Institute for Governance & Sustainable Development*

FREQUENTLY ASKED QUESTIONS ABOUT DESTROYING ODS BANKS UNDER THE MONTREAL PROTOCOL
(ABBREVIATED VERSION)

INTRODUCTION

Strengthening the Montreal Protocol on Substances that Deplete the Ozone Layer ("Montreal Protocol") to promote the destruction of "banks" of ozone-depleting substances ("ODSs") is critical to preventing dangerous anthropogenic interference with the climate system. Tipping points for abrupt and irreversible climate changes are sitting just beyond the horizon.[1] Urgent action is required. Last year, at the 20th Meeting of the Parties to the Montreal Protocol last year, the Parties initiated efforts to promote the recovery and destruction of ODS banks by adopting Decision XX/7.[2] This year, the Federated States of Micronesia and Mauritius, two island nations facing existential threats from sea-level rise, submitted a joint proposal to amend and strengthen the Montreal Protocol to promote the destruction of ODS banks to capture the climate benefits.[3] If adopted by the Parties, this amendment will deliver desperately needed, fast-action climate mitigation.

QUESTION 1: What are ODS banks?

The term "ODS banks" describes the total amount of ODSs contained in existing equipment, chemical stockpiles, foams, and other products not yet released into the atmosphere.[4] These ODSs also are powerful GHGs.[5] ODS banks accumulate in three primary sectors, refrigeration, air conditioning, and foams, with refrigerators and air conditioners being the most time-sensitive.[6] The Montreal Protocol only controls ODS production and consumption, not emissions.[7] Once placed onto the market, ODSs are no longer subject to control measures under the Montreal Protocol. Over the last several decades, the Montreal Protocol's exclusive focus on production and consumption has led to the accumulation of millions of ozone-depleting potential ("ODP") tonnes and billions of carbon-dioxide equivalent ("CO_2-eq.") tonnes of ODSs in banks.[8]

QUESTION 2: What is the climate impact of existing ODSs banks?

According to IPCC and TEAP, ODS banks will contain approximately 16-17 billion tonnes ("Gt") CO_2-eq. across all sectors worldwide in 2010, consisting of 12 Gt CO_2-eq. of CFCs and 4-5 Gt CO_2-eq. of HCFCs:[9]

- Non-Article 5 Parties (developed countries): TEAP estimates that approximately 72% of CFC banks and 40% of HCFC banks in the refrigeration and air-conditioning sectors will

be emitted over the 2010-2015 period. These lost banks will release CFC emissions of 0.7 Gt CO_2-eq. and HCFC emissions of 0.6 Gt CO_2-eq.[10]

- Article 5 Parties (developing countries): TEAP estimates that over 65% of the CFCs in refrigeration and air-conditioning units will be emitted over the 2010-2015 period.[11] These lost banks will release CFC emissions of 1.7 Gt CO_2-eq.[12] Further, HCFC consumption in Article 5 Parties will rise through 2012, increasing by 11% to approximately 2.36 Gt CO_2-eq. in 2015.[13]

Actions to recover and destroy CFC and HCFC banks in refrigeration and air conditioning—both stationary and mobile—represent the most cost-effective means of protecting the ozone layer and climate system. But this window of opportunity is rapidly closing.

QUESTION 3: What are the climate and ozone benefits of managing ODS banks to destruction?

At present, in non-Article 5 Parties, there are 3.8 Gt CO_2-eq. in ODS banks that can be managed to destruction with low or medium effort – categories differentiating relative efforts to manage ODS banks to destruction. In Article 5 Parties, there is 5 Gt CO_2-eq. The ODS banks that are most cost-effective to manage to destruction are the same banks that will emit the vast majority of their ODSs by 2015.[14] Without destruction, these banks will emit approximately 3 Gt CO_2-eq. by 2015.[15] TEAP also estimates that the cumulative savings of preventing the emission of only those ODSs in refrigeration and air-conditioning banks as of 2008 would accelerate the recovery of the ozone layer by up to two years—saving countless billions of dollars in global health-care costs.[16]

QUESTION 4: Why is immediate action needed to prevent emissions of ODSs from banks?

Immediate action is needed to avoid missed opportunities. The cost-effective climate and ozone benefits available now will be unattainable later. At the present, ODS banks are leaking into the atmosphere and will continue to do so until a comprehensive global program to manage ODS banks to destruction is established. Further, the majority of ODSs in the most cost-effective banks will be emitted by 2015 unless destruction activities begin immediately. This was a key message from the June 2009 TEAP report issued in response to Decision XX/7.[17]

QUESTION 5: How much will it cost to prevent ODS emissions from banks?

