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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Seventy-eighth Meeting
Montreal, 4-7 April 2017

ANNOTATED PROVISIONAL AGENDA

1. Noting that the 78th meeting of the Executive Committee is a special meeting that was convened by the Executive Committee to address matters related to the Kigali Amendment arising from decision XXVIII/2, and potential additional contributions to the Multilateral Fund, the agenda of the special meeting is completely different from the agenda of a regular meeting of the Executive Committee.
2. For the benefit of members of the Executive Committee, the Annotated provisional agenda briefly explains the background which led to the development of the agenda and provides an indicative summary of the documents prepared by the Secretariat for each agenda item.

Background

3. In the context of agenda item 10 of the 77th meeting, the Executive Committee discussed a note from the Secretariat on issues relevant to the Executive Committee arising from the Twenty-eighth Meeting of the Parties to the Montreal Protocol¹, which aimed to seek guidance from the Executive Committee on a way forward to address decision XXVIII/2 on the Kigali Amendment on phasing down HFCs. Through decision XXVIII/2 the Parties requested the Executive Committee, *inter alia*, to develop, within two years of the adoption of the Kigali Amendment, guidelines for financing the phase-down of HFC consumption and production in Article 5 Parties and to present those guidelines to the Meeting of the Parties for the Parties' views and inputs before their finalization by the Executive Committee. An extract of the Report of the 77th meeting regarding agenda item 10² which summarizes the discussion by members of the Executive Committee at the 77th meeting is contained in Annex I to the present document.
4. During the discussion, there was general acknowledgement of the historic importance of the adoption of the Kigali Amendment and of the challenges facing the Executive Committee in formulating a timely and appropriate response to decision XXVIII/2. Several members said that it was necessary to strike a balance between the need for prompt and decisive action, and the need to move forward in a thoughtful, judicious and well-informed manner. The process should be iterative, and the Executive Committee should be consulted at each step. There was consensus that the Committee needed to adopt a

¹ UNEP/OzL.Pro/ExCom/77/70/Rev.1.

² Paragraphs 205-213 of document UNEP/OzL.Pro/ExCom/77/76.

structured, strategic approach, applying appropriate guidelines and parameters, before defining specific actions and activities.

5. There was consensus that a special meeting of the Executive Committee should be held early in 2017, to discuss matters related to the Kigali Amendment, and how to deal with potential additional contributions from a group of donor countries³. Some members said that it would be useful for the Executive Committee to request the Secretariat to prepare relevant strategic documents to guide discussions at that meeting.

6. Several members said that an immediate priority for the Executive Committee was to decide whether to accept and how to deal with the additional voluntary contributions from a group of donor countries intended to finance activities for implementation of the HFC phase-down. Initially, the focus should be on fast-start support for implementation, including enabling activities in Article 5 countries, in order to gather early momentum. Priority areas identified included energy efficiency and the refrigeration and air-conditioning sector.

7. The Executive Committee agreed to establish a contact group to discuss how the Committee should move forward in dealing with matters related to the Kigali Amendment and decision XXVIII/2, as well as with the potential additional contributions from donor countries.

8. Following the report of the convenor of the contact group, the Executive Committee decided (decision 77/59):

- (a) To hold a four-day special meeting early in 2017 to address matters related to the Kigali Amendment to the Montreal Protocol arising from decision XXVIII/2 of the Meeting of the Parties, and potential additional contributions to the Multilateral Fund;
- (b) To request the Secretariat to prepare a document containing preliminary information in response to the elements in decision XXVIII/2 of the Twenty-Eighth Meeting of the Parties that requested the Executive Committee to take action, and addressing the following issues:
 - (i) Available information on HFC consumption and production, as well as on HFC-23 by-product, including from surveys of ODS alternatives funded by the Multilateral Fund and other sources;
 - (ii) The enabling activities required to assist Article 5 countries in commencing their reporting and regulatory activities in relation to the HFC-control measures;
 - (iii) Key aspects related to HFC-23 by-product-control technologies;
 - (iv) Identification of the issues that the Executive Committee might want to consider in relation to existing HCFC phase-out activities;
 - (v) Information relevant to the development of the cost guidelines requested from the Executive Committee;

³ Prior to the Twenty-eighth Meeting of the Parties, a press release issued by the White House of the United States of America on 22 September 2016 (<https://obamawhitehouse.archives.gov/the-press-office/2016/09/22/leaders-100-countries-call-ambitious-amendment-montreal-protocol-phase>) announced the intent of 16 donor countries (i.e., non-Article 5 Parties) to provide US \$27 million in 2017 to assist Article 5 countries through fast-start support for implementation if an ambitious HFC amendment with a sufficient early freeze date was adopted in 2016. This contribution would be one-time, and would not replace donor contributions going forward.

- (c) To invite Executive Committee members of the 77th meeting to share relevant information with the Secretariat on, but not limited to, the elements listed in sub-paragraphs (b)(i) to (v) above, no later than 31 January 2017 on an exceptional basis owing to the limited time until the end of 2016;
- (d) With respect to the intended US \$27 million fast-start contributions in 2017 from some of the non-Article 5 Parties:
 - (i) To accept, with appreciation, the additional contributions announced by a number of non-Article 5 Parties to provide fast-start support for implementation of the Kigali Amendment, noting that such funding was one-time in nature and would not displace donor contributions;
 - (ii) That the additional contributions mentioned in sub-paragraph (d)(i) above should be made available for Article 5 countries that had an HFC consumption baseline year between 2020 and 2022 and that had formally indicated their intent to ratify the Kigali Amendment and take on early HFC phase-down obligations in order to support their enabling activities, such as capacity building and training in handling HFC alternatives, Article 4B licensing, reporting, and project preparation activities, taking into account, but not restricted to, relevant guidelines and decisions of the Executive Committee;
 - (iii) To request the Secretariat to develop a document describing possible procedures for countries identified in sub-paragraph (d)(ii) above in accessing the additional fast-start contributions for enabling activities;
 - (iv) That the Treasurer would communicate with contributing non-Article 5 countries on procedures for making the additional contributions available to the Multilateral Fund for the purpose of early action in respect of the Kigali Amendment;
 - (v) That the Secretariat would report to the Executive Committee on the additional fast-start contributions received separately from the pledged contributions to the Multilateral Fund; and
- (e) To request the Secretariat to prepare an agenda for the special meeting referred to in sub-paragraph (a) above based on the issues identified in sub-paragraphs (b) to (d) above.

Preparation of the agenda and supporting documents

9. The Secretariat considered all the individual paragraphs of decision XXVIII/2⁴ in the light of decision 77/59 and developed a draft provisional agenda. In accordance with rule 8 of the Rules of procedure for Meetings of the Executive Committee of the Multilateral Fund, the draft Provisional agenda was sent to the Chair and the Vice-Chair and following their agreement the Provisional agenda was issued as document UNEP/OzL.Pro/ExCom/78/1.

10. The Provisional agenda for the 78th meeting includes the following substantive agenda items and corresponding documents:

⁴ UNEP/OzL.Pro.28/12.

- (a) Agenda item 3 on Secretariat activities presents the report on activities carried out by the Secretariat since the 77th meeting to address decision 77/59, namely, matters related to the Kigali Amendment arising from decision XXVIII/2, and potential additional contributions to the Multilateral Fund;
- (b) Agenda item 4 on the Status of additional contributions to the Multilateral Fund, was included pursuant to decision 77/59(d)(v) which requested the Secretariat to report on the additional fast-start contributions received separately from the pledged contributions. This report will be presented by the Treasurer of the Multilateral Fund;
- (c) Agenda item 5 on Available information on HFC consumption and production in Article 5 countries, was included pursuant to decision 77/59(b)(i) in order to present a report on the available information on HFCs from sources including, *inter alia*, the reports prepared by the TEAP Task Forces under decisions XXV/5 and XXVI/9, and the surveys of ODS alternatives funded by the Multilateral Fund and other sources;
- (d) Agenda item 6(a) on Information relevant to the development of the cost guidelines for the phase-down of HFCs in Article 5 countries was included pursuant to decision 77/59(b) and decision XXVIII/2. The document presents preliminary information and relevant policies, guidelines, and decisions of the Executive Committee and the Parties, as well as information received from members of the Executive Committee of the 77th meeting in response to decision 77/59(c). After giving due consideration to the amount of information to be presented, it was decided to organize this agenda item as three sub-items, namely (i) Draft criteria for funding; (ii) Enabling activities, and (iii) Institutional strengthening, and to provide a separate document for each sub-item;
- (e) Agenda item 6(b) on Identification of issues to be considered in relation to existing HCFC phase-out activities, was included pursuant to 77/59(b)(iv) and presents an overview of key issues that have been identified during the phase-out of HCFCs through the approval and implementation of HCFC phase-out management plans, in particular, in relation to the introduction of low-global warming potential (GWP) technologies;
- (f) Agenda item 6(c) on Key aspects related to HFC-23 by-product control technologies, is prepared pursuant to decision 77/59(b)(iii) for the consideration of the current status of HFC-23 emissions and potential means to reduce such emissions of HFC-23 by process optimization, destruction, collection for use, or converting it to other environmentally safe chemicals; and
- (g) Agenda item 7 on Procedures for Article 5 countries that have HFC consumption baseline years from 2020 to 2022 in accessing additional contributions for enabling activities, is prepared pursuant to decision 77/59(d) and presents possible procedures for those Article 5 countries that have formally indicated their intent to ratify the Kigali Amendment and take on early HFC phase-down obligations to access the additional fast-start contributions for enabling activities.

