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**Open-ended Working Group of the Parties to
the Montreal Protocol on Substances that
Deplete the Ozone Layer**
Twenty-ninth meeting
Geneva, 15–18 July 2009
Items 3 (b)–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-ninth meeting**

Note by the Secretariat

Addendum

Introduction

1. The present addendum summarizes in chapter I the issues discussed in the 2009 progress report of the Technology and Economic Assessment Panel that are related to issues on the agenda for the Open-ended Working Group (UNEP/OzL.Pro.WG.1/29/1) and a proposal for an amendment to the Montreal Protocol. It also includes, in chapter II, information on the expansion of the data access centre on the Ozone Secretariat website.

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

Item 3 (b): Review of nominations for essential-use exemptions for 2010 and 2011

2. Table 1 from the note by the Secretariat (UNEP/OzL.Pro.WG.1/29/2) is included below along with the recommendations of the Technology and Economic Assessment Panel on essential-use nominations for 2010–2012. The table is followed by a brief review of the Panel's findings, including those related to those nominations that the Panel was unable to recommend. Full details of the Panel's findings can be found on pages 16–22 of its 2009 progress report.

* UNEP/OzL.Pro.WG.1/29/1.

Table 1
Essential-use nominations submitted in 2009 for 2010, 2011 and 2012 (in metric tonnes)

<i>Party</i>	<i>Nominated for 2010</i>	<i>Nominated for 2011</i>	<i>Nominated for 2012</i>	<i>Recommendation of the Technology and Economic Assessment Panel</i>
Non-Article 5 Parties				
Russian Federation (metered-dose inhalers)	212	-	-	Recommended
Russian Federation (aerospace)	120	-	-	Recommended
United States of America (metered-dose inhalers)	67	-	-	Unable to recommend
Subtotal	399	-	-	-
Article 5 Parties				
Argentina (metered-dose inhalers)	178	-	-	Recommended
Bangladesh (metered-dose inhalers)	156.69	-	-	Recommended
China (metered-dose inhalers)	977.2	-	-	Recommended 972.2, all but ciclesonide
Egypt (metered-dose inhalers)	227.4	-	-	Recommended 227.4, agreed by Party
India (metered-dose inhalers)	350.6	-	-	Recommended 343.6, all but for export to the United Kingdom
Iran (Islamic Republic of) (metered-dose inhalers)	105	-	-	Recommended
Iraq (foams, domestic refrigerators/freezers and servicing needs)	690	690		Unable to recommend
Pakistan (metered-dose inhalers)	134.9	158.2	169.7	Recommended 34.9 for 2010; unable to recommend 2011 and 2012
Syrian Arab Republic (metered-dose inhalers)	44.68	49.22	-	Recommended all for 2010, unable to recommend 2011
Subtotal Article 5 Parties	3 864.48	897.42	169.7	-
Grand total – all nominations	2 599.37	897.42	169.7	-

3. This is the first year that the Panel has reviewed essential-use requests from Parties operating under paragraph 1 of Article 5. The Panel noted that it found it difficult to assess these nominations adequately owing, in particular, to a shortage of data on the availability and affordability of alternatives to chlorofluorocarbon (CFC)-based metered-dose inhalers for both the metered-dose inhaler manufacturing/nominating Parties and especially for the Parties operating under paragraph 1 of Article 5 listed as the destinations for their products. While the Panel attempted to assess availability and affordability and to minimize the requested quantities based on available information, it was unable confidently to make reductions in quantities without concern about whether there would be adequate supplies of CFCs to meet patient demand. While this resulted in approval of most of the nominations as proposed, the Panel cautioned that its recommendations this year should not be taken as an indication that next year nominations of the same nature would be recommended.

4. The Panel noted that none of the nominations that included significant CFC volumes designated for the manufacture of metered-dose inhalers for export had demonstrated that CFC-based metered-dose inhalers were essential in the designated export markets. In that regard, the Panel noted the importance of all Parties responding to the mandates of decisions XIV/5 and XII/2 (paragraph 3) and submitting information on alternatives available in their countries and information on what CFC moieties are no longer thought to be essential.

