Governments Warm to Greenhouse Action

Not all play Uncle Sam's climatic waiting game

By JANET RALOFF

In the Dutch city of Noordwijk last month, representatives from 70 nations stood ready to adopt or reject the world's first major multilateral agreement setting specific deadlines for limiting carbon dioxide (CO_2), a major player in global greenhouse warming. The initiative would have required industrial nations to freeze their CO_2 emissions at 1988 levels by the year 2005.

But when it came time to endorse the conference's final declaration on Nov. 7, the freeze provision was nowhere to be seen.

Although the vast majority of the participating nations expressed support for the proposal during discussions on Nov. 6, four economic superpowers — and major CO_2 emitters — did not: the United States, the United Kingdom, the Soviet Union and Japan. Since the conference sought a consensus statement, drafters struck the controversial freeze initiative from the concluding declaration.

But even without a Noordwijk freeze consensus, some foreign governments and U.S. states have recently committed themselves to ambitious policies aimed at limiting releases of greenhouse gases. A few have gone so far as to set deadlines for stabilizing CO_2 emissions.

The goal at Noordwijk's Ministerial Conference on Atmospheric Pollution and Climate Change — and at roughly a dozen other climate-change conferences over the past two years — was to identify what must be done to head off a forecasted global environmental catastrophe. The recent activist measures of a few foreign governments and U.S. states may only marginally slow the rate of global warming. However, if such policy decisions prove economically viable, they could ultimately send powerful shock waves throughout the world's capitals.

"These decisions by individual states and small countries highlight existing opportunities to achieve CO_2 reductions through actions that have little cost and multiple benefits. At the same time, they help to identify where long-term conflicts may exist between simplistic solutions and balanced economic development," says Irving M. Mintzer, who directs policy research at the Center for Global Change at the University of Maryland at College Park.

Last year, for instance, Sweden's parliament enacted legislation to freeze the nation's CO_2 emissions at 1989 levels, becoming the first country to do so. Sweden also intends to phase out CFCs by 1994 — six years earlier than supporters of the Montreal Protocol now advocate (SN: 6/10/89, p.367) — and to eliminate other ozone-depleting greenhouse gases (such as the halons used in many fire extinguishers) by 2000 at the latest, according to Maria Gårding, head of combustion- and heating-supply analysis at Sweden's Ministry of Environment and Energy in Stockholm.

But Sweden's most daring proposal to reduce CO_2 emissions is a tax of roughly 3.8 cents (U.S.) on each kilogram of gas emitted by the burning of fossil fuels for any purpose except electricity generation. If, as many observers expect, the parliament adopts the tax measure next spring, "Sweden will be the first country in the world to introduce a charge on CO_2 emissions," Gårding says. And the tax is steep, adding about 30 or 40 cents (U.S.) to the cost of a gallon of gasoline, she notes.

In May, the Dutch government announced plans to freeze its own growing CO_2 emissions at 1990 levels by the year 2000. The Netherlands' new cabinet, seated just last month, has already set interim targets for moving toward the freeze, says Bert Metz, environment counselor at the Netherlands embassy in Washington, D.C. These include a phased-in reduction of the annual rate of CO_2-emissions increase—from 3 or 4 percent a year to just 1 or 2 percent—over the next four years, Metz says. He also reports plans for an annual CO_2 tax as well as incentives to spur greater use of mass transit and to shift from coal and oil to natural gas, which emits far less CO_2 per unit of energy released.

And in June, Norway's parliament approved a plan to stabilize both energy use and CO_2 emissions by the end of the century. According to a report from the Norwegian environment ministry, "The government is preparing pricing and taxation policies which ensure that environmental costs are reflected in energy prices. This applies particularly to the price of fossil fuels."

Norway's plan features several additional measures to limit greenhouse emissions. These include phasing out 90 percent of the nation's CFC releases by 1995, reducing nitrogen oxide emissions by 30 percent by 1998, increasing railway passenger commuting and freight hauling, and encouraging greater use of public transportation by raising rush-hour tolls for automobile commuters in major urban centers.

Several U.S. states have also taken active steps to curb their contributions to global warming. The governors of Vermont and New Jersey, for instance, signed executive orders in October to limit CO_2 releases. Vermont's order seeks to reduce per capita nonrenewable-energy consumption in the

The greenhouse threat

Carbon dioxide and other greenhouse gases — including chlorofluorocarbons, methane, nitrous oxide and lower-atmosphere ozone — trap heat emanating from Earth's surface, much as a window traps solar heat inside a greenhouse. Many climatologists believe that at current emission rates, these gases may induce a global warming of 1.5°C to 5.5°C (2.7°F to 9.9°F) within the next 40 to 60 years.