11. In response to decision 77/59(c), the Governments of Argentina, Germany, Japan and the United States of America shared relevant information with the Secretariat. The full text of the information provided by those Governments is contained in Annex II to the present document.

12. Documents for the 78th meeting were prepared following a thorough review of the policies, guidelines and decisions of the Multilateral Fund, consideration of the information provided by Executive Committee members in accordance with decision 77/59(c), and an exchange of views regarding

implementation of the Kigali Amendment amongst the Secretariat, and bilateral and implementing agencies at the Inter-agency Coordination meeting (IACM) in February 2017⁵. At the IACM, the Ozone Secretariat, on the invitation of the Chief Officer, made a presentation on the Kigali Amendment and relevant decisions of the Twenty-eighth Meeting of the Parties.⁶

13. In line of decision 77/59(b), the document for each agenda/sub-agenda item prepared by the Secretariat contain preliminary information only and no analysis. All information relevant to the HFC phase-down is included and thus in some cases the individual documents are lengthy. In each document the sources of information are referenced.

⁵ Executive Committee members will find the Report of the Inter-agency coordination meeting (MLF/IACM.2017/1/19) on the in-session website of the 78th meeting.

⁶ Decisions XXVIII/2 related to the amendment phasing down hydrofluorocarbons, XXVIII/3 on energy efficiency, XXVIII/4 on establishment of regular consultations on safety standards, and XXVI/8: on measures to facilitate the monitoring of trade in hydrochlorofluorocarbons and substituting substances.

Annotated Provisional Agenda

1. Opening of the meeting

Opening remarks by the Chairperson of the Executive Committee.

2. Organizational matters:

(a) Adoption of the agenda

Document UNEP/OzL.Pro/ExCom/78/1 contains the provisional agenda for the 78th meeting of the Executive Committee.

The Executive Committee may wish to adopt the agenda of the meeting on the basis of the provisional agenda contained in document UNEP/OzL.Pro/ExCom/78/1 and, if necessary, as amended verbally at the plenary.

(b) Organization of work

The Chairperson will propose to the plenary the organization of work.

3. Secretariat activities

Document UNEP/OzL.Pro/ExCom/78/2 presents a report on the activities of the Secretariat since the 77th meeting to address decision 77/59 on matters related to the Kigali Amendment arising from decision XXVIII/2, and potential additional contributions to the Multilateral Fund.

The Executive Committee may wish to note the Secretariat activities contained in document UNEP/OzL.Pro/ExCom/78/2.

4. Status of additional contributions to the Multilateral Fund

Document UNEP/OzL.Pro/ExCom/78/3 presents a report, prepared pursuant to decision 77/59(d)(v), on the additional fast start contributions.

The Executive Committee may wish to note document UNEP/OzL.Pro/ExCom/78/3 on Status of additional contributions to the Multilateral Fund.

5. Available information on HFC consumption and production in Article 5 countries

Document UNEP/OzL.Pro/ExCom/78/4 was prepared pursuant to decision 77/59(b)(i) and presents an analysis of HFC consumption and production in Article 5 countries based on TEAP Task Force reports (section I) and preliminary information on HFC consumption from the ODS alternatives survey reports that have been submitted by implementing agencies, as at 27 February 2017 (section II). Some information on HFC-23 by-product is also included.

The Executive Committee may wish to note document UNEP/OzL.Pro/ExCom/78/4 on Available information on HFC consumption and production in Article 5 countries.

6. Elements for consideration of the Executive Committee related to the Kigali Amendment to the Montreal Protocol arising from decision XXVIII/2 of the Meeting of the Parties

(a) Information relevant to the development of the cost guidelines for the phase-down of HFCs in Article 5 countries

(i) Draft criteria for funding

Document UNEP/OzL.Pro/ExCom/78/5 presents information relevant to the development of criteria for funding the phase-down of HFCs. The proposed elements of the cost guidelines to be developed for the phase-down of HFCs are presented following the elements of the funding criteria for HCFCs. Each proposed element is presented with the relevant paragraphs or sub-paragraphs of decision XXVIII/2, the relevant information from Executive Committee members in accordance with decision 77/59(c), and the previous Executive Committee decisions and practice.

The Executive Committee may wish to note document UNEP/OzL.Pro/ExCom/78/5 on Draft criteria for funding.

(ii) Enabling activities

Document UNEP/OzL.Pro/ExCom/78/6 presents a review of the decisions and guidelines relevant to enabling activities that have been adopted by the Parties to the Montreal Protocol and the Executive Committee that could serve as a framework for a sustainable, cost-effective and successful phase-down of HFC consumption and production in Article 5 countries. The information could also assist the Executive Committee in deciding which enabling activities could be funded under the additional voluntary contributions of US \$27 million of a group of donor countries for fast-start action on the implementation of the Kigali Amendment for Article 5 countries that have HFC consumption baseline years from 2020 to 2022.

The Executive Committee may wish:

- (a) To take note of document UNEP/OzL.Pro/ExCom/78/6 on Information relevant to the development of the cost guidelines for the phase-down of HFCs in Article 5 countries: enabling activities;
- (b) To provide guidance to the Secretariat on how these activities will be considered as part of the cost guidelines for HFC phase-down; and
- (c) To provide guidance on which enabling activities may be included for funding under the US \$27 million additional contribution from a group of donor countries, as noted in the document on Procedures for Article 5 countries that have HFC consumption baseline years from 2020 to 2022 in accessing additional contributions for enabling activities (UNEP/OzL.Pro/ExCom/78/10).

(iii) Institutional strengthening

Document UNEP/OzL.Pro/ExCom/78/7 reviews and updates the information in document UNEP/OzL.Pro/ExCom/74/51, specifically with regard to the institutional strengthening activities and expected challenges in respect of the Kigali Amendment. Annex I to the document provides a summary of the development of rules and policies for the funding of institutional strengthening projects, and Annex II provides a list of the main documents on institutional strengthening policy.

The Executive Committee may wish to note document UNEP/OzL.Pro/ExCom/78/7 on the Information relevant to the development of the cost guidelines for the phase-down of HFCs in Article 5 countries: institutional strengthening.

(b) Identification of issues to be considered in relation to existing HCFC phase-out activities

Document UNEP/OzL.Pro/ExCom/78/8 presents an overview of some of the key issues that have been identified during the phase-out of HCFCs in Article 5 countries through the experience gained through the approval and implementation of stages I and II of HCFC phase-out management plans. It summarizes actions taken in a majority of Article 5 countries to introduce low-global warming potential (GWP) technologies mainly in the foam and refrigeration and air-conditioning manufacturing sectors and, to a lesser extent, in the aerosol and solvent sectors. It briefly describes challenges that have been encountered while introducing low-GWP technologies including key aspects related to the refrigeration servicing sector. The document also includes relevant information provided by Executive Committee members in response to decision 77/59(c).

The Executive Committee may wish to note document UNEP/OzL.Pro/ExCom/78/8 on Identification of issues to be considered in relation to existing HCFC phase-out activities.

(c) Key aspects related to HFC-23 by-product control technologies

Document UNEP/OzL.Pro/ExCom/78/9 presents preliminary information from various sources on key aspects related to HFC-23 by-product control technologies including an overview of HFC-23 emissions in Article 5 countries; and a description of potential opportunities for reducing HFC-23 emissions; including limited preliminary information on associated costs. The document also briefly describes enabling activities that could initiate the process of HFC-23 emission reporting and reduction.

The Executive Committee may wish to note document UNEP/OzL.Pro/ExCom/78/9 on Key aspects related to HFC-23 by-product control technologies.