5. Among the metered-dose inhaler requests that the Panel was unable to recommend, China's requested exemption for ciclesonide was not recommended because the moiety for that substance was undergoing regulatory review in 2009 and was not yet on the market and because there was no evidence that the product had any additional clinical advantages compared to other locally produced and locally available steroids. With regard to the nomination by Egypt, the Panel noted that the Government of Egypt had voluntarily reduced its initial nomination of 264 tonnes and had deferred an amount to a possible 2011 nomination. Regarding India's nomination, the Panel reduced the request by the amount that was nominated for export to the United Kingdom of Great Britain and Northern Ireland based on its understanding that a new regulation would ban the import of CFC-based metered-dose inhaler into the European Union from 1 January 2010. The Panel was unable to recommend 100 tonnes of Pakistan's 2010 nomination based on its understanding that the multinational firm expected to manufacture the metered-dose inhalers would cease production of such inhalers in 2009. The nomination by the United States of America was not recommended on the basis of the Medical Technical Options Committee's conclusion that the amount of CFCs required could be satisfied from stockpiles, rendering new CFC production unnecessary. Furthermore, the Panel did not consider that production of CFC-based metered-dose inhalers for epinephrine qualified as an essential use under decision IV/25, paragraph (a), and it considered that the alternatives available on the market were adequate even though, unlike epinephrine, they were available only on prescription. Finally, it should be noted that the Panel recommended only the 2010 nominations and did not recommend any nominations for 2011 or beyond.

6. In accordance with paragraph 4 of decisions XX/3 and on the basis of this first year's experience with reviewing essential-use exemption requests from Parties operating under paragraph 1 of Article 5, the Panel presented a list of proposed changes to the essential-use handbook aimed at providing both adequate information for the assessment of nominations and the flexibility to implement any possible future campaign production, if needed. The consequential changes from decision XX/3 are also included. Those proposed changes can be found on pages 43–46 of the Panel's 2009 progress report.

7. Regarding essential-use nominations for uses other than metered-dose inhalers, the Technology and Economic Assessment Panel recommended the 2010 request by the Russian Federation for a continuing exemption of CFCs for aerospace uses. On the other hand the Panel concluded that the request from Iraq for an essential-use exemption to cover foams, domestic refrigerators and freezers and servicing needs did not meet the essential use criteria that there should be "no available technically and economically feasible alternatives or substitutes that are acceptable from the standpoint of environment and health" and that "the controlled substance is not available in sufficient quantity and quality from existing stocks of banked or recycled controlled substances". The Panel noted that there were alternatives for the foam and refrigeration and air conditioning manufacturing industry that had been proven for the preceding 13 years and that there were adequate global stocks of recycled material that could be imported by Iraq for its applications. The Panel noted too that there were globally proven techniques for refrigerant management, such as the use of recycled CFCs, and for replacing CFCs with non-CFC blends in existing equipment, which could obviate the need for continued consumption of CFCs. As a result of these factors, the Panel noted, no other country had ever submitted a nomination for an exemption for these uses. The Panel pointed out that the Parties might wish to consider Iraq to be a priority case for the provision of assistance, including through the Multilateral Fund for the Implementation of the Montreal Protocol and bilateral projects.

Item 3 (d): Campaign production of CFCs for metered-dose inhalers

8. In 2001, the Panel first considered the feasibility of having a last batch of CFCs produced to meet the remaining long-term needs of those Parties that continued to produce metered-dose inhalers using CFCs. Since then, the Parties have considered such production, known as "campaign production", on various occasions.

9. In its 2008 report, the Panel examined options for the production of CFCs to meet requirements for metered-dose inhaler manufacture after 2009, including open-ended annual production after 2009, an extensive final campaign of production in late 2009 and a final campaign of production in 2011. In that report, it recommended the latter option because it provided 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-based metered-dose inhalers to switch to CFC-free alternatives. After considering these options, the Twentieth Meeting of the Parties requested the Panel to present a preliminary report to the Open-ended Working Group at its twenty-ninth meeting that discussed five issues: first, the potential timing for a final campaign of production, taking into account, among other things, any nominations for 2010 essential use exemptions submitted by Parties operating under paragraph 1 of Article 5; second, options for long-term storage, distribution and management of produced quantities of pharmaceutical-grade CFCs, including existing methods used by Parties not operating under paragraph 1 of Article 5; third, options for minimizing the potential for too much or too little CFC production as part of a final campaign; fourth, contractual arrangements that might be necessary to facilitate campaign production, considering the models currently used by Parties that submitted essential-use nominations; and fifth, options for reducing production of non-pharmaceutical-grade chlorofluorocarbons and options for final disposal.

