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**Workshop on management and destruction of ozone-depleting substance
banks and implications for climate change**
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**Report by the Secretariat on funding opportunities for the
management and destruction of banks of ozone-depleting
substances**

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I. Introduction

A. Background

1. Over the past 20 years, global implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer has reduced the production and consumption of ozone-depleting substances by more than 97 per cent from historic baseline levels. Because most ozone-depleting substances are potent global warming gases, the implementation of the Protocol has also eliminated at least 11 billion tonnes of carbon dioxide equivalents, making it a significant contributor to global efforts to address climate change.

2. While the Montreal Protocol has focused on eliminating the production and consumption of ozone-depleting substances, these substances, which include chlorofluorocarbons (CFCs) and halons, have been deployed over the past 50 years or more in various forms and in various types of user applications. Equipment currently in use, such as refrigerators, air conditioners and fire extinguishers, and foam-related products contain significant amounts of ozone-depleting substances. In addition, many companies and countries worldwide are holding discrete stockpiles of virgin, recovered, contaminated or confiscated ozone-depleting substances pending final disposition. Together, the total amount of substances contained in existing equipment, products and stockpiles are commonly referred to as “ozone-depleting-substance banks”.

3. While the Montreal Protocol has been very effective in reducing the production and consumption of ozone-depleting substances it does not control emissions from or require the elimination of ozone-depleting substance banks. In the absence of legislation or other incentives requiring or encouraging the capture or destruction of the substances contained in these banks, those holding them are likely to vent them, permit them to leak into the atmosphere or dispose of them with little regard for the consequences that the resulting emissions may have for the ozone layer and climate change.

4. Given this context, the Parties to the Montreal Protocol adopted decision XX/7, initiating action in three areas. First, they called for further study on the size and scope of existing ozone-depleting substance banks and the costs and benefits of taking action on different categories of banks in relation to the ozone layer and climate change. Second, they called for the Multilateral Fund to initiate pilot projects with a view to developing practical data and experience, achieving climate benefits and exploring opportunities to leverage co-financing. Third, they called for the identification of funding opportunities for the management and destruction of ozone-depleting substance banks. This third mandate is the focus of the present report.

B. Request for report on possible funding opportunities for the management and destruction of ozone-depleting substances

5. One of the key reasons for the global success of the Montreal Protocol to date has been the support provided to Parties operating under paragraph 1 of Article 5 through the Multilateral Fund for the Implementation of the Montreal Protocol. The Fund, which underwent its sixth replenishment in November 2008, was established to enable Parties operating under paragraph 1 of Article 5 to meet their control obligations under the Montreal Protocol. Given that the Protocol does not currently control emissions from banks of ozone-depleting substances, the Parties have to date agreed to fund only pilot projects relating to banks.

6. Given the Fund’s limited mandate, its funding levels have in the past been assessed primarily in relation to the elimination of production and consumption of ozone-depleting substances necessary to enable compliance. This has historically resulted in the Fund’s Executive Committee not allocating funds for reductions in emissions from banks of ozone-depleting substances. In consideration of the fact that investments aimed at dealing with banks of ozone depleting substances could, in addition to protecting the ozone layer, yield significant climate co-benefits, however, decision XX/7 requested the Ozone Secretariat to consult experts and prepare a report on possible funding opportunities for the management and destruction of banks. The decision requested that the report focus on describing possible institutional arrangements, potential financial structures, likely logistical steps and the necessary legal framework that could be used to provide financial support for the management and destruction of ozone-depleting substance banks in respect of each of the following, if relevant: recovery; collection; storage; transport; destruction; and supporting activities.

7. The present report has been developed in response to this mandate.

C. Focus of the present report

8. The mandate from the Parties in decision XX/7 for the present report is somewhat bifurcated in nature. In the first instance, it is clear that the Parties wanted the report to focus on potential funding opportunities and the modalities that might be available to make them operational. On the other hand, the Parties also indicated that the report, where relevant, should also consider the application of the identified funding modalities to the various actions that would be needed to implement specific ozone-depleting substance management and destruction interventions such as recovery, collection, storage, transport, destruction and supporting activities.

9. These latter components would, in all likelihood, need to be included in most interventions that would lead to ozone-depleting substance destruction, but to varying degrees. For example, addressing stockpiles of currently held ozone-depleting substances would not necessarily require recovery and collection as, by definition, such stockpiles involve substances that have already been brought together. In contrast, the recovery of CFCs from foams would require complex, multi-step recovery and collection efforts. In any event, and to the extent that the present report deals with the management and destruction of ozone-depleting substances contained in banks, it should be understood that unless stated otherwise the use of the term “destruction” is meant to embody not only that final act but also all the steps necessary to effectuate that aim.

10. As regards the dual mandate of decision XX/7, the review undertaken for the present report has led the Secretariat to conclude that the underlying financial opportunities identified in the present report would not be significantly affected by the more micro-project components of recovery, collection storage, transport and supporting activities. Accordingly, the report focuses more on the topic of broad financial opportunities and modalities than on the specific project-type interventions that may be available. That said, the report includes in chapter III a set of examples that discuss the role that recovery, collection, storage, transport, destruction and supporting activities might play in some of the sector-specific destruction interventions that are likely to be available.

D. Preparation and structure of the present report

11. The Secretariat’s effort to respond to the Parties’ request in decision XX/7 began immediately after the twentieth meeting of the Parties, in November 2008. After the preparation of an initial scoping document, in mid-December, a first set of letters was sent to the entities referred to in decision XX/7 and to other relevant experts, asking them to nominate contact persons to facilitate discussions on possible funding opportunities for the management and destruction of ozone depleting substance banks. This effort was followed by a February 2009 letter that was sent to a number of bilateral donors and a March e-mail that was sent to facilitate discussions with a number of expert representatives of Parties operating under paragraph 1 of Article 5 of the Montreal Protocol. Finally, in an effort to assemble information on destruction facilities directly from Parties, the Secretariat sent an e-mail to all Parties asking for related information.

12. In response to the Parties’ request in decision XX/7 to convene, if possible, a single meeting of experts from funding institutions, the Secretariat had hoped to be able to organize such a meeting. Given budget and time constraints, however, it was unable to bring together enough such experts to warrant such a meeting. The Secretariat did, however, discuss the potential for joint work with many of the entities interviewed.

13. The present report is divided into five chapters. The present introductory chapter provides initial background on ozone-depleting substance banks and the process that went into the report’s preparation. It also attempts to provide some context by reviewing past work describing the size of ozone-depleting substance banks. In addition, because the report touches on some newer financial modalities with which some Parties may not be very familiar, it includes a brief primer on the carbon markets, which explains in a broad manner the possibility that revenue for the destruction of ozone-depleting substances could be generated from the carbon dioxide benefit that would result from that destruction.

14. Chapter II reviews potentially viable opportunities identified during meetings and interviews held by the Secretariat with various entities in preparing the present report. It is divided into entity-specific sections that review the role of each entity, its mode of operation, the potential funding opportunity identified and the steps that might be needed to act on the identified opportunity. While some of the opportunities relate solely to Parties operating under paragraph 1 of Article 5 others could be used by any Party.

15. Chapter III reports on consultations held with the secretariats of the Strategic Approach to International Chemicals Management, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, the Stockholm Convention on Persistent Organic Pollutants and the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. Along with possible funding opportunities through synergistic actions, the chapter also discusses issues related to the Basel Convention that might have implications for the transboundary movement of ozone-depleting substance banks.

16. Chapter IV includes a brief overview of some of the specific types of project interventions that could be used to deal with ozone-depleting substance banks. In that context, and where feasible, the chapter discusses the role that recovery, collection, storage, transport, destruction and supporting activities might play in the implementation of such interventions.

17. Chapter V provides a brief overview of the Parties' decisions on the destruction of ozone-depleting substances and publicly available information on the global availability and location of facilities that could be capable of destroying such substances or polychlorinated biphenyls. Facilities for destroying the latter substance are included because it might be possible to use or modify such facilities to enable the safe destruction of ozone-depleting substances.

18. The report concludes with two annexes providing a list of approved technologies for ozone-depleting-substance destruction (annex I) and a map and table showing globally identified ozone-depleting-substance and polychlorinated biphenyl destruction facilities (annex II).

E. Size of the issue: potential benefits of action

19. At the Parties' request, efforts are being made by the Protocol's Technology and Economic Assessment Panel to characterize better the size of existing ozone-depleting substance banks and the feasibility of measures available to deal with them. It is expected that this information will be available in June 2009. In the absence of new information, and in an effort to frame the issue for effective consideration in the present report, however, the Secretariat includes in the following three paragraphs information from the most recent studies undertaken to characterize ozone-depleting substance banks. The figures presented in this section will, however, likely be superseded by those in the Panel's report, which is expected soon.

20. The most thorough study of banks and related emission reduction opportunities to date was carried out as the basis for a special joint report by the Intergovernmental Panel on Climate Change and the Technology and Economic Assessment Panel entitled "Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons" (the Special Report) and a supplementary report by the Panel alone setting out the ozone-depletion implications of the issues discussed in the Special Report (the Supplementary Report). The Supplementary Report estimated that in 2002 there were 3.78 million ozone-depletion potential (ODP)-tonnes of ozone-depleting substances being held in user equipment or inventories, with 70 per cent of the total held in developed countries. To put that number in perspective, 3.78 million ODP-tonnes is over 55 times more than global consumption of ozone-depleting substances in 2007. In 2002, 33 per cent of ozone-depleting-substance banks consisted of halons, 66 per cent of CFCs and 0.5 per cent of hydrochlorofluorocarbons (HCFCs). The Supplementary Report estimated that 2002 emissions from these banks were approximately 252,000 ODP-tonnes per year (a level four times larger than the 2007 level of consumption of ozone-depleting substances), with the largest portion of emissions (169,000 ODP-tonnes) being CFCs. The report predicted that if business continued as usual the high leak rate of substances from banks would result in a reduction of the ozone-depletion potential then held in banks by up to half by 2015. The leak rates discussed above suggest that efforts need to be made very soon to avoid the damage that would be caused by the leakage of the remaining banks or the relocation of equipment containing ozone-depleting substances to landfills where it would become practically unreachable.

21. In addition to the ozone benefits that could accrue through the environmentally sound management of ozone-depleting substance banks, the Special Report established that the climate benefits of eliminating banks could be very significant. Specifically, it found that in 2002 ozone-depleting substance banks were estimated to have a global-warming potential of approximately 20.128 billion carbon dioxide equivalent tonnes. It also suggested that, unless action were taken, about a third of this climate-relevant amount would have been vented by 2015. These numbers suggest that there could be a significant climate benefit to managing even a portion of ozone-depleting substance banks in an environmentally responsible manner.

22. While the ozone-depletion potential and global-warming potential of these banks are obviously critical in assessing the environmental benefits that might accrue from dealing with them effectively, in the context of destruction and the steps leading up to destruction (recovery, collection, storage, transport and support activities, etc.), what one must grapple with is the actual physical quantity of ozone-depleting substances that must be collected, transported and ultimately destroyed. In that regard, the estimated size of the 2002 and 2015 banks amounted to 5.25 million and 4.78 million tonnes, respectively.

23. As the present report relates to financial modalities to achieve ozone and climate benefits, it focuses to a significant extent on potential actions to deal with banks of ozone-depleting substances in Parties operating under paragraph 1 of Article 5. It is therefore useful to keep in mind the estimated size of the banks found in those countries. In that regard, the most recent analysis of the size of banks was contained in an expert report produced for the Multilateral Fund for the Implementation of the Montreal Protocol in 2006 (UNEP.OzL.Pro/Excom/48/42). That report estimated that in 2010 the reachable banks of CFCs in Parties operating under paragraph 1 of Article 5 would be on the order of 515,000 tonnes. As noted later in the present report, the Technology and Economic Assessment Panel has suggested that this most easily reachable segment includes CFCs contained in refrigeration equipment. Estimates indicate that this particular material is likely to be depleted by as much as 25 per cent by 2015 as related equipment is retired and moves to landfills or is recovered and used to extend the useful life of refrigeration equipment.

24. Regarding the recovery and reuse of CFCs, it is important to note that the Special Report estimated that the global demand for servicing CFC-based refrigeration equipment in the post-2010 era would amount to as much as 30,000 tonnes per year in 2010, falling to 3,000 tonnes in 2015. While the current level of consumption may suggest that this estimate may have been high, there is little doubt that efforts to recover ozone-depleting substances for destruction and the achievement of ozone layer and global warming benefits may compete with the desire of many to use recovered and recycled CFCs to extend the useful life of equipment.

25. One final factor affecting banks that may be reachable in Parties operating under paragraph 1 of Article 5 relates to the Multilateral Fund's significant experience to date with recovery and recycling projects. The Fund has approved at least 100 recovery and recycling projects. Most have facilitated the training of technicians and the purchase and distribution of recovery and recovery and recycling machines and, in some cases, the establishment of centralized facilities for the recovery and recycling of ozone-depleting substances. With some exceptions, the amount of ozone-depleting substances recovered from such facilities has fallen far short of what was thought to be available for recovery. For example, the expert group report cited above states that, on the basis of responses received from 11 Parties operating under paragraph 1 of Article 5, of 4,275 tonnes of ozone-depleting substances used in the most easily reachable area of servicing refrigeration equipment, only 23 tonnes were recovered. While these results are only anecdotal, they are indicative of both the challenges posed by recovery and the opportunities for enhanced action. They also point to the need for thorough consideration of the size of the incentive that would be needed to encourage more robust recovery. Furthermore, the data on leak rates show the desirability of quick action to address those reachable banks that are likely to leak more quickly. It is hoped that the report being prepared by the Technology and Economic Assessment Panel on the feasibility of reaching various categories of banks will help the Parties to understand these factors more clearly.

F. Primer on the carbon markets and their relation to ozone-depleting substance bank management

26. To understand the carbon markets fully and their relation to the management of ozone-depleting substance banks, it is necessary to understand the framework of the Kyoto Protocol to the United Nations Framework Convention on Climate Change. The Kyoto Protocol put in place what is widely referred to as a "cap and trade programme" featuring a number of flexible mechanisms. In the first instance, and broadly speaking, this means that the treaty established an allowable emissions level – or cap – for each developed country Party. In many cases, those countries have distributed their allowable levels of emissions of controlled greenhouse gases to specific emitters and mandated that no one could produce emissions without emission credits. Countries generally distributed their credits at a level lower than the prevailing emissions levels with a view to ensuring that, in the aggregate, they would be able to meet their agreed emissions reduction targets.

27. In addition to the establishment of an emissions cap, the Kyoto Protocol established market-based trading provisions and mechanisms. These mechanisms enable emitters that are able to

reduce their emissions to a level lower than their caps to sell or trade their excess emissions reduction credits. Conversely, they enable emitters who exceed their caps to purchase credits rather than reduce emissions. In theory, because the cost of achieving reductions is likely to vary significantly among emitters, allowing credits to be traded reduces the cost of compliance.

28. One of the mechanisms established by the Kyoto Protocol allows emissions reductions credits to be traded internationally. Another mechanism established to facilitate the buying and selling (or trading) of credits is the Clean Development Mechanism. The Mechanism enables developed country entities to get emissions reductions credit for certified emissions reductions achieved through approved projects that they undertake in developing countries. Again, in broad concept, credits gained through excess national emissions reductions or through certified projects in developing countries can either be used toward an entity's reduction obligation, retired (that is, never used) or sold to others to enable the purchaser to meet its obligations. The end result of such activities is that projects that reduce global warming emissions beyond expected or required levels can generate substantial resources. Specifically, the buying and selling of emission reduction credits (variously known certified emission reductions or European Union allowances) has become a multi-billion dollar industry.

29. The possibility of using the Kyoto Protocol's flexible mechanisms, and particularly the Clean Development Mechanism, to obtain carbon credit for ozone-depleting-substance destruction depends on the terms and interpretation of the Kyoto Protocol's provisions. Paragraph 2 of article 2 of the Protocol calls on Annex 1 (developed country) Parties to pursue the limitation or reduction of emissions of "greenhouse gases not controlled by the Montreal Protocol". In addition, the Kyoto Protocol establishes baselines and emissions targets solely for a specific basket of greenhouse gases that does not include those controlled by the Montreal Protocol. These provisions would appear to limit the reach of the Kyoto Protocol and its flexible trading mechanisms to gases other than those controlled by the Montreal Protocol. That said, article 12 of the Kyoto Protocol, which specifies the activities that can generate certified emissions reduction credits, requires only that project activities under the Clean Development Mechanism result in "real, measurable and long term benefits related to the mitigation of climate change", and thus does not appear to limit Clean Development Mechanism projects to non-Montreal Protocol gases.

