

# Nebraska ENERGY

Q U A R T E R L Y

Nebraska Energy Office

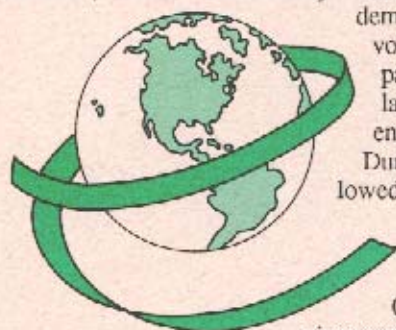
Spring 1990

It's April 22nd

## Earth Day is Back after 20 Years

On April 22, 1990, our country celebrated the 20th anniversary of Earth Day. Over 70 million people around the world participated in activities and special events.

Twenty years ago, Wisconsin Senator Gaylord Nelson, who was speaking in Seattle, suggested that Americans hold a "teach-in" to stimulate interest in environmental issues. "By the time I got back to Washington, my phone was ringing off the hook," Nelson said recently. The result was Earth Day, a demonstration which involved 20 million participants nationwide and launched the American environmental movement.



During the decade that followed April 22, 1970, great strides were made toward protecting our environment.

Congress created the Environmental Protection Agency and the National Oceanic and Atmospheric Administration and passed the Clean Water Act, a stronger Clean Air Act, the Endangered Species Act and other landmark legislation.



### World-wide Activity

Earth Day is no longer merely an American interest. More than 120 nations participated in activities to commemorate the anniversary, as individuals the world over renewed

*Continued on Page Three*

## Inside

Annual Report and Nebraska Energy Statistics .....	4
Did You Know That .....	4
Planting Trees .....	2
Recycling .....	2
Schools & Government Team-Up .....	4

## Is the World's Climate Changing?

### Global Warming

Few environmental issues have captured the attention of the world — and have been debated as widely — like the threat of global warming. There is little dispute about what may cause global warming. There is, however, disagreement over whether global warming is occurring.

Global warming is the result of the "greenhouse effect," which is the natural phenomenon that keeps our planet warm. Atmospheric gases trap solar heat rising from the earth's surface and radiate it back to the surface. Without the greenhouse effect, the earth would be too cold to support life.

### Problems from Fossil Fuels

Environmental concerns have developed because the atmospheric gases — carbon dioxide, methane, nitrous oxide and ozone — are increasing in concentration. This is primarily the result of burning fossil fuels to meet our energy needs. Carbon dioxide levels have increased twenty-five percent from preindustrial levels. Today, these gases are at the greatest levels ever recorded in the earth's history and the National Academy of Science reports that they are expected to double between 2030 and 2050.

Synthetic gases called chlorofluorocarbons, commonly used as coolants in refrigerators and air conditioning systems, and halon, often used in fire extinguishers, also contribute to the concentration of atmospheric gases. Methane, a naturally occurring gas associated with microbes present in cattle, and nitrous oxide, which is released in fossil fuel combustion and by nitrogen fertilizers, can also affect the atmosphere.

### Computer Models

With the assistance of computer models that simulate the earth's climatic processes, scientists have been able to manipulate conditions over an historical period to determine the environmental effects of increased atmospheric gases. Many scientists and climatologists argue that the result of the accumulated gases will be an increase in global temperature. The California Energy Commission reported that the average global temperature has risen one degree fahrenheit since the development of the industrial age. Indeed, the six warmest years on record occurred within the last decade.

The long term effects, some scientists conclude, will be increases in global rainfall, rising sea levels and a melting of the polar ice caps. Proponents further speculate that a warming of the earth's surface will also cause increases in

*Continued on Page Three*

## State Government Moves Ahead

# Recycling

Recycling in state government has taken off. Following Governor Kay Orr's announcement of the State Recycling Initiative last October, the Energy Office has taken the first steps toward developing a successful program to reduce solid waste in state government.

An advisory committee made up of key government officials was organized to guide the program. The committee decided to make paper collection and purchase of recycled paper the first priority. As directed by Executive Order 89-2, state employees are to receive recycling training, which includes instruction on recycling waste paper using "source separation," and tips for reuse and recycling in the home. Eight hundred employees have received training to date.

### A Goal of Behavioral Changes

Each agency has assigned a contact person to assist State Recycling Coordinator Monte McKillip with implementation of the program and to answer questions that employees may have as they start the source separation process. Each employee is responsible for sorting and emptying their individual paper receptacle. This is an important aspect of the recycling process because it asks each person to evaluate their own behavior and make a personal

commitment to decreasing waste. The learning process and behavior evaluation are integral components of the Recycling Initiative.

