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**Open-ended Working Group of the Parties to
the Montreal Protocol on Substances that
Deplete the Ozone Layer**
Twenty-eighth meeting
Bangkok, 7–11 July 2008
Items 3 (a)–9 of the provisional agenda*

**Issues for discussion by and information for the attention of the
Open-ended Working Group of the Parties to the Montreal Protocol
at its twenty-eighth meeting**

Note by the Secretariat

Addendum

Introduction

1. The present addendum summarizes the issues contained in the 2008 progress report of the Technology and Economic Assessment Panel and the final report of the consultant on destruction of ozone-depleting substances (ODS), both of which were finalized after the preparation of the note by the Secretariat (UNEP/OzL.Pro.WG.1/28/2).

**I. Summary of issues for discussion by the Open-ended Working
Group at its twenty-eighth meeting**

Item 3 (b): Review of nominations for essential-use exemptions for 2009 and 2010

2. With reference to table 1 in the note by the Secretariat (UNEP/OzL.Pro.WG.1/28/2), the explanations provided by the Technology and Economic Assessment Panel for its recommendations on essential uses are summarized below. Full details of the Panel's findings can be found on page 37–44 and 47–66 of its 2008 progress report.

3. The Panel is unable to recommend the amount requested by the European Community because that amount, requested for metered-dose inhalers intended for export to Parties operating under paragraph 1 of Article 5, could be supplied from existing stocks and the remainder of the request covers

* UNEP/OzL.Pro.WG.1/28/1.

combination CFC metered-dose inhaler products for which there are separate moieties available as CFC-free products. The Panel considers that combination CFC metered-dose inhaler products are not essential uses and suggests that the Parties may wish to consider a decision not to allocate CFCs for these types of combination therapies.

4. The positive recommendation regarding the request by the Russian Federation relating to metered-dose inhalers was based on the recognition of that Party's immediate need and the quantity of CFC requested being justified based on consumption trends. That said, the Panel notes the need for further clarification of the final phase-out strategy and stockpile management in the Russian Federation. The Chemicals Technical Options Committee notes that a recommendation on the Russian Federation's request for an exemption for aerospace uses remains pending and the Panel hopes to be able to meet Russian experts to discuss the matter further before the meeting of the Open-ended Working Group.

5. The Panel was unable to recommend the request by the United States of America because the amount requested could be supplied from existing stocks, and, in any event, the request related to moieties that the Medical Technical Options Committee does not regard as essential given the availability of CFC-free alternatives or alternative moieties.

6. The Working Group will be expected to consider the nominations and the recommendations of the Panel thereon, and make recommendations, as warranted, to the Twentieth Meeting of the Parties.

Item 3 (c): Summary of the scoping study addressing alternatives to hydrochlorofluorocarbons in the refrigeration and air-conditioning sectors in Parties operating under paragraph 1 of Article 5 (decision XIX/8)

7. The Technology and Economic Assessment Panel's report on this issue can be found on pages 223–226 of its 2008 progress report. As requested by decision XIX/8, the Panel and the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee focused on HCFC-22 replacement refrigerants for commercial refrigeration and unitary air-conditioning equipment operating at high ambient temperature conditions. In that regard, the Panel and the Committee noted that several of the hydrofluorocarbon blends that are commercialized as replacements for HCFC-22, such as R-410A, have a relatively low critical temperature. This is why their capacities and energy efficiencies decrease with increasing ambient (condensing) temperature, more than is the case for HCFC-22. The Panel noted that the scoping study had been delayed for technical reasons and that it intended to undertake further modelling analysis, particularly for substitutes other than the above-mentioned hydrofluorocarbon blends. The Panel plans to submit a draft report, containing the modelling results and an assessment of all published literature on the impact on performance of high ambient temperatures, to the Meeting of the Parties in November 2008. In the case of refrigerants for deep mines, the Panel noted that it required further specific information – which would be collected during field visits – before it could analyse further possible alternatives to HCFC-22 in deep mines and present its findings to the Parties.

