

## Global Warming: What's Being Done about It?

Some atmospheric scientists predict a 4- to 9-degree fahrenheit global temperature increase by the year 2050. To address such a potential change in global climate, two options are possible: (1) adapt to the changing climate, or (2) slow the emission of greenhouse gases and minimize climate change.

Some people believe that society can adapt to incremental changes in climate with minimal consequences. An oft-cited example is the development of heat- and pest-resistant crops for agriculture. The real key to adaptation, however, is to promote policies flexible enough to be beneficial whether or not a climate change occurs. Others believe that only through the control of greenhouse gas emissions can the serious impacts of a global warming be lessened. It is encouraging that both adaptation and control strategies are being considered in response to a potential changing climate.

### Policy Options

Several states have enacted legislation aimed at combatting global warming, usually in a form that also has environmental and economic benefits (i.e., increased energy efficiency, recycling, reduced air pollution, and reforestation), or that establishes task forces/groups to study the potential impacts and responses of the state to global warming.

Numerous bills directly addressing global climate change have been introduced into the U.S. Congress. None has yet been adopted, however. Several call for systematic decreases in the emissions of greenhouse gases responsible for global warming, such as carbon dioxide, methane, and nitrous oxide. Others have attempted to restrict deforestation and encourage conservation of resources. For example, the 1991 Carbon Dioxide Emissions Reduction Act (Cooper Bill) proposes that any growth in carbon dioxide (CO<sub>2</sub>) emissions be offset by equivalent reductions from other sources. Some electric utilities have proposed to offset their increased atmospheric emissions of CO<sub>2</sub> by planting trees that absorb this gas.

A number of foreign governments and individuals in the United States favor a carbon tax on energy

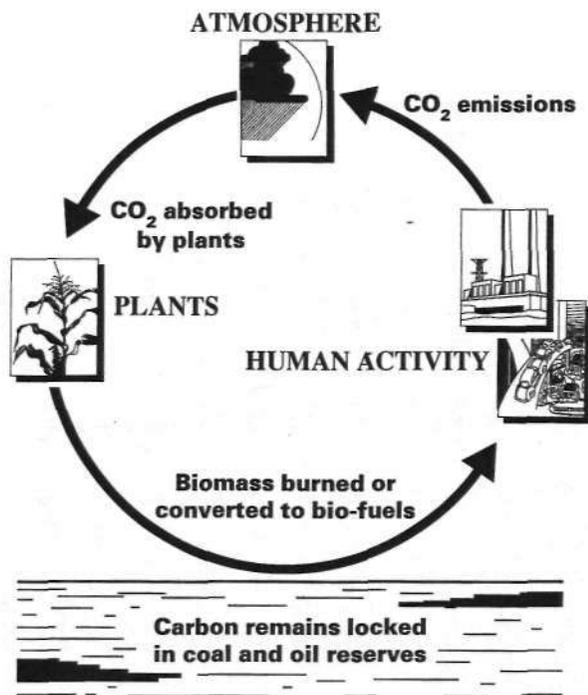
sources proportional to the carbon content of the fuel—the higher the carbon content, the higher the tax. A twist to a direct carbon tax is "tax switching" or reducing taxes on capital and labor, which contribute to economic growth, and increasing the tax on carbon sources (burning coal or gasoline).

Because all greenhouse gases are emitted to the atmosphere, their point of origin is irrelevant. Thus there is no advantage to a carbon tax that forces emission sources to move from state to state, or country to country. A carbon tax can only work as a global response to global warming. Some policy analysts even envision an emphasis on controls to greenhouse gas emissions from developing countries, which have growing populations and inefficient energy use, as the most cost-effective means to limit potential greenhouse warming. Ideally, the developed countries would provide the developing countries with technology and capital to limit greenhouse gas emissions and to enhance sinks (forests and other vegetation that absorb and store CO<sub>2</sub>).