30. While the above dichotomy may appear to create some ambiguity regarding the possibility of using the Kyoto Protocol's Clean Development Mechanism to generate credits for the destruction of ozone-depleting substances, it is clear that only the Parties to the Kyoto Protocol can interpret it. Furthermore, at present it would appear that the balance of opinion is that, unless the Parties to the Protocol express a different intent, reductions in ozone-depleting substances would not be eligible for compensation in the form of credits under the Protocol.

31. While the vast majority of carbon trading activities are designed to support compliance with the Kyoto Protocol, the carbon markets broadly relate to efforts that go well beyond those aimed at achieving compliance. They include efforts by organizations such as the Voluntary Carbon Standard Association and the California Climate Action Registry, both of which enable industries and non-governmental organizations to facilitate investments in carbon reduction activities and to offset carbon creation activities (such as the efforts of some businesses to use credits to achieve carbon neutrality or airline schemes to enable passengers to offset the carbon emitted during their flights). Still other efforts, such as those by the Chicago Climate Exchange, link the distribution of emissions credits to specific reduction commitments made by their members. In either event, these efforts all have in common the possibility of monetizing carbon reductions and thereby encouraging the reduction of greenhouse gas emissions. In the context of the present report, these efforts are relevant because of the possibility that they might be used to mobilize funding for the carbon dioxide benefit gained through ozone-depleting substance destruction.

32. A few final points about the carbon markets are worth mentioning. First, while the carbon markets are generating billions of dollars in revenue annually and may provide a real opportunity to mobilize funds to achieve ozone-depleting-substance destruction, as will be discussed in the context of specific opportunities in chapter II, gaining access to the bulk of those markets would necessitate not only a change in Kyoto Protocol guidance, but also the development and approval of new methodologies, both of which could be time-consuming endeavours. This is particularly true given the concern of some that opening the compliance-related Clean Development Mechanism to ozone-depleting substances would significantly increase the level of credits available and thereby decrease their value. In addition, it is important to note that carbon credits (and therefore related funding) are generally provided only after actual emissions reductions have been achieved and verified rather than before a project has begun. Consequently, use of the Clean Development Mechanism or other carbon market opportunities would not obviate the need to mobilize up-front funding to facilitate

project development and implementation. Finally, it is important to note that, just as in any market, the value of the commodity being traded in the carbon markets is generally based on supply and demand. In that regard, the recent global economic downturn has led to a general reduction in economic activity and industrial production and a concurrent reduction in carbon dioxide emissions. As a result, through decreased use, many firms are now able to meet or even exceed their reduction obligations without taking further new action. This means that they do not need to buy carbon credits to meet their reduction goals and may in fact have excess credits to sell. This situation has generally led to a significant decrease in the price and value of emissions credits. While it is assumed that this situation will change over time, it points to the fact that the carbon market alone is unlikely to assure a steady stream of funding for ozone-depleting-substance destruction activities.

Change in value of credits between October 2008 and February 2009



II. Overview of main entities interviewed and opportunities identified

33. The present chapter reviews consultations between the Secretariat and various entities undertaken in preparing the present report. It is important to note that these discussions were in the nature of brainstorming sessions. That is because, like the Ozone Secretariat, most of the entities interviewed have neither the authority to give definitive interpretations of their underlying mandates nor the ability to move forward on any of the modalities discussed without first obtaining the approval of their governing bodies. It should be understood, therefore, that neither the Secretariat nor any of the other entities has committed to pursuing any of the opportunities discussed below or agreed that such opportunities are within the scope of their mandates. Consequently, the present report does not go into great depth regarding such issues as the legal frameworks that might be necessary to implement any of the opportunities considered here. Accordingly, if the Parties to the Montreal Protocol wish to pursue further any of the opportunities or modalities discussed in the present report, then they may wish to consider what further action or charge, if any, they may wish to give to the Secretariat or undertake through a formal decision of the Parties.

34. The remainder of the present chapter is presented in two sections. Section A relates to all international entities consulted, starting with the Montreal Protocol's primary financial mechanism, the Multilateral Fund for the Implementation of the Montreal Protocol, and proceeding with other multilateral funding entities in alphabetical order. Section B discusses funding opportunities identified during bilateral consultations with various national experts. While nearly 20 opportunities are discussed the list is not exhaustive and it is clear that there are more entities, particularly in the carbon markets, that may present additional opportunities.

A. Consultations with international entities

1. Multilateral Fund for the Implementation of the Montreal Protocol

35. As the Parties are aware, the Multilateral Fund has been integral to the Protocol's success. To date the Fund has approved over \$2.5 billion in funding which, when fully implemented, is expected

virtually to eliminate the production and consumption of CFCs, halons, carbon tetrachloride, methyl chloroform and methyl bromide. In addition, the Multilateral Fund is now beginning to take on HCFCs.

36. The Fund's mandate with regard to the management and destruction of ozone-depleting substance banks stems from actions by the Meeting of the Parties. Specifically, in 1990, while amending the Protocol to create the Multilateral Fund with a mandate to "enable compliance", the Parties agreed upon an indicative list of incremental cost that includes, as paragraph (c) (ii), the "[c]ost of collection, management, recycling, and, if cost effective, destruction of ozone-depleting substances". Also relevant is decision IV/11, taken the same year that the Fund was made permanent, which called on the Parties "to facilitate access and transfer of approved destruction technologies in accordance with Article 10 of the Protocol, together with provision for financial support under Article 10 of the Protocol for Parties operating under paragraph 1 of Article 5". Most recently, the Parties took decision XX/7, which, among other things, directed the Executive Committee:

To consider as a matter of urgency commencing pilot projects that may cover the collection, transport, storage and destruction of ozone-depleting substances. As an initial priority, the Executive Committee might consider projects with a focus on assembled stocks of ozone-depleting substances with high net global warming potential, in a representative sample of regionally diverse Parties operating under paragraph 1 of Article 5. It is understood that this initial priority would not preclude the initiation of other types of pilot projects, including on halons and carbon tetrachloride, should these have an important demonstration value. In addition to protecting the ozone layer, these projects will seek to generate practical data and experience on management and financing modalities, achieve climate benefits, and would explore opportunities to leverage co-financing.

37. Given that the above-mentioned decision was adopted only a short time ago the work of the Fund Secretariat, implementing agencies and Executive Committee has been impressive. The Executive Committee has intensively studied issues related to unwanted ozone-depleting substances and has taken related decisions at ten meetings since its forty-fourth meeting, in 2004. As a result of this work, which included an experts meeting and a major study, the Committee was in a position at its fifty-seventh meeting to fund initial requests for the preparation of related projects.

38. The Executive Committee's work in this area will be reviewed in the context of three primary funding modalities: pilot project funding, traditional project funding and the potential for funding future ozone-depleting-substance destruction work through the use of a special facility.

a. Operationalizing the pilot projects called for in decision XX/7

39. While the mode of financing project work under the Fund is the subject of many specific decisions that have evolved significantly over the past decade, in general the Fund carries out its work within the framework of its annual business plan. While there are exceptions, projects, including pilot projects, must normally be part of the Fund's business plan to be considered in any given year. In addition to the annual business plan, the Fund's implementing agencies¹ also put together, and the Fund secretariat consolidates, a rolling three-year business plan, in addition to an analysis of how this plan and the projects therein will work to enable compliance by all Parties operating under paragraph 1 of Article 5 of the Montreal Protocol with their obligations under the Protocol.

40. In response to decision XX/7 noted above, the United Nations Development Programme (UNDP), the United Nations Industrial Development Organization (UNIDO) and the World Bank put forward at the fifty-seventh meeting of the Executive Committee, in March 2009, requests to prepare ozone-depleting substance bank management and destruction projects for 21 Parties. Related project preparation requests totalled \$1.062 million. The agencies were asked to include in their requests estimates of the amount of ozone-depletion potential to be destroyed under each project; for all 33 projects that the agencies originally identified, the ozone-depletion potential to be destroyed was estimated at approximately 2,450 tonnes of ozone-depleting substances. The requests for project preparation did not generally suggest the approach that might be taken to dealing with the banked ozone-depleting substances. For example, they did not note whether ozone-depleting substances would be collected and then destroyed in the countries where the banks existed or whether they would be exported for destruction.

¹ The implementing agencies of the Multilateral Fund are the United Nations Development Programme, the United Nations Environment Programme, the United Nations Industrial Development Organization and the World Bank.

41. In considering the project preparation requests, the Executive Committee noted that there was a lack of Executive Committee guidance on funding destruction projects and a general lack of specific information in the project preparation requests. They also noted, however, the mandate and guidance provided by decision XX/7. Accordingly, the Executive Committee agreed to approve project preparation requests in Brazil, Ghana, Indonesia, Mexico, the Philippines and Turkey on the basis of specific criteria, including those provided in decision XX/7. As regards the remaining 15 project preparation requests that were not approved at the meeting, the Executive Committee requested the Multilateral Fund Secretariat to prepare a document proposing criteria and guidelines for the selection of ozone-depleting substance disposal projects. This document, which is to be presented at the Executive Committee's fifty-eighth meeting, in July 2009, is to take into account decision XX/7 and the discussions held during the March 2009 meeting.

42. In terms of process, following approval of the project preparation requests, the related implementing agencies will work with the countries to develop pilot project proposals. This project preparation process, which can be expected to take from six months to a year, will result in complete project proposals that will include, among other things, information on whether ozone-depleting substances will be collected and destroyed in the country of origin or exported for destruction, the type of ozone-depleting substances to be destroyed and whether the ozone-depleting substances to be destroyed are virgin or contaminated. If the project requests are subsequently approved, the agencies and the countries will begin implementation. What this process implies is that the six pilot project proposals reviewed and approved in March 2009 may not yield actual ozone-depleting-substance destruction until late 2011 or early 2012, assuming a two-year project implementation time frame.

43. Given the nature of the Parties' decision and the pilot nature of the initial efforts noted above, it is likely that some of the interventions used to address unwanted ozone-depleting substances will be funded in the same manner as that in which projects are normally funded through the Multilateral Fund – that is, through the use of grant resources provided pursuant to Parties' contributions in response to the latest decision of the Parties on replenishment of the Multilateral Fund. The following sections will examine the possibility of funding ozone-depleting substance destruction projects, other than pilot projects, through the Fund's traditional funding process and through a special facility.

b. Traditional project funding and operationalization

44. One option for dealing with ozone-depleting substance banks would be for the Parties to consider deeming such projects to be eligible under the Multilateral Fund and deciding to fund their agreed incremental costs.

45. As noted above, the indicative list of incremental costs agreed by the Parties already includes in paragraph (c) (ii) the "[c]ost of collection, management, recycling, and, if cost effective, destruction of ozone-depleting substances". Furthermore, decision IV/11 called upon the Parties "to facilitate access and transfer of approved destruction technologies in accordance with Article 10 of the Protocol, together with provision for financial support under Article 10 of the Protocol for Parties operating under paragraph 1 of Article 5". As only the Parties to the Protocol can interpret it definitively, the Parties may wish to consider whether the current structure provides sufficient justification for including funding for the destruction of ozone-depleting substances within the traditional funding framework of the Multilateral Fund. Given the language of the indicative list, such a consideration would presumably include a finding by the Executive Committee or the Parties as to what component of the banks it is now cost-effective to destroy and then a determination by the Executive Committee as to the agreed incremental costs for related bank management and destruction. If this avenue were taken, additional projects could move forward in a time frame similar to that discussed above for pilot projects. If, on the other hand, the Parties were to conclude that the stated mandate of the Fund in article 10 (to enable compliance with articles 2A–2E) required a more substantial change to the Protocol such as an amendment, then additional delay can be expected, as experience has shown that the entry into force of an amendment can take several years. By that time, a substantial portion of ozone-depleting substance banks would likely have been vented.

46. In the case of either of the options noted above, a determination of agreed incremental costs would be necessary. In that context, the Multilateral Fund Secretariat has suggested that activities that might be seen as giving rise to some incremental cost might be divided broadly into three groups:

(a) Activities for the collection of ozone-depleting substances might facilitate the accumulation of medium-level quantities (larger than 50kg) of ozone-depleting substances in one location in one country and, potentially, the documentation of their origin. This might include the

collection of products containing ozone-depleting substances, recovery of ozone-depleting substances from products or equipment and legislative work;

(b) Other activities might deal with the transport of ozone-depleting substances aimed at aggregating them in quantities sufficient for destruction or reclamation at a location of the sort described in subparagraph (a). This would involve not only logistics, but also transboundary movement and, with that, activities to expedite export, import and transit;

(c) Finally, activities related to actual destruction might include operating, upgrading or establishing destruction facilities, provided that such activities are cost-effective.

47. As was previously pointed out, limited information is available on the potential amounts of unwanted ozone-depleting substances for destruction at the country level. Funding for preparation pilot projects for destruction of unwanted ozone-depleting substances in six Parties operating under paragraph 1 of Article 5 has, however, already been approved. Preparation of additional pilot projects might be approved by the Executive Committee in the light of its discussion at its fifty-seventh meeting.

48. National costs for activities related to the disposal of ozone-depleting substances, such as collection and transportation, will vary widely from country to country depending on the size of a given country, its location, geography and other factors. If the destruction of ozone-depleting substance banks is shown to be cost-effective and to have a positive impact on the environment, the resulting mitigation of greenhouse gas emissions could lead to the generation of carbon emission credits that could be traded in carbon markets; their value might be considered when determining the incremental cost. To ensure equitable access to destruction projects, it appears sensible to consider administering any possible income from carbon emission credits centrally and applying any such income equitably against the overall costs.

c. Special facility and its operationalization

49. The notion of creating a special facility under the Multilateral Fund for funding climate co-benefits had already been discussed by the Executive Committee prior to the adoption of decision XX/7. Specifically, at its fifty-fifth meeting, the Executive Committee adopted decision 55/5 regarding \$1.2 million that had been repaid to the Fund from an earlier chiller concessional loan project for Thailand. At that meeting it was decided that those funds were to be considered as additional income that could be used to create a special facility for providing additional project support to Parties operating under paragraph 1 of Article 5. Furthermore, the Committee decided to consider at its fifty-seventh meeting a facility for maintaining additional income from loans and other sources, and the potential uses of those funds.

50. A document presented at the fifty-seventh meeting of the Executive Committee (UNEP/OzL.Pro/ExCom/57/64) suggested that the purpose of the special facility could be to augment funding to cover non-agreed incremental costs associated with additional environmental benefits such as climate benefits that were not required for compliance with the Montreal Protocol. Four potential uses of the facility were discussed, including pilot projects to develop methodologies to mobilize resources from other sources, collection of additional income from public and private sources, establishment of closer relations with other funding entities and use of the facility to seek, house and manage credits from carbon markets. At present, it appears that the facility might, to a significant extent, encompass the climate benefits generated from HCFC phase-out and, potentially, ozone-depleting substance disposal projects. Discussions will continue at the fifty-eighth meeting of the Executive Committee, in July 2009.

51. The Executive Committee will further consider the potential uses of the returned chiller project funds at its fifty-eighth meeting in the light of a paper that it has requested the Fund Secretariat to prepare. That paper will, among other things, consider legal issues, describe structural arrangements and take up issues of timing and cash flow. Issues that might be discussed by the Executive Committee include the governance of the facility and the type and characteristics of contributions to be made to it. Under the terms of paragraph 2 of article 10 it would appear that a special facility for funding climate co-benefits could be included within the financial mechanism of the Montreal Protocol. Some concerns, however, have been raised regarding the legal basis and scope of such a facility in the light of article 10 of the Protocol. Depending upon whether the Parties' want the Multilateral Fund to address measures not directly related to compliance with Article 2 of the Montreal Protocol, the Parties might consider the need for further criteria or a specific mandate for the financial mechanism.