7. Procedures for Article 5 countries that have HFC consumption baseline years from 2020 to 2022 in accessing additional contributions for enabling activities

Document UNEP/OzL.Pro/ExCom/78/10 was prepared pursuant to decision 77/59(d) and presents possible procedures for Article 5 countries that have an HFC consumption baseline years from 2020 to 2022 and that have formally indicated their intent to ratify the Kigali Amendment and take on early HFC phase-down, to access additional contributions for enabling activities.

The Executive Committee may wish:

- (a) To note document UNEP/OzL.Pro/ExCom/78/10 on Draft procedures for Article 5 countries that have HFC consumption baseline years from 2020 to 2022 in accessing additional contributions for enabling activities;
- (b) To consider whether:
 - (i) The enabling activities contained in the document are those required for fast-start actions to implement the Kigali Amendment;
 - (ii) The possible funding modalities described in the document may be used for the distribution of the additional funds among Article 5 (Group I) countries; and

- (iii) To request bilateral and implementing agencies to prepare a special business plan strictly following the same requirements for business plan submissions, containing funding requests for enabling activities in Article 5 (Group I) countries, for the additional contributions by a group of donor countries to the Multilateral Fund.

8. Other matters

Substantive issues agreed for inclusion in agenda item 2(a) will be taken up under this agenda item.

9. Adoption of the report

The Executive Committee will have in front of it the draft report of the 78th meeting for its consideration and adoption.

10. Closure of the meeting

The meeting is expected to be closed on Friday, 7 April 2017.

Annex I

**EXTRACT FROM THE REPORT OF THE SEVENTY-SEVENTH MEETING OF THE
EXECUTIVE COMMITTEE (UNEP/OzL.Pro/ExCom/77/76)**

**AGENDA ITEM 10: ISSUES RELEVANT TO THE EXECUTIVE COMMITTEE ARISING
FROM THE TWENTY-EIGHTH MEETING OF THE PARTIES TO THE MONTREAL
PROTOCOL**

205. The representative of the Secretariat introduced a note by the Secretariat (UNEP/OzL.Pro/ExCom/77/70/Rev.1), which aimed to seek guidance from the Executive Committee on a way forward to address decision XXVIII/2 of the Twenty-Eighth Meeting of the Parties on the amendment on phasing down HFCs that had requested the Executive Committee, *inter alia*, to develop, within two years of the adoption of the Kigali Amendment, guidelines for financing the phase-down of HFC consumption and production in Article 5 Parties.

206. All members of the Committee spoke on various aspects of the matter. There was general acknowledgement of the historic importance of the adoption of the Kigali Amendment and of the challenges facing the Executive Committee in formulating a timely and appropriate response to decision XXVIII/2. Regarding the overall approach to be taken, several members said that it was necessary to strike a balance between the need for prompt and decisive action, and the need to move forward in a thoughtful, judicious and well-informed manner. The process should be iterative, and the Executive Committee should be consulted at each step. One member said that the process should be just, transparent and efficient. There was consensus that the Committee needed to adopt a structured, strategic approach, applying appropriate guidelines and parameters, before defining specific actions and activities.

207. Several members said that the note by the Secretariat provided helpful background information on issues relevant to the Kigali Amendment and useful suggestions on potential actions that the Executive Committee might wish to consider. Some members said that the note should have been developed in consultation with the Executive Committee, and in any case was premature, as the Committee had not requested its preparation. One member said that decision XXVIII/2 should form the basis of any work programme on the Kigali Amendment developed by the Committee, and identification of the main themes and priorities to be included in that programme.

208. On the way forward, there was consensus that a special meeting of the Executive Committee should be held early in 2017, with several members favouring the first week in April, to discuss matters related to the Kigali Amendment, and how to deal with potential additional contributions from donors. Some members said that it would be useful for the Executive Committee to request the Secretariat to prepare relevant strategic documents to guide discussions at that meeting.

209. Several members said that an immediate priority for the Executive Committee was to decide whether to accept and how to deal with the additional voluntary contributions from a group of donor countries intended to finance activities for implementation of the HFC phase-down. The modalities related to the contributions could be decided through bilateral discussions between the donor countries and the Treasurer, given variations in the financing mechanisms applied by different countries, which would necessitate a customized approach. One member said that the Executive Committee should first broadly define the purpose of those contributions before considering more specific requests and proposals from the implementing agencies. Several members said that, initially, the focus should be on fast-start support for implementation, including enabling activities in Article 5 countries, in order to gather early momentum. Priority areas identified included energy efficiency and the refrigeration and air-conditioning sector. One member highlighted some issues that should be given particular attention, including safety and data collection. Another member said that the focus should be on countries that were engaged and ready to move forward in taking early action on HFC reduction.

210. With regard to the new challenges presented by dealing with HFCs, one member said that it would be fruitful to take the modalities developed for dealing with HCFCs as the starting point and to adapt them to the particular needs of HFC activities, given that more flexibility will be required in line with the Kigali Amendment. Another member highlighted the uncertainties with regard to the sources and mode of implementation of the funding, including the fact that funds from the foundations would not be channelled through the Multilateral Fund. He also said that issues of equity should be given high priority when making decisions on the allocation of funding.

211. Following the discussion, the Chief Officer clarified the procedure by which the note had been produced. In line with normal practice in such cases, the Chief Officer had consulted with the Chair and Vice-Chair as to whether an item on the Kigali Amendment should be included in the agenda for the present meeting. Once that had been confirmed, the Secretariat had prepared the information note to inform the Executive Committee, taking into account the complex and wide-ranging discussions leading up to the Twenty-Eighth Meeting of the Parties, the various decisions taken on the matter, the strong commitment by donor countries and the need to develop financing modalities, and the overall need for urgent action to implement the Kigali Amendment. He also stated that, unless instructed by the policy body, the Secretariat did not consult with members in the preparation of documents; nor in the present instance had there been time to do so. Two main areas were highlighted in the document as requiring particularly urgent action: the refrigeration servicing sector and energy efficiency. The document contained no recommendations, but was intended to provide information to assist the Committee in its decision-making processes.

212. The Executive Committee agreed to establish a contact group, convened by the representative of Canada, to discuss how the Committee should move forward in dealing with matters related to the Kigali Amendment and decision XXVIII/2 of the Twenty-Eighth Meeting of the Parties, as well as with the potential additional contributions from donor countries.

213. Following the report of the convenor of the contact group, the Executive Committee decided:

- (a) To hold a four-day special meeting early in 2017 to address matters related to the Kigali Amendment to the Montreal Protocol arising from decision XXVIII/2 of the Meeting of the Parties, and potential additional contributions to the Multilateral Fund;
- (b) To request the Secretariat to prepare a document containing preliminary information in response to the elements in decision XXVIII/2 of the Twenty-Eighth Meeting of the Parties that requested the Executive Committee to take action, and addressing the following issues:
 - (i) Available information on HFC consumption and production, as well as on HFC-23 by-product, including from surveys of ODS alternatives funded by the Multilateral Fund and other sources;
 - (ii) The enabling activities required to assist Article 5 countries in commencing their reporting and regulatory activities in relation to the HFC-control measures;
 - (iii) Key aspects related to HFC-23 by-product-control technologies;
 - (iv) Identification of the issues that the Executive Committee might want to consider in relation to existing HCFC phase-out activities;
 - (v) Information relevant to the development of the cost guidelines requested from the Executive Committee;

- (c) To invite Executive Committee members of the 77th meeting to share relevant information with the Secretariat on, but not limited to, the elements listed in sub-paragraphs (b)(i) to (v) above, no later than 31 January 2017 on an exceptional basis owing to the limited time until the end of 2016;
- (d) With respect to the intended US \$27 million fast-start contributions in 2017 from some of the non-Article 5 Parties:
 - (i) To accept, with appreciation, the additional contributions announced by a number of non-Article 5 Parties to provide fast-start support for implementation of the Kigali Amendment, noting that such funding was one-time in nature and would not displace donor contributions;
 - (ii) That the additional contributions mentioned in sub-paragraph (d)(i) above should be made available for Article 5 countries that had an HFC consumption baseline year between 2020 and 2022 and that had formally indicated their intent to ratify the Kigali Amendment and take on early HFC phase-down obligations in order to support their enabling activities, such as capacity building and training in handling HFC alternatives, Article 4B licensing, reporting, and project preparation activities, taking into account, but not restricted to, relevant guidelines and decisions of the Executive Committee;
 - (iii) To request the Secretariat to develop a document describing possible procedures for countries identified in sub-paragraph (d)(ii) above in accessing the additional fast-start contributions for enabling activities;
 - (iv) That the Treasurer would communicate with contributing non-Article 5 countries on procedures for making the additional contributions available to the Multilateral Fund for the purpose of early action in respect of the Kigali Amendment;
 - (v) That the Secretariat would report to the Executive Committee on the additional fast-start contributions received separately from the pledged contributions to the Multilateral Fund; and
- (e) To request the Secretariat to prepare an agenda for the special meeting referred to in sub-paragraph (a) above based on the issues identified in sub-paragraphs (b) to (d) above.