10. The Panel's 2009 report on this matter reviews changes that have occurred since its previous report. It notes that the difference in cost between metered-dose inhalers that use CFCs and those that use alternatives has decreased steadily. It also notes that there has been progress in the approval and implementation of projects to convert metered-dose inhaler producers in Parties operating under Article 5 to the use of alternatives. Finally, it notes its understanding that the sole remaining European producer of metered-dose-inhaler-grade CFCs, which had been a significant supplier to some of the remaining producers of CFC-based metered-dose inhaler in Parties operating under paragraph 1 of Article 5, would stop production of CFCs on 1 January 2010. This latter fact will make it necessary for metered-dose inhaler manufacturing companies in many such Parties to find new sources of pharmaceutical-grade CFCs for any essential uses approved by the Meeting of the Parties for 2010. As this activity will likely require both a validation of the new propellant and the approval of the relevant health authorities, the Panel noted the possibility that the normal flow of metered-dose inhalers that are locally produced in Parties operating under paragraph 1 of Article 5 could be disrupted and that related activities could further delay the transition from CFC-based metered-dose inhalers.

11. As a consequence of the impending closure of the source for meeting much of the world's remaining demand for CFCs for metered-dose inhalers, and taking into account the size of the essential-use nominations submitted this year, the Panel put forward two scenarios.

12. The first, or "sole source", scenario suggests the possibility of satisfying global demand for CFCs by obtaining them from the last remaining plant in China. The Panel noted several complications, however. First, China's phase-out agreement with the Multilateral Fund does not allow exports of CFCs after 2009. Second, the CFCs produced in China might not meet the registered specifications of all metered-dose inhaler producing companies. Finally, the sole source option would give the supplier a monopoly and subject the global supply to possible disruption if the plant were forced to shut.

13. The second scenario, based on multiple sources of supply, assumes that additional producers such as Honeywell in the United States or swing plant producers in Parties operating under paragraph 1 of Article 5 such as India could also supply CFCs. The Panel notes, however, that this option would not obviate the need to validate quality and that there is a risk of delay owing to the need to obtain national approvals. Further, legal aspects, such as the ability of these plants and countries to supply essential-use nominations to other Parties might need to be clarified as, for example, swing plants in Parties operating under Article 5 have received funding from the Multilateral Fund to stop production of CFCs as part of their production phase-out agreements. The Panel also reiterated its concern that the multi-source option would involve open-ended annual CFC production and would therefore provide neither a clear target for ending such production nor an incentive for metered-dose inhaler manufacturers to switch to CFC-free alternatives. Finally, it noted that overall destruction costs for out-of-specification CFCs could be relatively high compared with a final campaign of production.

14. In closing, the Panel noted that one final source of CFCs for meeting essential uses could be the remaining stockpiles in Parties not operating under paragraph 1 of Article 5. As both the size of what will remain after phase-out and the future Party demand from Parties operating under paragraph 1 of Article 5 are uncertain, however, it is unclear if this source of supply would be sufficient.

Item 3 (e): Presentation on and review of nominations for critical-use exemptions for 2010 and 2011

15. Table 2 summarizes the interim recommendations of the Panel's Methyl Bromide Technical Options Committee on nominations for critical-use exemptions submitted in 2009.