Item 3 (d): Study on projected regional imbalances in the availability of halon 1211, halon 1301 and halon 2402 and potential mechanisms for the improved prediction and mitigation of such imbalances in the future (decision XIX/16)

8. The Technology and Economic Assessment Panel's report on regional imbalances of halons and potential mechanisms for the improved prediction and mitigation of such imbalances can be found on pages 69–72 of its 2008 progress report. In an effort to assess such imbalances, the Panel and the Halons Technical Options Committee evaluated supply in several categories and 10 regions worldwide. In general, the Panel found adequate near-term supply in all areas, except for the need for halon 2402 by the Indian military. In that regard, the Panel found that the shortage of halon 2402 in India for servicing-related equipment was a major concern, which, if not resolved, could lead to a request for an essential-use exemption for related production.

Item 3 (e): Review of and recommendations on process-agent use exemptions; on insignificant emission associated with a use and on process-agent uses that could be added to or deleted from table A of decision X/14 (decision XVII/6)

9. The Technology and Economic Assessment Panel's report on process-agent issues can be found on pages 49–51 of its 2008 progress report. Through this report, the Panel fulfilled its mandate to review available information and make recommendations on process-agent uses that could be added to or deleted from table A of decision X/14 as amended and on reductions to the make-up and maximum emission of controlled substances listed in table B of that decision. In that regard, the Panel concluded

that only 3 of 10 newly submitted process-agent nominations met the technical criteria for inclusion in table A: carbon tetrachloride as a dispersant or diluting agent in the production of polyvinylidene fluoride, carbon tetrachloride as a solvent for etherification in the production of tetrafluorobenzoyl ethyl acetate and carbon tetrachloride as a solvent for bromination and purification in the production of 4-bromophenol. The Panel and the Chemicals Technical Options Committee also confirmed that process-agent use in the production of dicofol (No. 6 in table A of decision XIX/15) had ceased in 2007 and recommended the deletion of this application from table A. As regards table B, they noted that they lacked sufficient information to make any recommendations on possible reductions in make-up or emissions contained in that table since only three Parties had submitted related data to the Secretariat.

Item 3 (f): Final report on carbon tetrachloride emissions and opportunities for reductions (decision XVIII/10)

10. An interim status report by the Technology and Economic Assessment Panel on its work on the final report on carbon tetrachloride emissions and opportunities for reductions can be found on pages 64 and 65 of its 2008 progress report. In summary, the Panel noted that, while its work was not yet complete owing to difficulties in gaining access to relevant information, a final report would be presented to the Parties at the twenty-eighth meeting of the Open-ended Working Group.

Item 3 (h): Review of nominations for critical-use exemptions for methyl bromide for 2009 and 2010

11. The Technology and Economic Assessment Panel has considered the recommendations of the Methyl Bromide Technical Options Committee on the nominations for critical uses. Detailed information on its initial findings and recommendations can be found on pages 93–150 and 151–210 of its 2008 progress report. The table below summarizes the Panel's recommendations on a consolidated, countrywide basis.

Table

Critical use nominations in metric tonnes submitted in 2008 for 2009 and 2010

<i>Party</i>	<i>Nominated in 2008 for 2009</i>	<i>Nominated in 2008 for 2010</i>	<i>Recommended amount for 2009</i>	<i>Recommended amount for 2010</i>
Australia	38.990	37.610		29.790
Canada	34.375	36.410	2	7.462
European Community ¹	0	0	0	
Israel	716.877	..	610.854	
Japan	508.900	288.500		219.970
New Zealand	0	0	0	
Switzerland	0	0	0	
United States of America	4958.034	3999.473		3147.274
Total	6257.176	4361.993	612.854	3404.496

¹ Members of the European Community having critical-use nominations and critical-use exemptions include 2005: Belgium, France, Germany, Greece, Italy, the Netherlands, Poland, Portugal, Spain and the United Kingdom of Great Britain and Northern Ireland; 2006: Belgium, France, Germany, Greece, Ireland, Italy, Latvia, Malta, the Netherlands, Poland, Portugal, Spain and the United Kingdom of Great Britain and Northern Ireland; 2007: France, Greece, Ireland, Italy, the Netherlands, Poland, Spain and the United Kingdom of Great Britain and Northern Ireland and 2008: Poland and Spain.