(Decision 77/59)

Annex II**ARGENTINA
COMMENTS SUBMITTED RELATED TO DECISION 77/59**

In response to Decision 77/59 where ExCom members were invited to share relevant information on certain specific elements, but not limited to, of Decision XXVIII/2 of the Twenty-Eighth Meeting of the Parties, Argentina is submitting for consideration at the 78th Meeting of the ExCom the following comments/proposals.

- (i) Available information on HFC consumption and production, as well as on HFC-23 by-product, including from surveys of ODS alternatives funded by the Multilateral Fund and other sources;

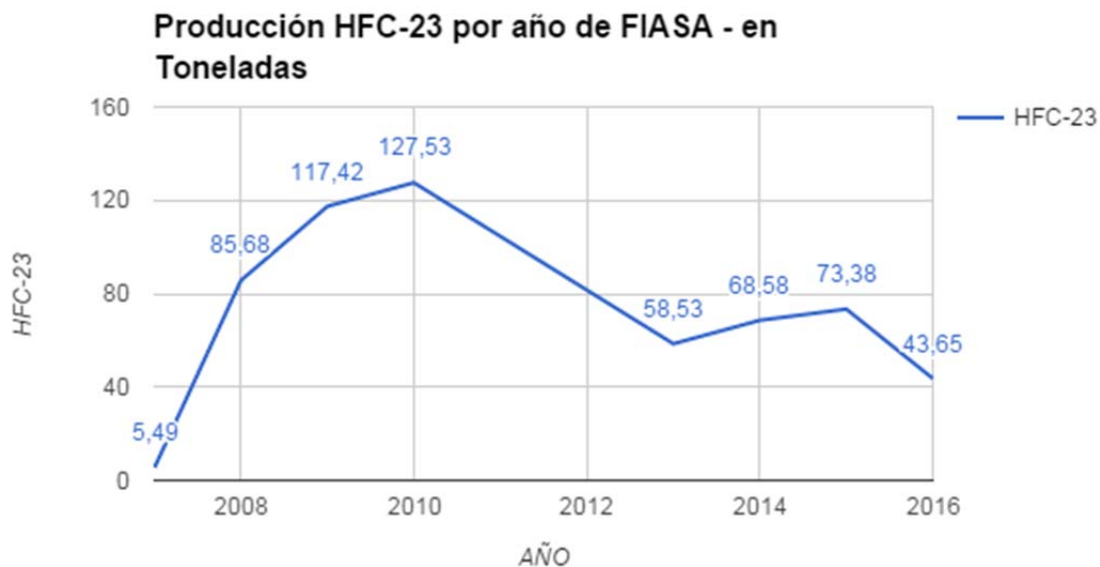
BRAZIL – HFC IMPORTS 2014-2015

Substances	2014	2015
HFC-23	1.82	0.46
HFC-32	1,219.17	1,541.05
HFC-125	2,065.59	2,688.24
HFC-134A	10,832.33	9,418.71
HFC-143A	828.25	794.41
HFC-152A	32.20	52.16
HFC-43ME	0.0	0.00
HFC-365	0.00	17.86
HFC-227	0.0	1.82
HFO 1234yf	0.00	0.52
HFC-236fa		0.32
Total	14,979.37	14,515.55

- (ii) The enabling activities required to assist Article 5 countries in commencing their reporting and regulatory activities in relation to the HFC-control measures;

Are included in paragraph 20 of Decision XVIII/2.

- (iii) Key aspects related to HFC-23 by-product-control technologies;
- (iv) The following information refers to Argentina's report production of HFC-23 from FIASA. Since 2013, the Ministry of Production of Argentina carries out the audit of the company FIASA on a quarterly basis, under the coordination of UEPRO - PRESAO of the National Directorate of Sustainable Industry Development.
- (v) Based on the audits and considering the relationship between the production of HCFC-22 and its by-product, HFC-23 gas, the present generation is of approximately 6TN of HFC-23 per month. In the following table, the production of HFC-23 in the last 10 years can be observed:



The company FIASA SA does not perform any treatment of destruction of the HFC-23, but that the gas is vented.

At the time that FIASA worked under the CDM, a project was implemented from which the production of HFC-23 was destroyed in a tower they had for this purpose. This tower is currently in disuse and the company believes that to start up the HFC-23 destruction plant again, investments should be made to:

- Replace damaged absorption tower.
- Repair valves.
- Buy zeolite for the oxygen generator PSA, among other issues.

According to the company, the estimated operating cost for the destruction of HFC-23 is 90 Argentinian pesos per kilogram of HFC-23 for a monthly production of 200TN of HCFC-22 and 6TN of HFC-23.

Please find below our comments on different items of Decision XXVIII/2:

Decision XXVIII/2	Element	Comments/Proposals
<i>Financial Issues</i>		
<i>Overarching principles and timelines</i>	9. To recognize that the Amendment maintains the Multilateral Fund for the Implementation of the Montreal Protocol as the financial mechanism and that sufficient additional financial resources will be provided by parties not operating under paragraph 1 of Article 5 to offset costs arising out of HFC obligations for parties operating under paragraph 1 of Article 5 under the Amendment;	
	10. To request the ExCom to develop, within two years of the adoption of the Amendment, guidelines for financing the phase-down of HFC consumption and production, including cost-effectiveness thresholds, and to present those guidelines to the Meeting of the Parties for the parties' views and inputs before their finalization by the ExCom;	Since the ExCom only has 2 years to develop the financing guidelines for HFC phase down, including the c.e. thresholds and submitting them for consideration of the Parties, this delegation thinks it should be ranked as a first priority in the ExCom work.
	11. To request the Chair of the ExCom to report back to the Meeting of the Parties on the progress made in accordance with this decision, including on cases where ExCom deliberations have resulted in a change in a national strategy or a national technology choice submitted to the ExCom;	To ensure transparency and equity across ExCom approvals, the Secretariat should prepare an overview table for the project review agenda item, summarizing for each and all country proposals (regardless if recommended for blanket approval or not), proposed and agreed strategy, technology choice and recommended level of funding, as well as: information on sectors and selected technologies covered by each project, the total eligible cost and C.E. based on eligible consumption for each sector as well as overall coverage (percentage of the baseline level) and the reason why the Secretariat is suggesting the changing of the proposed strategy chosen by the Country, if this is the case.
	12. To request the ExCom to revise the rules of procedure of the ExCom with a view to building in more flexibility for parties operating under paragraph 1 of Article 5;	Decisions that are clearly directed at individual investment projects approved prior to the performance-based project modality should be retired to prevent misuse (i.e. to limit country flexibility or funding levels). The ExCom should commission a report, to be updated periodically, containing a rolling list of decisions that no longer can be applied to sector/national plans.
<i>Flexibility in implementation that enables parties to select their own strategies and priorities in sectors and technologies</i>		
	13. That parties operating under paragraph 1 of Article 5 will have flexibility to prioritize HFCs, define sectors, select technologies and alternatives and elaborate and implement their strategies to meet agreed HFC obligations, based on their specific needs and national circumstances, following a country-driven approach;	Needs to be included in a Decision

<i>Decision XXVIII/2</i>	Element	Comments/Proposals
	14. To request the ExCom of the Multilateral Fund to incorporate the principle referred to in paragraph 13 above into relevant funding guidelines for the phase-down of HFCs and in its decision-making process;	

Guidance to the Ex Com with respect to the consumption, production and servicing sectors