Table 2

Summary of the Methyl Bromide Technical Options Committee's interim recommendations for 2010 and 2011 by country for critical-use nominations submitted in 2009 for methyl bromide (in metric tonnes)

Country	Critical-use nomination for 2010 and 2011		Interim recommendation	
	2010	2011	2010	2011
Australia		35.45		27.22
Canada	4.740	19.368	3.529	19.368
Israel	383.700		290.914	
Japan		249.42		239.746
United States		2 388.128		2 050.819
Total	388.44	2 692.366	294.443	2 337.153

16. The Panel received 27 nominations for exemptions for a total of nearly 2,883 tonnes for soils applications for approximately 15 different crops. The Panel's recommendations on a national basis are in almost all cases lower than the nominated amounts. In most cases, amounts recommended for individual uses are also reduced from the levels nominated. The Panel gave a number of explanations for the reductions, including its belief that Parties could meet at least part of their need through alternatives and the application of its presumptions related to the use of barrier films and application rates. Of the soils nominations the Methyl Bromide Technical Options Committee recommended 289.874 tonnes for 2010 and 2,154.467 tonnes for 2011. Amounts not recommended were 92.266 tonnes for 2010 and 346.347 tonnes for 2011.

17. Parties submitted nine nominations relating to structures and commodities applications in 2009, amounting to 332.802 tonnes of methyl bromide. Two nominations were for 2010 for a total of 6.30 tonnes and seven were for 2011 for a total of 191.502 tonnes. In addition, the Russian Federation submitted a nomination for 135 tonnes; this nomination is still on hold and has not been reflected in the chart above pending further correspondence to determine, among other things, whether any of the nominated uses might be considered quarantine and pre-shipment uses.

18. Of the structures and commodities nominations just noted, the Methyl Bromide Technical Options Committee recommended 4.569 tonnes for 2010 and 182.686 tonnes for 2011. The Committee did not recommend 1.731 tonnes for 2010 and 8.816 for 2011. Cuts to nominated amounts were recommended for various reasons including the Committee's application of a transition rate to cases that had not been achieving sustained reductions in nominated amounts and the application of reduced dosage rates.

Item 3 (f): Presentation of and discussion on the interim report of the Technology and Economic Assessment Panel on quarantine and pre-shipment applications of methyl bromide (decision XX/6)

19. The Panel's interim report on quarantine and pre-shipment applications can be found on pages 145–179 of its 2009 progress report. The executive summary of the report is briefly summarized here. The Panel's final report will be presented to the Twenty-First Meeting of the Parties.

20. By decision XX/6 the Twentieth Meeting of the Parties requested the Panel to review all relevant, currently available information on the use of methyl bromide for quarantine and pre-shipment applications and related emissions; to assess trends in the major uses of methyl bromide, available alternatives, other mitigation options and barriers to the adoption of alternatives; and to determine any additional information or action that might be required to meet those objectives.

21. The Panel set up a revitalized Quarantine and Pre-shipment Task Force, comprising four experts from Parties operating under paragraph 1 of Article 5 and six from Parties not so operating, to respond to decision XX/6.

22. Reported global production and consumption for quarantine and pre-shipment was roughly constant over the 2004–2007 period. There were, however, substantial fluctuations from year to year, the reasons for which have not been identified. Global consumption for quarantine and pre-shipment uses has averaged nearly 11,000 metric tonnes a year since 1995, with some variation from year to year, with minimum consumption of less than 8,000 tonnes in 1998 and with peaks in 1999, 2003 and 2006 at 12,425, 12,286 and 12,207 tonnes, respectively.

23. Parties not operating under paragraph 1 of Article 5 accounted for approximately 62 per cent of consumption in 2006 and 46 per cent in 2007. Two Parties accounted for 82 per cent of total consumption by such Parties in 2007. The United States reports a wide annual variation in quarantine and pre-shipment consumption, peaking at 5,089 metric tonnes in 2006 and dropping to 2,930 tonnes in 2007. Quarantine and pre-shipment consumption in Parties operating under paragraph 1 of Article 5 has increased since 2000, particularly in Asia, while in Parties not so operating it has declined. Consumption by Parties operating under paragraph 1 of Article 5 amounted to 38 per cent of total global consumption in 2006 and 54 per cent in 2007. Quarantine and pre-shipment treatments are frequently carried out at the point of export to meet the requirements of importing countries.

24. Despite data gaps and uncertainties, the Quarantine and Pre-shipment Task Force was able to make preliminary estimates of the volumes of uses covering more than 77 per cent of total reported quarantine and pre-shipment consumption. The Task Force estimated that at least 66 per cent of total global consumption resulted from five main categories of use: fresh fruit and vegetables (8 per cent of identified uses); grain, including rice (12 per cent); soil (14 per cent); whole logs (21 per cent); and wood and wood packaging material (13 per cent). In all of these categories there are at least some instances in which alternatives were not technically available.