Most policy attention has focused on the climate-altering effects of CO_2 because scientists estimate that global releases of this gas — primarily from fossil-fuel combustion and deforestation—now contribute at least 50 percent of the warming potential of today's atmospheric soup of greenhouse pollutants. Global atmospheric levels of CO_2 have been climbing about 0.4 percent annually for the last four decades. But yearly CO_2 releases in many industrialized countries, including the United States, are growing at 4 to 10 times that rate.

state by 20 percent during the next decade. New Jersey's requires state agencies to use the most energy-efficient equipment when a device's lifetime energy savings will lower operating costs; to ensure that these agencies' energy and regulatory policies maximize tax and other incentives for using energy sources that reduce greenhouse-gas releases; to recycle CFCs or switch to alternative compounds where possible; and to replace all trees lost through state-funded activities such as construction. As trees grow, they absorb and store carbon, limiting CO_2 buildup in the atmosphere.

California and Oregon have completed studies of how greenhouse changes might affect their energy needs, natural resources (such as water availability), agriculture and coastal communities. Agencies in both states are now analyzing potential responses to the climate-change forecast – including mitigation of greenhouse-gas emissions as well as adaptations in agricultural and resource policies such as water-use management. Missouri has established a new commission to conduct similar analyses for its governor and congressional delegation.

Oregon's legislature also passed two bills this year aimed at slowing greenhouse warming. Provisions in one not only ban CFCs and halons in some products but also require recycling of CFCs in car air conditioners. The second law directs Oregon's energy department to develop a detailed strategy over the next two years for reducing the state's greenhouse-gas emissions by the year 2005 to a level 20 percent below 1988 releases.

New York Governor Mario M. Cuomo, citing concerns over global warming as one motivator, signed an executive order last December to establish integrated energy planning in his state. The first such plan, issued in September, lists many recommendations to mitigate greenhouse warming. These include a 20 percent reduction in energy use for all state facilities by the end of the century, tougher energy-efficiency standards for appliances and building codes, substitution of natural gas for coal-fired electricity where possible, and accounting for "the environmental costs of air emissions" when utilities use least-cost analyses to choose among alternative sources of power (SN: 5/7/88, p.296).

Such activities hardly represent isolated pockets of environmental sensitivity, says Christopher Flavin, vice president of the Worldwatch Institute in Washington, D.C. He observes, for example, that 22 U.S. state legislatures this year introduced a total of at least 130 bills relating to global warming. Moreover, in an October 1989 Worldwatch report entitled "Slowing Global Warming," Flavin notes that West Germany is investigating a comprehensive plan to address climate warming and the United Kingdom is considering controls on its releases of methane, an especially potent greenhouse gas.

A number of nongovernmental organizations in the United States are also conducting research and outreach programs to spur state and national responses to the threat of greenhouse warming. Among them is the nonprofit Center for Clean Air Policy (CCAP) in Washington, D.C. That group is now preparing a series of reports on policy options – and their associated costs – that individual states can adopt to reduce greenhouse-gas emissions. Last summer it initiated a dialogue between industrial representatives and officials from eight states on ways to reduce electric-utility CO_2 emissions by 20 percent. To help focus discussions, CCAP has also begun a year-long analysis investigating real-world costs, energy-savings potentials and fuel-switching capabilities at two of the nation's largest coal-fired utilities.

Though policy experimentation "is as important as consideration of technological alternatives," most discussions of greenhouse responses focus only on technological fixes, says Alan S. Miller, executive director of the Center for Global Change. His center, created last summer, aims to determine the societal costs and trade-offs associated with various greenhouse policy options such as CO_2 taxes and changes in building codes.

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Why the White House prefers to wait

"We strongly advocate common efforts to limit emissions of carbon dioxide and other greenhouse gases, which threaten to induce climate change, endangering the environment and ultimately the economy."
– statement signed by President Bush on July 16, 1989

Less than four months after endorsing this consensus statement at a Paris economic summit of leading industrialized democracies, Bush forbade his representatives at the Noordwijk conference to endorse specific emissions limits on greenhouse gases or a timetable for achieving them.

Senate leaders explored the apparent contradiction between the administration's rhetoric and policy at a Nov. 14 hearing. Testifying the day after he returned from Noordwijk, White House Science Adviser D. Allan Bromley acknowledged that in helping quash a proposal for freezing CO_2 emissions by 2005, the U.S. delegation left "an impression abroad, and to some degree in this country, . . . that the United States and specifically the Bush administration is dragging its feet" on curbing greenhouse-gas emissions.

But an anti-freeze stance "was in fact the highest form of leadership," Bromley told the Senate hearing. Many countries pressing for a specific timetable for reductions in greenhouse-gas emissions "totally lack the understanding of what they are committing themselves to, how they would achieve those commitments and what the cost of achieving those commitments might be," he said.

The United States will back only those initiatives that "we can follow through on" and achieve "in an economically reasonable fashion," Bromley said. Toward that end, he added, the United States seeks to quantify the economic impacts of various greenhouse reponses in time for the November 1990 second World Climate Conference in Geneva, Switzerland.

The U.S. government has also led an international effort to phase out ozone-damaging CFCs and has strongly supported greenhouse research, Bromley noted. It currently spends about $500 million annually, he said, on research into climate change and greenhouse-warming mitigation – "more than an order of magnitude more than any other nation."