	15. To request the ExCom, in developing new guidelines on methodologies and costs calculations, to make the following categories of costs eligible and to include them in the cost calculation:	
<p><i>Elegible costs in the HFC manufacturing sector</i></p>	(a) Incremental capital costs;	<p>The decision made at the MOP should be the main guiding document as well as the lessons learnt during HPMP implementation, which proved that for some sectors the ICC provided was not sufficient and the IOC should be extended for a much longer period in order to provide sufficient incentive for the conversion to new alternatives. The A2 countries may wish to demonstrate to A5 countries successful conversions to low-GWP alternatives in their countries and share their experience, especially with those countries, which are facing difficulties in introducing new alternatives. • Cost-effectiveness thresholds should be developed using actual incremental costs of HFC phase-out . Those actual incremental cost items should become the basis for a list of standard, eligible equipment for the particular sector. • The ExCom should then approve new C.E. thresholds and the associated standard list of equipment for each subsector. The Secretariat would be required to apply the thresholds and the standard list of equipment in its project review to ensure transparency and equity. • To implement this approach, a cost template should be developed by the Secretariat and Implementing Agencies (as was done for CFCs) for reviewing project costs. • With the above standard costs and set of equipment, there would be no need to maintain artificial levels of IOC. • Where required information for establishing the above thresholds is not available, the ExCom would commission an external technical review by experts selected by the ExCom to determine actual costs as experienced in developed countries and/or approve demonstration projects with an aim to obtain this information.</p>
	(b) Incremental operating costs for a duration to be determined by the ExCom;	
	(c) Technical assistance activities;	
	(d) Research and development, when required to adapt and optimize low-GWP or zero-GWP alternatives to HFCs;	
	e) Costs of patents and designs, and incremental costs of	

<i>Guidance to the Ex Com with respect to the consumption, production and servicing sectors</i>		
	royalties, when necessary and cost-effective; (f) Costs of safe introduction of flammable and toxic alternatives.	
<i>Elegible costs in the HFC production sector</i>	(a) Lost profit due to shutdown/closure of the production facilities as well as production reduction;	<ul style="list-style-type: none"> • Approval of HFC funding guidelines should not preclude the approval of HFC phase-down activities, particularly for HFC-23 emissions that must be eliminated by 2020. • Most important action would be to agree on the HCFC and HFC production guidelines and ensure that funding is swiftly provided to swing plants for production closure/conversion. The most effective way to reduce HFC-23 by-product is to close HCFC-22 production and provide guidance and sufficient funding for that. • Reduction of emission of HFC-23, a byproduct from the production process of HCFC-22, by reducing its emission rate in the process, destroying it from the off-gas, or by collecting and converting to other environmentally safe chemicals, should be funded by the MLF, to meet the obligations of A5 countries specified under the HFCs Amendment.
	(b) Compensation to displaced workers;	
	(c) Dismantling of production facilities;	
	(d) technical assistance activities;	
	(e) Research and development related to the production of low/zero-GWP alternatives to HFCs with a view to lowering the cost of alternatives;	
	(f) Costs of patents and designs or incremental costs of royalties;	
	(g) Costs of converting facilities to produce low/zero-GWP alternatives to HFCs when technically feasible and cost-effective;	
(h) Costs of reducing the rate of emissions of HFC-23, destroying HFC-23 from off-gas, or collecting HFC-23 and converting it to other environmentally safe chemicals.		
	16. To request the ExCom to increase in relation to the servicing sector the funding available under ExCom Decision 74/50 above the amounts listed in that decision for parties with total HFC baseline consumption up to 360 metric tonnes when needed for the introduction of alternatives to HFCs with low-GWP and zero-GWP alternatives to hydrofluorocarbons and maintaining energy efficiency also in the servicing/end-user sector;	Need a clarification to what is intended with this request. How is servicing sector related to energy efficiency??
<i>Energy efficiency eligible costs</i>	22. to request the ExCom to develop cost guidance associated with maintaining and/or enhancing the energy efficiency of low/zero-GWP replacement technologies and equipment, while taking note of the role of other institutions addressing energy efficiency, when appropriate.	<ul style="list-style-type: none"> • Energy efficiency is not included in agreed incremental costs. Are we going to finance energy efficiency?. This is the first decision that should be taken into account and be taken to the Parties consideration, and then decide whether we should invest time in developing this cost guidance. • There is a need to establish a definition for low-GWP alternatives.

Guidance to the Ex Com with respect to the consumption, production and servicing sectors

		<ul style="list-style-type: none">• In terms of energy efficiency, the Executive Committee has not approved funding for improved energy efficiency of refrigeration and air-conditioning equipment, as this is not considered as an eligible incremental cost under the MLF and because the focus was on phasing-out of ODS. Past Executive Committee decisions determined that technological upgrades go beyond what is covered as eligible incremental costs and would not be funded unless they were unavoidable as part of the project
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Requests to consider by the secretariat in the preparation of a document containing preliminary information in response to the elements in decision XXVIII/2 of the Twenty-Eighth Meeting of the Parties.

30.01.2017 prepared by the German Constituency

Background

In the Conference Room Paper *UNEP/OzL.Pro/ExCom/77/CRP.3/Rev.1* “DRAFT DECISION ON AGENDA ITEM10: ISSUES RELEVANT TO THE EXECUTIVE COMMITTEE ARISING FROM THE TWENTY EIGHTH MEETING OF THE PARTIES TO THE MONTREAL PROTOCOL: KIGALI AMENDMENT – NEXT STEPS FOR THE EXECUTIVE COMMITTEE”

“The Executive Committee decided:

- a) *To invite members of the 77th Executive Committee, to share relevant information with the Secretariat on the elements listed but not limited to the sub-paragraphs (b) (i) to (v) above, no later than 31 January 2017 on an exceptional basis noting the limited time between now and the end of the year”*

The following document entails requests/relevant information of the German Constituency for consideration of the secretariat. The document has been structured according to the decision 77/59 and includes additional issues raised in excom doc. 7770 and decision XXVIII/2 of the MOP. However, in keeping the contextual structure of dec 77/59, there are necessarily a number of overlapping issues that need to be mentioned at multiple places.

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I. General remarks on funding issues when implementing the Kigali amendment

In the following we describe the challenges we see in developing the HFC guidelines. As a principle we would like to maintain the existing ODS guidelines as much as possible as they are well understood by members and implementing agencies and are operating well. This paper is therefore, mainly associated with the development of guidelines for new issues to the MLF such as energy efficiency, HFC-23 and the integration with the UNFCCC.

In general we believe that the evaluation of requests for financing incremental costs of a given HFC-project shall take into account the following principles:

- the most cost-effective and efficient option should be chosen, taking into account the national industrial strategy of the recipient A5,
- operational policies, guidelines and administrative arrangements, including the disbursement of resources, for the purpose of achieving the objectives of the MLF (Article 10(5)) should:
 - strictly relate to compliance with the provisions of the Protocol, and
 - meet agreed incremental costs (Article 10(6));
 - consequently, all activities which require MLF funding, including energy efficiency, should be strictly related to the phase down of HFCs, and kept within agreed cost thresholds.
- to seek, to the extent possible, co-funding from other multilateral and bilateral funding efforts, for activities not related to compliance and agree operational modalities for effective cooperation that will ensure there is no delay in disbursing funds or double-counting in view of other multilateral and bilateral funding efforts in the targeted sectors, in specific with view on energy efficiency
- when establishing the incremental costs in the various subsectors, to take into account *any savings or benefits that will be gained at both, the strategic and project levels, during the transition process* (dec/4/15)- continue to fund greenhouse gas reductions on the basis of sustained aggregate reductions. Therefore, any request (HFC, energy use) shall be presented with a baseline and the respective reduction targets that are measurable, (independently) verifiable and reportable, matching the requirements of *both, the MP and the UNFCCC*.
- develop together with reknown institutions in the field of energy use reduction on methodologies and procedures for conservatively projecting and measuring greenhouse gas reductions in the RAC sector, for example with view on complex monitoring needs for appliances
- in the evaluation of greenhouse gas reductions, measure and illustrate the impact in tCO₂ eq. on the basis of annual consumption, lifetime emissions and aggregated savings until 2050 vs. a business as usual scenario.
- give priority to funding (incentivize) requests that implement zero/low GWP, HFC-free solutions and eliminate the need for additional conversions and costs (leapfrogging)
- ensure that an overall national (sub)sector management plan will initiate and enforce normative measures, necessary for establishing a qualitative infrastructure that will facilitate a safe supply of alternative services and products.
- when applying a holistic approach in the servicing sector, take into account experiences, components and synergies of ODS management plans and activities (CFC, HCFC, etc.) previously funded under the MLF, such as tools, equipment, infrastructure, vocational sector actors, training

and certification agents

- to design a credible range of enforcement measures in order to raise the perception of risk among recipients of funding.

- when designing guidelines on capital and operational incremental costs, take into account negative experiences of the fund with cash payments for IOCs and consequently the need for seamless monitoring and control on the sustainability of such transitions.

