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**Twenty-First Meeting of the Parties to the
Montreal Protocol on Substances that
Deplete the Ozone Layer**
Port Ghalib, Egypt, 4–8 November 2009

**Issues for discussion by and information for the attention of the
Twenty-First Meeting of the Parties**

Note by the Secretariat

Addendum

Introduction

1. Chapter I of the present addendum summarizes further work related to the forthcoming Twenty-First Meeting of the Parties completed since the preparation of the note by the Secretariat (UNEP/OzL.Pro.21/2) and prior to 12 October 2009. Included in the present addendum is a summary of the supplemental work of the Technology and Economic Assessment Panel and the Ozone Secretariat on the destruction of banks of ozone-depleting substances, further Panel consideration of the essential-use nomination by the United States of America for 2011 and the Panel's final reports on: alternatives to hydrochlorofluorocarbons (HCFCs) for high-temperature applications; campaign production of chlorofluorocarbons (CFCs) for metered-dose inhalers; quarantine and pre-shipment applications of methyl bromide; and methyl bromide critical-use nominations. The addendum also summarizes information on the proposed 2010 workplan of the Methyl Bromide Technical Options Committee. Lastly, it includes a summary of an option proposed by the Governments of Canada, Mexico and the United States for consideration in the context of a proposed amendment to the Montreal Protocol pertaining to high-global-warming-potential alternatives to ozone-depleting substances.
2. Chapter II includes additional information on matters that the Secretariat would like to bring to the Parties' attention, including Secretariat missions, ozone-related studies and Montreal Protocol matters that relate to other forums.

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I. Overview of items on the agenda for the Twenty-First Meeting of the Parties to the Montreal Protocol

A. Environmentally sound management of banks of ozone-depleting substances (decision XX/7) (item 5 of the provisional agenda for the preparatory segment)

1. Presentation of the final analysis of the task force of the Technology and Economic Assessment Panel

3. In accordance with decision XX/7, the Technology and Economic Assessment Panel has completed its final report on issues related to the sound management of banks of ozone-depleting substances, which can be found on the Ozone Secretariat's website.¹

4. In that report, the task force responds to the request formulated by the Open-ended Working Group at its twenty-ninth meeting to assess various issues and in so doing includes charts and explanations designed to inform the Parties. The issues include:

- (a) Development of a time series of ozone-depleting substances entering the waste stream by region;
- (b) Further review of the benefits arising from bank management in terms of ozone, climate, other environmental and social factors and economic factors;
- (c) Subregional examples of banks entering the waste stream;
- (d) Issues relating to the investment required to manage banks and likely timing;
- (e) Logistical challenges arising from efforts to manage banks;
- (f) Funding sources and factors affecting availability;
- (g) Ensuring that decision-making is carried out on an environmentally sound basis.

5. The task force found that its final report did not contradict the conclusions in its preliminary report, but instead, provided an opportunity for it to refine further its overall conclusions. In that regard, the final report includes the following specific conclusions:

- (a) The collection, recovery and destruction of refrigerants of all types represent the most immediate and cost-effective method of mitigating climate impacts from the release of banks;
- (b) Developing countries offer particularly valuable opportunities over the coming 10–15 years, during which the proportion of CFC in the refrigerant waste streams will remain significant. The current prevalence of HCFC-22 in these waste streams will also maintain a significant climate return over the period up to 2030;
- (c) For developed countries, the opportunity for end-of-life management of refrigerants containing ozone-depleting substances will broadly be over by 2025. At end-of-life, however, many substitutes for ozone-depleting substances will contain hydrofluorocarbons (HFCs) and any infrastructure created to manage ozone-depleting substances will therefore provide a climate benefit;
- (d) The global flow of ozone-depleting substances into the waste stream is expected to peak at between 200,000 and 225,000 tonnes annually over the period 2018–2020. Over 90 per cent of this amount is expected to be in the form of refrigerants;
- (e) Although estimates of destruction capacity for ozone-depleting substances remain preliminary, it is not anticipated that additional global capacity will be required to meet this global flow, even if the level of activity in bank management increases substantially. Nevertheless, there will be significant logistical challenges in delivering recovered ozone-depleting substances to appropriate destruction facilities;

¹ http://www.unep.ch/ozone/Assessment_Panels/TEAP/Reports/TEAP_Reports/teap-october-2009-decisionXX-7-task-force-phase2-report.pdf or http://ozone.unep.org/Assessment_Panels/TEAP/Reports/TEAP_Reports/teap-october-2009-decisionXX-7-task-force-phase2-report.pdf.