But Sen. John F. Kerry (D-Mass.), who chaired the hearing, remained unconvinced. The vast majority of nations, he said, went to Noordwijk prepared to adopt a freeze. Derailing their consensus signifies a failure of U.S. leadership, Kerry charged. Though scientists cannot predict precisely when the climate warming will occur and how large it will be, he said, it is "abundantly obvious" that if the world – including the United States – stays on its present course, environmental catastrophe lies ahead. Kerry quoted a statement made at Noordwijk by Mostafa K. Tolba, the executive director of the United Nations Environment Program: "We know enough right now to begin action."

"Between now and next November," Bromley argued, "we are not going to have any dramatic greenhouse-induced [climate] changes, so I am prepared to wait [until then to draft policies]."

This wait-and-see attitude might seem more acceptable, Sen. Albert Gore (D-Tenn.) said at the hearing, if serious questions remained about whether current greenhouse-emissions rates indeed threaten Earth's climate. But Gore pointed out that Bromley had just testified that the delay in U.S. action stems not from scientific uncertainties but instead from the administration's lack of data on the costs of responding to the greenhouse threat. – *J. Raloff*

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Predictions drop for future sea-level rise

Global sea levels are rising and will continue to rise in the future, causing serious problems for low-lying areas. But the ocean will not rise as quickly as predicted, and the West Antarctic ice sheet will not melt in the next century, climate experts said last week at a meeting of the American Geophysical Union in San Francisco.

"We have revised rather drastically our best estimates of how much global sea level will rise due to greenhouse warming," says Mark F. Meier of the University of Colorado at Boulder, who in 1985 chaired a National Research Council committee investigating changes in sea level. He adds, however, that many uncertainties plague these latest predictions.

Scientists believe the expected global warming will partially melt glaciers as well as cause the oceans to expand. According to Meier, the information available in 1985 led his committee to predict that sea levels would rise about 1 meter with a 3°C increase in global average temperature. At the time, scientists estimated the meter rise would occur by the year 2100, when carbon dioxide concentrations in the atmosphere are expected to reach double their 1950 value. The committee also reported the slim possibility that part of the West Antarctic ice sheet could slide into the sea within that time frame, causing a catastrophic rise in sea levels in the next century.

On the basis of information presented last week, Meier says the best predictions now call for a rise of only one-third meter with a doubling of 1950 carbon dioxide levels. This rise should occur before 2100, perhaps by midcentury, he says, because growing levels of other greenhouse gases are also heating the atmosphere.

Recent research on the West Antarctic ice sheet indicates this structure will not disintegrate within the next century, Meier adds.

The lower predictions for global sea-level rise primarily reflect new information concerning how the Antarctic climate will respond to a warmer world. Instead of shrinking, the ice cap atop Antarctica will most likely grow in the coming decades, pulling water out of the ocean, says Charles R. Bentley of the University of Wisconsin-Madison.

Climate models have suggested the polar regions will warm more than the rest of the globe, but the most pronounced warming should occur during the coldest season, when Antarctic temperatures are in no danger of rising above freezing. The models also indicate that even a slight warming will allow the atmosphere to hold significantly more water vapor than it does now, causing more snow to fall on Antarctica. This process will transfer water from the ocean onto the continent, Bentley says.

On its own, Antarctica would actually lower sea levels around the world, but other effects should overshadow the Antarctic response and cause a modest climb in global sea levels, according to the new predictions. Like the melting of ice from alpine glaciers and along Greenland's margin, drainage of underground water reservoirs for human use enhances sea-level rise because much of this water eventually runs into the ocean.

Given the uncertainties in the estimates, Meier and his colleagues offer a broad spread to the predictions of a one-third-meter rise. At the extreme, ocean levels could rise by 0.7 meters; or they could fall by 0.1 meter.

Citing one example of the "horrendous" uncertainties plaguing researchers in this field, Meier points out that when scientists add up all known contributions to the current sea-level rise, they cannot match the observed rate of about 1.3 millimeters a year.

"This means our understanding of the system is not very good at the moment," he says. – *R. Monastersky*

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The Washington, D.C.-based Environmental and Energy Study Institute, an independent bipartisan group established in cooperation with environment leaders in the House and Senate, brings in experts to brief members of Congress and their staffs on a wide range of climate-change issues – from corporate concerns to the latest scientific findings and environmental issues.

Though lacking the CO_2 freeze initiative, the Noordwijk consensus demonstrated that world leaders – including the United States – already support the idea of stabilizing and eventually reducing greenhouse-gas releases. But most participating nations also believe it will take an international accord – comparable to the CFC-curbing Montreal Protocol but covering a broader range of greenhouse gases – to put the brakes on global warming in time to head off irreversible ecological damage. And that's why many heads of state, like British Prime Minister Margaret Thatcher in her Nov. 10 speech before the United Nations General Assembly, advocate completing a framework for international controls on greenhouse gases in time for adoption at the 1992 World Conference on Environment and Development. International scientific and policy groups are working to draft such a framework now. □