### Paper Recycling Increases 800%

State employees are participating in the program with great enthusiasm. Success can be measured by the volume of paper now collected for recycling. Prior to the Governor's Initiative, approximately 120 lbs. of recyclable paper was



Cindy Dorsey (left), and Dannie Dearing (right), of the Department of Environmental Control, deposit their agency's recycled paper in a collection bin while Monte McKillip (center), State Recycling Coordinator, assists.

collected daily. Since training began, 1000 lbs. of paper is being collected each day. McKillip believes that as more employees receive recycling training, this figure will continue to increase.

Purchasing or procurement of recycled paper is another priority. All state agencies are to begin using recycled paper. The specifications for the purchase of recycled paper were written by State Purchasing in consultation with guidelines established by the Environmental Protection Agency (EPA). As the existing contracts for paper used by state government expire, they will be

*Continued on Page Three*

## Arbor Day is April 27th

# Planting Trees

Save the earth, plant a tree. As simple as it sounds, planting a tree is one of the easiest and least expensive ways to conserve energy and protect the environment.

Healthy, growing trees can have a dual impact on the environment, by decreasing the amount of energy needed to heat and cool our homes and by absorbing harmful fossil fuel gases in the atmosphere.

Heat gains or losses in the home are due to radiation, conductive heat transfer and air leakage through the house. The result of unwanted heat gain or loss is inefficient use of energy and higher utility bills.

### Cooling Naturally...with Trees

Proper landscaping around a home can reduce cooling and heating needs. Plant materials neither reflect heat nor store heat for later radiation. By using foliage or trees to create shade from the summer sun, exterior surface temperatures of a house are reduced. Direct solar radiation and reflected ground radiation is diminished. Vegetation also reduces the surrounding air temperature through the process of "evapotranspiration" or evaporative cooling.

Depending on their density, trees can reduce solar heat gain by 40-80 percent. A recent Department of Housing and Urban Development report indicates that on a sunny summer day, the grass-covered backyard of a typical quarter-acre lot can have the cooling effect of two typical air conditioning units.

Landscaping also reduces air leakage by lowering or redirecting wind velocity around the house. Not only can landscaping provide shelter from winds, it can also make winds work for you, either by changing their course or by increasing the air flow. Planting trees to create a wind break is an effective method of diverting winds to provide ventilation.

### Planting on the Right Side for Best Results

Dense tree, shrub and hedge combinations are most effective on the west and northwest side of a structure because they block the low afternoon sun. Deciduous trees planted on the east, west and south sides adapt through the seasons by providing shade during the summer months and by allowing sunlight to penetrate through the branches in the winter. Planting evergreens to the north will reduce infiltration year round while keeping the southern exposure open to allow breezes to reach the home in summer.

### Absorbing Carbon Dioxide

Growing trees serve a second environmental function by absorbing harmful carbon dioxide (CO<sup>2</sup>) gases. Carbon dioxide is emitted when fossil fuels are burned and is the atmospheric gas chiefly responsible for depleting the earth's ozone layer and for intensifying the greenhouse effect.

The metabolism of a tree depends on intake of carbon dioxide through chloroplast in the leaves. Trees convert carbon into sugar and starches that are used to make the trunk, bark, leaves and roots. The remaining oxygen is released back into the atmosphere.

*Continued on Page Three*

re-bid using the new specifications for recycled paper. Vendors are asked to bid only recycled products, which demonstrates the state's commitment to purchasing recycled paper and products.



Barb Lawson, Administrator, and Lyn Koenig, Buyer, DAS-Material Division, examine bids for recycled paper from paper company representatives.

The first two contracts for recycled paper have been bid and the contracts will be awarded soon.

### The Recycling Loop

Procurement of recycled paper will also create a market for the paper that is collected within state government and in other source separation operations. It is possible that paper collected by the state could be sold to a paper mill for reprocessing and the same paper then purchased for use by the state again. This is the important part of completing the recycling loop that will make the State Recycling Program successful long into the future.

Approximately two to three billion tons of carbon are released into the atmosphere each year. Scientists estimate that it would be necessary to create forests in an area half the size of the United States to counter the effects of carbon released into the atmosphere by human activity. Although planting one acre of new trees will not solve the greenhouse effect, it is an effective way to lower atmospheric gases while the world learns to decrease fossil fuel use through better energy efficiency and creation of non-threatening alternative energy sources.



So, do your part to save the earth. Plant a tree.

their commitment to preserve a safe, sustainable planet.

Former-Senator Nelson, now with the Wilderness Society in Washington, D.C., commented, "There's much more interest, much more understanding, much more concern now than there was then." He added that the anniversary observance will succeed "as a grassroots explosion of activity, as it did in 1970."

severe weather, increased human mortality rates, wildlife habitat destruction, extinction among plants and animals, economic dislocation and air quality deterioration. Others within the scientific community counter that the computer models are unsophisticated and inferior and that current understanding of global climate is too limited to make predictions about the long-term atmospheric effects. The most advanced computer models, they stress, supply only crude representations of the earth's actual climate, distorting temperatures and other geological and geographical factors by measuring in 500-mile regions.

