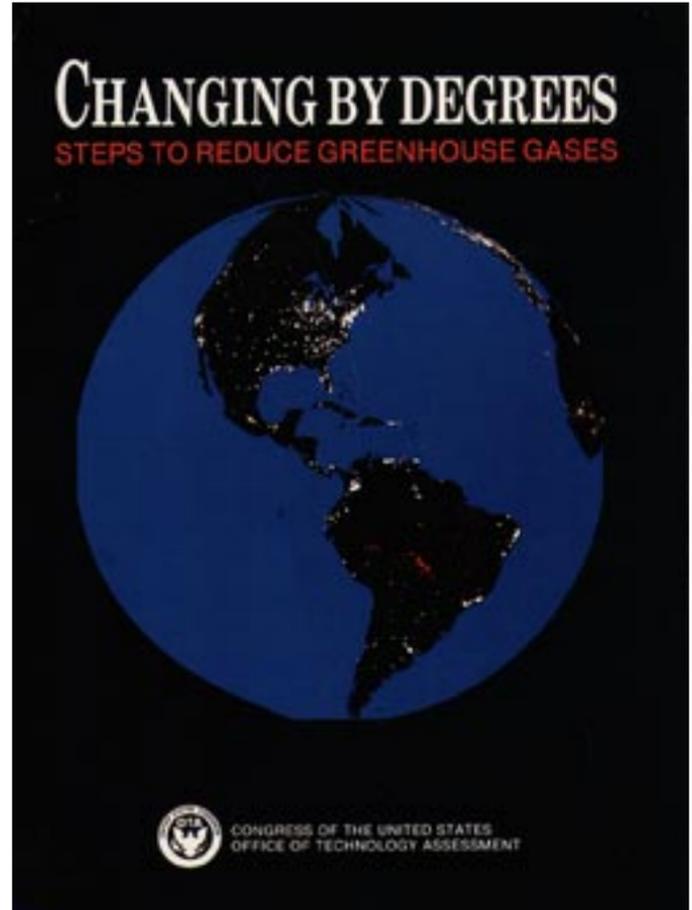


*Changing by Degrees: Steps To Reduce
Greenhouse Gases*

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Foreword

Our Nation has a history of people working towards common goals. It has demonstrated this in time of war, in landing a man on the moon, and in reducing energy use during the oil crises of the 1970s. However, in each case, the effort was sustained less than a decade; the desired goals were achieved or the crises passed.

The United States is the world's leading industrial society and largest single emitter of carbon dioxide. Climate change therefore presents a unique challenge to this Nation. It is a threat that will require major prudent political actions even before all the scientific certainties are resolved. The analysis, prevention, and remediation of global warming will require unprecedented international cooperation and action—an effort requiring actions sustained over decades, not just a few years.

Carbon dioxide and chlorofluorocarbon (CFC) emissions are responsible for 80 percent of the “global warming commitment” caused by human activities over the last decade. A landmark international agreement to totally phase out the use of CFCs by the year 2000 is already in effect. Many of the nations involved in that accord are now seeking ways to reduce the carbon dioxide emissions. This task is clearly more daunting since most industrialized nations currently depend so heavily on fossil fuels—the major source of carbon dioxide—for their economic well-being.

For this reason, this assessment focuses principally on ways to cut carbon dioxide emissions both in the United States and in other countries as well, although it does examine all greenhouse gases. The report responds to the concerns of six Committees of Congress who requested in 1988 that OTA undertake this study. The Senate requesting Committees are: Commerce, Science, and Transportation; Energy and Natural Resources; Environment and Public Works; and Governmental Affairs. The House requesters are: Committee on Science, Space, and Technology; and the Committee on Foreign Affairs.

This assessment shows that major reductions of carbon dioxide and other greenhouse gases will require significant new initiatives by the Federal Government, by the private sector, and by individual citizens. Many of these initiatives will pay for themselves; for others, the economic cost may be considerable. And many of these efforts must be sustained over decades.

Although many ancillary environmental benefits will accrue from the actions necessary to effect a major reduction of U.S. carbon dioxide emissions, such a decrease will not, in itself, significantly decrease the greenhouse effect. Other nations will have to take similar actions and, even then, those actions will only slow any warming trend. An Intergovernmental Panel on Climate Change and the U.S. Environmental Protection Agency estimated that at least a 50- to 80-percent worldwide reduction in carbon dioxide emissions is needed to keep the atmosphere at today's already altered level.

That level of reduction requires the world to wean itself from fossil fuels if it hopes to keep emissions from growing steeply under the combined pressure of economic and population growth. Steps taken now to use more efficient energy technologies would reduce emissions while buying time required for the transition to nonfossil fuels.

OTA appreciates the support this effort received from hundreds of contributors both from the United States and abroad. Workshop participants, reviewers, contractors, and informal advisers provided OTA invaluable support as it attempted to sift through the voluminous material on this subject. OTA, however, remains solely responsible for the contents of this report.


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