B. Global Environment Facility

52. The Global Environment Facility (GEF) began operation in 1991 and since then has become the operational financial mechanism for several multilateral environmental agreements, including the Convention on Biological Diversity, the Stockholm Convention, the United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa and the United Nations Framework Convention on Climate Change. GEF has to date provided over \$8 billion in grants and has leveraged over \$33 billion in co-financing to fund more than 2000 projects in over 165 countries to protect the global environment. The Facility's outstanding work to protect the ozone layer is among its many accomplishments. While GEF has not been officially designated as the financial mechanism for the Montreal Protocol, the GEF Instrument as originally negotiated and restructured includes ozone-layer depletion as one of its six focal areas. Accordingly, the Instrument calls for GEF "to meet the agreed incremental cost of measures to achieve agreed global benefits" in this focal area. The extent of GEF work in ozone layer protection is prescribed by its 1995 strategy document and subsequent strategies that have subsumed the 1995 mandates. In accordance with its mandate GEF work on ozone layer protection has to date been limited to supporting efforts that would not be compensable under the Montreal Protocol's Multilateral Fund. Such work has primarily taken place in countries with economies in transition. Since 1991 GEF has approved over \$175 million in grant funding for projects that have helped 18 countries with economies in transition to comply with the Montreal Protocol's requirements. GEF has also supported an ozone-monitoring project for the Southern Cone of South America. Finally, on occasion GEF has co-funded projects with the Multilateral Fund, such as a chiller project in Thailand funded through a revolving fund, or "on-lending", that has stimulated the conversion of hundreds of chillers in that country.

53. As the financial mechanism for the United Nations Framework Convention on Climate Change GEF allocates and disburses some \$250m per year for projects in the areas of energy efficiency, renewables and sustainable transportation. In addition, it manages the Convention's Least Developed Countries Fund and Special Climate Change Fund, and its secretariat serves as the secretariat for the Kyoto Protocol's Adaptation Fund.

54. GEF operates under the broad strategic guidance of the conventions for which it serves as the financial mechanism and, operates in accordance with the frameworks agreed by GEF participants in the context of GEF replenishments and the strategic directions adopted by the GEF Council. The GEF Council, which comprises representatives of 32 specific groups of countries known as "constituencies", works with the GEF secretariat and its Chief Executive Officer to convert that guidance into operational criteria for GEF projects. Projects are generally developed and implemented with the assistance of one of the Facility's implementing agencies including UNDP, UNEP, UNIDO, the World Bank, the Food and Agriculture Organization of the United Nations (FAO) and the regional development banks.

1. Potential opportunities for funding and their operationalization

55. Potential opportunities for funding the management and destruction of ozone-depleting substance banks through GEF exist in the GEF focal areas for ozone and climate, in addition to the focal area for chemicals management. Opportunities relative to each of those areas are discussed below.

a. Ozone

56. As noted above, the GEF instrument includes ozone layer depletion among the GEF focal areas. The most recent strategic guidance for the ozone focal area was adopted by the GEF Council in 2007 and has continued to make clear that the GEF "goal in the ozone layer depletion focal area is to protect human health and the environment by assisting countries to phase out consumption and production and prevent releases of [ozone-depleting substances] according to their commitments to Montreal Protocol phase-out schedules, while enabling low-GHG (Greenhouse Gas) alternative technologies and practices. As a consequence of achieving this overall objective, the GEF will also contribute generally to capacity development for the sound management of chemicals".

57. In translating this broad guidance into practical direction, GEF has historically taken into account the assistance provided by the Multilateral Fund to Parties operating under paragraph 1 of Article 5 for activities resulting in eligible expenditures. The 1995 GEF ozone strategy states that GEF, "[i]n conformity with the principle of complementarity -- avoiding duplication of effort and not substituting for other sources of funds -- will provide only complementary assistance outside the financial mechanism." This means, in effect, that GEF will assist otherwise eligible recipient countries that are not Parties operating under paragraph 1 of Article 5 and that it will assist Parties, including

Parties operating under paragraph 1 of Article 5, “whose activities, while consistent with the objectives of the Montreal Protocol, are of a type not covered by the Multilateral Fund.”

58. This mandate, which forms the basis for subsequent GEF strategies in the ozone focal area, has heretofore led GEF to focus its efforts on supporting countries that would not be eligible under the Multilateral Fund – namely countries with economies in transition. To date, only one activity approved by GEF has fallen within the second half of the above-noted mandate (i.e., assistance for activities which, while consistent with the Montreal Protocol, are of a type not covered by the Multilateral Fund). Specifically, in 1993 GEF funded an ozone monitoring station for the Southern Cone of South America. That said, GEF guidance has over the years recognized the possibility of additional action. In that regard, and most directly relevant, is the language included in the strategic guidance for the fourth replenishment, which noted that GEF retained “the flexibility to respond to policy evolutions under the Montreal Protocol, for example regarding the destruction of unwanted [ozone-depleting substances]”.

59. While that language makes clear that funding the destruction of unwanted ozone-depleting substances is within the contemplation of current GEF guidance, and while extending ozone focal area funding eligibility beyond countries with economies in transition has been done in the past for the Southern Cone monitoring project noted above, it is fair to say that action in this area will depend on the will of GEF and its governing bodies.

60. *Operationalizing this opportunity* As noted in a note by the Ozone Secretariat to the Twentieth Meeting of the Parties (UNEP/OzL.Pro.20/3), GEF is currently preparing for discussions on its fifth replenishment. That exercise, expected to end in early 2010, is likely to involve both a review of the current ozone focal area strategy and a suggested earmark of funding for all focal area activities, including ozone. Thus, if the Parties to the Montreal Protocol want to see GEF support either broad (both countries with economies in transition and developing countries) or more narrow (countries with economies in transition) efforts for ozone-depleting substance management and destruction activities, they should make their desires known to their delegates to the GEF replenishment discussions, as the Facility’s ability and level of effort for the 2010–2013 time period will be established during those discussions. In the meantime, and given existing GEF strategic guidance, it would appear possible for GEF to entertain initial project proposals from its implementing agencies for the destruction of unwanted ozone-depleting substances that are found in countries with economies in transition and possibly destruction of unwanted ozone-depleting substances found in some Parties operating under paragraph 1 of Article 5. As suggested above, however, approval of such activities before the next GEF replenishment would depend on the Facility’s level of available funds and willingness, and specifically the willingness of its Chief Executive Officer and its Council to pursue this effort.

b. Climate change: short-term response measures

61. As noted above, GEF serves as the financial mechanism for the United Nations Framework Convention on Climate Change. As such, it allocates and disburses some \$250 million in projects per year in the areas of energy efficiency, renewables and sustainable transportation.

62. In prior sections of the present report it has been noted that the Kyoto Protocol specifically limits coverage to those global warming gases not covered by the Montreal Protocol and has heretofore excluded the issuance of certified emission reduction credits for ozone-depleting substance-related activities. Such a limitation would not seem to apply in the case of GEF, as its strategic goal of greenhouse gas avoidance is not so circumscribed. That said, the GEF strategic programme focus is more directed to undertaking activities to catalyse market transformation and thus bring about long-term greenhouse gas emission reductions rather than to undertaking individual greenhouse gas reduction projects.

63. There was previously, however, a GEF funding window for climate change work that could possibly be reactivated to support projects aimed at reducing greenhouse gas emissions through actions to destroy ozone-depleting substance banks in countries with economies in transition or Parties operating under paragraph 1 of Article 5. The purpose of that funding window was to support short-term response measures designed to enable near-term cost-effective reductions in emissions of greenhouse gases, a purpose that could encompass projects outside of the main climate change strategy. While it has not been used recently and is not mentioned in the climate strategy under the fourth replenishment, it could be reactivated to enable the achievement of climate benefits through the destruction of ozone-depleting substances.

64. Operationalizing this opportunity would require similar action to that noted above. Specifically, if Parties to the Montreal Protocol want to see funding under this window made available to Parties with

economies in transition and developing country Parties, or only the former, they should make that desire known to their delegates to the GEF replenishment discussions. It would therefore be useful if the possibility were mentioned in the context of the strategic review now being developed in preparation for the fifth replenishment.

c. Climate change and energy efficiency project enhancements

65. GEF has approved many projects aimed at addressing climate change by promoting energy efficiency. For example, it has funded projects aimed at replacing old, inefficient refrigeration equipment with new, more energy-efficient models. Some of these projects could be enhanced to deal with ozone-depleting substance issues. For example, the GEF portfolio of already approved projects could be systematically augmented with project components designed to ensure that any ozone-depleting substances or ozone-depleting substance foams taken from retired equipment are destroyed in an environmentally sound manner. In addition, any new projects of this type could include such components from the beginning. Such activities would appear to be consistent with general safeguard policies and would help to reduce emissions, benefiting both the ozone layer and climate change.

66. *Operationalizing this opportunity:* In discussing this idea with the GEF secretariat the Ozone Secretariat learned that UNDP had already suggested it to GEF. The Ozone Secretariat will follow up with the GEF Secretariat and will report on any further progress in this area. In the meantime, GEF delegates may wish to raise this issue both in the context of the review of current projects, when considering new projects and in the context of the replenishment discussions.

d. Chemicals management: persistent organic pollutants

67. GEF is the principal entity responsible for the operation of the financial mechanism of the Stockholm Convention on Persistent Organic Pollutants. In the persistent organic pollutants focal area, it provides assistance to developing countries and countries with economies in transition to implement their national implementation plans under the Stockholm Convention. The bulk of projects approved in this area under the fourth replenishment, as they most likely will under the fifth replenishment, deal with the phase-out and environmentally sound disposal of persistent organic pollutants, in addition to the environmentally sound disposal of persistent organic pollutant waste and waste containing such pollutants (such as obsolete stocks of pesticides).

68. These activities typically include removal and transport abroad for disposal, but also include the establishment of infrastructure for collection, temporary storage and in some cases disposal of persistent organic pollutant wastes. There appears to be significant potential for synergies in this area. For example, in one recently approved project addressing pesticide disposal in China, a small but important sub-component of the project will explore the feasibility of extending a planned persistent organic pollutant waste disposal facility to the destruction of CFCs.

69. Although not a source of funding per se, the Facility's work in this area does present opportunities for countries to maximize linkages between ozone-depleting substance bank destruction and the management and disposal of persistent organic pollutants, with a view to sharing management structures and infrastructure in a cost-effective manner, and generally to take into account all waste streams when devising strategies for hazardous waste management.

70. *Operationalizing this opportunity:* Partner countries could be encouraged by GEF (and the Multilateral Fund) to seek opportunities to establish fruitful linkages between related activities and to seize opportunities for synergies. In that regard, GEF (and the Multilateral Fund) could be encouraged to include evidence that such opportunities will be explored as a prerequisite for project approval. GEF delegates may wish to raise this issue in the context of current projects supporting the development of infrastructure for persistent organic pollutant destruction and in the context of the strategic review being developed in preparation for the fifth GEF replenishment.

C. World Bank

71. All Protocol Parties are aware of the outstanding work by the World Bank under the Multilateral Fund and the Global Environment Facility to assist Parties in phasing out ozone-depleting substances. The present section will explore possible funding opportunities for the management and destruction of ozone-depleting substance banks that fall outside of the World Bank's Multilateral Fund and GEF portfolios. Specifically, taking into account the current status of related reductions relative to the Kyoto Protocol, three broad funding modalities were discussed during the consultations between the Ozone

Secretariat and the World Bank. The first modality was the possible use of one or more of the many donor trust funds that have been established under the auspices of the Bank. The second modality would involve the Bank mobilizing additional donor resources to address the management and destruction of ozone-depleting substance banks. The third funding modality discussed involved reliance on the normal funding route of Bank projects, under which ozone-depleting substance management and destruction activities could be considered holistically with other chemicals management matters and within countries' development plans. Each of these possibilities is discussed more fully below.

1. Use of World Bank donor trust funds to address management and destruction of ozone-depleting substance banks

72. Donor trust funds, which are accounted for separately from the Bank's own resources, are financial and administrative arrangements with external donors set up to provide grant funding for high-priority development needs. While they are often used for such matters as technical assistance, advisory services, debt relief, post-conflict transition and co-financing the use of money from a given trust fund depends on agreement between the donor country and the Bank. The Bank currently has several donor trust funds with environmental components and, in theory, the donor countries could agree with the Bank and potential recipients that trust funds could be used to support ozone-depleting substance destruction projects. In terms of making this option operational, it would be at the discretion of the country sponsoring a given trust fund.

2. Mobilization of funds specifically for an ozone-depleting substance destruction initiative

73. The World Bank has significant experience mobilizing donor resources to meet specific needs. This type of support has previously been demonstrated in the Montreal Protocol context through an effort to address the closure of ozone-depleting substance production facilities in the Russian Federation. While GEF had provided over \$60 million to facilitate reductions in ozone-depleting substance consumption in the Russian Federation, funding was not forthcoming for the production sector. Out of concern that continued production from the 143,000 tonnes of production capacity in the Russian Federation would jeopardize the compliance of that country and that of others, the World Bank initiated studies on what was possible, entered into negotiations with the Government and producers and mobilized nearly \$27 million in donor support to fund the closure of CFC and halon production facilities.

74. This example could be replicated to deal with ozone-depleting substance destruction. Such an effort could, in theory, be undertaken through national, regional or global projects and could be initiated either by the Bank or through discussions with donors.

3. Addressing ozone-depleting substance management and destruction within the chemicals management focal area or country assistance strategy

75. At the country level, the Bank has worked to integrate chemicals management issues into many of its clients' poverty reduction strategies, which are in essence medium-term plans that, among other things, diagnose a country's policies, institutions and capacity and identify priorities for action. In working with its clients, the Bank prepares two- to three-year country assistance strategies that interweave the Bank's own strategic priorities and principles and those of the countries. Given the critical role of chemicals in a number of sectors and their relationship to issues of vulnerability, poverty and equity, the Bank has begun to work with its country partners to integrate chemicals management into the country assistance strategies for various countries. Including ozone-depleting substance destruction in the chemicals management framework provided by these fundamental planning documents could help to provide points of entry for donors and other agencies to provide funds for this issue area in a sustainable manner that promotes synergies among various environmental responsibilities. This option could be operationalized through discussions between the Bank and its client countries, with or without encouragement from the Parties to the Protocol.

4. Climate investment funds: the Clean Technology Fund and the Strategic Climate Fund

76. The Bali Action Plan adopted at the thirteenth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change includes a call for a comprehensive strengthening of the catalytic role of the Convention regime through, among other things, encouraging multilateral bodies to support adaptation and mitigation in a coherent and integrated way. In an effort to respond to this call, the World Bank has collaborated with the regional development banks to establish two "climate investment funds" that it hopes will fill an immediate financing gap pending final

agreement on the future climate change regime being discussed under the Convention. The Ozone Secretariat was not able to meet the climate investment fund secretariat prior to the finalization of the present report; it is therefore includes below only an overview of available background material on the operation of the two funds. Any further information on related opportunities will be issued in the form of an addendum to the present report.

77. The Clean Technology Fund aims to provide incentives for demonstrating, scaling up, deploying and transferring to developing countries low-carbon technologies and mitigation techniques with significant potential for long-term greenhouse gas emission savings. Investment programmes to be undertaken under this fund are to be developed on a country-specific basis with an overall objective of financing at scale, in the near- to medium-term, actions to support rapid deployment of low-carbon technologies or measures to increase energy efficiency in sectors such as power (including demand management techniques in the industrial, commercial and residential building sectors) and transportation.

78. The Clean Technology Fund will seek to optimize blending of multilateral development bank funding with other sources of funding and to deploy a range of financial products to provide appropriate incentives and meet the countries' needs. Financing from the Fund, which could include public and private sector investments, will include a grant element tailored to cover the identifiable additional cost of investments necessary to make a project viable in addition to a range of concessional financing and risk mitigation instruments. Complementary funding for policy and institutional reforms and regulatory frameworks, in addition to the creation of enabling environments including the development of codes, norms and standards, may also be provided. Country access to the Fund will be based on development assistance eligibility and the presence of an active multilateral development bank programme. Investment plans will be submitted to a trust fund committee, which will comprise an equal number of representatives of donor and recipient countries, to endorse further development of activities, including approval of financing. The further processing of a programme or project will follow the multilateral development bank policies and procedures.

79. The Strategic Climate Fund was developed to complement the Clean Technology Fund. Its aim is to mobilize new and additional financing for activities and investments that demonstrate how financial and other incentives can be used to support new development approaches or scaled up activities aimed at a specific climate change challenge or sectoral response to support adaptation and mitigation. This interim fund, which will operate pending decisions by the Parties to the Climate Change Convention on a longer-term financial architecture, is designed to initiate programmes as soon as possible through the mobilization of programme-specific pledges and resources and the development of project specific arrangements.

80. The Strategic Climate Fund will begin with a pilot programme on climate resilience aimed at funding national development plans that integrate climate objectives into sectoral and national planning, covering the full range of development sectors relevant to mitigation and adaptation. The Fund's objective is to demonstrate in 5–10 countries ways to transform national development planning to make it more climate resilient.