25. Despite recent surveys and submission of further data by various Parties, additional quantitative data on consumption for major uses is required from Parties to permit satisfactory assessment of usage trends. For Parties not operating under paragraph 1 of Article 5 there is a discrepancy of about 1,300 tonnes for 2007 between total consumption estimated by bottom-up analysis and total consumption reported by Parties pursuant to Article 7. This difference apparently arises from undefined use in one Party. A discrepancy of similar magnitude is apparent yearly over the period 2003–2007. Further clarification of this is being sought.

26. Development of alternatives to methyl bromide for quarantine and pre-shipment applications for commodities continues to be difficult. Complicating factors include the multitude of commodities being treated, the diverse situations in which treatments are applied, a constantly changing trade and regulatory landscape, requirements for bilateral agreement on quarantine and pre-shipment measures, requirements for very high levels of proven effectiveness and a lack of patent or other commercial protection for some potential alternatives.

27. Regulations prescribing methyl bromide treatment alone are a major barrier to adoption of alternatives as often there is little incentive for such regulations to be changed. A key barrier to development of alternatives for soil treatment for growing plants of certified high health status is the rigorous testing required to prove an alternative effective.

28. So far the Technology and Economic Assessment Panel has identified the treatment of export coffee (Viet Nam), export rice and cassava chips (Thailand, Viet Nam) and soil to produce propagation material (United States) as categories of use that have been classified as quarantine and pre-shipment by some Parties but not by others.

29. The Panel will publish a list of applications for which technically feasible alternatives have not been identified in its September 2009 report. The Panel encourages Parties to submit additional quantitative data on consumption for major uses as soon as possible.

Item 3 (g): Scoping study addressing 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)

30. The Panel's report on the scoping study addressing alternatives to hydrochlorofluorocarbons (HCFCs) in the refrigeration and air-conditioning sectors in Parties operating under paragraph 1 of Article 5 may be found on pages 121–143 of its 2009 progress report. As requested by the Nineteenth

Meeting of the Parties in decision XIX/8, the report focuses on HCFC-22 replacement refrigerants for commercial refrigeration and unitary air-conditioning equipment operating in high ambient temperature conditions. The Panel notes in the report that thermodynamic principals result in declining capacity and efficiency as heat-rejection (refrigerant condensing) temperatures increase and approach what is known as the critical temperature. Because several of the commercialized hydrofluorocarbon (HFC) blends that are now widely used as replacements for HCFC-22 have a relatively low critical temperature they experience a decrease in capacity and energy efficiencies with increasing ambient (condensing) temperature, making them much less efficient than HCFC-22 in some key applications in very hot climates.

31. The report considers a group of HFCs and HFC blends (including HFC-134A, HFC-32, R-404A, R-407C, R-410A and R-422B, and HFC-1234yf) as possible alternatives to HCFCs. It also considers hydrocarbons (HC-290, HC-600a and HC-1270); ammonia (R-717) and carbon dioxide (R-744).

32. The report notes that for air conditioning the most widely used replacements for HCFC-22 at the present time are R-410A and R-407C. These blends, and in fact all of the alternatives noted above, exhibit diminished efficiency and capacities at very high temperatures compared to HCFC-22. Nevertheless, after reviewing these alternatives the Panel concludes that in the near term regions with hot climates should be able to rely on R-407C and R-410A to replace HCFC-22 in air-conditioning applications. It also notes that HC-290 could be an effective replacement for low charge room and portable air conditioning applications. While HFC-134A and HC-600A can perform as well as HCFC-22 at high ambient temperatures, the use of these low pressure refrigerants requires extensive redesign of base system components in order to achieve the same capacity and efficiency as HCFC-22. The Panel therefore did not consider them to be cost-effective options for replacing HCFC-22 in unitary air-conditioning applications.