### Natural Cooling

The earth also has the ability to provide natural cooling through oceans and clouds. Clouds, for example, cool the earth by blocking sunlight and warm it by trapping heat. The organic ability of clouds to heat and cool is complex and infinitely variable. Current computer models do not adequately reproduce or predict the effects of cloud change.

Similarly, oceans absorb a great deal of heat and their photoplankton consume carbon dioxide. Simulating ocean currents in some models significantly lowered the level of predicted warming. However, most oceans — two-thirds of the earth's surface — remain largely unsampled.

Actual temperature records indicate that the predominant warming trends occurred before the presumed increase in atmospheric gas concentrations. Temperatures actually fell from the 1940s to the 1970s — precisely when use of gases was increasing rapidly.



### The Costs

Much of the debate over global climatic change has centered around the cost of reducing carbon dioxide emissions. Economic analysts estimate that unless it becomes easier to adapt technologies that reduce demand for oil, natural gas and coal, the price of reducing carbon dioxide emissions may run into the trillions of dollars through the next century. However, measures can be taken which will actually save money and have an impact on the environment.

### Low Cost Solutions

Increasing the energy efficiency of home appliances and commercial lighting, for example, could save more in electricity bills than they would cost in new equipment. Along with reducing carbon dioxide, increasing energy efficiency would reduce acid rain and provide additional economic benefit by decreasing our nation's dependence on foreign imports. It is estimated that improving energy productivity would save the world more than a trillion dollars per year.

The issues remain unresolved. However, as scientists continue to study our complex and continually changing planet, personal investment in energy efficiency and use of renewable resources remains an intelligent response to growing environmental and economic concerns.

As We Went to Press...

## Schools & Government Team-up in Recycling Competition

Governor Orr has challenged Lincoln public school children to match the commitment of state employees to reduce solid waste. In a recent letter to School Superintendent Philip Schoo, the Governor proposed that ten schools and ten Nebraska state agencies team up to collect recyclable items over a two-week period. At the end of the two weeks, collections will be sold to a recycling center and the winning team declared. Proceeds from the sale of the recycled objects will be used to purchase items for the winning school, for example, playground equipment or trees for the school grounds.

The project was scheduled to coincide with the twentieth anniversary of Earth Day.

### Two New Publications

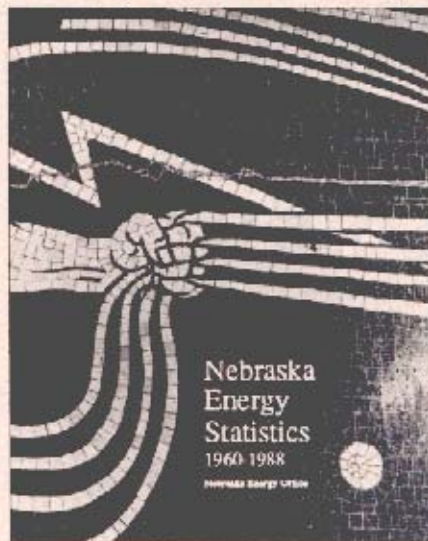
## Annual Report and Nebraska Energy Statistics

Copies of the Nebraska Energy Office's *Annual Report* and *Nebraska Energy Statistics, 1960-1988* are now available.

The *1989 Annual Report* details the agency's state and federal programs and activities during the last fiscal year,

outlines the status of the oil overcharge funds and reports on emerging trends and issues.

*Nebraska Energy Statistics, 1960-1988* presents the most current information about the state's energy use and supply system. Over 100 tables of data are augmented by 70 graphic presentations of the data.



If you would like copies, please contact Jerry Loos at the Nebraska Energy Office, (402) 471-2867.

### Preserving the Environment

## Did You Know That...

- Each year Americans throw away 16 billion disposable diapers and 220 million tires.
- Making newspaper from virgin materials uses twice as much energy as recycled paper.
- Litter clean-up costs Americans \$42.5 billion annually. (Colorado Energy Talk)
- A recent ruling by the Environmental Protection Agency mandates that all insulation materials installed by agencies using federal funds must contain a minimum content of recycled materials.
- The EPA indicates that the United States produces 3.5 pounds of solid waste per day per capita. Germany produces 1.6 lbs. and Japan produces .5 lb. The EPA also estimates that 90% of solid waste is recyclable.
- According to the City of Lincoln Recycling Office, each ton of paper recycled saves 17 trees and 390 gallons of oil. Recycling aluminum creates 95% less air pollution and 97% less water pollution.
- The Conservation and Renewable Energy Inquiry and Referral Service estimates that the United States used over 37.5 million barrels of crude oil per day in 1988 and increased foreign imports by 5%.
- The National Recycling Coalition reports that 34 states currently have laws favoring use of recycled products, an increase of 21 states since 1986.
- A study conducted at the MIT Center for Energy Policy Research estimated that carbon dioxide accounted for 49% of the atmospheric gases that create the greenhouse effect.

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