81. Additional investment programmes are foreseen for forests and for investments in low-income countries in energy efficiency, renewable energy and access to modern sustainable energy. New programmes will be considered depending on donor interest and resource availability, lessons learned, complementarity with other financial mechanisms or initiatives and the link between climate and development.

82. A trust fund committee comprising an equal number of donor and recipient countries (currently pegged at eight) will oversee the operation of the Fund's activities and a subcommittee with representatives of up to six donor and six recipient countries will be established for each programme under the Fund.

83. *Overview of this opportunity:* Consideration could be given to requesting the Clean Technology Fund and the Strategic Climate Fund to provide up-front funding for ozone-depleting substance destruction. To the degree that funding is provided on a loan basis, any funding recouped through the monetization of any related carbon credits could be used to help repay the loans. Discussions would have to be held with the Fund managers, however, to determine their openness to this possibility.

D. United Nations Development Programme: ozone-depleting substance carbon facility

84. All Protocol Parties are aware of the outstanding work by UNDP under the Multilateral Fund and the Global Environment Facility to assist Protocol Parties in phasing out ozone-depleting substances. The present section will explore possible opportunities for funding from UNDP for the management and destruction of ozone-depleting substance banks that fall outside of the Multilateral Fund and GEF portfolios for UNDP.

85. At the fifty-seventh meeting of the Executive Committee of the Multilateral Fund, UNDP gave a presentation on the strengths and weaknesses of leveraging carbon finance for ozone-depleting substance projects. The presentation drew on the experience of the UNDP carbon finance team, the Millennium Development Goal Carbon Facility and the long-standing role of UNDP as an implementing agency under the Montreal Protocol. Overall, the view was expressed that carbon finance was well suited as a funding source for ozone-depleting substance destruction projects, but that it would be necessary to take a considered and phased approach to establish credibility and to send appropriate signals to the market. Through such an approach various sources of carbon finance, including voluntary markets, compliance markets and fund-based markets, could be accessed, with the long-term objective of fully linking to the compliance markets. Although UNDP noted that carbon finance could be a funding source for ozone-depleting substance projects related to both accelerated phase-out and ozone-depleting substance bank recovery and destruction, this review of their inputs focuses on bank management projects in line with the scope of decision XX/7.

86. UNDP noted that a central requirement for any successful entry into carbon finance, whatever form was employed (voluntary-, compliance- or fund-based), was the establishment of a robust oversight framework. Key roles for such a framework could include both the assurance of the quality of methodologies and project quality, in addition to the establishment of a registry to track ozone-depleting substance emissions avoided and related credits. This oversight framework would seek to ensure a trusted and reputable standard of ozone-depleting substance credits, with the benefit of increasing the value of such credits to a level where they would act as a significant contributor to the cost of abatement. UNDP suggested that the Montreal Protocol bodies were well suited to playing this role, given their technical understanding of the processes that underlie methodologies and their extensive studies of ozone-depleting substance production, consumption, banks and emissions, knowledge of which would be key in establishing a reliable registry.

87. In terms of accessing sources of carbon finance, UNDP suggested that the current voluntary and compliance markets could be considered. While today's voluntary markets could well prove important for early pilot projects that could provide what might be termed "proof of concept", UNDP raised wider concerns about the ability of the voluntary markets to absorb the potential supply of ozone-depleting substance credits, the lack of an in-built oversight framework and general reputational issues regarding voluntary markets – all of which could contribute to lower prices than might be achievable in a compliance-driven environment.

88. With regard to compliance markets, UNDP noted that ozone-depleting substances were currently ineligible as greenhouse gases under the flexibility mechanisms of the Kyoto Protocol and in particular its Clean Development Mechanism. UNDP expressed the view that it would therefore be challenging for ozone-depleting substance projects to access funding from the Mechanism in the immediate future, but in the long term compliance markets would ultimately be the preferable source of carbon finance. In the near term, it might be possible for such projects to take advantage of pockets of compliance market demand, for instance in United States federal and state-based systems.

89. *Operationalizing this opportunity* In the light of the immediate challenges in the voluntary and compliance markets, UNDP suggested that an alternative interim source of carbon finance could be the establishment of a fund. Such a fund, which with an accompanying oversight framework could potentially be called the ozone-depleting substance carbon facility, could finance early and intermediate ozone-depleting substance destruction projects on a cost-driven basis, similar to normal grant-supported Multilateral Fund activities. Ozone-depleting substance projects under this approach would comply with accredited methodologies and quantify their climate impact through the generation of ozone-depleting substance credits. A fund of this sort could be held by the Montreal Protocol bodies, possibly the Multilateral Fund secretariat, or some other relevant organization, and could be supported voluntarily by Government sponsors or other benefactors seeking to stimulate early action in this area. Ozone-depleting substance credits generated under the ozone-depleting substance carbon facility would be accrued by these sponsors and their participation in the fund could be viewed as either a donation

(with retirement of credits and bragging rights), or as an investment in the future value of ozone-depleting substance credits (either via monetization or in terms of pre-compliance, assuming ozone-depleting substance credits ultimately become eligible for compliance purposes).

90. UNDP emphasized its view that a fund-based ozone-depleting substance carbon facility should always be seen as an interim measure and in the longer-term as a mechanism to be fully linked to the compliance markets, perhaps as part of the third climate change commitment period (i.e., post-2020). Parallels were drawn with the United Nations Collaborative Programme Reducing Emissions from Deforestation and Forest Degradation in Developing Countries, an effort that is supported by the Government of Norway, among others, and is similarly pursuing an interim fund-based mechanism. Both areas share the same rationale: in the near term, there is a risk that both the Collaborative Programme and ozone-depleting substance credits could destabilize and flood existing markets. By establishing a trusted supply of credits in parallel to the compliance markets' second commitment period and by giving clear, advance signals to the markets, however, the international community would be able to adjust its caps appropriately in preparation for a third commitment period and thereby ensure effective linkage with and sufficient demand from the compliance markets.

91. With this long-term objective in mind, UNDP expressed the view that there was no reason why an ozone-depleting substance carbon facility concept could not be extended to cover existing ozone-depleting substance banks in Parties not operating under paragraph 1 of Article 5, although the management of bank projects might be more appropriately undertaken by a body outside of the existing Multilateral Fund structure, which remains focused exclusively on Parties operating under paragraph 1 of Article 5 at present.

92. In summary, while UNDP sees the long-term objective as enabling the equitable treatment of all greenhouse gases within an enlarged compliance market, it views the establishment of an ozone-depleting substance carbon fund within the Montreal Protocol bodies as a short-term measure that could be used to prove the concept and mobilize funds for ozone-depleting substance destruction.

E. United Nations Industrial Development Organization

93. The Parties to the Montreal Protocol are familiar with the outstanding work by UNIDO under the Multilateral Fund and the Global Environment Facility to support Parties' efforts to comply with the Montreal Protocol. As regards ozone-depleting substance destruction, in its discussions with the Ozone Secretariat UNIDO noted that while technologies for the destruction of CFCs and other unwanted ozone-depleting substances were available for use by Parties operating under paragraph 1 of Article 5 a set of technical, economic and policy barriers hindered developing countries from establishing and operating systems for the collection, management and disposal of such substances. Technical barriers stem from a lack of information and knowledge about the best available technologies for the destruction of ozone-depleting substances rather than the absence of the technologies themselves. Policy barriers include the absence of a scheme and regulations to promote and control the management, tracking and disposal of ozone-depleting substance waste and waste products beyond the point of sale. Finally, economic barriers include a lack of grants and financial incentives to push through such projects.

94. In seeking financial incentives outside the scope of the Multilateral Fund, UNIDO is looking at two main streams for generating income revenues to secure co-financing and ensure the sustainability of ozone-depleting substance disposal projects. First, it is working with countries to establish regulations obliging manufacturers to pay fees for the disposal of the ozone-depleting substance-based products at the point of sale of such products. These disposal fees would be collected at an entity within the Government that would be responsible for operating a system for the collection of and disposal of unwanted ozone-depleting substances. UNIDO expected that this would be an excellent income generator for further destruction operations.

95. Second, in the absence of the ability to leverage additional funding for the destruction of ozone-depleting substances through the Clean Development Mechanism, UNIDO is exploring ways to mobilize funds through the use of carbon credits from the voluntary carbon markets. It is currently working with specialists in the field on developing, validating and registering a methodology for obtaining credits for the destruction of ozone-depleting substances. The methodology is based on approved guidelines of the United Nations Framework Convention on Climate Change for such projects. UNIDO notes that the challenge with credits from the voluntary carbon market is that their issuance is a lengthy process subject to a number of different standards such as the voluntary carbon standard, the gold standard and the blue standard. This in turn influences the price per tonne of the credits produced, which ranges between \$5 and \$11. Finally, UNIDO noted that, given the worldwide

economic crisis and the fact that the market for the credits is still in its development phase, the prices of the credits from the voluntary market were relatively low.

F. United Nations Framework Convention on Climate Change Clean Development Mechanism

96. Under the Kyoto Protocol, Annex I (developed) countries have committed themselves to meeting specified greenhouse gas emission limitations. As a supplement to achieving direct emission reductions at home, the Protocol allows developed country Parties to obtain credit toward meeting their commitments by undertaking approved greenhouse gas emission reduction projects in developing countries through the Clean Development Mechanism.

97. As noted above, the Clean Development Mechanism issues certified emission reduction credits for approved emissions reductions projects on the basis of rules that it establishes. Those rules seek to ensure that credit is given only for those projects that clearly demonstrate reductions that are additional to those that would have taken place in the normal course of business. The Mechanism and its expert staff within the Convention secretariat develop methodologies and review project proposals to ensure that projects that are “registered” (i.e., approved) can deliver additional, fully verifiable emissions reductions when measured against an approved baseline. As the present section makes clear, the focus of the Clean Development Mechanism and indeed the Kyoto Protocol on emissions reductions makes it distinctly different and arguably more complex to verify than the system of production and consumption under the Montreal Protocol, and the effort to verify emission reductions can be complex and costly.

98. The Clean Development Mechanism is supervised by an executive board that operates under the guidance of the Conference of the Parties to the Kyoto Protocol. The board declined to engage in discussions with the Ozone Secretariat as it prepared the present report. Consequently, the Ozone Secretariat endeavoured to fulfil the Parties’ request for an examination of Clean Development Mechanism opportunities by conducting a literature search and holding discussions with several Governments and non-governmental organizations familiar with the Mechanism’s operation. This included a discussion with the staff of the secretariat of the United Nations Framework Convention on Climate Change.

99. *Opportunities identified* In general, and as noted above, the discussions held with various entities regarding opportunities under the Clean Development Mechanism strongly suggested that the Kyoto Protocol’s specific focus on global warming gases other than those controlled by the Montreal Protocol would appear to inhibit the ability of entities to obtain certified emissions reductions for actions aimed at the management and destruction of ozone-depleting substance banks. Unless the Parties to the Kyoto Protocol decide otherwise, therefore, the Clean Development Mechanism does not currently appear to be a practical option for funding the destruction of ozone-depleting substance banks.

100. In terms of the opportunities that might be available if the Parties to the Kyoto Protocol were to allow the Mechanism to issue certified emissions reductions for ozone-depleting substance destruction, it is possible to estimate broadly the benefits that would result. Taking into account the fact that certified emissions reductions are issued for each tonne of carbon dioxide equivalent avoided and the fact that, for example, CFC-12 has a global warming potential of 10,720, the destruction of 1 tonne of CFC-12 could generate 10,720 certified emission reduction credits. Assuming that the current value of a certified emission reduction credit is approximately \$10, the destruction of 1 tonne of CFC-12 could generate as much as \$107,200. This compares to a cost of destruction estimated by the Technology and Economic Assessment Panel at approximately \$5/kg or \$5,000 per tonne. If it is assumed (for the sake of example only) that the act of destruction itself constitutes 20 or even 10 per cent of the overall cost of recovery, collection, storage, transport, destruction and supporting activities, it would appear that given the current value of certified emissions reductions using the Mechanism to monetize the climate benefits of CFC destruction, could, if permitted, cover all destruction-related costs and provide a significant financial incentive for destruction. It should be noted, however, that the related benefits would depend on the ozone-depletion potential of the particular ozone-depleting substance being destroyed and that, as a result, the destruction of HCFCs, for example, would have a much smaller income-producing potential.

101. *Practical process for exploiting the use of the Clean Development Mechanism to fund ozone-depleting substance destruction activities:* While only the Parties to the Kyoto Protocol are competent to interpret it, it would seem very likely that the Protocol would have to be changed in some manner to enable the Clean Development Mechanism to issue certified emissions reductions for greenhouse gas reductions achieved through the destruction of banks of ozone-depleting substances. The Parties to the Kyoto Protocol are currently considering changes to the Protocol for the post-2012

era. If it was thought necessary and desirable by the Kyoto Protocol Parties to amend the Kyoto Protocol to facilitate the issuance of Clean Development Mechanism credits for ozone-depleting substance destruction, it is useful to know that the goal of the Kyoto Protocol Parties is to have Protocol changes enter into force by the start of 2012, some two-and-a-half years from now.

102. If, on the other hand, the Parties to the Protocol were to determine that they could expand the coverage of the Clean Development Mechanism to include destruction of ozone-depleting substance banks through a decision of the Parties, it is possible that they could adopt such a decision at their Copenhagen meeting in December 2009, which would in theory facilitate the initiation of the process of considering credit for destruction of ozone-depleting substances as early as 2010. While only the Parties to the Kyoto Protocol can determine what action would in fact be needed to effectuate coverage of ozone-depleting substance destruction by the Clean Development Mechanism, it is worth noting that the modalities and procedures for the operation of the Mechanism were in the past established by a decision of the Parties.

103. In terms of timing, it should also be noted that if the Kyoto Protocol Parties agree to permit ozone-depleting substance destruction to be covered under the Clean Development Mechanism, such an action would not lead to the immediate flow of related funding. That is because the traditional process for making operational the allocation of certified emissions reductions to any new area is a time-consuming one. Specifically, and assuming that the process for obtaining certified emissions reductions for ozone-depleting substance bank-related work would be similar to the process that the Mechanism has used in other sectors, the Mechanism Executive Board would have to approve a related baseline and monitoring methodology before an entity could seek credit for destruction of ozone-depleting substances. An analysis of the time for the development and approval of previous methodologies undertaken by the UNEP Risø Centre on Energy, Climate and Sustainable Development indicates that the process takes on average 293 days. Further, once a methodology was created, proponents of a given project would have to develop and file documentation with the Executive Board seeking to demonstrate additionality (i.e., that the carbon equivalent reductions resulting from its proposed destruction of ozone-depleting substances would not have taken place in the normal course of business and without their projects). The proponents' documentation must also estimate future emissions in the absence of the project and present a plan for achieving verifiable emission reductions validated by a neutral third party, known as a designated operational entity. The Executive Board would then decide whether to register the project. There are several thousand projects in the current queue for project registration and the analysis by the Risø Centre suggests that the historic average review time for projects from validation to registration is 407 days.

104. It has been suggested that innovative mechanisms, such as the establishment of a separate programme of activities or Montreal Protocol Clean Development Mechanism window, could, if agreed, facilitate quicker action in this area. The above analysis, however, suggests that even if the Kyoto Protocol Parties were able to extend the Mechanism's applicability to ozone-depleting substance destruction through an action short of an amendment, application of the normal Mechanism process would mean that it could still be a matter of years before the first projects were registered. In addition, it is very important to note that, even after a project is registered, in most cases little or no funding is provided at that point in time. In general, it is not until after Mechanism projects are implemented and emissions reductions are verified that certified emission reductions are issued. When they are issued, the number is based on the carbon dioxide equivalent level of global warming potential destroyed and the monitored difference between the baseline and actual emissions.

105. In summary, it is generally assumed that the current legal, operational and institutional framework under which the Clean Development Mechanism operates would not permit it to issue certified emissions reductions for ozone-depleting substance destruction. The Parties to the Montreal Protocol could if they wished, however, work individually or collectively to request the Kyoto Protocol Parties to rectify that situation. If certified emissions reductions were to be granted for such activities, the resources generated could be sufficient to fund robust recovery and destruction efforts and related supporting activities. Depending on the nature of any mandate by the Parties to the Kyoto Protocol, however, if the issuance of certified emissions reductions for ozone-depleting substance destruction projects followed the normal Clean Development Mechanism process it would likely be a matter of years before methodologies were developed and initial projects were approved.