.. Not yet available.

Item 3 (i): Any other issues arising out of the Technology and Economic Assessment Panel reports**1. Campaign production of CFCs for metered-dose inhalers**

12. In 2001, the Technology and Economic Assessment Panel first considered the feasibility of having a last batch of CFCs produced to meet the remaining long-term needs of those Parties not operating under paragraph 1 of Article 5 that continued to produce metered-dose inhalers using CFCs. Since then, the Parties have considered such production, known as “campaign production”, on various occasions and the Panel has reviewed the issue once again in its 2008 progress report (see pages 28–36).

13. In its 2008 report, the Panel examines three options for the production of CFCs to meet requirements for metered-dose inhaler manufacture after 2009 in the light of such issues as security of CFC supply, predicted volume requirements and relative costs for production, storage and destruction.

14. The first option considered, open-ended annual production after 2009, was not recommended because it does not provide a clear target for ending CFC production, does not provide predictability for CFC producers and does not provide incentives for companies to switch to CFC-free alternatives.

15. The second option, extensive final campaign production in late 2009, is not recommended and is now deemed impractical for a variety of reasons, including the difficult logistics of organizing a campaign by 2009, the likely overproduction of CFCs that would result from the current imprecise understanding of the timing of continuing conversions and the likely long-term need for CFCs for metered-dose inhalers, the high cost of storage that would be required for the related ODS, the lack of related decisions by the Parties and the logistics of using the associated essential-use nomination and approval process.

16. The third option considered by the Medical Technical Options Committee is final campaign production in 2011. The Committee recommends this option and believes that it would be feasible, provided that implementation of conversion projects in countries operating under paragraph 1 of Article 5 is not delayed further. The Panel supports the 2011 date because it provides a clear target for ending CFC production, predictability for CFC producers, lower storage costs than those associated with a 2009 campaign production run and because it would serve as an incentive for those companies currently manufacturing CFC metered-dose inhalers to switch to CFC-free alternatives.

17. In terms of the quantity of CFCs that would have to be produced, the Panel believes that a campaign production run of some 1,000 tonnes would be sufficient for all countries (excluding China, which the Panel assumes will continue to meet its own metered-dose inhaler needs), assuming that India ceases CFC metered-dose inhaler manufacture at the end of 2009 (as implied in decision 54/35 of the Executive Committee).

18. To facilitate campaign production in 2011, the Medical Technical Options Committee suggests numerous adjustments to the essential-use process and related decisions, including:

(a) Amending the language of numerous decisions relating to essential uses to make clear their applicability to countries operating under paragraph 1 of article 5. These would include decisions IX/19(5) and XII/2;

(b) Strengthening a number of other decisions to facilitate the provision of better information on issues related to economic feasibility;

(c) Amending the language of existing decisions to request (rather than encourage) Parties to undertake such actions as coordinating between governing authorities and ensuring that pricing policies do not discriminate against CFC-free metered-dose inhalers;

(d) Establishing clearer criteria for defining reasonable levels of active research and development and an end point to the conclusion of related efforts that are not proving successful;

(e) Adopting a decision stating that CFC metered-dose inhalers first marketed after 2007 are not essential;

(f) Strengthening information requirements for further essential uses to encompass additional information that will be important to enhancing precision on the size of the 2011 campaign production run;

(g) Taking any decisions needed to ensure that exemptions continue to be requested and reviewed prior to gaining access to the campaign production stockpile;

(h) Considering requiring that exporting Parties demonstrate that their exports are deemed to be essential by the countries importing the CFC metered-dose inhalers, and in that regard, considering strengthening the existing decision requiring Parties to report to the Secretariat when they believe that imports of such inhalers for a particular formulation are no longer essential;

(i) Creating more flexibility in the use of stockpiles than currently exists in decisions.