(f) Decisions to include ozone-depleting-substance substitutes within the scope of end-of-life activities could increase the demand for destruction capacity to as much as 400,000–450,000 tonnes annually by 2030, although some segregation and deselection might be expected for those substitutes seen as relatively benign;

(g) Most refrigerant management plans being implemented through the Multilateral Fund for the Implementation of the Montreal Protocol are focused on recovery, reclamation and recycling. As demand for servicing needs decreases in the period after 2015, active consideration will need to be given to the destruction of materials arising in this cycle. Premature destruction that might stimulate re-manufacture must, however, be avoided;

(h) Several protocols and methodologies are emerging within the voluntary carbon market community. The most notable of these are methodologies being produced by the Voluntary Carbon Standard and the Climate Action Reserve. Both take a conservative view regarding the substances to be included so as to avoid perverse incentives and take due care of accounting for ozone-depleting-substance replacements;

(i) The early retirement of refrigeration equipment could be justified based on improvements in energy efficiency. Early retirement to manage banks could, however, be counter-productive if the replacement technologies offer no additional benefit in life-cycle climate performance;

(j) The holistic management of domestic appliances has been practised in both Europe and Japan for several years. The overall cost of the process in climate terms remains below \$50 per tonne of carbon dioxide saved while significant quantities of CFCs persist in the waste stream, but once CFCs no longer form part of that waste stream the cost per tonne of reduction will rise significantly;

(k) In developing countries, CFCs will remain in the domestic refrigerator waste stream until at least 2020. Investment costs for the fully automated recovery and destruction of all ozone-depleting substances may, however, not be supportable in all cases. Newer, semi-automated refrigerator recycling plants may reduce the investment burden to some degree, but it is expected that many developing country regions will be obliged to focus exclusively on refrigerant extraction (or what are termed as “stage 1”) processes;

(l) The potential for funding bank management activities continues to receive significant attention and ideas are continuing to mature. There remain concerns that unfettered use of the voluntary carbon markets could, however, strip out the low-hanging fruit from banks and leave the more challenging areas untouched;

(m) The overall scale of the funding task also remains a significant and imminent challenge, particularly since ozone-depleting-substance waste streams in the low-effort and medium-effort categories are currently at their peak. Linkage to wider climate programmes appears an inevitable step if the funding requirements are to be met substantively;

(n) Insulating foams will be a minor source of ozone-depleting substances in the waste stream in the period up to 2030. Current costs of recovery and destruction suggest that such projects will not be justified based solely on climate investment criteria. The combining of ozone-depleting-substance flows (e.g., as with refrigerants and blowing agents in domestic refrigerators) may be an appropriate means of optimizing foam bank management;

(o) Halons are unlikely to be included in near-term ozone-depleting-substance destruction strategies, and indeed, the draft Climate Action Reserve standard excludes them from its coverage. This places further emphasis on the need to manage long-term stocks carefully to avoid unnecessary releases.

2. Further consideration of work initiated by the Open-ended Working Group at its twenty-ninth meeting

6. In the context of the one-day workshop on the management and destruction of banks of ozone-depleting substances and the related discussions that took place during the twenty-ninth meeting of the Open-ended Working Group, the Ozone Secretariat was requested to compile additional information related to some specific aspects of its original report on funding options for the destruction of banks (UNEP/OzL.Pro/Workshop.3/2, UNEP/OzL.Pro/Workshop.3/2/Add.1 and UNEP/OzL.Pro/Workshop.3/2/Corr.1). The additional information, which can be found in document UNEP/OzL.Pro.21/INF/6, includes further information on producer responsibility programmes for ensuring the collection and disposal of banks; the categorizing suggested by the Parties of the funding options for the collection and safe disposal of banks; and information on further efforts by the

Secretariat to gather information on past discussions on the legality of funding destruction under the Multilateral Fund.