G. Voluntary carbon initiatives

1. Carbon credit incentives for ozone-depleting substance destruction: Chicago Climate Exchange

106. Efforts to address climate change have catalysed the creation of a variety of market mechanisms that seek to compensate entities for the reduction or elimination of greenhouse gases. These include voluntary mechanisms to facilitate trading in credits issued for various reasons, including corporate social responsibility, the desire to be environmental friendliness (such as credits enabling flyers to offset their flight emissions) and carbon neutrality, and quasi-voluntary mechanisms requiring some form of compliance. Among the latter group is the effort by the privately-run Chicago Climate Exchange. In general terms, the Exchange is an emissions reduction and trading programme that requires member entities to commit to reducing greenhouse gas emissions by a specified level. Entities may meet their emissions targets by making reductions internally, by purchasing credits or by implementing qualifying greenhouse gas mitigation projects. In either case, emissions credits are traded in the form of carbon financial instruments. To date, the Exchange has over 400 members as diverse as major corporations and major United States cities and municipalities. Together, the member entities have a substantial aggregate emissions baseline of over 600 million metric tons of carbon dioxide equivalent.

107. As noted earlier in the present report, the Kyoto Protocol's trading mechanisms focus solely on greenhouse gases other than those controlled by the Montreal Protocol, and therefore do not currently enable credits to be issued for ozone-depleting substance reduction activities. The Chicago Climate Exchange programme is not so limited. Understanding that the absence of a requirement or incentive for ozone-depleting substance destruction would result in ozone-depleting substance banks eventually leaking and thereby contributing to climate change, the Exchange has published a methodology that enables its members to receive and sell carbon dioxide credits through the capture and destruction of qualifying ozone-depleting substances.

108. *Overview of funding opportunity for ozone-depleting substance destruction:* The Exchange has an active programme that will provide credit for ozone-depleting substance destruction projects undertaken on or after 1 January 2007. Under current rules, qualifying projects can earn offsets for ozone-depleting substances destroyed for the years 2007–2010. Like the Clean Development Mechanism, the Exchange seeks to ensure additionality and to exclude giving credit for those reductions that would have taken place anyway. In this case, the ozone-depleting substance destruction for which credit is being sought must not have been required by law. In addition, to avoid creating a perverse incentive for production, credit is allowed only for chemicals that have been subject to a phase-out. Other conditions are that destruction must take place in the United States and at hazardous waste combustion facilities that meet strict United States air pollution and hazardous waste requirements and that destruction projects must be verified by an approved project verifier who attests that the project data are correct and that destruction takes place in accordance with Exchange rules.

109. *Operationalizing the opportunity:* In short, an Exchange member entity or an "offset aggregator" (such as, for example, an implementing agency, the Multilateral Fund or another approved entity) could facilitate both the collection, transportation and destruction of banked ozone-depleting substances and the transaction needed to obtain carbon financial instruments or Exchange credit. The level of credit would be 75 per cent of the 100-year global warming potential weighted value of the ozone-depleting substances destroyed. That credit could then be sold to an Exchange member that needed the credit to meet its emissions reduction obligation and, through that sale, funding could be generated for, among other things, sponsoring more ozone-depleting substance destruction projects. The value of the credits would be determined by the market rate prevailing at the time of sale. While the current rules require that destruction take place at United States facilities meeting specific environmental requirements, over time, it is possible that facilities in other countries could be certified. In the meantime, this opportunity for compensating for ozone-depleting substance destruction stands ready to be tested in those Parties operating under paragraph 1 of Article 5 that have achieved early production and consumption phase-out. Countries that will not achieve phase-out until 2010 can participate in destruction for credit projects after phase-out.

110. In terms of the opportunities presented to the Parties through the Exchange, it is possible to estimate broadly related benefits. Taking the example cited earlier in the present report, that is, that CFC-12 has a global warming potential of 10,720, that the current value of a carbon financial instrument is approximately \$2.15 and that the Exchange discounts the allocation of carbon financial instruments by 25 per cent, the destruction of 1 tonne of CFC-12 could generate as much as \$17,286. This compares to a cost of destruction estimated in 2005 by the Technology and Economic Assessment Panel of approximately \$5/kg or \$5,000/tonne. Assuming that the act of destruction itself constitutes 20

or even 10 per cent of the overall cost of recovery, collection, storage, transport, destruction and supporting activities, it would appear that, given the current value of carbon financial instruments, using the Exchange to monetize the climate benefits of ozone-depleting substance destruction could facilitate coverage of a portion of the funding needed to cover overall destruction-related activities. Thus it would appear that some co-funding would be needed.

2. Carbon credit for ozone-depleting substance destruction: Voluntary Carbon Standard Association

111. The Voluntary Carbon Standard Association programme was designed to provide a global standard, programme framework and institutional structure for validating and verifying voluntary greenhouse gas emission reductions and removals. By so doing, it aims to provide assurance for investors, buyers and other users that the carbon credits (or “voluntary carbon units” as they are called by the Association) that they are purchasing are real, additional and permanent.

112. Like other credit systems, projects registered under the programme must meet certain core requirements. Under the programme, projects must be real, in that they must be proven to have genuinely taken place. All greenhouse gas emission reductions and removals must be measurable and quantifiable using recognized measurement tools (including adjustments for uncertainty and leakage) against a credible emissions baseline. The reductions must be permanent – such that adequate safeguards must be in place to ensure that there is no risk of reversal and that, should any reversal occur, a mechanism is in place that guarantees the reductions or removals will be replaced or compensated. The emissions reductions must be additional to what would have happened under a business-as-usual scenario if the project had not been carried out. The reductions must be independently verified to a reasonable level of assurance by an accredited verifier with the expertise necessary in both the country and sector in which the project is taking place. They must be unique, i.e., they should only be associated with a single greenhouse gas emission reduction or removal activity, and they must be transparent in that they publicly disclose sufficient and appropriate greenhouse gas related information to allow intended users to make decisions with reasonable confidence. Finally, they must be conservative in that they must use conservative assumptions, values and procedures to ensure that the greenhouse gas emission reductions or removals are not over-estimated.

113. The programme provides the standards and framework for independent validation and verification of greenhouse gas emission reductions and removals based on specific standards established by the International Organization for Standardization. The programme does not develop methodologies, but rather has a double approval process under which methodology developers can develop new methodologies and have them approved by at least two independent validators. The programme is very new, but already, it covers two million tonnes of carbon dioxide equivalents and there are 30 registered projects.

114. *Overview of opportunity:* As at April 2009 the Voluntary Carbon Standard Association was accepting projects related solely to the six Kyoto Protocol gases. It is, however, extending its programme to cover destruction of ozone-depleting substances. In that regard it has drafted an initial set of criteria for the eligibility of ozone-depleting substance destruction projects and has had the general idea tentatively approved by its board. The next steps in its process involve discussions with key outside experts and then putting the eligibility criteria to open consultation. This will involve public web and e-mail distribution of the proposed criteria along with an invitation to comment. On the basis of the comments received the Association will reconsider the proposal. Barring any unforeseen problems, it expects to finalize eligibility criteria and formally include ozone-depleting substance destruction in its programme at its next release, which is likely to be toward the end of 2009.

115. *Operationalizing this option* Once eligibility criteria have been established, the programme will be open to the registration of ozone-depleting substance destruction projects that meet those criteria and use methodologies approved by two independent validators. Credits, known as voluntary carbon units, will be issued after verification that the destruction contemplated in approved projects has taken place. Theoretically, related projects could be developed, registered and implemented by firms, national entities, implementing agencies or even, potentially, the Multilateral Fund.

III. Bilateral consultations with national experts

116. In an effort to extend the range of financial experts consulted, the Secretariat consulted a handful of Parties that have been active in either the field of ozone-depleting substance destruction or the field of funding bilateral ozone-depleting substance reduction projects. Specifically, in response to a

request for consultations, the Secretariat heard back from and was able to hold discussions with Australia, Belgium, Canada, China, the European Commission, India, Italy, Mexico and Sweden. These discussions were generally helpful in providing background and experience on a number of the national efforts that are being undertaken to manage and destroy banks of ozone-depleting substances, and the present report has benefited from that input. In terms of the topic of the present report – possible funding sources and opportunities – the discussions with national experts facilitated an explanation of a number of modalities and opportunities for funding ozone-depleting substance management and destruction. A review of some of those modalities is included below.

A. Use of carbon dioxide allowance auction revenues

117. In the context of the climate regimes that have been agreed within the European Community, European Community countries are allocated allowances amounting to what they are allowed to emit. They are then required to auction off these allowances to emitters at an aggregate level commensurate with or under their expected carbon dioxide obligations. As it relates to the mobilization of funds that may be used to address ozone-depleting substance destruction, the Community's legislative mandate requiring the auctioning of emissions allowances states that at least 50 per cent of the revenue gained through related auctions should be used for the purpose of mitigating climate change. In discussions with the European Commission it was noted that the use of allowance revenue to fund mitigation could include the possibility of using revenues from the member State auctions to fund ozone-depleting substance destruction activities in developing countries. In fact, Germany is currently already using part of its auction revenues to provide financial support for the introduction of full-scale refrigerator recycling in Brazil. As another example for using auction revenues, the Commission has recently proposed to work in the international negotiations on climate change toward the development of a global forest carbon mechanism, i.e., a financial mechanism through which developing countries would be rewarded for emissions reductions achieved by taking action to reduce deforestation and forest degradation. The mechanism would complement existing carbon market mechanisms and avoid creating serious imbalances between supply and demand in present schemes. A European Commission communication on this matter identified that a major portion of European Union funding for such a mechanism could come from proceeds from the auctioning of allowances within the European Union emissions trading system.

118. In terms of operationalizing this opportunity, it is suggested that the Parties, collectively through a decision, through the Secretariat, or individually, might consider raising this issue with countries that are auctioning off their allowances to see if a portion of the funds generated could be used to address destruction ozone-depleting substances or to see if related countries would use some of the funds from the auctions to undertake projects in Parties operating under paragraph 1 of Article 5.

B. Producer responsibility programmes: use of levies on ozone-depleting substance imports to fund ozone-depleting substance destruction

119. During bilateral discussions, some countries drew attention to their use of producer responsibility programmes to deal with the end-of-useful-life disposal of ozone-depleting substances and ozone-depleting substance-based equipment. Under these programmes a levy, or licensing fee, is imposed on the bulk import of ozone-depleting substances and ozone-depleting substance-containing equipment and is set aside to fund the decommissioning of equipment at the end of its useful life and the environmentally sound destruction of related ozone-depleting substances. Such systems can be run as voluntary programmes (as is the case in Canada, where a non-governmental organization manages the imposition and use of a levy on imports of both ozone-depleting substances and ozone-depleting substance-based refrigeration equipment for firms volunteering to participate) or be supported by national legislation or regulations requiring participation (such as the programme in place in Australia, which imposes a levy or licensing fee on bulk imports and imports of pre-charged refrigeration equipment).

120. In terms of operationalizing this opportunity, it is clear that the feasibility of imposing such a levy would have to be considered by each Party in the context of its own laws. An analysis of such approaches undertaken for the Executive Committee and the Parties in 2008 by the firm ICF International suggested that producer responsibility programmes generally work well when there are few producers and importers involved and where there is strong public or government involvement.

C. Including end-of-life disposal fees in the price of new refrigeration equipment

121. Efforts somewhat similar to those discussed above are taking place in some countries that have programmes under which fees are imposed on the sale of ozone-depleting substance-using refrigeration equipment to fund the cost of collection, recovery and disposal of that equipment and ozone-depleting substances contained therein. These fees may either be imposed by the Government or by industry through a voluntary programme. In either case, consumers pay the fee when they purchase the equipment, with the result that the cost of disposal is internalized in the purchase price of the item. Programmes such as this tend to level the playing field for all who participate, while facilitating the sound environmental destruction of ozone-depleting substance wastes. In terms of operationalizing this approach, again, it would have to be considered on a country-by-country basis and in the context of national laws.

D. Leveraging the interest of alternatives producers to fund ozone-depleting substance destruction

122. During bilateral discussions, Italy reported success with halon destruction by combining a mandate for destroying halons with a voluntary programme run by a producer of halon alternatives. The alternatives producer offered to collect and destroy halons held by users that committed themselves to use the alternative. Italy estimates that it was able to recover 80 per cent of its national stock of halons through this programme, all of which it either destroyed or exported. It was noted that the country's effort to destroy ozone-depleting substances other than halons had not been as successful, as it had not been combined with a similar incentive. This reinforces the message of various experts that appropriate incentives are essential to facilitating robust collection and destruction of ozone-depleting substances.

123. Another idea along these lines came from China, which suggested –a fire extinguisher exchange programme under which consumers seeking refills for their empty halon-based extinguishers could exchange them for halon-free extinguishers.

124. Operationalizing these options requires an alternatives producer, Government or outside funding entity willing to pay for the necessary incentive. In concept, individual Parties or the Secretariat could discuss this issue with alternatives producers to determine whether there is any interest in pursuing this option and under what terms.

E. Leveraging the work done under energy efficiency-related refrigerator or air conditioner exchange programmes to recover and destroy ozone-depleting substances

125. As noted above in the context of the Global Environment Facility, some countries are moving forward with GEF- or nationally-run projects to replace older, less-efficient refrigerators and air conditioners with more energy-efficient models, with the goal of reducing energy use and related carbon dioxide emissions. As these programmes involve the delivery of the old equipment to a centralized decommissioning site, they present a very good opportunity to achieve the cost-effective recovery and destruction of ozone-depleting substances.

126. In terms of operationalizing this option, the Multilateral Fund or another funding institution could consider funding ozone-depleting substance recovery add-ons to non-GEF equipment-replacement projects. The destruction carried out under such projects might be eligible for carbon credits in the voluntary market, which could provide a means of repaying the entities funding the add-ons.

IV. Consultations with the Strategic Approach to International Chemicals Management and the Basel, Stockholm and Rotterdam conventions

127. Mindful of the possible linkages between the issue of ozone-depleting substance bank management and the scope of multilateral environmental agreements and initiatives discussed above, other than the Climate Change Convention, the Ozone Secretariat consulted the secretariats of the Strategic Approach and the Basel, Rotterdam and Stockholm conventions. An overview of those consultations is presented below.

A. Strategic Approach to International Chemicals Management

128. Long-standing concerns over the health and environmental harms of chemical exposure led to the adoption of the Strategic Approach to International Chemicals Management by the International Conference of Chemicals Management at its first session, in February 2006. The Strategic Approach is not a legally binding treaty but rather an international policy framework set out in three documents, the Dubai Declaration on International Chemicals Management, the Overarching Policy Strategy and the Global Plan of Action.² Its overall objective is to attain the goal set out in the Johannesburg Plan of Implementation, adopted at the World Summit on Sustainable Development, of achieving the sound management of chemicals throughout their life cycle so that, by 2020, chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment.

129. The Strategic Approach explicitly encompasses the promotion of practices that avoid or minimize the generation of hazardous wastes and policies that require the environmentally sound management of hazardous wastes, including their storage, treatment and disposal. It is also intended, as stated in paragraph 10 of the Overarching Policy Strategy, to “take due account of instruments and processes that have been developed to date and be flexible enough to deal with new ones without duplicating efforts”.

130. To achieve the overall objective of the Strategic Approach the Overarching Policy Strategy sets out subsidiary objectives in five areas: risk reduction; knowledge and information; governance; capacity-building and technical cooperation; and illegal international traffic. The issue of ozone-depleting substance bank management is of relevance to all of these areas.

131. *Funding modalities under the Strategic Approach:* The Strategic Approach calls for existing and new sources of financial support by Governments, the private sector and bilateral, multilateral and global agencies or donors. The Overarching Policy Strategy explicitly invites the Global Environment Facility and the Montreal Protocol and its Multilateral Fund “to consider, within their mandates, whether and how they might support implementation of appropriate and relevant Strategic Approach objectives and to report”.

132. Strategic Approach financial arrangements include the Quick Start Programme, which was established to support initial enabling capacity-building and implementation activities in developing countries, least developed countries, small island developing States and countries with economies in transition. The programme seeks to enhance synergies with processes initiated under relevant chemical and waste multilateral environmental agreements and encourages regional and global approaches. It consists of a time-limited trust fund administered by UNEP, in addition to multilateral, bilateral and other forms of cooperation. Work under the Programme is overseen by an Executive Board and assisted by the Strategic Approach secretariat.

