



TWENTIETH ANNIVERSARY SEMINAR ON THE MONTREAL PROTOCOL – “CELEBRATING TWENTY YEARS OF PROGRESS”: 16 SEPTEMBER 2007

The twentieth anniversary of the Montreal Protocol on Substances that Deplete the Ozone Layer was commemorated on Sunday, 16 September 2007, with a seminar entitled “Celebrating 20 Years of Progress.” The event was hosted by Environment Canada and the UN Environment Programme (UNEP), and took place at the Palais de Congrès in Montreal, Canada, in the lead-up to the nineteenth Meeting of the Parties to the Montreal Protocol (MOP-19).

Participants from governments, international organizations, business and civil society took part in the day’s celebrations, which commenced with an opening ceremony, keynote presentations, and an awards ceremony. A range of panel discussions then followed, focusing on the history, development and implementation of the Montreal Protocol, ozone science, links with other environmental issues, and future challenges. A celebratory dinner concluded the day’s events.

OPENING CEREMONY

Marco Gonzalez, Executive Secretary, Ozone Secretariat, highlighted the work of the 191 parties and thousands of institutions and individuals to protect the ozone layer in the last 20 years, which he said has made the Montreal Protocol a model of international cooperation. He added that the Protocol’s success is a clear result of political will to take action in the light of new science and to promote new technological alternatives from industry.



Marco Gonzalez, Executive Secretary, Ozone Secretariat, opened the seminar.

Achim Steiner, Executive Director, UNEP, welcomed delegates and said the 20th anniversary of the Protocol was an opportunity to celebrate and show the world

a successful framework for transforming science into policy making. He highlighted the work of the scientists that “opened our eyes” to ozone depletion, and noted the importance of political will, the efforts of non-government organizations to provide a “transmission belt between knowledge and public will”, and the leadership of the private sector.

Cécile Cléroux, Assistant Deputy Minister, Environment Canada, said the Montreal Protocol is widely recognized as the most successful multilateral environment agreement (MEA). She emphasized that more than 95 percent of ozone depleting substances (ODSs) have been eliminated, a remarkable achievement that proves that international cooperation, with the support of science, can bring about positive environmental change.



Cécile Cléroux, Assistant Deputy Minister, Environment Canada, welcomed delegates on behalf of the Government of Canada.

KEYNOTE PRESENTATIONS: SCIENTIFIC DISCOVERY

Executive Secretary Gonzalez introduced keynote speakers Professor Frank Sherwood Rowland, University of California, and Professor Mario Molina, Massachusetts Institute of Technology. Gonzalez pointed out that Rowland and Molina’s 1974 discovery of the problem of ozone depletion led to the development of the Montreal Protocol.

Rowland provided an overview of the development of ozone science since the 1930s. He explained the chemical process through which chlorofluorocarbons (CFCs) destroy stratospheric ozone, and said that actual measurements confirmed the predictions of the theory. He outlined the history of scientific measurements of ozone levels, including measurements by the British Antarctic Survey showing that 1984 ozone levels were 30 percent below 1970s levels, and listed other key events such as the subsequent discovery of the Antarctic ozone hole, the US Nimbus-7 satellite data confirming falling ozone levels, and the 1988 report of the International Ozone Trends Panel. Rowland stressed that atmospheric chlorine would have increased steeply and ozone would have declined precipitously had it not been for the Montreal Protocol and its amendments.



Professor Mario Molina, Massachusetts Institute of Technology

Molina explained that understanding the chemistry in polar stratospheric clouds

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marked a new kind of atmospheric chemistry. He highlighted the role of the “science-policy interface” in the success of the Protocol, stressing the role of collaborative science, industry participation and the Multilateral Fund. Molina then addressed climate change issues and the similarities between the Montreal Protocol and the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC), whereby science considers the risks and society then decides whether these risks are acceptable and what action should be taken. He said that MOP-19 provides an opportunity for achieving more reductions. In closing, he stressed that human population growth is the root of many environmental problems and highlighted the challenge of increasing standards of living for the growing global population while understanding that the world has limited natural resources and that the atmosphere has a limited capacity to absorb emissions.

AWARD CEREMONIES

Throughout the day, a series of awards were presented to individuals who have made outstanding contributions to the Montreal Protocol and its implementation.