B. High-global-warming-potential alternatives to ozone-depleting substances (decision XX/8) (item 6 of the provisional agenda for the preparatory segment)

Proposed amendment to the Montreal Protocol

7. In accordance with paragraph 2 of Article 9 of the Vienna Convention, the Governments of the Federated States of Micronesia and Mauritius submitted a proposed amendment to the Protocol to bring within its control the production and consumption of HFCs. Their proposal, which was introduced and discussed during the twenty-ninth meeting of the Open-ended Working Group, included a component on the destruction of HCFCs.

8. In the past, the submission of a proposed amendment by a Party consistent with the provisions of the Vienna Convention has led to the subsequent submission by other Parties of other related proposals. These various proposals have subsequently been considered and negotiated alongside the initial proposal.

9. It is in this context that the Governments of Canada, Mexico and the United States have submitted a proposed amendment to the Protocol. Their proposal can be found in document UNEP/OzL.Pro.21/3/Add.1. The proposal aims to list 20 specific HFCs, including two HFOs (a brand name given to some low-global-warming-potential HFCs) in a new annex F to the Protocol. Recognizing that alternatives are not currently available for all HFC applications, their proposal calls for a phase-down rather than a phase-out of the listed chemicals. Specifically, for developed countries (those Parties not operating under paragraph 1 of Article 5), they propose a phase-down of production and consumption beginning in 2013. That initial phase-down would be followed by a series of further reduction steps leading to a final phase-down plateau of 15 per cent of the baseline in 2033. For Parties operating under paragraph 1 of Article 5, the proposal calls for a phase-down of production and consumption beginning in 2016, with a series of subsequent interim reduction steps leading to a final phase-down plateau of 15 per cent of the baseline in 2043. Both the developed and the developing country reductions would be from a baseline derived by taking the average of 2004–2006 annual production and consumption of HCFCs and HFCs.

10. In addition, the proposal calls for the introduction and use of global-warming potentials for HFCs (as compared to the habitual Protocol practice of using ozone-depleting potentials); strict limitations on HFC-23 by-product emissions resulting from the production of HCFCs (e.g., HCFC-22); licensing of HFC imports and exports; bans on imports and exports of HFCs to non-Parties to this amendment; and reporting on production and consumption of HFCs and on HFC-23 by-product emissions.

11. This proposal would not affect the provisions of the United Nations Framework Convention on Climate Change and its Kyoto Protocol governing HFCs. The Montreal Protocol obligations would therefore be additional obligations and Parties could follow those as a way of meeting some of their HFC obligations under the Convention. The proposal envisions an amendment to the Montreal Protocol and a related decision by the Parties to the Convention confirming the proposed Montreal Protocol approach.

12. The Twenty-First Meeting of the Parties may wish to consider this proposal alongside that submitted by the Federated States of Micronesia and Mauritius during the preparatory segment for possible formal adoption, with any amendments that it deems appropriate, during the high-level segment.

C. Issues related to essential-use exemptions (item 7 of the provisional agenda for the preparatory segment)

1. Proposal on nominations for essential-use exemptions for 2010 and 2011

13. Following the twenty-ninth meeting of the Open-ended Working Group, the United States submitted a revised nomination for an essential-use exemption for epinephrine for 2011. The revised nomination lowered the requested level of the 2011 exemption from 67 to 52 tonnes and provided additional information justifying the nomination. The Technology and Economic Assessment Panel's review of this issue and its explanation for being unable to recommend the original and revised

nomination can be found in the addendum to its 2009 progress report on essential-use nominations for metered-dose inhalers.

2. Campaign production of chlorofluorocarbons for metered-dose inhalers

14. By decision XX/4, the Parties requested the Technology and Economic Assessment Panel to present a report to the Twenty-First Meeting of the Parties, preceded by a preliminary report to the Open-ended Working Group at its twenty-ninth meeting, concerning a number of specific issues related to campaign production. The Panel's preliminary report to the Open-ended Working Group focused on the significant actions taken since its previous report, in 2008. In that regard, the Panel noted that the difference in price between CFC-based metered-dose inhalers and those not using CFCs had narrowed over the past year, and that progress was being made in approving and implementing projects designed to convert metered-dose-inhaler manufacturers to CFC-free formulations in Parties operating under paragraph 1 of Article 5. The Panel also noted that the remaining European Union producer of pharmaceutical-grade CFCs would be closing at the end of 2009, which could affect the supply of CFCs for the remaining producers of CFC-based metered-dose inhalers.