133. Activities supported by the Quick Start Programme should serve national priorities, should be enabling in character and should relate to the following three strategic priorities:

(a) Development or updating of national chemicals profiles and the identification of capacity needs for sound chemicals management;

(b) Development and strengthening of national chemicals management institutions, plans, programmes and activities to implement the Strategic Approach, building upon work conducted to implement international chemicals-related agreements and initiatives;

(c) Undertaking analysis, interagency coordination and public participation activities directed at enabling the implementation of the Strategic Approach by integrating – i.e., mainstreaming – the sound management of chemicals in national strategies, and thereby informing development assistance cooperation priorities.

² The three constituent documents of the Strategic Approach were first issued as annexes I, II and III, respectively, to the report of the first session of the International Conference on Chemicals Management (SAICM/ICCM.1/7), along with resolutions adopted by the International Conference on Chemicals Management. The constituent documents and the resolutions were subsequently reissued in an official publication by the SAICM Secretariat. The publication, *Strategic Approach to International Chemicals Management: SAICM texts and resolutions of the International Conference on Chemicals Management* (ISBN 978-92-807-2751-7), is available on the internet at <http://www.chem.unep.ch/saicm/saicm%20texts/SAICM%20text.htm>.

134. The Quick Start Programme Trust Fund provides seed money to support projects submitted by Governments of developing countries and countries with economies in transition, in addition to civil society networks. Projects can extend over a maximum period of two years and grants are limited to \$50,000 to \$250,000 per project. Approval of a project and dispatch of funding takes place within eight weeks from the project submission date.

135. The Strategic Approach secretariat assists stakeholders in initiating project proposals and further processing. Applications are appraised and approved by the Trust Fund Implementation Committee. To become eligible for support from the Trust Fund, Governments of developing and transition economy countries must have nominated a Strategic Approach focal point. Priority is given to least developed countries and small island developing States. Since 2006, the Trust Fund has received pledges for contributions totalling approximately \$19,313,000. Over six rounds, the Trust Fund Implementation Committee has approved 82 applications with a total value of \$16,019,986 out of 151 eligible proposals. The Trust Fund will be open for contributions until the third session of the International Conference on Chemicals Management in 2012 and will continue disbursements until 2013.

136. *Potential opportunities for funding* The various aspects of ozone-depleting substance bank management appear to relate primarily to the first and second Quick Start Programme strategic priorities listed above. A proposed project aimed at the development of a programme for recovery, collection, transport and storage of ozone-depleting substance banks, for example, might fall under strategic priority (b) if the activity was to be coordinated with relevant work under other multilateral environmental agreements such as the Stockholm and Basel conventions. Preparatory activities for recovery, collection, transport and storage of ozone-depleting substance banks, and possibly persistent organic pollutants and other types of wastes, are indeed initial activities that enable assessment of a country's situation with regard to hazardous chemicals and wastes before further management steps are taken. The relevance of projects on such activities to the various work areas of the Global Plan of Action and the subsidiary objectives of the Strategic Approach (e.g., risk reduction) could possibly be demonstrated.

137. *Operationalizing the potential opportunities:* Developing countries, countries with economies in transition and in particular least developed countries and small island developing States could consider submitting proposals for projects that include ozone-depleting substance bank management to the Strategic Approach secretariat. Interested countries that have not yet appointed Strategic Approach focal points, however, must do so to become eligible for Quick Start Programme funding. As synergistic aspects of projects are noted, proponents may wish to coordinate their proposals with other stakeholders or activities related to other agreements such as the Stockholm and Basel conventions. At any rate, it is important that project proposals clearly demonstrate relevance to at least one of the three Quick Start Programme strategic priorities, and to the objectives set out in the Strategic Approach Overarching Policy Strategy.

B. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

138. The Basel Convention was negotiated to address concerns over the adverse health and environmental effects of unregulated cross-border transport and dumping of hazardous wastes, occurring most often at the expense of developing countries and countries with economies in transition. The Convention was adopted in 1989 and entered into force in 1992. It provides for a conference of the Parties and a secretariat, while implementation is also assisted by 14 regional and coordinating centres. The Convention has 172 Parties.³

139. The Convention regulates transboundary movements of hazardous and other wastes through a prior informed consent procedure, which requires that such movements take place only:

- (a) Upon prior written notification to the competent authorities of the States of export, import and, if appropriate, transit;
- (b) Upon consent from these authorities;
- (c) Under the condition that each shipment is accompanied by a movement document from the point at which transboundary movement begins to the point of disposal.

3 <http://www.basel.int/ratif/convention.htm>.

140. Parties are also required to manage and dispose of hazardous and other wastes in an environmentally sound manner, that is, to minimize the quantities that are moved across borders; treat and dispose of wastes as close as possible to their place of generation; and prevent or minimize the generation of wastes at their source. The import and export of wastes is prohibited where the importing country cannot manage the wastes in an environmentally sound manner.

141. Regarding the movement of wastes between Parties and non-Parties, the Convention provides that “a Party shall not permit hazardous wastes or other wastes to be exported to a non-Party or to be imported from a non-Party”. Parties may, however, enter into bilateral, multilateral, or regional agreements or arrangements with non-Parties provided that such agreements or arrangements provide for the environmentally sound management of hazardous wastes and other wastes required by the Convention. Parties may also conclude bilateral or regional agreements that go beyond the Convention’s provisions. The Secretariat must be notified of any such agreements or arrangements, a collection of which can be found on its website.⁴

142. The Convention also provides that Parties have the right to prohibit the import of hazardous or other waste for disposal. A list of notifications reported by Parties since 2003 can be found on the Secretariat’s website.⁵ In addition, agreements or arrangements concluded between Parties may prohibit the import or export of all or specific wastes.

143. A technical cooperation trust fund was established to assist developing countries and other countries in need of technical assistance in the Convention’s implementation. This donor-driven fund receives voluntary contributions from Parties that are primarily applied to financing projects, capacity-building activities and participation in the meetings of the Parties. Alternative efforts to mobilize resources for the Convention have successfully targeted the Quick Start Programme of the Strategic Approach to International Chemicals Management, and the Global Environment Facility.

1. Relevance of the Basel Convention to the transboundary movement of ozone-depleting substance banks

144. Under the Basel Convention, wastes are defined as “substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law”. Disposal refers to a number of operations including incineration on land; storage pending incineration on land; solvent reclamation and regeneration; and recycling and reclamation of organic substances not used as solvents.

145. The Convention specifies the types of hazardous wastes regulated, and, in short, applies to two groups of hazardous wastes:

(a) Wastes listed in Annex I that have the specific hazardous characteristics contained in Annex III, such as explosive, flammable, oxidizing, poisonous, infectious, corrosive, toxic or ecotoxic (bio-accumulative). Annexes VIII and IX further clarify which wastes are considered to be hazardous under the Convention;

(b) Wastes that are considered to be hazardous wastes by the domestic legislation of the Party of export, import or transit, as notified to the Secretariat.

146. Ozone-depleting substances (halogenated organic compounds) are included in Annexes I and VIII to the Convention.⁶ Bearing in mind that only the Parties to the Convention can interpret it definitively, it would appear, however, that most ozone-depleting substances do not in fact display any of the characteristics listed in the Convention and noted above, as they are not explosive, flammable, oxidizing, infectious, poisonous, corrosive, toxic or ecotoxic. The co-chairs of the Technical and Economic Assessment Panel’s Chemical Technical Options Committee reviewed this important issue and concluded that the only ozone-depleting substance wastes that appeared to have any of the listed characteristics were those involving methyl bromide and carbon tetrachloride, owing to their toxicity.

4 <http://www.basel.int/article11/multi.html>.

5 <http://www.basel.int/natdef/frsetmain.php>.

6 Annex I, code Y 41: Halogenated organic solvents; Annex I, code Y 45: Organohalogen compounds other than substances referred to in Annex I; Annex VIII, code A 3150: Waste halogenated organic solvents; Annex VIII, code A3160: Waste halogenated or unhalogenated non-aqueous distillation residues from organic solvent recovery operations.

147. Any other ozone-depleting substance waste that might be subject to the requirements of the Convention and its prior informed consent procedure would be wastes that fall within the second group of wastes covered by the Convention described above, that is, wastes that have been declared to be hazardous by the domestic legislation of a Party of export, import or transit. The Basel Secretariat maintains on its website a collection of national definitions of “hazardous wastes” and the procedures applicable to them that have been notified by Parties since 2005.⁷ Given the use of various languages, in addition to the technical nature of the submissions, the Ozone Secretariat has been unable to assess all these definitions with confidence. The Basel Secretariat has, however, agreed to ask the Parties that have submitted their national definitions whether they include ozone-depleting substances. Any reply received will be provided in an addendum to the present report. It is also advisable for national ozone officers to liaise with their Basel Convention counterparts to assess their national situations on this important matter.

148. With respect to the Convention’s applicability to banks of recycled and reclaimed ozone-depleting substances, decision III/15 of the Basel Conference of the Parties states that ozone-depleting substances “which are reclaimed and purified to usable purity specifications prescribed by appropriate international and/or national organizations including the International Standards Organization (ISO) do not fall under the scope of the Basel Convention”. Exports and imports of recycled or reclaimed ozone-depleting substances are, therefore, not subject to the requirements of the Basel Convention.

149. In conclusion, it appears that the requirements of the Basel Convention apply only to the transboundary transport of ozone-depleting substance wastes that consist of or include methyl bromide or carbon tetrachloride, and to cases where Parties to the Convention have declared ozone-depleting substance wastes to be hazardous in their domestic legislation. In these cases, potential import, export or transit restrictions on the movements of these wastes, as notified by Parties to the Secretariat, would also need to be taken into account.

2. Opportunities identified and their operationalization

150. The purpose of contacting the Convention Secretariat was twofold: First, to identify funding opportunities as requested by decision XX/7 and, second, to acquire better knowledge of the potential implications of the Convention requirements on the transboundary movement of ozone-depleting substance banks for treatment, reuse or destruction. A note prepared by the Convention Secretariat highlighted relevant aspects of the Convention.

151. With regard to funding opportunities, the Basel Convention Secretariat has expressed strong interest in projects of joint relevance. It has also received positive indications regarding such projects during discussions with donors and developing countries. A possible area of collaboration could involve projects co-funded by the Multilateral Fund and interested Basel Convention donors. In such cases, the Convention’s regional centres might be able to coordinate their activities with the regional networks under the Montreal Protocol. It should be noted, however, that the scope of any projects that might be co-funded by the Basel Convention would likely be limited to the types of ozone-depleting substance wastes discussed above.

C. Stockholm Convention on Persistent Organic Pollutants

152. The Stockholm Convention on Persistent Organic Pollutants is a global treaty to protect human health and the environment from the adverse effects of highly dangerous chemicals that remain intact in the environment for long periods, become widely distributed geographically and accumulate in the fatty tissue of humans and wildlife. Adopted in 2001, it entered into force in 2004 and has 162 Parties.

153. Protection of human health and the environment is pursued through measures to control the production, trade, use, release and storage of persistent organic pollutants. The Convention originally covered 12 substances, including eight pesticides (aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex and toxaphene), two industrial chemicals (polychlorinated biphenyls and hexachlorobenzene, which is also a pesticide), and two unwanted by-products of combustion and industrial processes (dioxins and furans). At the recent fourth meeting of the Conference of the Parties to the Convention the Parties dramatically increased that number by adding nine new chemicals to the Convention.

154. Measures to reduce or eliminate releases from stockpiles of and wastes containing persistent organic pollutants are set out in article 6 of the Convention. In particular, Parties are required to develop

7 <http://www.basel.int/natdef/frsetmain.php>.

and implement strategies for identifying stockpiles and products and articles containing persistent organic pollutants. Once identified, these stockpiles need to be managed in a safe, efficient and environmentally sound manner. In addition, wastes containing persistent organic pollutants are required to be handled, collected, transported and stored in an environmentally sound manner. The toxic content needs to be destroyed or transformed irreversibly. Recovery, recycling, reclamation, direct reuse or alternative uses of persistent organic pollutants are forbidden, as is improper transportation across international boundaries.

155. Article 6 also mandates close cooperation with the Basel Convention to, among other things, identify environmentally sound disposal methods.

156. To fulfil its obligations under the Convention, each Party is required to develop and endeavour to carry out a national implementation plan, which is submitted to the Conference of the Parties and is subject to periodic review and updating, as appropriate. Parties must also report periodically their statistical or estimated data on persistent organic pollutant production, imports and exports, in addition to related information to the extent practicable.

157. The Convention's operation is reviewed by the Conference of the Parties, which meets every two years. Chemicals proposed for addition to the Convention are reviewed by the Persistent Organic Pollutants Review Committee, while a DDT expert group evaluates whether there is a continuing need for the use of DDT for disease vector control.

158. The Convention's effectiveness is periodically evaluated through a global monitoring report prepared by a coordination group. Technical assistance and technology transfer to developing Parties and Parties with economies in transition are promoted through a number of regional and subregional centres operating around the world.

159. Financial assistance to Parties that are developing countries or countries with economies in transition is provided through the Global Environment Facility, which serves as the principle entity entrusted with the operations of the financial mechanism.

1. Opportunities identified

160. Potential funding opportunities identified under the GEF persistent organic pollutants focal area are discussed in chapter II. The following outlines the major points covered in the consultations between the Ozone Secretariat and the Secretariat of the Stockholm Convention.

161. During the consultations representatives of the Stockholm Convention Secretariat expressed their willingness to bring to the fore issues of mutual interest to the two regimes whenever the opportunity arose. They suggested that in dealing with hazardous stockpiles and wastes priority could be given to reducing risks through proper recovery, collection, transport and storage, bearing in mind that the technology for safe storage had reached a very advanced point. As the volumes of persistent organic pollutants and ozone-depleting substances banks in many developing countries and countries with economies in transition are not known, such activities would enable such countries to assess the magnitude of the problem before undertaking further action. In that regard, collaborative initiatives could, for example, include preparation of projects targeting recovery, collection, transport and storage of stockpiles of and wastes containing both persistent organic pollutants and ozone-depleting substances. Financial assistance to carry out such projects could be sought from both the Multilateral Fund and GEF or the Strategic Approach Quick Start Programme. Importantly, such initiatives would necessitate good coordination of relevant actors at the national and, if appropriate, regional levels.

162. Channelling funds to the establishment of new destruction facilities in the developing world for persistent organic pollutants (and synergistically ozone-depleting substances) was cautiously accepted for consideration by the Secretariat as such a development has many advantages and disadvantages to be evaluated. While environmentally sound facilities exist in developed countries with the seeming capacity to dispose of the remaining global amounts of persistent organic pollutant wastes, there are many hurdles in transporting such wastes to these facilities, especially for landlocked countries. It was also suggested that the establishment of a new destruction facility in a developing country to serve the needs of its region had some political dimensions that could arguably hamper implementation, with requirements for ample technical expertise and sustainable production being among many issues to be analysed. It was reiterated that any proposal to introduce destruction facilities in developing countries should undergo rigorous evaluation and assessment to ensure that the best option was implemented.

2. Operationalizing this opportunity

163. Countries that are Parties to the Montreal Protocol and the Stockholm Convention could explore possibilities for synergistic actions to tackle sound management of both ozone-depleting substances and persistent organic pollutants. Projects aimed at reducing risks posed by persistent organic pollutants and ozone-depleting substances could then be prepared through the efficient coordination of relevant actors in the country or region in question. Given the synergistic character of such projects, co-funding by the Multilateral Fund and GEF could be possible, for example in the form of demonstration projects. A quicker (but perhaps more limited) funding option, however, could be through the Strategic Approach Quick Start Programme. In that regard, projects compliant with the Programme's overarching strategy could, for example, seek to develop the capacity to collect and store persistent organic pollutant and ozone-depleting substance banks, exploring various scenarios in doing so and recording lessons learned.

D. Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

164. The Rotterdam Convention is a multilateral treaty that aims to protect human health and the environment from the harmful effects of certain hazardous chemicals, including some pesticides and industrial chemicals. This goal is pursued through facilitating information exchange on chemicals that have been banned or severely restricted by one or more national Governments and on severely hazardous pesticide formulations causing problems under the conditions of use in developing countries or countries with economies in transition. After its adoption in 1998, the Convention entered into force in 2004 and has 128 Parties.