Tamara Curll, Ozone Secretariat, facilitated the morning awards presentation, highlighting that a significant accomplishment of the Montreal Protocol is the manner in which Article 5 parties have not only met their commitments, but have generally done so sooner than required under the Protocol. Accompanied by Augustin Sanchez, Secretariat for Environment and Natural Resources, Mexico, she presented forty-three awards in three categories: implementing agency champions; Multilateral Fund and UNEP champions who have provided outstanding support for parties; and global awareness-raising champions. Winners were also announced for a range of ozone-related contests and quizzes. A full list of award winners will shortly be published on the Ozone Secretariat website at <http://ozone.unep.org/Publications/>



The *Earth Negotiations Bulletin* received an award for outstanding work in raising awareness of ozone depletion and the Montreal Protocol. ENB writer William McPherson accepted the award on behalf of IISD Reporting Services.

PANEL SESSIONS

The panel sessions consisted of parallel discussions on the development, implementation, lessons learned, and future challenges of the Montreal Protocol. Panel A considered the policy aspects of each topic, while Panel B discussed the scientific aspects. In each panel, a range of speakers gave presentations, followed by a question-and-answer session.

PANEL 1A: DEVELOPMENT STAGE

Ambassador Richard Benedick, former US Chief Negotiator for the Montreal Protocol, reviewed the history of international negotiations and concurrent domestic political struggles in the US. He noted that the road to the Montreal Protocol was beset by some failures and domestic opposition, but identified factors behind the success of the Protocol that provide lessons for the



Richard Benedick, former chief US negotiator on the Montreal Protocol, stressed the importance of courageous leadership by individuals and countries.

climate process, including: the importance of leadership by countries and individuals; holding small meetings rather than large conferences; and working closely with key industries to facilitate technological innovations.

Victor Buxton, former Canadian Chief Negotiator for the Montreal Protocol, listed challenges during the negotiations including: scientific uncertainty; barriers to trade including perceived market share agendas; concerns from developing countries about access to chemicals for development; and issues around technology transfer

and intellectual property rights. He then outlined some solutions such as phase-out adjustments, development assistance, delayed compliance for developing countries, non-compliance procedures, using trade sanctions as a policy driver, and providing incentives to join early.

Ambassador Juan Antonio Mateos, Mexico, stressed the achievements of the ozone process and said its success has not yet been replicated elsewhere. Discussing lessons that can be applied in other negotiations, he listed the importance of the Multilateral Fund, new market opportunities and technological options, the change in global geopolitical context with the end of the Cold War, and the increased access of NGOs to negotiations.

The ensuing discussion considered the active role of the Ozone Secretariat in the success of the Montreal Protocol, and the possible use of the Multilateral Fund as a model for involving developing countries in commitments in a UNFCCC post-2012 agreement.

PANEL 1B: EVOLUTION OF OZONE SCIENCE

Richard Stolarski, US National Aeronautics and Space Administration (NASA), outlined historical advances in ozone science from 1840 to the present, including: the identification of ozone; the measurement of the solar spectrum cut-off and the location of ozone in the stratosphere; the theory of ozone formation and loss and the quantification of atmospheric distribution and variability; and catalytic ozone loss. He explained that our understanding of the Antarctic ozone hole progressed rapidly because the ideas were already in place through the basic science of the previous generation. Stolarski explained that the Protocol is having an effect and that atmospheric concentrations of controlled substances are leveling off or decreasing, stratospheric chlorine has begun to decrease, and ozone levels show signs of recovery.

Ayité-Lo Ajavón, University of Lomé, Togo, discussed the role of developing countries in ozone science, with an emphasis on the need for data on the effects of ozone depletion to convince policymakers to support the science. He noted that the Montreal Protocol's financial mechanisms depend on arrangements between governments, not among scientists. While noting that many remote sensing stations are located in developing countries, he lamented that scientists from developed countries often “own” the stations and do not always share data. Ajavón observed that developing country governments face a choice between financing poverty alleviation and science, and poverty alleviation always takes priority.

Discussion focused on the possibilities of funding science in developing countries through Montreal Protocol mechanisms, especially with the support of the Scientific Assessment Panel.

PANEL 2A: IMPLEMENTATION STAGE: NATIONAL OR REGIONAL PERSPECTIVES

Marianne Wenning, European Commission, outlined the EU's "building blocks" for implementing the Montreal Protocol and emphasized the need for measures to be cost effective. She said the EU aims to exceed Montreal Protocol targets, and highlighted lessons learned including the need for affordable compliance provisions and the prevention of market disruptions.

Ana María Contreras Vigil, Ministry of Environment and Natural Resources, Mexico, presented Mexico's programmes addressing ODSs and noted that Mexico was the first to adopt and ratify the Protocol in 1988. She reported on Mexico's compliance efforts, which she said were ahead of schedule, including: closure of CFC plants; training of more than 2000 technicians on refrigeration recovery; and continuous monitoring of methyl bromide.