19. The Medical Technical Options Committee has prepared a non-exhaustive list of decisions that may require consideration to facilitate any change to the essential-use process to provide coverage for Parties operating under paragraph 1 of Article 5 and final campaign production.²

2. Technology and Economic Assessment Panel administrative matters

20. On budget issues, the Technology and Economic Assessment Panel notes that it continues to strive to minimize costs and that the Methyl Bromide Technical Options Committee and the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee are reviewing their membership to ensure cost efficiency. An important reason for the latter Committee to do this relates to the need to refocus on significant hydrochlorofluorocarbon replacement issues. As regards Panel travel, the Panel has requested emergency funding of \$100,000 per year for 2008 and 2009 to cover the travel of members from Parties not operating under paragraph 1 of Article 5 and miscellaneous meeting expenses. If such funding is not possible, it suggests that future assignments to the Panel could be paid for from the Ozone Secretariat, Multilateral Fund budget or other appropriate sources on a time and cost basis. Given that the Parties have rejected such requests in the past, the Panel notes that it will need to continue to seek funding from Governments, associations and companies and investigate funding from foundations.

21. As regards the Methyl Bromide Technical Options Committee, the Panel reported that its two subcommittees can meet separately, which would have the advantage of minimizing costs and facilitating important field visits. It also reported that Mr. Jonathan Banks had assumed in 2007 the role of Co-Chair of the Structures and Commodities Subcommittee of the Methyl Bromide Technical Options Committee. As regards the Medical Technical Options Committee, the Panel notes that its work is likely to diminish after 2011 as essential-use requests decrease and that further consolidation of the Panel's structure, particularly related to its committees, may be considered at that time. Lastly, in terms of membership, the Panel noted that it is seeking, in particular, a co-chair for the Halons Technical Options Committee from a Party operating under paragraph 1 of Article 5, an expert in nutsedge control, orchard replant, forestry and nursery propagation for the Methyl Bromide Technical Options Committee (Soils Subcommittee), experts in aviation fire protection for the Halons Technical Options Committee and experts in the manufacture of metered-dose inhalers from Parties operating under paragraph 1 of Article 5.

3. Climate aspects of ozone layer protection

22. The 2008 progress report includes a chapter on climate aspects of ozone layer protection on pages 227–234. After reviewing the Protocol's developing concern over the years regarding climate change (spanning from the 1987 Protocol's preambular language recognizing that ODS are themselves greenhouse gases to decision XIX/6, which called for the climate to be taken into account when selecting alternatives to hydrochlorofluorocarbons), the report notes the significant potential climate benefits that can accrue through the wise selection and deployment of replacement technologies. To attain these benefits, the Panel suggests that it will be important to consider the life cycle climate performance of alternatives in both the selection and timing of conversions.

23. The report also reviews other available options to achieve both ozone and climate benefits including: further acceleration of the scheduled phase-outs of ODS for Parties operating under paragraph 1 of Article 5; collection and destruction of ODS and hydrofluorocarbons; restrictions or controls on exempted uses; practical measures to contain, recover, and reuse ODS and hydrofluorocarbons; requirements and incentives to offset the ozone-depletion and climate impact of any continuing uses; reducing intentionally emissive applications (e.g., leakage from banks of chemicals contained in equipment and foam products, testing and maintenance of fire protection and refrigerated equipment) and deploying low- or zero-global warming potential alternatives where they can safely

² The list includes decisions IV/25; V/18, para. 5; VI/9, para. 4; VII/34, para. 5(b); VII/28, para. 2; VIII/9, paras. 8, 9 and 10; VIII/10; VIII/11; VIII/12, para. 3; IX/19, para. 5; IX/20; X/6, para. 5; XII/2, paras. 2–6 and 8; XIV/5; XV/5; XVI/12, paras. 2 and 3; XVII/5, para. 2; XVIII/7, paras. 2 and 3; XVIII/16, paras. 7 and 8 and XIX/13, paras. 2 and 3.