165. The Convention establishes a prior informed consent procedure, which assists Parties to assess the risks associated with the use of chemicals covered by the Convention. The procedure also provides a means for formally obtaining and disseminating the decisions of importing Parties as to whether they wish to receive shipments of the chemicals covered by the Convention and for ensuring compliance with those decisions by exporting Parties. For each chemical covered by the Convention, a "decision guidance document" is circulated to all Parties with a request that they decide whether they will allow future import of the chemical. The Parties' import decisions are published and exporting Parties are obliged to take appropriate measures to ensure that exporters within their jurisdictions comply with them. The administrative functions required to implement the Convention's provisions are performed by national authorities designated by Parties.

166. In addition to the prior informed consent procedure, information exchange is one of the key provisions of the Convention. It provides Parties with opportunities to obtain information on potentially hazardous chemicals and share both information and experience with those facing similar concerns. Exports of chemicals that are banned or severely restricted and subject to the prior informed consent procedure must also be properly labelled and accompanied by basic health and safety information in the form of a safety data sheet. The World Customs Organization has assigned specific customs codes under the Harmonized Commodity Description and Coding System to many of the individual chemicals or groups of chemicals covered by the Convention.

167. The Convention currently covers 40 chemicals, including 25 pesticides, 4 severely hazardous pesticide formulations and 11 industrial chemicals. Many more chemicals are expected to be added in the future. None of these chemicals, however, are ozone-depleting substances. Furthermore, the scope of the Convention does not include wastes.

168. The operation of the Convention is overseen by the Conference of the Parties. The review of chemicals and the preparation of decision guidance documents for the consideration of the Parties are entrusted to the Chemical Review Committee, which comprises government-designated experts in chemicals management. The Committee is responsible for making recommendations and assessing whether additional banned or severely restricted chemicals should be made subject to the prior informed consent procedure. The various functions of the Convention are assisted by a secretariat, the duties of which are performed jointly by FAO and UNEP.

169. Financial resources to assist Parties in their implementation of the Convention are available through a general trust fund, supporting primarily the Secretariat's core activities, and a special voluntary trust fund, providing mainly for technical assistance activities and meetings of the Conference of the Parties. Apart from donor contributions, the Convention relies on collaborative initiatives with other multilateral environmental agreements (e.g., the Stockholm and Basel conventions) on related work areas that fall within the scope of global funds such as the Global Environment Facility and the Quick Start Programme.

1. Opportunities identified

170. During consultations, the Convention secretariat highlighted the importance of enhanced cooperation between the Rotterdam Convention and the Montreal Protocol, in particular in the fields of customs officer training and combating illegal trade. It should be recalled that the Convention's key principles have been successfully applied by the ozone regional networks for South-East Asia and the Pacific and South Asia to combat illegal trade in ozone-depleting substances. In particular, efforts made by these networks, supported bilaterally by Sweden, comprise the exchange of information on trade in ozone-depleting substances and the voluntary adoption of the prior informed consent procedure to control the export of CFCs to countries in those regions.

171. As mentioned above, however, the Rotterdam Convention covers neither ozone-depleting substances nor wastes. Consequently, it is of no direct relevance to the issue of ozone-depleting substance banks. Co-funding opportunities involving Convention donors for activities directly related to ozone-depleting substance banks could therefore not be identified at this stage.

V. Overview of interventions available to reduce emissions from ozone-depleting substance banks

172. As noted earlier, decision XX/7 requested the Ozone Secretariat to consult funding experts and to prepare a report on possible funding opportunities for the management and destruction of ozone-depleting substance banks. The decision stated further that the report should focus on describing possible institutional arrangements, potential financial structures, likely logistical steps and the necessary legal framework for each of the following, if relevant: recovery, collection, storage, transport, destruction and supporting activities.

173. In the course of the Secretariat's discussions with funding experts, it became clear that while the activities listed in the preceding paragraph were important considerations in the development of cost-effective interventions for ozone-depleting substance management and destruction they were often quite separate from the financial modalities that were available to mobilize resources to deal with ozone-depleting substance banks. That is to say, the opportunities for mobilizing funds were one thing and the steps and activities necessary to manage and destroy ozone-depleting substance banks in a cost-effective manner were another. Chapter II of the present report focuses on the financial modalities for mobilizing funding. The present chapter attempts to provide an overview of how the activities listed in the preceding paragraph might fit into ozone-depleting substance management and destruction efforts by reviewing a subset of sectors and the sectoral interventions that might be available to address ozone-depleting substance banks in the refrigeration and foam sectors and in existing stockpiles.

A. Overview of issues related to ozone-depleting substances contained in refrigeration equipment

174. While the Technology and Economic Assessment Panel is preparing a new report on ozone-depleting substance banks, the 2005 special report by the Intergovernmental Panel on Climate Change and the Technology and Economic Assessment Panel cited earlier in the present report suggested that interventions to decrease bank emissions were most likely to be most substantial and cost-effective in the refrigeration sector. Effective interventions in this area would be likely to involve all of the steps identified by the Parties in decision XX/7, namely, recovery, collection, storage, transport, destruction and supporting activities.

175. As it relates to recovery and collection, it is useful to note that, to date, the Multilateral Fund has supported training activities for thousands of refrigerant technicians in most Parties operating under paragraph 1 of Article 5. In the context of this training, which has focused on recovery and recycling and the application of best practices in reducing emissions during refrigeration servicing, many countries have established technician certification programmes. These efforts would underlay any further interventions that would be undertaken in the refrigeration area. In addition, related Multilateral Fund work has resulted in the purchase and distribution of thousands of recovery and recycling units, which would also help to support the initial steps necessary to facilitate recovery, collection and environmentally sound disposal of ozone-depleting substances. While to date there has been no suggestion that the currently distributed fleet of recovery and recycling machines is underused, it cannot be assumed that no further interventions would be needed for this component of any recovery effort. In fact, it is likely that a careful examination of the situation of each country would still be necessary as in

many cases the exact location and current usage of previously distributed recovery and recycling machines is not clear.

176. A great deal of CFC- and HCFC-charged machinery is still operating in the residential and commercial refrigeration and air-conditioning sectors. This includes in home refrigerators, which contain CFCS, and grocery store and other commercial refrigeration equipment and commercial and industrial chillers, which contain HCFCs and (to a much lesser extent) CFCs. Several primary interventions are possible in this sector. First, if it is believed that the equipment will be used for many more years, retrofitting of equipment could be considered. Second, efforts could be made to reduce emissions through reductions in charges and other maintenance activities. Presumably, technicians that have been trained in Multilateral Fund technician training efforts described above are already putting such measures into place, but this does not rule out the potential benefits of updated training that could include an augmented focus on handling HCFCs and HFCs.

177. Third, and perhaps most important from the standpoint of continuing opportunities, it is very useful to consider the benefits action to capture any CFCs or HCFCs remaining in refrigeration equipment being retired at the end of its useful life. Widespread interventions in this area in Parties not operating under paragraph 1 of Article 5 and in some that are operating under that paragraph have tended to focus on the collection of CFC refrigerants from refrigerators at the end of their useful lives. These interventions have been augmented in some Parties by efforts to collect and destroy CFCs contained in the foam in refrigerators. While efforts to recover the foam from such equipment as refrigerators is more complex than recovering CFCs used as a refrigerant it can, in some instances, prove cost-effective. On this point, it is useful to note the extensive experience of European Community member States, where such enhanced treatment is required. In that regard, it is hoped that the Parties will benefit in 2009 from a new report by the European Community to catalogue their experience; this report may be available to the Parties by the time of the Twenty-First Meeting of the Parties, in November 2009.

B. Overview of some sector-specific opportunities in the refrigeration sector

1. Mobile air conditioners

178. The logistics of recovery and recycling CFCs from mobile air-conditioning units has made them a prime target for recovering significant amounts of CFCs. Mobile air-conditioning units contain an appreciable amount of CFCs and they can be readily driven to recovery and recycling facilities, which reduces the cost and burden of recovery and collection. Furthermore, assuming that the CFCs are not highly contaminated, technicians are often able to put recovered and recycled CFCs back into use almost immediately. In spite of these benefits, mobile air-conditioning unit recovery and recycling projects in Parties operating under paragraph 1 of Article 5 have had only moderate success. While the reasons for this vary, they are often linked to the sustainability and difficulty of using the recovery and recycling machines and the relatively low price for CFCs. As a result, there has been relatively little incentive for their collection. While the price of CFCs is rising, the amount of CFCs contained in mobile air-conditioning units has fallen significantly over the years and is likely to decrease even more significantly over the next few years as the existing mobile air-conditioning units containing CFCs and the cars in which they reside, reach the end of their useful lives. Accordingly, the Special Report by the Intergovernmental Panel on Climate Change and the Technology and Economic Assessment Panel estimate of 149,000 tonnes in banks in this subsector is likely to have been reduced significantly by now. If this source of remaining CFC emissions is to be addressed, time is an urgent factor.

179. In terms of activities, given the speed of fleet turnover, retrofits and overall leakage, in addition to the training of technicians that has already taken place, further training programmes aimed at leak detection and maintenance are unlikely to result in additional appreciable reductions OF CFCS. Accordingly, programmes requiring that mobile air conditioning units be evacuated at the end of their useful lives, which have been enacted by law in many countries, may be a useful option to consider. Notable efforts in this area include that of China, which requires end-of-life recycling of all automobile materials, including ozone-depleting substances. As an alternative or supplement to such mandatory programmes incentives can also be provided to scrapyards to facilitate recovery. Such incentives would, however, need to be combined with incentives to spur the transport of CFCs to centralized collection points or with government or private sector collection services. Supporting activities needed to make such programmes a success include the development of legislation and a robust effort to communicate with stakeholders.

180. As is the case with most of the sector-specific interventions reviewed below, the steps following recovery and collection would necessitate transport of ozone-depleting substances to centralized storage facilities that would need to hold them until a sufficient amount of material was gathered to justify the cost of transport to a destruction facility.

181. As this summary suggests, the process leading up to destruction involves a significant amount of transportation, both within a country, and, when it comes to destruction, possibly between countries. In addition to the monetary and carbon dioxide costs associated with transportation, this movement of ozone-depleting substances, which often involves the transfer of CFCs from one containment vessel to another, is likely to result in leakage.

2. Commercial refrigeration equipment

182. While historically there has been a substantial amount of CFC-12 used in commercial refrigeration equipment, over the years a very significant slice of this sector has converted, with many users moving to HCFCs. In any event, and without discussing the advantages and disadvantages of early efforts to recover and destroy HCFCs, it is useful to note that the discussion that follows is generally applicable to both CFCs and HCFCs.

183. A number of factors make recovery of ozone-depleting substances from commercial refrigeration equipment more challenging than is the case for mobile air-conditioning units. First, unlike the mobile air-conditioning sector, where the source of ozone-depleting substances can be transported to recovery facilities, interventions in the commercial refrigeration sector generally depend on recovery equipment being transported to wherever the commercial refrigeration equipment is installed. Second, commercial refrigeration equipment typically has a relatively high level of leakage and, presumably, efforts to train technicians on leak reduction techniques have achieved a good part of the reductions that can be achieved through such interventions. Finally, while commercial refrigeration equipment is likely to be more prevalent in cities, it remains the case that such equipment is likely to vary in size and to be widely dispersed within a country. This fact tends to exacerbate the recovery, collection, and transportation challenges discussed above in respect of the mobile air-conditioning sector. Also present here would be the time factor for capturing CFCs. CFC-based commercial refrigeration units have not been produced for several years and further opportunities to collect appreciable sums of CFCs from such equipment are diminishing quickly. That said the fact that much of the sector has converted to HCFCs means that this subsector will continue to present a long-term opportunity for addressing HCFCs.

3. Household refrigerators

184. The aggregate amount of CFCs contained in both the refrigeration systems and the foam insulation of household refrigerators makes these appliances a significant component of ozone-depleting substance banks. In fact, the Special Report cited above estimated that ozone-depleting substances in appliances such as household refrigerators amounted to more than 425,000 tonnes in 2002. While an appreciable number of newer, alternative-based refrigerators have been deployed since 2002, the long lifetimes of refrigerators, particularly in Parties operating under paragraph 1 of Article 5, means that refrigerators currently in use still contain a very large quantity of CFCs. While this makes refrigerators appear to be a good candidate for action, they present many challenges. These relate primarily to the fact that each individual refrigerator contains a very small amount of CFCs, refrigerators are widely disbursed and the cost of retrofitting or taking evacuation equipment to each refrigerator is nearly prohibitive. Recovery and collection efforts, if done individually, are thus difficult. Efforts to deal with ozone-depleting substances from refrigerators have therefore been most effective when teamed with government requirements that used refrigerators be turned in for proper disposal and programmes such as those dealing with energy efficiency.

185. As already noted, energy efficiency programmes aimed at refrigerators have been proliferating in recent years. The programmes typically require that old refrigerators be retired, which makes recovery and collection of ozone-depleting substances much easier and presents a much more cost-effective model for dealing with the ozone-depleting substances contained in refrigerators' refrigeration systems and foam insulation. Furthermore, the scope of such efforts also reduces the storage time necessary for gathering sufficient ozone-depleting substances to justify transport to final destruction. Such efforts take time and a great deal of supporting activities to initiate, however. Finally, programmes that include the capture and destruction of ozone-depleting substances in foams are more complex and costly, requiring the deployment of additional equipment such as dedicated shredding machines.

C. Stockpiled material

186. Stockpiled ozone-depleting substances generally consist of discrete supplies of such substances that are held either by firms or Governments. They include substances that are collected and held for future use, substances that have been confiscated and substances that are contaminated and considered by their owners to be unsalvageable. Because stockpiled materials have, by definition, already been recovered, collected and, in theory, stored, the steps necessary to deal with them are greatly reduced, as is the cost. In terms of the list of activities outlined by the Parties in decision XX/7, dealing with stockpiles is likely to require only the more limited steps of transport and destruction – making it more likely that this component of ozone-depleting substance banks would be among the most cost-effective to address. Furthermore, as confiscated ozone-depleting substances or ozone-depleting substances held for future use are likely to be virgin material, their export for destruction may not require compliance with any special waste-related legal requirements. That said, one of the most prevalent concerns expressed in this area stems from how to deal with very small stockpiles of already collected contaminated ozone-depleting substances that holders believe are unsalvageable. These stockpiles are likely to be widely disbursed among users in a country and their identification and collection in sufficient amounts to justify destruction is therefore likely to present significant challenges.

D. Ozone-depleting substances contained in foams

187. While the treatment of ozone-depleting substances contained in foams involves the application of newer technologies than those that have been used to tackle ozone-depleting substances in refrigeration equipment, the steps in the process are generally the same as those outlined in decision XX/7, namely, recovery, collection, storage, transport, destruction and supporting activities. That said, in the case of foams the process is more complex because the foam material itself is often less accessible and the ozone-depleting substances it contains are not directly available for capture because they are a component of a mixed media solid. This makes relatively small-scale recovery efforts less efficient. That said, many European countries have experience with recovery of ozone-depleting substances from foams in the context of larger national programmes aimed at the environmentally sound disposal of used refrigerators. In that context, many countries have deployed machinery designed to ensure effective recovery of the ozone-depleting substances from, for example, refrigerator foams. As noted earlier in the present report, the European Community is preparing a study on its experience in the ozone-depleting substance recovery area and the Parties may be able to benefit from this work before the end of 2009.

E. Conclusion

188. While the stocks of CFCs used in the refrigeration sector are diminishing with the retirement of old equipment, significant opportunities still exist for the recovery and destruction of ozone-depleting substances. Furthermore, HCFCs currently used in such equipment will present a long-term opportunity to reduce both ozone and climate effects. It should be noted, however, that the potential use of the carbon markets to fund HCFC efforts would, owing to a reduced global-warming potential, likely result in the generation of much smaller levels of funds than, for example, the destruction of CFCs.

189. Recent efforts to include recovery of ozone-depleting substances within the context of programmes to enhance energy efficiency in refrigeration equipment have enabled more efficient and cost-effective recovery of ozone-depleting substances. Dealing with ozone-depleting substances that are already in discrete stocks obviates the need for recovery and collection and to the degree that the stocks consist of virgin material transportation for destruction is much easier. While a large portion of the long-term bank of ozone-depleting substances is in the foams sector, recovery of ozone-depleting substances in foams is a complex, multi-step process that involves removing the CFCs from the solid matrix of which they form a part. This process requires the proper use of specialized equipment that is likely to be more efficient when used in the context of centralized, large-scale efforts. The European Community is undertaking a study that is expected to provide further information on the experience of several of their member States in recovering and destroying CFCs contained in some foam products.