15. The Panel's final report can be found on the Ozone Secretariat's website.² The following paragraphs are unedited excerpts from the executive summary of the Panel's final report on campaign production:

A coordinated final campaign production for essential MDI uses was recommended previously by the TEAP and its Medical Technical Options Committee (MTOC) when it was understood that after 2009 only the CFC producer in Spain would be supplying the majority of CFCs needed for Article 5 Parties, and that China would supply itself. However, with changed circumstances (resulting from the recent EC ban on CFC production from 1st January 2010) and the current uncertainty of CFC supply, it is difficult to predict where essential use CFCs approved by Parties will be sourced for 2010 and beyond. Therefore, it is uncertain whether a coordinated final campaign production would still be relevant or recommended. TEAP and its MTOC will continue to follow the developments concerning production and supply of pharmaceutical-grade CFCs, but is unable to provide Parties with a detailed response to Decision XX/4 until Parties clarify the CFC production situation.

This report does outline options for the possible future supply of bulk pharmaceutical-grade CFCs to meet demand for MDI manufacture and estimated CFC requirements after 2009. If approved by Parties, about 2,300 tonnes of essential use pharmaceutical-grade CFCs for MDIs would need to be produced in 2010 or sourced from stockpiles that would otherwise be destroyed, with an estimated further demand of about 3,700 tonnes (that is, about 6,000 tonnes in total) until phase-out.

Options considered in this report include supplying pharmaceutical-grade CFCs from a single production facility source or multiple production facilities. Parties might wish to consider a fixed timetable for CFC production at a single facility or multiple facilities to avoid open-ended CFC production. Remaining stockpiles that would otherwise be destroyed are also a potential source of pharmaceutical-grade CFCs. If Parties do not resolve the current CFC production uncertainties, the default outcome could be that CFC MDI production ceases at the end of 2009, in many countries. With such uncertainty, Parties may wish to consider the source of production of CFCs for granted essential use exemptions for MDIs, and vigorously pursuing opportunities to source stockpiles that would otherwise be destroyed.

TEAP and its MTOC emphasize that given the uncertainties and risks associated with the long-term supply of suitable quality CFCs after 2009, the highest priority for continued supply of metered dose inhalers is to complete transition as quickly as possible and ensure the expeditious introduction of CFC-free alternatives.

² http://ozone.unep.org/Assessment_Panels/TEAP/Reports/TEAP_Reports/teap-mtoc-report-2009_final-report-on-decision-xx4.pdf

D. Issues related to methyl bromide (item 8 of the provisional agenda for the preparatory segment)

1. Presentation by the Technology and Economic Assessment Panel

16. The Twenty-First Meeting of the Parties is expected to hear a presentation from the Technology and Economic Assessment Panel on methyl bromide issues. This presentation will include segments pertaining to its final review of critical-use nominations, its final report on quarantine and pre-shipment issues and the requirements of decision XVI/4, including the proposed 2010 workplan of the Methyl Bromide Technical Options Committee, and any proposed changes to the assumptions that the Panel uses to evaluate and make recommendations on nominations for critical-use exemptions.

17. The Panel's latest report includes no proposals to alter those assumptions. The proposed 2010 workplan can be found on pages 71–73 of the report, which in turn can be found on the Ozone Secretariat's website.³ Its workplan envisions two meetings of the Methyl Bromide Technical Options Committee during 2010, which is essential to enabling both a review of critical-use-exemption nominations and the finalization of its work on the 2010 quadrennial assessment. The workplan estimates meeting costs at \$14,000 and requests \$24,000 in funding for experts from Parties not operating under paragraph 1 of Article 5. While the costs of meetings and of experts from Parties operating under paragraph 1 of Article 5 have traditionally been met by the budget line in the Secretariat budget dealing with the Technology and Economic Assessment Panel, the Parties have funded only the participation of experts from Parties not operating under paragraph 1 of Article 5 to Methyl Bromide Technical Options Committee meetings in 2005 and 2006 and on an exceptional basis.