33. The area of commercial refrigeration currently faces similar challenges to those noted above for air conditioning, as R-404A, the most widely used replacement for HCFC-22, suffers from a relatively low critical temperature. This again results in lower capacities and energy efficiencies at very high temperatures compared to HCFC-22. With regard to replacements for small equipment, the report notes that three possible refrigerants can be easily used in high ambient temperature conditions applying current refrigeration technologies: HFC-134A, HC-600A and HC-290. While it is too early to make any definite statements at present, it might be possible to add HFC-1234yf to this list in the future. The Panel concludes preliminarily that the replacement of HCFC-22 in commercial refrigeration in hot climates might be feasible through the introduction of two-stage systems such as a normal cascade system or what is termed a "injection cycle", in which the same refrigerant is used in the two stages. Sub-cooling of the liquid and cooling of the vapour are achieved at an intermediate temperature. These two-stage designs increase energy efficiency significantly (up to 30 per cent) depending on the ambient (outdoor) temperature.

34. With regard to refrigerants for centralized systems, the report concludes that the use of indirect systems is possible in countries with high ambient temperatures and that it is possible to replace HCFC-22 in large commercial refrigeration systems with HFC blends such as R-404A or even R-422D or R-427A. The Panel notes, however, that for these blends the refrigerating capacity could be about 5 per cent lower than for HCFC-22 and that efficiency could be on the order of 5–10 per cent lower. It also notes that R-407C is used in centralized systems in Japan (R-407C has the lowest global warming potential (1800) of all HFC blends), and that hydrocarbons such as HC-290 and HC-1270 could be used under hot ambient temperature conditions as they exhibit relatively low discharge temperatures compared to HCFC-22. The Panel notes, however, that use of these alternatives requires that refrigerant quantities should be limited for safety reasons and that direct expansion systems should have an almost completely welded circuit in order to limit refrigerant leaks. It also notes that one of the most important safety precautions for these alternatives is charge reduction.

35. Finally, as requested by the Parties, the Panel addresses the issue of refrigerants for use in deep mines. In that regard, it notes that most mine chillers in the last decade have used HFC-134A or ammonia (R-717), although some recently developed systems have used water (R-718) as a refrigerant in a vacuum-vapour-compression flash cycle to produce ice slurries directly. Some proposed systems would use air (R-729) in air-standard Brayton cycles. Thus, while it would appear that the technologies are available to deal with the phase-out of ozone-depleting substances used in cooling deep mines, refrigerant questions remain with respect to future acceptability of options. To address these questions the Panel has planned a visit to South Africa in May 2009, where it expects to meet with leading mining companies, the engineering firms supporting them, researchers and possibly government contacts to

verify the problems and confirm needs. Following that visit, the Panel intends to review the list of options and prepare a final evaluation.

Item 3 (h): Updated 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)

36. The Panel's report on regional imbalances in the availability of halons and potential mechanisms for the improved prediction and mitigation of such imbalances can be found on pages 89–119 of its 2009 progress report. In its report the Panel defines regional imbalances as a lack of parity between supply and demand on a regional basis, rather than differences in quantities available from region to region.

37. For halon 1211 the Panel notes that while adequate supplies of recycled halon 1211 appear to be currently available in all regions there are strong indications that outside of China there may not be sufficient quantities to meet future demand. Specific areas of concern noted by the Panel include the aviation and military sectors in the European Union, the Russian Federation and the United States.

38. Regarding halon 1301, the Panel notes that only about 20 per cent of global banks of the substance are found in Parties operating under paragraph 1 of Article 5. The Panel notes that China has expressed its concern that it may not be able to meet its needs for this substance that they deem critical. No Party not operating under paragraph 1 of Article 5 has expressed similar concerns. Finally, the Panel notes that restrictions on imports that have been required by the Multilateral Fund in connection with halon banking projects might impede imports of halon 1301 that might be needed in the future by some Parties operating under paragraph 1 of Article 5.

39. Regarding halon 2402, while the Panel has not found any apparent shortage on a global basis, it has found that there are regional problems in some sectors (namely, defence and aviation), where users are having problems meeting their demand owing in part to the high cost of recycled halon 2402.

