

## GLOBAL WARMING

# Most Nations Miss the Mark On Emission-Control Plans

Two years ago, at the United Nations' "Earth Summit" in Rio de Janeiro, 155 nations solemnly pledged to cap industrial emissions of carbon dioxide and other gases believed to contribute to global warming. The next step was to develop "action plans" describing how each country intended to live up to its obligation. In compliance with a September deadline set by the treaty, 15 developed countries have now released their plans, and environmentalists and some government officials are not impressed: "No [developed] countries have actually met what the treaty guidelines require them to do," says geologist Jonathan Pershing, a U.S. State Department science officer who helped negotiate the treaty as a member of the Bush Administration.

What's worse, the target seems to be moving. The plans, which were discussed together for the first time at a meeting\* earlier this month in Washington, D.C., are being offered even as new analyses from an international panel of scientists suggest that the goals agreed to in Rio may not be sufficient to stabilize atmospheric concentrations of carbon dioxide. Together, those results have rekindled a long-simmering debate over what should be done to avert potentially devastating consequences of global warming.

The treaty, known formally as the United Nations Framework Convention on Climate Change, calls for the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." It requires signatory countries to develop policies and measures that "aim" to return industrial emissions of greenhouse gases to 1990 levels by the end of the decade. As *Science* went to press, 15 of the 18 developing nations so far required to submit action plans had done so.

Many of the plans focus on reducing emissions of the dominant greenhouse gas—carbon dioxide—to

1990 levels by the year 2000. Some go further—Germany's calls for all industrial greenhouse gas emissions to be slashed to half of 1987 levels by the year 2005—while others are more conservative than what is called for in the treaty (see table). To reach their targets, the action plans contain measures ranging from voluntary reductions in emissions by utilities to higher taxes on everything from home heating fuel to gasoline.

Notwithstanding those efforts, most of the plans are unlikely to meet their targets, say two coalitions of environmental organizations—the U.S. Climate Action Network and Climate Network Europe. In a critique released last summer, the two groups cite a number of complicating factors. For example, the environmentalists argue that voluntary measures such as those at the core of the U.S. and New Zealand plans are unlikely to be effective. At the same time, bureaucratic snags have delayed implementation of plans adopted by Austria, Italy, and Switzerland. Only Norway, Denmark, and the United Kingdom were judged likely to meet the treaty's goals. "Overall, the collection of plans is very disappointing," says Daniel Lashoff, an analyst at the Natural Resources Defense Council who reviewed the U.S. plan.

Environmentalists aren't alone in voicing concerns. Pershing and other officials acknowledge that the action plans, as a whole, leave a lot to be desired. Only five of the plans, including the U.S. plan, include explicit information on how their strate-

gies will reduce emissions to target levels, says Pershing. Although Pershing says the United States "has done a very good job" in attempting to implement the treaty in comparison with other countries, he adds that U.S. officials are trying to address shortcomings in the plan. "There's an initiative in the White House to look for additional measures" to strengthen the action plan, he says.

Such talk concerns U.S. industry, which has hailed the voluntary measures adopted under the U.S. plan. The Global Climate Coalition, an industry-sponsored organization based in Washington, D.C., said in August that "the current knowledge of climate change science and our understanding of its effects ... do not justify new commitments."

That's not a view shared by most scientists in the field, however. A September report by an international panel created under the treaty warns that carbon dioxide emissions will have to drop below 1990 levels and remain there over the next century just to stabilize atmospheric concentrations at twice present-day levels. The data, say some officials, strongly point to the need for additional steps to rein in carbon dioxide emissions.

The question of whether additional commitments are needed to reduce greenhouse gas emissions will be discussed next March in Berlin at the first meeting of signatory countries. Indeed, Germany and several other countries are expected to propose that the treaty be strengthened to require developed countries to reduce greenhouse gas emissions to 80% of 1990 levels by 2005. But such provisions are expected to be vigorously opposed by China, Russia, and Saudi Arabia, says Pershing.

And a weak economy makes it unlikely that the United States will join in the call for tougher measures. "It's not clear what's additionally possible at this point," says Pershing.

—Richard Stone

## HOW SOME COUNTRIES PLAN TO CURB GREENHOUSE GASES

Country	Target	Key Measures	Critique*
<b>DENMARK</b>	Reduce annual CO <sub>2</sub> emissions to 80% of 1988 levels by 2005	Carbon tax, improve energy efficiency, increase use of alternative energy sources	Likely to succeed
<b>FRANCE</b>	Limit annual CO <sub>2</sub> emissions to 2 tons per person by 2000	Greater use of public transportation and nuclear power, proposed carbon tax	Emissions will increase as population grows
<b>GERMANY</b>	Reduce annual greenhouse gas emissions to 50% of 1987 levels by 2005	Close eastern factories, promote wind and photovoltaic energies, tax relief to alternative-energy consumers	Little impact on use of coal
<b>JAPAN</b>	Stabilize per capita annual CO <sub>2</sub> emissions at 1990 levels by 2000	Improve vehicle fuel efficiency, build more nuclear power plants	More coal plants, few alternative sources
<b>SPAIN</b>	Cap annual CO <sub>2</sub> emissions at 125% of 1990 levels by 2000	Rely more on natural gas and less on coal	Increased CO <sub>2</sub> emissions
<b>UNITED KINGDOM</b>	Reduce annual CO <sub>2</sub> emissions to 1990 levels by 2000	Taxes on fuel and power consumption, convert from coal to natural gas	Likely to achieve target
<b>UNITED STATES</b>	Reduce annual CO <sub>2</sub> emissions to 1990 levels by 2000	Increase efficiency of utilities, clean car initiative, industry incentives	Relies heavily on voluntary measures

\* An international coalition of environmental groups has done the only comprehensive critique of all available plans.  
SOURCES: INDIVIDUAL NATIONAL PLANS/U.S. CLIMATE ACTION NETWORK/CLIMATE NETWORK EUROPE

\*\*National Actions for International Commitment: Evaluating Climate Action Plans," 30 November to 2 December, Washington, D.C.