2. Consideration of nominations for critical-use exemptions for 2010 and 2011

18. During the twenty-ninth meeting of the Open-ended Working Group, the Methyl Bromide Technical Options Committee presented its initial recommendations on the new nominations that it had received in 2009 for critical-use exemptions in 2010 and 2011. Following a question-and-answer session on the nominations, the Committee met nominating Parties bilaterally to exchange views and further information. Through an iterative process the Committee received further information that enabled it to carry out a second round of evaluations by e-mail on some nominations where there were outstanding questions from either the Panel or the Parties concerned.

19. In a small number of cases, that process led to small changes in nominations by Parties and in the Panel's recommendations. The final recommendations by country are included in the table. More detailed information on the application-specific nominations and recommendations can be found on pages 24–59 of the Panel's final report.⁴

Table

2009 round of critical-use-exemption nominations by Parties in 2010 and 2011 (in metric tonnes)

Country	Requests in 2009 for 2010 and 2011		Final recommendation	
	2010	2011	2010	2011
Australia	-	35.450	-	28.710
Canada	4.74	19.368	3.529	19.368
Israel	382.14	-	290.914	-
Japan	-	249.420	-	239.746
United States	-	2,388.128	2.018	2,055.200
Total	386.88	2,692.366	296.461	2,343.024

3

http://www.unep.ch/ozone/Assessment_Panels/TEAP/Reports/TEAP_Reports/Teap_September_2009_MBTOC_CUN-report.pdf

4

http://www.unep.ch/ozone/Assessment_Panels/TEAP/Reports/TEAP_Reports/Teap_September_2009_MBTOC_CUN-report.pdf

3. Quarantine and pre-shipment applications of methyl bromide

20. In accordance with decision XX/6, the Technology and Economic Assessment Panel was requested to prepare an interim report for the Open-ended Working Group at its twenty-ninth meeting and a final report for the Twenty-First Meeting of the Parties on quarantine and pre-shipment applications of methyl bromide. A summary of the Panel's initial report was included in the note by the Secretariat (UNEP/OzL.Pro.21/2). The executive summary of the Panel's final report can be found in document UNEP/OzL.Pro.21/7.

E. Other issues arising out of the report of the Technology and Economic Assessment Panel (item 9 of the provisional agenda for the preparatory segment)

1. Alternatives to hydrochlorofluorocarbons in the refrigeration and air-conditioning sectors in Parties operating under paragraph 1 of Article 5 with special conditions (decision XIX/8)

21. During the discussions leading up to the Nineteenth Meeting of the Parties, when decision XIX/8 was taken, and during subsequent meetings (including the twenty-ninth meeting of the Open-ended Working Group), the Panel expressed an interest in visiting South Africa to obtain a better understanding of the issues that it faced in phasing out HCFCs used in mines that were not open pit mines. Following the twenty-ninth meeting, the Panel was able to verify that most such mines in South Africa had never used HCFCs. The Panel and its Refrigeration Technical Options Committee noted, however, that numerous developments have occurred pertaining to these mines and they are now intending to describe their findings in time for the thirtieth meeting of the Open-ended Working Group, after proper review of this part of the document. Consequently, and considering that their report to the Open-ended Working Group at its twenty-ninth meeting was otherwise complete in the areas of commercial refrigeration and unitary air conditioning, the Panel and its Refrigeration Technical Options Committee will submit no further information on this matter to the Twenty-First Meeting of the Parties.

2. Proposal on potential further work on carbon tetrachloride emissions

22. Over the past several years, the Parties have considered the issue of carbon tetrachloride and more recently the various estimates that have resulted from what are known as "bottom-up" and "top-down" analyses of related emissions. During the twenty-ninth meeting of the Open-ended Working Group, the Parties agreed to forward to the Twenty-First Meeting of the Parties a draft decision on the issue with the understanding that further work would be done intersessionally to endeavour to refine the proposal. Subsequent to the issuance of document UNEP/OzL.Pro.21/3, an updated draft proposal was submitted by Sweden on behalf of the European Union. That new draft proposal, which is designed to replace the older version, can be found as document UNEP/OzL.Pro.21/3/Add.2. The Twenty-First Meeting of the Parties is expected to consider further the issue of emissions of carbon tetrachloride.