40. Regarding the mitigation of imbalances, the Panel suggests that for halon 1211, the Parties may wish to explore ways to increase the flow of 1211 on the international market. For halon 1301 the Panel suggests that increasing the use of alternatives would lead to the increased flow of 1301 from other applications to applications for which it is more critical. For halon 2402 the Panel suggests that Parties that use this substance should undertake needs assessments and that halon 1301 should not be destroyed before existing demands are met.

Item 3 (i): Laboratory and analytical-use exemptions (decisions XVII/10 and XIX/18)

41. In relation to the Parties' request that the Panel review the state of alternatives to methyl bromide for laboratory and analytical uses the Panel notes that it has not been able to obtain any new information since its last report.

42. In relation to the Parties' request in decision XIX/18 the Panel has prepared a list of laboratory and analytical uses of ozone-depleting substances. The list, which can be found on pages 52–56 of the Panel's 2009 progress report, includes information on feasible alternatives for virtually all of the uses noted. The report also includes case studies that explain how restrictions on the use of carbon tetrachloride for laboratory and analytical purposes have been implemented by several Parties.

Item 3 (j): Review by the Technology and Economic Assessment Panel and Executive Committee of the Multilateral Fund on the progress made in reducing emissions from process-agent uses and consideration of the Panel's recommendations on process-agent use exemptions (paragraph 100 of the report of the Twentieth Meeting of the Parties)

43. The Panel's 2009 progress report does not include any further information on progress made on reducing emissions from process-agent uses. The report does, however, address decision XVII/6 and its mandate to report and make recommendations on process-agent use exemptions, on insignificant emissions associated with use and on process-agent uses that could be added to or deleted from table A of decision X/14. Specifically, the Panel notes that its 2008 review concluded that three of ten submitted process-agent nominations met the technical criteria for inclusion in table A of decision XIX/15,

namely, 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 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 that application from table A.

44. With regard to table B of decision X/14, the Panel notes in its 2009 report, as it had in its 2008 report, that while it has not received data from all Parties using the process-agent exemption the emissions data reported by the European Community and the United States are at levels less than one third of the maximum (allowable) levels set out in table B. Since the Panel's 2008 report new information for table B has been obtained only from Japan, which reported that no more process-agent uses existed in that country. On that basis the Panel has reduced the related maximum allowable limits of 300 metric tonnes of make-up or consumption and five metric tonnes of maximum emissions in table B to zero. Owing to the fact that all of the data from all Parties were not available the Panel did not make any further recommendation for changes to the make-up and maximum emissions levels included in table B.

45. While the Panel's 2009 progress report did not include any further information on progress made on reducing emissions from process-agent uses, the report of the Executive Committee on this issue (UNEP/OzL.Pro.WG.1/29/4) provided a number of details about the efforts of that body to achieve related reductions in Parties operating under paragraph 1 of Article 5. Specifically, the report tracks the projects that have been approved under the Multilateral Fund to reduce the use of carbon tetrachloride as a process agent. In that regard, it notes that the total carbon tetrachloride consumption included in the projects approved amounted to 40,843 ODP-tonnes. The latest reported consumption for the same projects, most of which have been completed, is 5,848 ODP-tonnes. Furthermore, the projected eventual consumption upon completion of those projects is 1,216 ODP-tonnes. Since consumption is equivalent to emissions, the report notes that the maximum remaining emissions upon completion of all projects will be less than 3 per cent of pre-project levels. The total cost to the Multilateral Fund for these activities was reported as \$194,658,156, including the cost of phasing out the production of carbon tetrachloride in China and India.

Item 3 (k): Other issues arising out of the Panel's reports

46. Following a review of its membership, the Panel notes that Mr. Radhey S. Agarwal has resigned from his post as co-chair of the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee. The Panel is expected to put forward for consideration by the Meeting of the Parties the nomination of Mr. Roberto de Aguiar Peixoto (Brazil) to fill the vacancy created by Mr. Agarwal's resignation.

47. The Panel has also noted the intent of its co-chair Mr. Jose Pons Pons to resign from that leadership position at the end of 2010 after 19 years of service. For this post and for others the Panel is working on succession planning and will report to the Parties further in 2010.