II. Available information on HFC consumption and production, as well as on HFC-23 by-product, including from surveys of ODS alternatives funded by the Multilateral Fund and other sources;

Invite the remaining 17 Article 5 countries, that had not yet received assistance to conduct surveys on ODS alternatives from the Multilateral Fund, to provide, consumption and production data for alternatives to ODS in particular HFCs and provide an overall analysis of the results of the surveys for the consideration of the Executive Committee by its first meeting in 2017.

The secretariat should include in its evaluation of the HFC- Inventories

- an overview on the implemented measures of ODS Alternatives inventories (compilation of reports per country) in order to allow the ExCom a differentiated analysis of HFC use patterns in A5 countries
- clearly identify missing information from the ODS Alternatives Surveys
- describe needs to integrate and include emission reporting under the MP
- ways forward to harmonize with tier 2 or 3 (bottom-up) approach used under UNFCCC
- get a full picture on whether the information from ODS Alternatives Surveys are sufficient to build preliminary baselines for HFCs and to include baselines for energy use emissions in the RAC subsectors

Furthermore we support the secretariat to provide information on the studies and investigation of HFC-23 disposal technologies and HFC-23 reductions using best practices that had been funded through the HCFC production phase-out management plan. In addition, we invite other Governments to provide, on a voluntary basis, information on their experience in controlling HFC-23 by-product emissions.

In the evaluation of information on potential HFC-23 funding, we would like include:

- how independent verification of the information on HFC-23 emission will be warranted?
- what the lifetime of existing productions are and timeline for regulations avoid emissions for new productions?
- if and what incentives for early action are needed, incremental costs of establishing HFC-23 destruction capacity

III. The enabling activities required to assist Article 5 countries in commencing their reporting and regulatory activities in relation to the HFC-control measures;

According to the XXVIII/2 the following activities would be eligible for funding: implementing HFC phase down strategies and public awareness; data reporting; enforcement and customs training; service sector training and capacity building; measures for safe introduction of hazardous alternatives.

We recommend to integrate service sector funding under the HCFC and HFC phase down as soon as possible in order to support/facilitate early ratification and rapid phase-down of HFCs. Particularly A5 need a systems for import/export licensing, quota, reporting, data collection, customs, amended regulation and new training for f
UNEP/OzL.Pro/ExCom/78/1/Add.1
Annex II
atives to reduce transition to high-GWP in the me

In the HFC Management Strategy/Plan we would like to see the following issues being addressed:

- activities that will speed up phase-down and limit HFC growth most rapidly and effectively, taking into account the lifetime effects of alternatives at realistic leakage rates as established in the HPMPs (72/42)

HFC- Inventories (see chapter i. above)

- methodologies for establishing baselines for both, HFC and energy consumption in the RAC subsectors

Seek for **synergies** when enabling

- the servicing sector activities for capacity-building and training for HFC alternatives in the manufacturing and production sectors;
- the development of national strategies for a combined institutional HCFC and HFC management and support structure;
- Article 4b on licensing and reporting

Demonstration projects

- How to identify key subsectors and select demonstration projects enabling HFC and HCFC management, controls and enforcement, funding could be linked to HPMPs

Implementation

- Ask countries to advise on which activities that are particularly important for “fast start” phase-down action

IV. Key aspects related to HFC-23 by-product control technologies

With regard to the potential HFC-23 by-product control technologies, we would like to know:

- what is the state of art, what is the incremental cost of destruction?
- what is the mechanism influencing avoidance of new cases of HFC-23 by-production?
- how will HFC-23 mitigation become mandatory for everybody in the long-term?
- what will be the market demand for HCFC-22 feedstock on view of future products (PTFE, Refrigerants?)

V. Identification of the issues that the Executive Committee might want to consider in relation to existing HCFC phase-out activities;

In discussing challenge 6 during the OEWG 38, Parties generally acknowledged the linkage between the HFC and HCFC reduction schedules relevant to subsectors and the preference to avoid transitions from HCFC to high-GWP HFC. They are willing to provide flexibility if no other technically proven and economically viable alternatives are available.

In order to avoid double conversions we recommend that parties acknowledge these linkages with respect to certain subsectors, in particular industrial process refrigeration. *Parties are willing to provide flexibility if no other alternatives are available in cases where HCFC supply may be unavailable from existing allowable consumption, stocks as well as recovered/recycled material, and if it would allow for a direct transition at a later date from HCFCs to low-GWP or zero-GWP alternatives.*

In this proposal parties have signalled their alignment with the principle of using resources most cost-effective manner when seeking synergies between the HCFC and HFC phase-down regimes.

With regard to the integration of the consumption sector we would like to include:

- how could leapfrogging of HFC transitions be further maximised?
- could this also apply to HPMP projects where high-GWP alternatives have been approved already, but have not yet been implemented?
- how to account additional funding resources in view of the starting point for HFC, when avoiding the phase-in of high-GWP HFCs?
- how to rationalise costs following the synergizing effects of implementing servicing simultaneously under the HCFC and HFC phase down

With regard to the integration of production sector we would like to know:

- how will the transition to high-GWP production be avoided/minimized?

VI. Information relevant to the development of the cost guidelines requested from the Executive Committee;

a Sustained aggregate reductions

Background Principles

“Remaining consumption tonnage eligible for funding will be determined on the basis of the starting point of the national aggregate consumption less the amount funded by previously approved projects in future multi-year agreement templates for HFC phase-down plans (consistent with decision 35/57).”

We agree that for those Article 5 countries that submit projects in advance of their assessed baseline, the starting point for aggregate reduction in HFC consumption would be established at the time of submission of either the HFC investment project or the HFC-Management plan, whichever was submitted first to the Executive Committee. In cases where calculated HCFC baselines, based on reported Article 7 data, were different from the calculated starting point before the baseline, the starting points could be adjusted.

We want to maintain the practice of fixing a starting point on eligible funding, clearly divided in subsectors and respective eligible HFC consumption in kg substance. This will provide predictable clarity about financial needs for the parties in each of the subsectors.

Generally the Multilateral Fund's strategy is based on a compliance-driven business planning approach. Accordingly, the required reduction level for each country is calculated prior to allocating the resources that are needed to achieve it. This calculation is made in case of HFCs on the basis of an agreed baseline of eligible consumption figures in terms of environmental impact (tCO₂eq). Energy consumption of HFC technologies shall be as well measured in tCO₂. When energy consumption of alternatives is funded, a subsector baseline on energy consumption is necessary in order to ensure that the funding provided will result in sustained reductions.

Methodological Issues of Impact Assessment

We need a paradigmatic change for assessing and reporting climate impact in comparison to the approach we have taken so far under ODS controls, when the impact of GHG reduction was a secondary benefit. With regard to projecting and reporting climate impact we need to dramatically improve transparency and reliability of reporting and clearly distinguish between verified (hard) emission reductions (e.g. HFC) and not verifiable (soft) reductions that depend on unpredictable conditions (as for energy use, unless an agreed conservatively proven methodology is applied).

The evaluation of the environmental impact should include in case of HFCs:

- lifetime emission of conversion of annual productions
- the aggregated impact (tCO₂) until 2050
- the separated indication of the impact (tCO₂) of hard and soft reductions

Each data set should include underlying assumption and a description of means of verification.

Any funding should be used in light of the principle of sustained aggregate reductions, however would like to know also:

- on which principles/decisions could we justify incremental costs of energy efficiency, and
- in case we do so, is it confirmed that EE will fall as well under the agreed subsector cost thresholds
- how to maintain the principle of sustained aggregate GHG reductions of energy use in a RAC subsector and avoid diluting/offsetting GHG reductions and cost effectiveness of the HFC phase down
- how would a possible starting point be assessed in such case (bottom up?)
- will in such case the ExCom agreement complement for individual compliance to targets of the a recipient country with regard to GHG reductions in the energy use subsector

b Multiple staged conversions of HFC -based manufacturing enterprises

We fully support the principles agreed by the Parties, no additional clarification needed.

c Eligible incremental costs of HFC phase-out projects

i Guidelines for enabling activities

The Secretariat recommends using \$27m for enabling activities (→ *see comments chapter I. & II. in this report.*)

The secretariat expects funding for HFC enabling activities to be similar to the HPMP development costs. If though, then very little money (if support costs are included) will be left to do any other than enabling activities. Priority should be given to overcome regulatory and other barriers.