Drusilla Hufford, US Environmental Protection Agency, highlighted "clear policy goals, smart NGOs, transformative industry leadership, and gold-standard science" as keys to the US' successful implementation of Montreal Protocol. She said the US Clean Air Act involved a market-based, cost-effective, results-driven program. Hufford said there were many important opportunities still to come, specifically in containment, reclamation and destruction of ODSs.

During discussion, a member of the Chinese delegation reported that his country has also closed a number of ODS-producing facilities and has converted refrigeration plants from ODSs to other refrigerants.

PANEL 2B: PATH TO THE MONTREAL PROTOCOL

Alex Chisholm, Environment Canada (retired), discussed the steps that led to the development of the Montreal Protocol, highlighting: the power of science, particularly the "bombshell" of the Antarctic ozone hole; the importance of recognizing technical, industrial and commercial realities; the role of domestic politics; and the need for incremental steps.

Susana Diaz, National Council of Scientific Research (CONICET), Argentina, outlined three early alternative theories on the causes of ozone depletion, which focused on anthropogenic substances, atmospheric dynamics and solar cycles, respectively. She stressed that when the Montreal Protocol was signed, the connection between CFCs and ozone depletion had not been absolutely confirmed. Drawing a connection between the ozone and climate processes, she noted that the countries which created the Montreal Protocol decided to act rather than waiting for conclusive scientific evidence.

Mack McFarland, DuPont Fluoroproducts, gave an overview of the changing uses of ODSs, starting with mostly aerosol propellant applications and shifting to refrigeration as the major component. He also recounted DuPont's work to phase out



Mack McFarland, DuPont Fluoroproducts

CFC production, following preliminary findings that CFCs were responsible for ozone depletion shortly after the Montreal Protocol was signed.

In the discussion, the panel exchanged views on the role of scientific assessments, the role of the availability of substitutes for ODSs, production versus consumption control, the possibility of regulating banked fluorocarbon and the importance of economics in the Montreal and Kyoto Protocols. One participant questioned whether the Montreal Protocol is really a success given the current levels of ODSs and the ozone hole.

PANEL 3A: FINANCIAL MECHANISMS: TECHNOLOGY TRANSFER, CAPACITY BUILDING AND LESSONS LEARNED

Mohamed El-Ashry, former Chief Executive Officer and Chairman, Global Environment Facility (GEF), described the role of the GEF in supporting the Montreal Protocol implementation. He noted that in the intense international debate on climate change, the Montreal Protocol could guide the deliberations on actions post-2012.

Omar El-Arini, Multilateral Fund, explained that the voting system of the Multilateral Fund is similar to that of the



Omar El-Arini, former head of the Multilateral Fund

Global Environment Facility (GEF), and is based on a double majority. He said this arrangement altered the terms of technology transfer, and he highlighted that developing countries were provided with a "menu" of technologies to choose from under the Fund, and received them on fair and equitable terms.

Jacqueline Aloisi de Larderel, former Director, UNEP Division of Technology, Industry and Economics (DTIE), discussed technological and economic issues related to the Montreal Protocol's evolution from a set of contentious proposals to an agreement with wide support. She listed key factors in the Protocol's success, such as technology transfer, awareness raising, networking and capacity building. She said that capacity building is not just equipment transfer and investment, but also includes localization and human resource development.

Jose Pons Pons, Montreal Protocol Technology and Economic and Assessment Panel (TEAP), stressed that alternative technologies must be competitive and safe, and outlined the challenges identified since the inception of the Montreal Protocol including the need to allocate resources carefully. Pons Pons stressed that work on ozone protection should be completed as soon as possible for the world to be better prepared to face remaining environmental challenges.

PANEL 3B: SCIENCE ASSESSMENTS

A.R. Ravishankara, US National Oceanic and Atmospheric Administration (NOAA), spoke on the process of assessing ozone science. He said assessments evaluate the state of knowledge and involve participation from scientists worldwide, but do not provide policy recommendations, and are never final because information and ideas change constantly. He said the 2006 assessment involved 300 scientists from various countries, was fully reviewed three times by the international scientific



Panel on "Science Assessments". L-R: Moderator Lambert Kuijpers, Netherlands; Jan van der Leun, Ecofys Netherlands; A.R. Ravishankara, US National Oceanic and Atmospheric Administration (NOAA); and Ted Shepherd, University of Toronto.

community, and addressed the state of the ozone hole, trends in ozone depleting substances and the impacts of climate change on ozone levels. He said the Montreal Protocol is working as intended and that ultraviolet (UV) levels are expected to return to pre-1980 levels.