### Technical Options

The most direct approach to control greenhouse gases is to restrict their release to the atmosphere through increased energy efficiency (efficient electric motors, home insulation, improved fuel mileage, etc.). Remember, every time coal, wood, or gasoline is burned, CO<sub>2</sub> is released into the atmosphere. Other options are nonfossil-fuel energy sources such as solar, wind, hydroelectric, geothermal, and nuclear power.

One renewable resource receiving considerable attention is the use of biomass (vegetation) as a substitute for fossil fuels (coal and oil) via direct combustion or conversion to another fuel. Examples of biomass use in Illinois have included the burning of seed corn to fuel electric power plants and conversion of corn to ethanol, a liquid fuel for use in transportation. Biomass burning is attractive because any carbon released was originally removed from the atmosphere by the growing vegetation. This closed loop system would mean that the carbon in fossil fuels would remain locked in the earth's crust (see figure). The United States has sufficient cropland to support biomass as a renewable resource.



Other approaches require capture and storage of greenhouse gases. Examples include recovery of methane from coal mines, landfills, and animal waste lagoons. Methane can then be recycled and used as fuel. CO<sub>2</sub> can be captured from combustion sources and recycled in carbonated beverages or injected into the ocean or geological voids. Long-term retention options include reforestation, increased carbon accumulation by soils, and improving ocean algae through bioengineering to increase carbon uptake.

One approach under review is large-scale farming (over 1 million square miles) of seaweed to collect atmospheric CO<sub>2</sub>. After harvesting the seaweed, the CO<sub>2</sub> would be separated and injected deep into the ocean.

### Illinois Responses

Illinois faces twin issues with global climate change: (1) its impact on society and natural resources, and (2) regulation of activities and industries to minimize climate change. While climate change is a global concern, its effects will be realized locally and actions to adapt and/or control climate change will rely on local and state incentives. Aside from promoting energy efficiency, what is Illinois doing to address global climate change?

In Fall 1991, the Illinois General Assembly established House Resolution 81 providing for the formation of the Global Climate Change Program at the Illinois State Water Survey, and to establish a Task Force. The Program's goal is to provide a center of expertise with a three-way focus, including studies of climate change and its effects, monitoring of climate-related environmental changes, and the timely distribution of information about the issue (see *By Degrees* MP137-1). The mandate of the Task Force, established in 1992, is to provide policy guidance to the Governor and the Illinois General Assembly.

Illinois contributes about 1 percent of the global emissions of greenhouse gases—if Illinois were a country, it would rank within the top 25 sources of greenhouse gases. To better determine the amount and sources of greenhouse gases from Illinois, the Department of Energy and Natural Resources is conducting a comprehensive inventory. In another ENR study, the state is negotiating a project with a sister province in China to characterize emission sources and to explore the benefits of joint implementation of policies and controls.

Several Illinois communities have acted to improve the environment, thereby lessening the sources contributing to a global climate change. For example, the city of Chicago, in conjunction with the U.S. Forest Service, is conducting the "Chicago Urban Forest Climate Project" to study the effects of urban forests on climate. The city of Springfield is participating in the "Cooling Our Community" program, sponsored by the U.S. Environmental Protection Agency and the American Forestry Association's Global Releaf program. In both cities, the planting of more trees is seen as a means to reduce the emissions of CO<sub>2</sub> either through the storage of carbon in the trees, or by reducing CO<sub>2</sub> emissions through energy conservation—reducing heating and cooling needs.

### What You Can Do about Global Warming

There are a number of ways that you can make a difference. If burning fossil fuels increases CO<sub>2</sub> emissions, energy conservation practices will lessen the emission of this gas. If cutting down trees contributes to global warming, then planting trees will reduce CO<sub>2</sub> in the atmosphere. It is also important to be aware of global warming issues. Confronting the potential threat of global warming will require the cooperation of people everywhere and at all levels of government. The global community has begun to respond in this way, as illustrated by the June 1992 "Earth Summit" in Rio de Janeiro, Brazil.