ExCom would request bilateral and implementing agencies to submit funding proposals and prepare capacity assistance.

ii Institutional strengthening

Institutional needs to maintain relationship with regard to the replenishment level. Since there are many similarities between the HFC and HCFC management, costs could be rationalized. Relating costs to the total consumption under implementation could be an important aspect.

iii Eligible production costs:

Eligible production sector costs: lost profit from shutdown or reduction, displaced worker compensation, dismantling facilities, technical assistance, R&D to lower cost of alternatives, patents and royalties, conversion costs to low-GWP, reducing HFC-23 from HCFC-22 production.

Note: similar issues are currently being considered for HCFCs by the production sub-group.

- how should we handle the read-across between HCFC and HFC guidelines
- asking China and other producers to provide info to inform HFC-23 destruction options may need independent verification

iv Eligible manufacturing costs:

ICCs and IOCs for a duration to be determined by ExCom

General market considerations

- Technology deployment will definitely develop faster after the ratification of the Kigali Amendment;
- ICC/IOCs need to be seen in light of the early phase down in many A2 countries, the market will be very different in 5 yrs from now;
- Start with cost effective alternatives, conversions where there are no cost-effective alternatives yet should be backloaded;
- Preference, incentive systems need to be developed for low-/zero-GWP versus technologies based on HFC.

ICCs

- Need to take into account on-going review of prices for components, parts and refrigerants;
- Starting point of cost-effectiveness considerations should be the existing HPMP guidelines, considering that with increasing market introduction, prices will go further down

IOCs

- approval of IOCs need to take into account negative experiences and possible cases of misuse, consequently there is a need for seamless monitoring and control of the sustainability of such transitions.
- IOCs should not be extended over a longer period of time, because IOCs are only meant to compensate for a loss during the initial market introduction that is caused by a lack of established procedures. New products are generally thought to be overall more competitive than predecessor product/service they replace. Therefore, there is no longer-term need for IOC.
- keep the limit to transfer of funds from eligible ICCs to IOCs at 20%
- considering we have an average implementation of 36 month for approved projects, the application of present market prices for some alternatives, e.g. such as HFOs, with presently only marginal production, is highly volatile and speculative. In these cases IOCs need to be based on real production price, rather than on speculative prices stimulated by initially limited supplies. Ask secretariat to describe marginal production costs of HFOs and HFC-32.

Prioritisation of funding for manufacturing

- Ask to prioritize subsectors with highest impact, along both the GWP of the alternative and the lifetime consumption (taking into account initial charge and refill).

Overview: Average Lifetimes and leakage-rate per year for equipment assumed in the various RAC subsectors for Article 5 Parties by TEAP and the MLF Secretariat.

Subsector	LIFETIME	ANNUAL LEAK TEAP	ANNUAL LEAK MLF (72/42)	LIFETIME REFILL TEAP	LIFETIME REFILL MLF
Domestic refrigeration	20	2%		40%	
Industrial refrigeration	15-30	15-30%	44%	506%	990%
Transport refrigeration	9-30	15-30%	23%	450%	460%
Commercial refrigeration	20	15-40%	38%	550%	760%
Stationary AC	10-25	2-10%	29%	105%	508%
Mobile AC	15-20	10% - 20%		350%	

This table illustrates that early action would have the largest impact in the industrial, commercial and stationary AC sector. The impact in the domestic sector would be exceptional low (less than 10% compared to the other sectors). This has important implications when giving priority in the selection of subsectors.

Based on above the table below table illustrates an example how the impact of lifetime emissions influences the impact of mitigation scenarios when choosing a subsector:

- If 10% of the HFC-410A is replaced with R32 in stationary A/C, the remaining lifetime emissions (33 Mio tCO₂) would be still be higher than the total emissions of HFC-134a in the domestic refrigeration sector (29 Mio. tCO₂) and cause a need for additional conversion in the A/C sector.
- If, alternatively, 10 % of the HFC-410A in stationary A/C sector are replaced with an HFC-free alternative (e.g. Propan) the remaining lifetime emissions would fully offset the existing emissions of HFC-134a in the domestic refrigeration sector (in tCO₂).

This clearly indicates that in evaluating strategic priorities, both consideration of the GWP of the alternative and the lifetime consumption (charge and refill) are decisive/essential for a cost effective reduction. A/C conversion to zero/low GWP has the highest reduction potential and cost-effectiveness compared to measures in the domestic refrigeration sector or conversion of A/C to HFCs (e.g. R-32) and should be taken into account.

SUBSECTOR BAU	Refrigerant	GWP	LT TCO2/ Unit (C&R)*	CONSUMPTION 2020 (KT)	LT Consumption in MTCO2
Domestic refrigeration	134a	1400	1,4	14610	29
Stationary AC	410A	1920	8,0	134702	938
MITIGATION SCENARIO	Refrigerant	GWP	LT TCO2/ Unit (C&R)*	CONSUMPTION 2020 (KT)	LT Consumption in MTCO2
Domestic refrigeration	600a	6	0,0	14610	1
Stationary AC	290	3	0,0	134702	1
Stationary AC	32	675	3,0	134702	330

* Emissions from charge plus refill over lifetime (20yrs, no EOL recycling)

This shows that priority setting could help to quickly and sustainably remove emissions, it needs to take into account the actual leakage rates of equipment and how the best environmental outcome is achieved by prioritising HFC-free alternatives.

Therefore, enabling activities need to build framework conditions and capacities to manage flammability and toxicity issues for a safe introduction of HFC-free alternatives and initiate the local adaptation of rules and standards in support of demonstration projects.

d Aspects related to the refrigeration and air conditioning servicing sector

Include aspects related to the refrigeration servicing sector, taking into account previous policy documents, case studies, and monitoring and evaluation reviews, while developing new guidelines on methodologies and cost calculations.

It is important to review the servicing sector activities. In the past servicing sector activities have not been necessarily designed as a package of policies, regulations, enforcement, skill training and conformity monitoring to build a functioning, qualitative service infrastructure in developing countries. Especially with regard to the formulation and enforcement of regulations countries need more support.

Cost categories considered to be eligible and included in the cost calculation:

- training of customs officers;
- preventing illegal trade of HFCs;
- policy development and implementation;
- public awareness activities;
- training of technicians in good practices and the safety of alternatives, including training equipment and servicing tools;
- certification programmes, monitoring conformity of products, equipment and services in the RAC sectors;
- recycling and recovery of HFCs;
- [best practice on energy efficiency]

It is important to integrate servicing activities for HCFC and HFCs and rationalise the implementation of activities. Thus, a strategy needs to be in place that illustrates the necessary actions with regard to the introduction of low-GWP alternatives under both plans.

This requires a larger degree of differentiation between the various subsectors, alternatives and applications in a country. It will require a stricter formalization of servicing sectors in the countries, specifying requirements in terms of education, quality assurance, tools and conditions at which new technologies with low-GWP alternatives need to be serviced and maintained.

This necessarily includes a review of local standards. Countries need to make sure that there is no concession on safety for users, independent from the fact whether new or refurbished equipment is in use. Furthermore, this should include a review of vocational training systems, the qualification and certification that can be provided through them. In addition, for local quality assurance, certifiers may be needed to confirm the scope of local supplies, compliance of services with standards, product checks, final inspection, as required for certification of equipment, and regular inspection.

The secretariat speaks for a holistic approach. A holistic approach would result in robust local qualitative infrastructure that builds capacity throughout the sectors and institutions: national vocational training system, national certification bodies, policy makers in government and associations, code of practice and skill developers, enforcement authorities, local providers of certification, testing and quality assurances.

Therefore, the delivery of a holistic approach will require longer-term formalised structural changes of processes and institutions. It needs to be assisted by agents, which are sufficiently experienced in delivering institution building in A5 countries in the field of national vocational training and certification.

Altogether developing countries need to provide a qualitative infrastructure to install, operate and disassemble products and equipment operating on low-GWP alternatives, with new operational and safety requirements.

In this regard, it needs to be recognised that the ExCom has already anticipated the need and adapted guidelines to significantly increased servicing sector funding for A5s in view of managing the more difficult introduction of low-GWP alternatives, with a priority on those A5 with consumption below 360mt HCFC.

In summary, addressing the servicing sector can have a big impact on emissions and energy use, it should be addressed holistically. Given flammables and toxicity of alternatives, local needs for certification need to be seen in context of regulations and standards and should be reviewed for all MLF funded activities in this sector.