It will cost significantly less than other climate-mitigation measures. TEAP identified those sectors requiring a *low effort* to manage ODS banks to destruction for both Article 5 and non-Article 5 Parties, estimating that 2.25 Gt CO_2-eq. would cost US$11.8-15.9 per CO_2-eq. tonne and 2.11 Gt CO_2-eq. would costs US$9-12.4 per CO_2-eq. tonne, respectively.[18] TEAP also identified those sectors requiring a *medium effort* to manage ODS banks to destruction for both Article 5 and non-Article 5 Parties, estimating that 2.76 Gt CO_2-eq. would cost US$15.9-21.0 per CO_2-eq. tonne and 1.67 Gt CO_2-eq. would cost US$27.1-35.6 per CO_2-eq. tonne, respectively.[19]

To put these costs into a climate perspective, under the Kyoto Protocol's Clean Development Mechanism ("CDM"), one CO_2-eq. tonne of avoided GHG emissions in Article 5 Parties sold on the carbon market at an average price of US$22 from 2005-2008.[20] By comparison, ODS-bank destruction in Article 5 Parties costs an average of US$14-18.7 per CO_2-eq. tonne to prevent all 5.01 Gt CO_2-eq. of ODS-bank emissions from low- and medium-effort banks. And ODS-bank destruction in non-Article 5 Parties costs an average of US$13.4-17.9 per CO_2-eq. tonne to prevent all 4.78 Gt CO_2-eq. of ODS-bank emissions from low- and medium-effort banks.

QUESTION 6: Are existing international efforts to address ODS banks adequate to prevent these emissions?

No. Because ODS emissions from banks occur after production and consumption, they are not controlled by the Montreal Protocol. With the exception of the pilot projects approved in Decision XX/7 last year, the Montreal Protocol has thus far not provided financing for ODS bank destruction in Article 5 Parties despite having the authority to do so since 1992.[21] Nor are emissions of these powerful GHGs regulated under the Kyoto Protocol—which does not include ODSs under Annex A listing the GHGs targeted for emission reductions.[22] Therefore, in order to prevent emissions of ODSs in banks, the international community must act swiftly and in a coordinated manner to close this jurisdictional void.

QUESTION 7: Which sources of funding can be mobilized to recover and destroy ODS banks?

In non-Article 5 Parties, it can be financed by providing financial incentives generated from levies and taxes, providing financial incentives to users and other responsible parties to promote the responsible disposal of ODS-containing products and equipment at end-of-life. These incentives should be supported by a legal mandate requiring proper ODS disposal. One proven method of financing these incentives and ODS-bank destruction is to place a levy on virgin or imported ODSs and their replacements.[23] Another method of generating funding for incentives is to place a tax on new ODS-containing equipment, such as new motor vehicles or refrigerators.[24] To date, these levies and taxes have had no discernable economic impact on applicable sectors and have provided sufficient funding such that additional tax-payer funding has not been required.

In non-Article 5 parties, financial assistance from international institutions is likely needed. Traditionally, all of the funding for ODS reductions in Article 5 Parties has come through MLF.[25] Because ODSs in banks harm both ozone layer and climate system, their management to destruction can be financed through climate-dedicated funding or as part of larger sustainable development projects utilizing numerous international sources of funding. Potential sources include, *inter alia*: direct MLF funding; incremental cost or co-financing from climate-mitigation funds, such as GEF or new financial transfer mechanisms under UNFCCC; and co-financing from implementing agencies, such as UNDP and the World Bank.

QUESTION 8: How can the entities established under the Montreal Protocol facilitate the management of ODS banks to destruction?

Entities under the Montreal Protocol—particularly MLF—should have a central role in facilitating the management of ODS banks to destruction. MLF can do this by directly funding ODS-bank destruction using traditional MLF funds and coordinating with international funding and implementing agencies to use alternative sources of funding. MLF and TEAP are the only entities with the requisite expertise, infrastructure, governance institutions, and existing relationships with national ozone offices capable of benefiting from economies of scale to quickly and cost-effectively destroy ODS banks in the near-term.

QUESTION 9: What actions can the Parties to the Montreal Protocol take to promote the recovery and destruction of ODS banks?