achieve equal or even better energy efficiency than high global warming potential options. Aside from technical options, the Panel notes the importance of policy options such as regulations (e.g., bans on non-essential products, performance standards, certification, restrictions and end-of-life hydrofluorocarbon recovery), economic instruments (e.g., taxation, emissions trading, carbon offsets, financial incentives and chemical use deposits and refunds), voluntary agreements (e.g., voluntary reductions in use and emissions, industry partnerships, release of patented technology to the public domain and implementation of best practice guidelines) and international cooperation (e.g., ozone financing from the Multilateral Fund with additional contributions from climate funding mechanisms such as the Clean Development Mechanism or the Global Environment Facility to enable the Fund to ensure that the projects financed for developing countries to protect ozone also protect the climate and environment better).

24. As regards Parties operating under paragraph 1 of Article 5, the Panel notes the need for the Executive Committee of the Multilateral Fund to find the ways and means to implement its mandate under decision XIX/6 to consider other environmental issues, including the climate, when funding the phase-out of ODS. In that regard, the Panel notes that the dual protection of ozone and climate by the Montreal Protocol provides an opportunity to increase the cost-effectiveness of global environmental action by, for example, supplementing the funds available under the Multilateral Fund with those available from other sources, if needed. To accomplish this in an effective manner, avoid delay and facilitate one-stop financing, it recommends the use of a window at the Fund. It also suggests, however, that the Fund's current guidelines and cost-effectiveness thresholds, which take into account ozone-depleting potential alone, may need to be adjusted to optimize ozone protection in connection with the climate. In that regard, it notes that alternative approaches to calculating cost-effectiveness for high-global warming potential ODS alternatives, such as those that would take into account the life cycle assessment of alternatives, could be useful.

25. In terms of replacing hydrochlorofluorocarbon technologies, the Panel suggests that the first priority of each Party should be to convert sectors where good technically mature alternatives are available and where environmentally superior alternatives are not yet under development (e.g., containment and servicing of refrigeration and air-conditioning equipment, most solvent and aerosol ODS uses and the use of hydrocarbons, carbon dioxide and other natural refrigerants where safety and energy efficiency can be achieved). The second priority could be to adopt technically mature alternatives where additional investment (from any source, but via the Multilateral Fund for those Parties operating under paragraph 1 of Article 5) can mitigate effects on the climate through containment, improved energy efficiency or implementing best practices to recover ODS when a product reaches the end of its life. The last priority could be to delay investment (if such delays will not affect compliance) and deprioritize any projects or activities where available alternatives have significant effects on the climate and the environment.

26. In conclusion, the Panel notes that it is technically and economically feasible to implement decision XIX/6 to "give priority to cost effective projects and programmes, which focus [on] ... substitutes and alternatives that minimise environmental impacts, in particular impacts on climate, as well as meeting other health, safety and economic considerations". Parties may not, however, always consider related measures to be cost-effective in the terms normally considered by the Fund. It suggests nonetheless that coordinated ozone and climate investment will usually be more cost-effective than pursuing these goals independently. Lastly, the Panel notes that Parties operating under paragraph 1 of Article 5 will be guided by instructions given to the Executive Committee when "developing and applying funding criteria for projects and programmes" and that Parties may therefore wish to ensure that actions to include climate factors in Parties operating under paragraph 1 of Article 5 are consistent with technologies and policies (and resulting products) pursued in Parties not operating under that provision, taking into account the global nature of markets and issues of sustainability.

Item 4: Report of the Executive Committee on case studies called for under decision XVII/17 on environmentally sound destruction of ozone-depleting substances (decision XVIII/9)

27. The final report of the consultant employed by the Executive Committee to study issues related to the environmentally sound destruction of ODS has now been completed. That report, entitled "Study on the collection and treatment of unwanted ozone-depleting substances in Article 5 and non-Article 5 countries", is now available on the Ozone Secretariat website at <http://ozone.unep.org>.