190. The present chapter has dealt with the refrigeration and foams sector and the stockpile component of ozone-depleting substance banks to provide an overview of the role that recovery, collection, storage, transport, destruction and supporting activities might play in some areas. This is not meant to imply, however, that sectors other than those listed do not provide opportunities for management and destruction. Banks of halons and solvents in particular might be ripe for action.

VI. Destruction-related actions by the Parties to the Montreal Protocol

A. Actions by the Parties on destruction

191. The Parties to the Montreal Protocol have taken a number of actions that relate to ozone-depleting substance destruction. These actions generally fall into the categories of policy actions and technical actions.

B. Policy actions

192. Arguably, the most significant action taken by the Parties as it relates to ozone-depleting substance destruction was the inclusion of destruction in the Montreal Protocol's definition of production. That action enabled Parties to subtract from their level of production the amount destroyed by technologies approved by the Parties. Because consumption under the Protocol is defined as production plus imports minus exports, the inclusion of destruction within the definition of production allows even countries that do not produce ozone-depleting substances to subtract from their consumption the calculated sum of any ozone-depleting substances destroyed using technologies approved by the Parties. In that context, the amount of a particular ozone-depleting substance that is subtracted from production (and consequently consumption) is the amount that is destroyed multiplied by its ozone-depletion potential multiplied by the destruction efficiency of the destruction process used.

193. All other actions taken by the Parties on destruction have been in the form of decisions. In addition to the several decisions requesting the Technology and Economic Assessment Panel to undertake specific analyses, the Parties' policy decisions have often focused on Parties operating under paragraph 1 of Article 5. Most notable are those reviewed in chapter II, namely, the inclusion of destruction (if cost-effective) in the indicative list of incremental costs and the provision in decision IV/11 which called upon the Parties "to facilitate access and transfer of approved destruction technologies in accordance with Article 10 of the Protocol, together with provision for financial support under Article 10 of the Protocol for Parties operating under paragraph 1 of Article 5". Most recently, the Parties took decision XX/7, which, in addition to giving rise to the present report, directed the Executive Committee "to consider as a matter of urgency commencing pilot projects that may cover the collection, transport, storage and destruction of ozone-depleting substances with an initial priority of focusing on assembled stocks of ozone-depleting substances with high net global warming potential, in a representative sample of regionally diverse Parties operating under paragraph 1 of Article 5." The decision said that such projects, in addition to protecting the ozone layer, would "seek to generate practical data and experience on management and financing modalities, achieve climate benefits, and would explore opportunities to leverage co-financing".

C. Technical decisions

194. The Parties have taken a number of technical decisions relating to ozone-depleting substance destruction. Most pertinent are those that list and delineate the coverage of approved destruction technologies (decisions IV/11, V/26, VII/35, XIV/6 and XV/9), that specify good housekeeping procedures for the destruction of ozone-depleting substances (decisions IV/11 and XV/9) and that clarify destruction efficiency issue (decisions IV/11, XV/10 and XVII/17). For ease of reference, the list of technologies approved for ozone-depleting substance destruction can be found in annex I to the present report.

D. Ozone-depleting substance destruction facilities

195. In mid-March 2009, the Secretariat wrote to all Parties requesting information on facilities for the destruction of ozone-depleting substances that existed in their countries. Approximately 30 Parties responded to the Secretariat's request. Given the relative lack of information available from Parties the Secretariat has reviewed publicly available information. The most recent and complete review of ozone-depleting substance destruction facilities from public sources is that found in the ICF International report that was undertaken at the request of the Executive Committee of the Multilateral Fund and produced for the twenty-eighth meeting of the Open-ended Working Group. ICF, noting that the data that it had been able to gather were often incomplete, provided information on commercial destruction facilities in 20 countries that were using Party-approved technologies. A table from the

report, with additions or changes based on the information from Parties received by the Secretariat, is incorporated in table 1 of annex II.

196. In its report ICF stated that known destruction capacities of related units ranged from 40 to 600 metric tonnes per year and faced destruction costs that ranged from \$2 to \$13/kg destroyed. It also noted that there were a number of known facilities capable of destroying polychlorinated biphenyls, which is one of the compounds that is most difficult to destroy. In that regard, ICF suggested that, with modifications, these facilities were capable of destroying ozone-depleting substances to the destruction efficiencies required by the Parties' decisions. The report cited documentation noting that polychlorinated biphenyl destruction facilities currently existed in Brazil, Cameroon, Mexico, Norway and the Republic of Korea. An inventory of worldwide polychlorinated biphenyl destruction capacity published by the Chemicals Branch of the UNEP Division of Technology, Industry and Economics in 2004, however, shows that such facilities exist in many more countries than those mentioned above.

A map illustrating the countries with known destruction facilities for ozone-depleting substance and countries with polychlorinated biphenyl destruction facilities as identified in the above-mentioned reports and in Parties' submissions to the Ozone Secretariat may be found in annex II to the present report. Information on known such facilities operating in the above countries is further presented in table 1 of annex II.

Annex I

Approved destruction processes

	Applicability		
	Concentrated sources		Dilute sources
Technology	Annex A, Gp. I Annex B Annex C, Gp. I	Halon (Annex A, Gp. II)	Foam
<i>Destruction and removal efficiency (DRE)</i>	<i>99.99%</i>	<i>99.99%</i>	<i>95%</i>
Cement kilns	Approved	Not approved	
Liquid injection incineration	Approved	Approved	
Gaseous/fume oxidation	Approved	Approved	
Municipal solid waste incineration			Approved
Reactor cracking	Approved	Not approved	
Rotary kiln incineration	Approved	Approved	Approved
Argon plasma arc	Approved	Approved	
Inductively coupled radio frequency plasma	Approved	Approved	
Microwave plasma	Approved		
Nitrogen plasma arc	Approved		
Gas phase catalytic dehalogenation	Approved		
Superheated steam reactor	Approved		

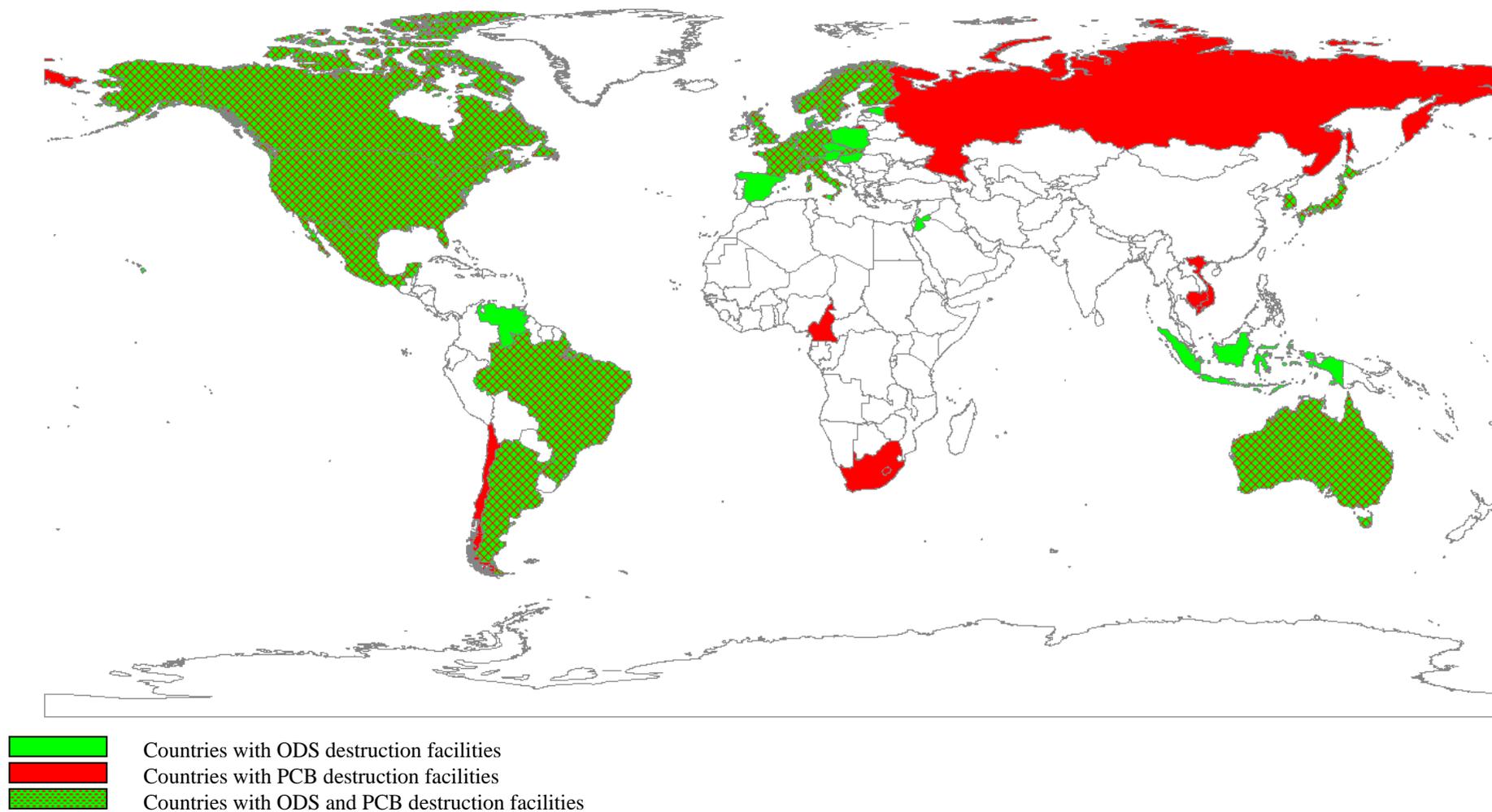
Notes:

1. The DRE criterion presents technology capability on which approval of the technology is based. It does not always reflect the day-to-day performance achieved, which in itself will be controlled by national minimum standards.
2. Concentrated sources refer to virgin, recovered and reclaimed ozone-depleting substances.
3. Dilute sources refer to ozone-depleting substances contained in a matrix of a solid, for example foam.

Annex II

Known destruction facilities for ozone-depleting substances (ODS) and polychlorinated biphenyls (PCBs) worldwide

Figure 1: Countries with destruction facilities for ODS and PCBs



Source: See table 1

Table 1: Known destruction facilities for ODS and PCBs worldwide

Country	Number of known ODS destruction facilities in operation	Number of known PCB destruction facilities	Technologies used in ODS destruction facilities	ODS destruction capacity (except where indicated) (in metric tonnes (MT))	Destruction costs (US\$)
1. Argentina	NA	1	NA	NA	NA
2. Australia	1	1	Argon plasma arc	600 MT/year	\$7/kg
3. Austria	1	-	High temperature incineration	NA	NA
4. Belgium	1	1	Rotary kiln	NA	NA
5. Brazil	NA	NA	Rotary kiln	NA	NA
6. Cambodia	-	1	-	-	-
7. Cameroon	-	NA	-	-	-
8. Canada	1	6	Rotary kiln	45,000MT/year	As of 2007, the average programme cost to dispose of one kilogramme of ozone-depleting refrigerant is C\$11.50 The cost includes collection and destruction, which would also include transport and storage.
9. Chile	-	1	-	-	-
10. Czech Republic	1	-	Rotary kiln	40 MT/year	NA
11. Denmark	3	-	<ul style="list-style-type: none"> ▪ High temperature incineration ▪ Catalytic destruction 	NA	NA
12. Estonia	1	-	NA	NA	NA
13. Finland	1	1	Rotary kiln (4)	545 MT/year	NA
14. France	2	3	High temperature incineration	NA	NA
15. Germany	7	11	<ul style="list-style-type: none"> ▪ Hazardous waste incinerator ▪ Reactor cracking ▪ Thermal splitting ▪ D10 ▪ High temperature incineration 	1,600 MT/year ^b (reactor cracking)	NA
16. Hungary	5	-	<ul style="list-style-type: none"> ▪ Rotary kiln ▪ Liquid injection incineration 	<ul style="list-style-type: none"> ▪ 13 MT/year (liquid injection incineration) ▪ 75 MT/year^a (rotary kiln) 	NA
17. Indonesia	1	-	Cement kiln	60 kg/hour	NA

Country	Number of known ODS destruction facilities in operation	Number of known PCB destruction facilities	Technologies used in ODS destruction facilities	ODS destruction capacity (except where indicated) (in metric tonnes (MT))	Destruction costs (US\$)
18. Italy	12	1	NA	NA	NA
19. Japan	80	2	<ul style="list-style-type: none"> ▪ Cement kilns/lime rotary kilns (7) ▪ Nitrogen plasma arc (8) ▪ Rotary kiln incineration/municipal solid waste incinerators (24) ▪ Liquid injection incineration (7) ▪ Microwave plasma (5) ▪ Inductively coupled radio frequency plasma (1) ▪ Gas-phase catalytic dehalogenation (1) ▪ Superheated steam reactors (25) ▪ Solid-phase alkaline reactor (1) ▪ Electric furnace (1) 	<ul style="list-style-type: none"> ▪ 36 MT/yr (one catalytic facility) ▪ 2,600 MT/year^b (one incinerator) 	Rotary kilns: \$4/kg Superheated steam: \$5/kg Plasma arc: \$9/kg Reactor cracking: \$4–6/kg Gas-phase catalytic dehalogenation: \$5–7/kg
20. Jordan	2	-	Incineration	NA	NA
21. Mexico	2	2	<ul style="list-style-type: none"> ▪ Argon plasma arc technology ▪ Modified cement kiln 	<ul style="list-style-type: none"> ▪ 60kg/hour ▪ 30–50kg/hour 	NA
22. Netherlands	6	3	NA	NA	NA
23. Norway	NA	1	Cement kiln	NA	NA
24. Poland	1	-	NA	NA	NA
25. Republic of Korea	1	-	High temperature pyrolysis technology (1,200~1,400) in a thermal oxidizer.	1,100 tonnes destroyed in 2008, 1900 MT destroyed in 2009 - only destroys byproduct of production	NA
26. Russian Federation	-	3	-	-	-
27. Slovakia	1	1	Two step oxidation/high temperature incineration	NA	NA
28. South Africa	-	1	-	-	-
29. Spain	1	-	NA	NA	NA
30. Sweden	4	1	Air Plasma, among others	100 MT/year (air plasma)	NA
31. Switzerland	> 4	2	Rotary Kiln, among others	<ul style="list-style-type: none"> ▪ 910 MT/year^b (rotary kiln) ▪ > 320 MT/year (others) 	NA

Country	Number of known ODS destruction facilities in operation	Number of known PCB destruction facilities	Technologies used in ODS destruction facilities	ODS destruction capacity (except where indicated) (in metric tonnes (MT))	Destruction costs (US\$)
32. United Kingdom of Great Britain and Northern Ireland	5	1	<ul style="list-style-type: none"> ▪ Chemical treatment ▪ Plasma arc ▪ High temperature incineration 	NA	NA
33. United States of America	< 10	5	<ul style="list-style-type: none"> ▪ Rotary kilns ▪ Plasma arc ▪ Fixed hearth units ▪ Liquid injection units ▪ Cement kilns ▪ Lightweight aggregate kilns 	318 MT/year (plasma arc) 6,188,600 MT/year ^b (US total hazardous waste destruction capacity)	\$2–13/kg
34. Venezuela, Bolivarian Republic of	NA	-	NA	NA	NA
35. Viet Nam	-	1	-	-	-

The ODS destruction facilities listed in the table above are only those known to be operational. It should be noted, however, that several Parties submitted information regarding the presence of incineration facilities that could, with appropriate funding, be upgraded to enable safe, localized ODS destruction.

NA = facility (-ies) known to exist but details are not available.

“-“ = no information available.

^a Number represents approximate ODS destruction capacity based on known overall plant capacity and typical ODS feed rates for rotary kilns.

^b Capacity is not specific to ODS; value shown refers to capacity for all hazardous wastes and/or other types of wastes.

Sources:

- ICF International. 2008. Study on the Collection and Treatment of Unwanted Ozone-Depleting Substances in Article 5 and Non-Article 5 Countries. Available at: http://ozone.unep.org/Meeting_Documents/oewg/28oewg/ICF_Study_on-Unwanted_ODS-E.pdf
- Reports by Montreal Protocol Parties received by the Ozone Secretariat in the first half of 2009.
- UNEP Chemicals. 2004. Inventory of Worldwide PCB Destruction Capacity. Available at http://www.chem.unep.ch/pops/pcb_activities/questionnaire/default.htm