In view of the urgency of the climate crisis and the rapidly closing window of opportunity to reap this double dividend on ozone and climate protection, it is essential that the Parties to the Montreal Protocol take aggressive actions now, up to, and beyond the next MOP in November 2009 to manage ODS banks to destruction. These actions include:

- mandating that non-Article 5 Parties manage a certain amount of their cost-effective ODS banks to destruction;
- approving a supplemental replenishment to MLF to finance a comprehensive ODS-bank-destruction program;
- requesting the Ozone Secretariat immediately communicate and coordinate with other MEAs, international funding institutions, and implementing agencies to pursue all available funding to finance the management of ODS banks to destruction; and
- requesting the Parties communicate within their governments and with their respective climate counterparts and representatives at international funding agencies to take all decisions necessary to pursue every opportunity to develop and finance programs to manage ODS banks to destruction.

The near-universal ratification of the Montreal Protocol means the Parties to the Montreal Protocol are represented on the decision-making bodies of every international funding institution and include all the Parties to UNFCCC.[26] The representatives to these institutions and Parties to these MEAs can require the necessary coordination by reaching a decision at a sufficiently high level of government to give specific instructions to representatives to seize this singular climate-mitigation opportunity. International treaties are ultimately beholden to their signatories. If the Parties wish to pursue the destruction of ODS banks and to reap the ozone and climate benefits of managing ODS banks to destruction, nothing in any treaty represents an insurmountable obstacle.

[*] IGSD (www.igsd.org) welcomes any questions, comments, or insights readers may have regarding this document. Please send all correspondence to Pete M. Grabiel (pgrabiel@igsd.org) or Tim R. Grabiel (tgrabiel@igsd.org).

[1] Tipping points are thresholds for non-linear climatic changes, where small increases in global warming produce irreversible and potentially catastrophic climate impacts, often exacerbating the climate crisis. Climate scientists warn that anthropogenic GHG emissions are pushing the climate system toward such tipping points, with some tipping points as close as 10 years away. Potentially catastrophic impacts and runaway feedbacks include the disappearance of Arctic summer sea ice, disintegration of the Greenland Ice Sheet, collapse of the West Antarctic Ice Sheet, deglaciation of the Himalayan-Tibetan plateau, shutdown of the Atlantic Thermohaline Circulation, dieback of Amazonian and boreal forests, and the release of methane stored in permafrost and ocean hydrates. *See e.g.* Timothy Lenton, et al., *Tipping elements in the Earth's climate system*, 105 PROC. OF THE NAT'L ACAD. OF SCI. 1786 (2008); V. Ramanathan & Y. Feng, *On avoiding dangerous anthropogenic interference with the climate system: Formidable challenges ahead*, 105 PROC. OF THE NAT'L ACAD. OF SCI. 14245 (2008).

[2] *See* Montreal Protocol, Report of the Eighth Meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer and Twentieth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, Doha, Qatar [hereinafter Report of the 20th MOP], at Decision XX/7.

[3] *See* Proposed Amendment to the Montreal Protocol (submitted by the Federated States of Micronesia and Mauritius), (30 April 2009) [hereinafter ODS Banks Amendment], http://ozone.unep.org/Meeting_Documents/oewg/29oewg/OEWG-29-8E.pdf.

[4] *See* IPCC & TEAP, IPCC/TEAP SPECIAL REPORT ON SAFEGUARDING THE OZONE LAYER AND THE GLOBAL CLIMATE SYSTEM: ISSUES RELATED TO HYDROFLUOROCARBONS AND PERFLUOROCARBONS (2005) [hereinafter IPCC/TEAP 2005 SPECIAL REPORT] at *Summary for Policymakers* at 9.

[5] *See id.* at 8.

[6] *See* TEAP, TASK FORCE DECISION XX/7 – INTERIM REPORT, "ENVIRONMENTALLY SOUNDS MANAGEMENT OF BANKS OF OZONE-DEPLETING SUBSTANCES," (June 2009) [hereinafter TEAP DECISION XX/7 INTERIM REPORT], at 7.

[7] *See generally* Montreal Protocol on Substances That Deplete the Ozone Layer, *opened for signature* Sept. 16, 1987, 26 I.L.M. 1550 (1989) (as amended 32 I.L.M. 84) (1992) [hereinafter Montreal Protocol]; *see also* Montreal Protocol, Report of the Thirteenth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, (2004), at Decision XV/9 ("To recall that the Montreal Protocol does not require the Parties to destroy ozone depleting substances.")