F. Compliance and data reporting issues (item 11 of the provisional agenda for the preparatory segment)

Proposal on the treatment of stockpiled ozone-depleting substances relative to compliance (decision XVIII/17)

23. At the twenty-ninth meeting of the Open-ended Working Group the Parties considered a proposal by the European Union on the treatment of cases in which Parties had stockpiled ozone-depleting substances for exempted use in future years. In that regard, the Working Group agreed to forward to the Twenty-First Meeting of the Parties a draft decision on the issue with the understanding that further work would be done intersessionally to endeavour to refine the proposal. Subsequent to the issuance of document UNEP/OzL.Pro.21/3, an updated draft proposal was submitted by Sweden on behalf of the European Union. That new draft proposal, which is designed to replace the older version, can be found in document UNEP/OzL.Pro.21/3/Add.2. The Twenty-First Meeting of the Parties is expected to consider further the issue of stockpiled ozone-depleting substances relative to compliance.

II. Matters that the Secretariat would like to bring to the attention of the Parties

A. Secretariat missions

24. Since the completion of its note (UNEP/OzL.Pro.21/2), the Secretariat has participated in a number of meetings, including the network meetings of Ozone officers from Latin America and the Caribbean, South Asia, Southeast Asia, the Pacific and Africa. During each of those meetings representatives of the Secretariat gave presentations and initiated informal consultations on the issue of high-global-warming-potential alternatives to ozone-depleting substances, with document UNEP/OzL.Pro.20/INF/3 used as a point of departure therefor. In addition, Ozone Secretariat staff attended a meeting hosted by the evaluation office of the Global Environment Facility and the Executive Secretary attended the second week of the climate change negotiations in Bangkok, in October 2009.

B. New ozone-related studies

25. Two new articles relevant to the protection of the ozone layer have been published since the finalization of document UNEP/OzL.Pro.21/2:

(a) A. R. Ravishankara, John S. Daniel, Robert W. Portmann, "Nitrous Oxide (N₂O): The Dominant Ozone-Depleting Substance Emitted in the 21st Century", *Science*, volume 326, 2 October 2009, pages 123–125;

(b) Mario Molina, Durwood Zaelke, K. Madhava Sarma, Stephen O. Andersen, Veerabhadran Ramanathan, Donald Kaniaru, "Reducing Abrupt Climate Change Risk Using the Montreal Protocol and Other Regulatory Actions to Complement Cuts in CO₂ Emissions", *PNAS Early Edition*, 31 August 2009, pages 1–6.

26. The links to these articles can be found on the Ozone Secretariat's website under "publications". The Scientific Assessment Panel will review these articles under the current assessment process.

C. Montreal Protocol issues discussed in other forums

27. As noted above, the Executive Secretary attended the climate change negotiations in Bangkok. Among the many issues discussed at that meeting was a proposal by the European Union for the treatment of HFCs under the Montreal and Kyoto protocols. That proposal, which will be considered further during the November climate change negotiations to be held in Barcelona, Spain, is reproduced as follows:

In order to contribute to the reduction of HFC emissions and to pursue the ultimate objective of the Convention, Parties agree on the adoption of appropriate measures under the Montreal Protocol to progressively reduce production and consumption of HFCs, and of provisions on adequate reporting to the [Convention] on the reductions achieved. Such measures shall neither exclude HFCs from the scope of the Convention or any instruments related thereto nor affect existing commitments undertaken by Parties thereunder. Financial resources made available for the implementation of such measures, including resources made available through the Multilateral Fund or any other instruments deemed appropriate by Parties, shall be accounted for under the [Convention].

28. Montreal Protocol issues were also discussed at an August 2009 meeting in Tashkent, at which an evaluation of the work of Global Environment Facility on ozone-related projects was presented and discussed.