 10-15 times longer than an incandescent lamp and produce 5 times as much light. (U.S. D.O.E.)
- According to the U.S. Department of Energy, if all thermostat settings were reduced an average of six degrees over a 24-hour period, over 570,000 barrels of oil would be saved each day.
- The Alliance to Save Energy estimates that uninsulated heating ducts can draw away up to 40% of the heat your furnace creates.
- Each degree above 70 degrees that you set your thermostat may increase your heating bill from 1 1/2 to 3%. (Minnegasco A.C.T.)
- Because glass and ceramic baking dishes distribute heat better than metal, they let you lower oven heat 25 degrees F. (EnergySense)

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