[8] For purposes of this discussion, we will mirror TEAP's assessment of ODS banks and limit our discussion to "reachable" banks, i.e., banks that have yet to be emitted or reach the waste stream. *See supra* note 6, TEAP DECISION XX/7 INTERIM REPORT at 7-9. Once an ODS bank reaches the waste stream it is very difficult to locate and often prohibitively expensive to recover, hence the urgency in addressing ODS banks in advance of their expected entry into the waste stream.

[9] *See supra* note 4, IPCC/TEAP 2005 SPECIAL REPORT at *Summary for Policymakers* at 9 (giving an estimates of CFC and HCFC banks from 2002 – 2015); *see also* TEAP, TASK FORCE DECISION XX/8 REPORT, ASSESSMENT OF ALTERNATIVES TO HCFCS AND HFCS AND UPDATE OF THE 2005 TEAP SUPPLEMENTAL REPORT DATA (May 2009) [hereinafter TEAP DECISION XX/8 REPORT] at 10 (giving estimates of HCFC banks from 2002-2020); *supra* note 6, TEAP DECISION XX/7 INTERIM REPORT at 21-25 (indicating that previous CFC refrigeration bank estimates may have underestimated the bank by 10%). Based on these estimates, 2010 banks have been approximated.

[10] *Compare supra* note 6, TEAP DECISION XX/7 INTERIM REPORT at 22-23 *with* TEAP, RESPONSE TO DECISION XVIII/12, REPORT OF THE TASK FORCE ON HCFC ISSUES (WITH PARTICULAR FOCUS ON THE IMPACT OF THE CLEAN DEVELOPMENT MECHANISM) AND EMISSIONS REDUCTIONS BENEFITS ARISING FROM EARLIER HCFC PHASE-OUT AND OTHER PRACTICAL MEASURES (2007) [hereinafter TEAP RESPONSE] at 27. Estimates of CO_2-eq. have been calculated based on the GWP of CFC-12 (10,900) and HCFC-22 (1,810), the most common refrigerants found in refrigeration, SAC, and MAC banks. *See* P. FORSTER & V. RAMASWAMY ET AL., IPCC, *Changes in Atmospheric Constituents and Radiative Forcing*, *in* CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS, CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE [hereinafter AR4 THE PHYSICAL SCIENCE BASIS] 212 (S. Solomon et al. eds., 2007) (setting forth the GWP of CFC-12 and HCFC-22); *supra* note 4, IPCC/TEAP 2005 SPECIAL REPORT at *Technical Summary* at 53-63 (listing the most common ODSs by sector).

[11] *Compare supra* note 6, TEAP DECISION XX/7 INTERIM REPORT at 22-23 *with supra* note 10, TEAP RESPONSE at 27.