48. Finally, the Panel notes its continuing difficulty in ensuring the participation of experts from Parties not operating under paragraph 1 of Article 5 who work in the private sector and who do not receive funding for their travel and other expenses arising from their work for the Panel and its subsidiary bodies. The Panel is urgently requesting the Governments of all Parties not operating under paragraph 1 of Article 5 once more to look into all possible means of funding certain costs for their national experts. For their part the Panel and its technical options committees will continue to seek funding from Governments, associations and companies and to minimize meeting-related costs.

Item 8: Proposed amendments to the Montreal Protocol

49. On 4 May 2009 the Ozone Secretariat received a proposal to amend the Montreal Protocol from the Federated States of Micronesia and Mauritius. The proposal would add a new Article 2J to the Protocol that would require the control of the production and consumption of HFCs. Specifically, the proposal calls for Parties not operating under paragraph 1 of Article 5 to freeze production and consumption of HFCs in 2012 at average 2004–2006 levels and to reduce production and consumption by 15 per cent in 2015, 30 per cent in 2018, 45 per cent in 2021, 60 per cent in 2024, 75 per cent in 2027 and 90 per cent in 2030. In the proposal text all of these reduction rates and years are enclosed in square brackets to indicate that they are negotiable. The proposal would also allow the production of an additional 10 per cent beyond the levels noted above in order to meet the basic domestic needs of Parties operating under paragraph 1 of Article 5. Calculation of production and consumption would be

based on the 100-year global warming potential of the relevant gases, with an option for considering the use of life-cycle analysis type measures.

50. Two options are proposed for the application of control measures to Parties operating under paragraph 1 of Article 5. The first option would delay the determination of related controls until 2011, pending the outcome of study. The second option would delay the application of control measures to these countries by a number of years (which would indicate the grace period between the imposition of developed and developing country control measures) that would be independently determined for each reduction step included in the proposed Article 2J. The baseline for Parties operating under paragraph 1 of Article 5 could be the lower of the average consumption over a stated period or a negotiated level of consumption per capita. The proposal includes a provision that would extend the mandate of the Multilateral Fund to cover agreed incremental costs of activities to enable such Parties to comply with the agreed HFC controls, with the proviso that any funds that a Party got from another funding mechanism to meet part of its agreed incremental costs would not be met by the Multilateral Fund. The proposal also calls for preference to be given to alternatives other than HFCs in the funding of HCFC phase-out projects under the Fund.

51. The proposal would require all Parties to destroy HFCs emitted as the result of HCFC production. It would also extend to HFCs the Protocol's provisions on trade with non-Parties and import and export licensing requirements.

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

A. Expansion of the Ozone Secretariat's data service on its website

52. As most Parties are aware, in 2006 the Secretariat introduced a data access centre on the Secretariat's web site at http://ozone.unep.org/Data_Reporting/Data_Access/. This effort, which was well received by the Parties, has now been extended to match more closely the type of data that is usually presented to the Parties in the annual data reports. The data centre now also includes the quarantine and pre-shipment data requested by the Parties in paragraph 2 (b) of decision XX/6. New information added to the website also includes laboratory uses, production allowance limits for basic domestic needs, data received on imports and exports of recovered, recycled and reclaimed ozone-depleting substances and summary information on essential and critical use approvals by the Parties. The improvements allow the Parties web-based and query-driven access to data and information that was previously only disseminated once a year and consolidate what was previously available only by consulting several documents that were published in different years.

B. Cooperation with the International Plant Protection Convention

53. Cooperation between the Montreal Protocol and the International Plant Protection Convention continues. The fourth session of the Convention's Commission on Phytosanitary Measures was held in Rome from 30 March to 3 April 2009. At that session the Convention secretariat, on behalf of the Ozone Secretariat, informed the Commission about progress on methyl bromide-related issues under the Montreal Protocol, including regarding decision XX/6 on quarantine and pre-shipment matters and related activities such as the work of the Quarantine and Pre-shipment Task Force. The Commission adopted a revised version of ISPM 15, the international standard for phytosanitary measures entitled "Regulation of Wood Packaging Material in International Trade". Previous versions of ISPM 15 gave equal status to methyl bromide fumigation and the alternative, heat treatment. The 2009 version clearly states a preference for heat treatment because of the damage to the ozone layer caused by methyl bromide.