Ted Shepherd, University of Toronto, discussed data on ozone levels and causes of ozone depletion. He elaborated on the impacts of latitude, altitude and seasonal changes on ozone levels. Shepherd identified early signs of ozone recovery, and said that while the ozone hole is "saturated and currently at its worst," the most severe holes are expected to improve very slowly over the coming decades.

Jan van der Leun, Ecofys Netherlands, discussed the environmental effects of ozone depletion, particularly skin cancer, and highlighted related research which revealed the effect that temperature has on UV radiation. Responding to a question on the impacts of ozone depletion in developed versus developing countries, van der Leun said that most data comes from developed countries but can be valid for developing countries.

PANEL 4A: FUTURE OF THE MONTREAL PROTOCOL – LESSONS LEARNED AND APPLICABILITY TO OTHER ENVIRONMENTAL ISSUES

Jukka Uosukainen, Ministry of Environment, Finland, described the Montreal Protocol as the only legally binding convention with the commitment of all countries to time-bound targets. He noted that "no convention is an island" and highlighted the work of the Basel, Rotterdam and Stockholm Conventions to convene an *Ad Hoc* Joint Working Group on synergies between chemical conventions, and suggested the Montreal Protocol join this group.

Claudia McMurray, Bureau of Oceans and International Environmental and Scientific Affairs, US, said the Protocol's successes have supported further commitments by governments. She argued that its promise was realized through the power of consensus, with agreement on ambitious goals and a flexible approach to achieving them.

Ambassador Raul Estrada Oyuela, Argentina, compared the Montreal and Kyoto Protocols and stressed that while similarities exist, there are also key differences. He said that the Kyoto Protocol does not include provisions for the phase out or substitution of chemicals, and is instead a modest effort to alter the emission trends. He asserted that there is no "beauty contest" between the two Protocols, but that we need to work with both of them.

Tadanori Inomata, UN Joint Inspection Unit, discussed the application of the Montreal Protocol to environmental governance. He cited the precautionary principle, implementation of common but differentiated responsibilities, clear mandatory objectives, funding for capacity building, normative assistance and networking as model practices of the Protocol. He also suggested closer linkage between the ozone regime, other MEAs and sustainable development policies.



Panel on "Future of the Montreal Protocol - Lessons learned and applicability to other environment issues". L-R: Tadanori Inomata, UN Joint Inspection Unit; Ambassador Raul Estrada Oyuela, Argentina; Claudia McMurray, Bureau of Oceans and International Environmental and Scientific Affairs, US; and Jukka Uosukainen, Ministry of Environment, Finland.

PANEL 4B: TWENTY YEARS OF PROGRESS

Moderator Tom McElroy, Environment Canada, asked panelists to outline how ozone science has progressed, and what the future challenges would be. Richard Stolarski, NASA, described the increasing sophistication of atmospheric monitoring by satellite, which now features daily data on a range of atmospheric chemicals including ozone. He displayed a video of data from the Aura Earth Observing System (EOS) satellite, showing a dynamic feedback cycle between ozone and climate, and links between ozone and temperature. However, he noted that climate-ozone feedback models need to be further tested. Stolarski stressed that current research is concerned with determining both the impact of ozone on changing climate, and the impact of changing climate on the recovery process for the ozone layer.

Professor Frank Sherwood Rowland, University of California, showed that hydrochlorofluorocarbons (HCFCs) contribute significantly to global warming, and highlighted the Montreal Protocol's potential to combat climate change by phasing out HCFCs. He also discussed the need for more regionally-specific data on tropospheric ozone, which he said has large global warming potential under the scenarios provided by the Intergovernmental Panel on Climate Change (IPCC), and also noted uncertainties relating to methane emissions.

In response to a question regarding the panelists' personal experiences in the overall evolution of ozone science, Stolarski said he was thrilled to be in a research field where governments and civil society paid close attention and listened carefully to scientists. On lessons learned from the ozone process and their applicability to climate issues, Rowland noted that public misconceptions of scientific facts never disappear. Stolarski stressed the importance of communicating the gist of research and its implications for society.

CELEBRATORY DINNER

The seminar closed with a celebratory dinner featuring an awards ceremony for "visionaries of the Montreal Protocol" and keynote speeches. John Baird, Minister of Environment, Canada, reflected on the "great vision" of the Montreal Protocol, and highlighted the potential double benefits of HCFC reduction for the ozone layer and climate change. Closing the event, Brian Mulroney, former Prime Minister of Canada, drew a connection



Brian Mulroney, former Prime Minister of Canada, closed the Twentieth Anniversary celebrations.

between the ozone and climate processes, stressing the vital importance of collaborating with industry on technological solutions and securing the involvement of the US, China and India. In conclusion, Mulroney extolled the successes of the Montreal Protocol, identifying it as the single most successful international treaty to date.