

PREFACE

The present document will be part of the information upon which the Parties to the United Nations Montreal Protocol will base their future decisions regarding protection of the stratospheric ozone layer.

The Charge to the Assessment Panels

Specifically, the Montreal Protocol on Substances that Deplete the Ozone Layer states (Article 6): “. . . the Parties shall assess the control measures . . . on the basis of available scientific, environmental, technical, and economic information.” To provide the mechanisms whereby these assessments are conducted, the Protocol further states: “. . . the Parties shall convene appropriate panels of experts” and “the panels will report their conclusions . . . to the Parties.”

To meet this request, the Scientific Assessment Panel, the Environmental Effects Panel, and the Technology and Economic Assessment Panel have each prepared, about every 3-4 years, major assessment reports that updated the state of understanding in their purviews. These reports have been scheduled to be available to the Parties in advance of their meetings at which they will consider the need to amend or adjust the Protocol.

The Sequence of Scientific Assessments

The current 2002 report is the latest in a series of nine scientific assessments prepared by the world’s leading experts in the atmospheric sciences and under the international auspices of the World Meteorological Organization (WMO) and/or the United Nations Environment Programme (UNEP). This report is the fifth in the set of major assessments that have been prepared by the Scientific Assessment Panel directly as input to the Montreal Protocol process. The chronology of all the scientific assessments on the understanding of ozone depletion and their relation to the international policy process is summarized as follows:

<u>Year</u>	<u>Policy Process</u>	<u>Scientific Assessment</u>
1981		<i>The Stratosphere 1981: Theory and Measurements</i> . WMO No. 11.
1985	Vienna Convention	<i>Atmospheric Ozone 1985</i> . Three volumes. WMO No. 16.
1987	Montreal Protocol	
1988		<i>International Ozone Trends Panel Report 1988</i> . Two volumes. WMO No. 18.
1989		<i>Scientific Assessment of Stratospheric Ozone: 1989</i> . Two volumes. WMO No. 20.
1990	London Adjustments and Amendment	
1991		<i>Scientific Assessment of Ozone Depletion: 1991</i> . WMO No. 25.
1992		<i>Methyl Bromide: Its Atmospheric Science, Technology, and Economics (Montreal Protocol Assessment Supplement)</i> . UNEP (1992).
1992	Copenhagen Adjustments and Amendment	
1994		<i>Scientific Assessment of Ozone Depletion: 1994</i> . WMO No. 37.
1995	Vienna Adjustment	

PREFACE

<u>Year</u>	<u>Policy Process</u>	<u>Scientific Assessment</u>
1997	Montreal Adjustments and Amendment	
1998		<i>Scientific Assessment of Ozone Depletion: 1998</i> . WMO No. 44.
1999	Beijing Amendment	
2002		<i>Scientific Assessment of Ozone Depletion: 2002</i> . WMO No. 47.
2003	15 th Meeting of the Parties	

The Current Information Needs of the Parties

The genesis of *Scientific Assessment of Ozone Depletion: 2002* occurred at the 11th Meeting of the Parties to the Montreal Protocol in Beijing, China, at which the scope of the scientific needs of the Parties was defined in their Decision XI/17.5(a): “To request the Scientific Assessment Panel to include the following in the 2002 scientific assessment:

- (a) An evaluation of the observed trends in controlled substances and their consistency with reported production of ODS;
- (b) A quantification of the ozone-depleting impacts of new (e.g., short-lived) halogen-containing substances;
- (c) A characterization of methyl bromide sources and sinks and the likely quantitative implications of the results for the ozone layer;
- (d) A characterization of the known interrelations between ozone depletion and climate change including feedbacks between the two;
- (e) A description and interpretation of the observed changes in global and polar ozone and in ultraviolet radiation, as well as set future projections and scenarios for those variables, taking into account also the expected impacts of climate change...”.

The Assessment Process

The formal planning of the current assessment was started early in 2001. At the request of the Scientific Assessment Panel, the Parties suggested experts from their countries who could participate in the process, and those suggestions contributed about half of the participants who served as authors, contributors, and reviewers. Furthermore, an ad hoc international scientific steering group also suggested participants from the world scientific community. In addition, this steering group contributed to crafting the outline of the assessment report. As in previous assessments, the participants represented experts from the developed and developing world. The developing-world experts bring a special perspective to the process, and their involvement in the process contributes to capacity building.

The information of the 2002 assessment is contained in five chapters, with most containing past trends and future projections associated with ozone-layer topics:

- Chapter 1. Controlled Substances and Other Source Gases
- Chapter 2. Very Short-Lived Halogen and Sulfur Substances
- Chapter 3. Polar Stratospheric Ozone: Past and Future
- Chapter 4. Global Ozone: Past and Future
- Chapter 5. Surface Ultraviolet Radiation: Past and Future

The interactions between the ozone layer and the climate system are varied and appear appropriately as a special section in most of the chapters.

A special resource for the Panel’s work was the earlier report, *Aviation and the Global Atmosphere*. This 1999 assessment of the impacts of aviation on ozone depletion and climate change was a collaboration of the Intergovernmental Panel on Climate Change (IPCC) and the Scientific Assessment Panel of the Montreal Protocol. The assessment had been requested by the International Civil Aviation Organization (ICAO). Because this comprehensive study had been

recently done, the present 2002 assessment could cite the major relevant findings of the 1999 study and provide any updates of knowledge that had occurred.

The initial plans for the chapters of the 2002 Scientific Assessment Panel's report were examined at a meeting that occurred on 27-28 June 2001 in London, United Kingdom. The Lead Authors and Cochairs focused on the content of the draft chapters and establishing the needs for coordination among the chapters.

The first drafts of the chapters were examined at a meeting that occurred on 28-30 November 2001 in Fairfax, Virginia, United States, at which the Lead Authors, Cochairs, and a small group of international experts focused on the scientific content of the draft chapters.

The second drafts of the chapters were reviewed by 133 scientists worldwide in a mail peer review. Those comments were considered by the authors. At a Panel Review Meeting in Les Diablerets, Switzerland, held on 24-28 June 2002, the responses to these mail review comments were proposed by the authors and discussed by the 74 participants. Final changes to the chapters were decided upon at this meeting. The Executive Summary contained herein (and posted on the UNEP and WMO web sites on 23 August 2002) was prepared and completed by the attendees of the Les Diablerets meeting.

The 2002 State-of-Understanding Report

In addition to the scientific chapters and the Executive Summary, the assessment also focuses on a set of questions that are frequently asked about the ozone layer. Based upon the scientific understanding represented by the assessments, answers to these frequently asked questions were prepared, with different readerships in mind, e.g., students and the general public. These questions and answers are included in this report.

The final result of this two-year endeavor is the present assessment report. As the accompanying list indicates, the *Scientific Assessment of Ozone Depletion: 2002* is the product of 275 scientists from the developed and developing world who contributed to its preparation and review¹ (170 scientists prepared the report and 182 scientists participated in the peer review process).

¹ Participating were Albania, Argentina, Armenia, Australia, Austria, Belgium, Bolivia, Brazil, Canada, Chile, Colombia, Denmark, Egypt, Estonia, Finland, France, Germany, Greece, India, Iran, Italy, Japan, Kenya, Malaysia, New Zealand, Norway, Poland, Russia, South Africa, Sweden, Switzerland, Taiwan R.O.C., The Netherlands, The People's Republic of China, Togo, United Kingdom, United States of America, and Venezuela.