[12] *Id.*

[13] *Compare supra* note 6, TEAP DECISION XX/7 INTERIM REPORT at 23 *with supra* note 10, TEAP RESPONSE at 27.
[14] *See supra* note 10, TEAP RESPONSE at 27; EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR IMPLEMENTATION OF THE MONTREAL PROTOCOL, REPORT OF THE MEETING OF THE EXPERTS TO ASSESS THE EXTENT OF CURRENT AND FUTURE REQUIREMENTS FOR THE COLLECTION AND DISPOSITION OF NON-REUSABLE AND UNWANTED ODS IN ARTICLE 5 COUNTRIES (FOLLOW UP TO DECISION 47/52) (2006) [hereinafter MLF FOLLOW UP REPORT] at 13; ICF INTERNATIONAL, STUDY ON THE COLLECTION AND TREATMENT OF UNWANTED OZONE-DEPLETING SUBSTANCES IN A5 AND NON-A5 COUNTRIES (2008) [hereinafter MLF 2008 REPORT] at 11-12.
[15] *See supra* notes 10 -13. This total does not account for HCFC emissions from banks in Article 5 Parties which are difficult to estimate based on TEAP figures because these banks will grow over the period from 2010 to 2015 period, but will nonetheless emit HCFCs during this time. Readily available stockpiles of ODS banks also exist in nearly all countries. *See supra* note 14, MLF 2008 REPORT at 11-12.
[16] *See supra* note 10, TEAP RESPONSE at 12.
[17] *See supra* note 6, TEAP DECISION XX/7 INTERIM REPORT at 16 ("For the purposes of this report, one of the key messages in managing the remaining ODS banks is that refrigerant banks will decline through emission much more rapidly than blowing agent banks in foam. Therefore actions on refrigerant banks and emissions are generally seen as having higher urgency. The one exception for the foam sector is the use of foams in refrigeration equipment, where life cycles are generally much shorter than in buildings.").
[18] *See supra* note 6, TEAP DECISION XX/7 INTERIM REPORT at 44.
[19] *See supra* note 6, TEAP DECISION XX/7 INTERIM REPORT at 44.
[20] *See* Carbon Finance, *Cost-effectiveness of CDM Projects*, Nov. 18, 2008, http://www.carbon-financeonline.com/index.cfm?section=cdmjianalysis&action=view&id=11663 (stating that the average price per CER from 2005-2008 was €16 or US$22 based on the exchange rate as of June 22, 2009).
[21] In the 1990 amendment to the Montreal Protocol, the Parties created MLF and agreed upon an indicative list of incremental costs that included the "[c]ost of collection, management, recycling, and, if cost effective, destruction of ozone-depleting substances." *See* Ozone Secretariat, HANDBOOK FOR THE MONTREAL PROTOCOL ON SUBSTANCES THAT DEPLETE THE OZONE LAYER (7th ed.) (2006) [hereinafter MP HANDBOOK] at 425 (containing the indicative list of incremental cost and listing destruction under paragraph (c)(ii)). In 1992, the Parties decided to facilitate access and transfer of approved destruction technologies in accordance with Article 10 of the Protocol, together with a provision for financial support under Article 10 of the Protocol for Article 5 Parties. *See* Montreal Protocol, Report of the Fourth Meeting of the Parties to the Montreal Protocol, (1992), at Decision IV/11.
[22] *See* Kyoto Protocol to the United Nations Framework Convention on Climate Change, *opened for signature* March 16, 1998, U.N. Doc FCCC/CP/1997/7/Add.1, 37 I.L.M. 22 (1998) [hereinafter Kyoto Protocol]at Art. 3 & Annex A.
[23] For example, Australia has implemented a producer responsibility program for bulk ODS disposal of refrigeration and SAC banks, Refrigerant Reclaim Australia ("RRA"), backed by a legal mandate. RRA has been immensely successful and financially self-sufficient. Run by industry and funded by levies placed on the production and import of virgin and reclaimed ODSs, RRA provides a rebate on the return of used refrigerant. The levies and rebates apply to all fluorocarbons, including HFCs, ensuring RRA remains capable of handling all refrigerants as industry moves from using CFCs to HCFCs to HFCs and other alternatives. However, Australia's program does not mandate the collection of foams in these applications which would increase the resulting ozone and climate benefits using existing governance institutions and infrastructure. *See* Refrigerant Reclaim Australia, http://www.refrigerantreclaim.com.au/ (last accessed Feb. 3, 2009); *see also supra* note 14, MLF 2008 REPORT at 61-76.
[24] Japan has mandated the recovery and destruction of ODS banks in several sectors. In addition to laws mandating the recovery and destruction of ODSs in commercial refrigeration and SAC banks, in 2005 Japan also passed the End-of-Life Vehicle Recycling Law mandating the recovery and destruction of ODSs in MAC banks in vehicles. In response, industry has implemented a recycling program under which end-of-life vehicles are sent to registered recovery operators, who recover ODSs and are paid based on the number of MACs and quantity of refrigerant recovered. The costs of recovery and destruction are borne by vehicle owners at the time of purchase, i.e., incorporated into the cost of purchasing new vehicles. *See supra* note 14, MLF 2008 REPORT at 106-20. Like RRA, this program has also been immensely successful and cost-effective.
[25] "Article 5 Parties" are Parties operating under paragraph 1 of Article 5 of the Montreal Protocol and are generally considered "developing countries." *See supra* note 7, Montreal Protocol at Art. 5(1). These Parties receive financial and technical assistance from non-Article 5 countries via MLF to meet their compliance obligations under the Montreal Protocol. *See id.* at Art. 10.

[26] The overlap of the Parties that have signed and ratified both the Montreal Protocol and the Kyoto Protocol is almost total. Afghanistan, Chad, the Holy See, Turkey, the United States, and Zimbabwe are the only Parties to the Montreal Protocol that have not ratified the Kyoto Protocol.