28. In a broad sense, the report noted that, from a market perspective, the recycling and reclamation of ODS refrigerants will be essential to satisfy after-market servicing demand in countries operating under paragraph 1 of Article 5 after 2010 (and most importantly to avoid shortfalls), and that recycling and reclamation of halons will be important in satisfying demands for critical-use applications.

Furthermore, from an environmental perspective, the destruction of any unwanted ODS will be essential in avoiding release into the atmosphere.

29. The report also suggested that:

(a) While regulations (such as those prohibiting venting and requiring technician certification and the use of recovery equipment) are necessary for ODS management schemes, they are not sufficient – industry outreach, education, training and enforcement are also key elements in the success of any programme, particularly if market incentives are not developed to play a key role in the programme;

(b) The scope of the programme must be determined. In that regard, key scoping questions include which sectors should be included in the programme (as not all equipment types lend themselves to cost-effective ODS recovery); whether to recover ODS from foams, together with those used as refrigerants and whether to develop capabilities for reclamation and or destruction of collected non-recyclable ODS. With regard to which sectors should be included, the study suggests that the refrigeration, air-conditioning and appliance foam sectors and, in particular, commercial sector applications warrant the most attention;

(c) As cost is the major obstacle to better ODS management, creating cash flow through economic incentives for recovery, reclamation and destruction will be vital to the success of related programmes. In this regard, the study notes that funding options currently used in Parties not operating under paragraph 1 of Article 5 include municipal taxes and taxes on new equipment. Rebates have been offered for the return of used ODS. The study also suggests that producer responsibility schemes, which impose on producers accountability for the entire life cycle of products, may work when there are few stakeholders involved and in countries where there is a strong public or State effort or both.

(d) Given that one of the major cost components in any ODS management programme will be the transportation of ODS from the user to the site intended for final disposal, a country's geography and infrastructure are key considerations when developing the programme. In that regard, the study suggests that the establishment of bulk ODS or appliance collection programmes beyond urban areas may not be economically viable or beneficial from an environmental (climate) perspective;

(e) While current destruction facilities are believed to have adequate capacities to handle current and future ODS waste streams, exporting ODS for destruction can lead to complications. Accordingly, it may be best for countries with large quantities of ODS to pursue domestic destruction or reclamation options. In this regard, upgrading existing destruction facilities (such as cement kilns) may help to reduce costs (as opposed to building facilities from the ground up). The study suggests that it will not be cost-effective for countries with smaller quantities of ODS to build or operate destruction facilities, as the cost of installing such a facility can be significant, depending on the technology and size and destruction potential involved). To assist countries with smaller quantities of ODS-related waste, the study suggests that export requirements should be clarified and streamlined and that assistance will need to be provided to ensure that such countries are able to export related wastes in accordance with the requirements of the Basel Convention and other potentially applicable regional conventions. The study also suggests that it may be useful for the Multilateral Fund to provide an international clearing house system to match supply with demand by connecting countries requiring destruction to those with available destruction capacity or with customers requiring such materials for continuing critical uses.

30. Other recommendations include:

(a) That, to maximize environmental benefits, and given that facilities and procedures developed to handle ODS are largely applicable to hydrofluorocarbons with high global warming potential, any management schemes should encompass all substances, both ODS and hydrofluorocarbons;

(b) That essential recordkeeping and reporting requirements should be balanced against the related administrative burden;

(c) That end users should not be required to pay for reclamation or destruction;

(d) That new funding options should be pursued to assist efforts by countries operating under paragraph 1 of Article 5 in this area, including direct assistance from the Multilateral Fund or climate-related emissions trading schemes. In that regard, the mandates of these institutions should be reviewed and extended to promote the safe disposal of unwanted ODS.

Item 5: Report of the Technology and Economic Assessment Panel on the replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol (decision XIX/10)

31. An extensive summary of the report of the Technology and Economic Assessment Panel's study on the replenishment of the Multilateral Fund can be found in paragraphs 24–68 of document UNEP/OzL.Pro.WG.1/28/2.