On the mandate and role of UNEP/CAP in this respect please refer to chapter iv Role of UNEP CAP

e Key aspects for improving the energy efficiency of refrigeration and air-conditioning equipment

The MOP has requested the Executive Committee “to develop cost guidance associated with maintaining and/or enhancing the energy efficiency of low-GWP or zero-GWP replacement technologies and equipment, when phasing down HFCs, while taking note of the role of other institutions addressing energy efficiency, when appropriate”.

i Donor coordination and integration with other funding initiatives in the energy sector

Before hovering into this new aspect we need answer the following questions:

- We need an action plan for parties on how MP and MLF/ExCom can maximise energy efficiency opportunities as part of the HCFC and HFC phase down:
- What are the opportunities?
- What funding is available with us and with others?
- What should we do to release that funding and use it most effectively and in synergy with the HCFC and HFC phase downs? and,
- Do we have a national framework and strategy that is supportive enough that action can start.

There are several sources of environmental and development funding available for energy efficiency, such as the Global Environment Facility (GEF), the \$5.8bn Clean Technology Fund (CTF) administered by the Multilateral Development Banks or the Green Climate Fund which includes as one of its priorities 'reduced emissions from buildings, cities, industries and appliances'. At the moment, these funds are not well integrated with the Multilateral Fund, which means that opportunities to improve energy efficiency as part of MLF funded projects may be missed. Better integration and co-ordination between the funding streams could lead to more rapid and effective improvements in cooling sector energy efficiency, with less disruption for businesses, and achieve greater improvements from the same overall level of funding. The additional funding for the energy efficiency aspects of the plans could come from the existing sources such as the GEF, GCF and CTF. Consequently, mechanisms could be established to ensure funding approval from those sources was co-ordinated with the ExCom to avoid delays in adopting the Management Plans.

A co-ordinated approach of this type could bring energy efficiency benefits more rapidly and maximise the potential benefits for both energy efficiency and HCFC/HFC reduction from the available funding.

- The World Bank announced \$1bn for energy efficiency in urban areas by 2020, which could include high efficiency cooling technologies, other development banks and initiatives have similar targets.
- 53 Mio. will be added by Philanthropic Organisations (Kigali Cooling Efficiency Fund)
- There are many bilateral initiatives on energy efficiency worldwide. At present the German Ministry of Economic Cooperation and Development implements 120 Mio. of energy efficiency projects in developing countries. Altogether in the EU several billions are pledged for energy efficiency programs, including RAC technologies, in the EU but also in developing countries
- The Green Climate Fund is still growing, but it has already started disbursing money and includes in its priorities reduced emissions from buildings, cities, industries and appliances.
- Overall funding for energy efficiency programs supersedes the budget of the MLF for HFCs by far. These other funds may also be able to provide funding for energy efficiency activities which the MLF does not have the resources or expertise to address, such as cooling demand reduction.

- Therefore, to maximise funding for energy efficiency in the RAC sector it will be important to link up with these existing funding mechanisms

ii Proofing readiness of A5 to facilitate energy efficiency measures

The other funds above will already have their own criteria and guidelines for approving energy efficiency funding. For any energy efficiency funding provided by the MLF, cost guidance needs to be conservative in light of the possible climate impact. Therefore, it is first of all important to analyse and describe necessary governing structure for energy efficiency funding that includes baselines, mitigation targets and instruments for measuring, reporting and verification of funded activities.

There are a number of policy, technical and costs barriers for the introduction of high energy efficient refrigeration and air-conditioning equipment in A5 that needs to be identified. These barriers need to be sufficiently addressed.

The readiness of countries should be assessed through the following information:

- List of relevant needs and methodologies to assess national baselines and performance metrics, such as energy productivity, intensity, fossil power efficiency, potential emission of residential, commercial, industrial sector consumption, mandatory energy savings policies & goals, tax credits, loan programs, incentives, relevant R&D efforts.
- Measures to implement EE certification processes and testing,
- Options for attaching EE strictly to HFC phase-down activities (not being a stand-alone activity)
- Options for verifying funded energy efficient products' compliance or non-compliance when in operation.
- Existing institutional and organizational readiness to enable necessary policies, legal and regulatory frameworks and their enforcement
- Necessary support from recipient countries in terms of institutional arrangements, stakeholder coordination
- Options for evaluating the financial and economic readiness including review of energy prices and tariffs, market structures, financial support and incentives
- Options for evaluating readiness of existing awareness, stakeholder information, education, training, prevalent skills, technologies, infrastructure
- Options for ensuring compatibility with the other mitigation initiatives under the UNFCCC such as CDM or NAMAs
- Institutional requirements to build synergies between other EE initiatives
- Options to make sure that the climate impact of verified emission reductions (HFC) is not sacrificed by diluting these with not-verifiable emission reductions, which are unpredictable in nature and often depended on behavioural patterns and change of energy use.

iii Strategic planning under the Kigali Amendment

Secretariat proposes to a project-by-project approach. The analysis of the priority sectors illustrates that almost all strategic subsector are also subject to the HCFC phase-down. Therefore, the HCFC

phase-down provides sufficient level playing field to generate best practice examples based on regular implementation modalities.

iv Role of UNEP CAP

UNEP CAP, the compliance assistance programme, was entrusted by the Parties in 1991 to the political promotion of the objectives of the Protocol, research and data-gathering and Clearinghouse function. It delivers regional assistance to governments in choosing and enforcing policies required to implement the Protocol, when making informed decisions about alternative technologies and sustain compliance obligations.

UNEP has been chosen to host umbrella bodies under the Montreal Protocol, including convention/protocol and fund secretariat, as well as the CAP programme. The actual implementation of country activities is through the multilateral bilateral and implementing agencies. The parties have always been cognizant of this work division in order to avoid a conflict of interest and double counting of country based activities.

We support the idea that CAP should continue its efforts to ensure compliance of countries with the HFC phase down policies and targets, e.g. through regional efforts on regulations and ensuring measures for controlling imports and exports are harmonized and enforced..In addition, CAP should continue to support the investment and capacity building programmes of bilateral and implementing agencies through facilitation of the regional and global exchange of experiences between agency experts and country representatives. Such exchange is not part of the approved HFC- phase down projects and should be financially supported through CAP.

We would be interested to discuss the extent to which the CAP is currently able to deliver the holistic, structural changes needed in A5 institutions to meet the requirements of the Kigali amendment. Therefore, we support the proposal that CAP should include on the agendas of regional network meetings of ozone officers, beginning in 2017, issues related to the ratification of the Kigali Amendment to the Montreal Protocol and the phase-out of HCFCs and the phase-down of HFCs, with the participation of experts that could address issues of relevance to Article 5 countries, and encourage the Secretariat and the bilateral and implementing agencies to attend those meetings and engage in the discussions.

Before discussing any longer term mandates of CAP, we suggest to wait for the outcome of the evaluation of the CAP programme.

v Plus up Administration

Governments need to have flexibility from which budgets to take the plus up, which may influence their choice of contribution. Regarding the mechanism for providing the plus up, it is our understanding that it would be treated as an earmarked, voluntary contribution, either in the form of bilateral or cash contributions under the fund. Since the contributions are voluntary, limitations to the share of bilateral contributions shall not apply and those contributions could exceed 20% of the total contribution.

ANNEX

Leak rates per subsector :

On average between 22 to 44% /annum (EXCOM document 72/42)

Subsector	Estimated annual emission rates in HPMPs		
	Average (%)	Lowest value (%)	Highest value (%)
Residential air-conditioning	29	4	79
Commercial air-conditioning	40	3	70
Industrial air-conditioning	40	8	54
Transport	23	8	40
Chillers	22	14	30
Commercial refrigeration	38	2	82
Industrial refrigeration	44	7	100

Source: A sample of 38 approved HPMPs in which this data is available. The data corresponds to estimations made by each country and the methods may differ between countries.

Government of Japan

(i) Available information on HFC consumption and production, as well as on HFC-23 by-product, including from surveys of ODS alternatives funded by the Multilateral Fund and other sources;

According to the data for FY 2015 reported by operators of more than 10,000 t-CO₂ equivalent HFCs production in the previous FY, the total amount of HFCs production from April 2015 to March 2016 in Japan is 47.73 million t-CO₂. The total amount of HFCs production is estimated to be 48.52 million t-CO₂, also taking into account the estimated amount of the operators of less than 10,000 t-CO₂ equivalent HFCs production.

(ii) The enabling activities required to assist Article 5 countries in commencing their reporting and regulatory activities in relation to the HFC-control measures;

Regarding the enabling activities (a) to (f) below, which are listed in paragraph 30 of the document ExCom77/70/Rev.1, we believe that priority should be given in particular to the activities of (a), (b) and (f).

- (a) Capacity-building and training for handling HFC alternatives in the servicing, manufacturing and production sectors;
- (b) Institutional strengthening;
- (c) Article 4B licensing (e.g., training of customs officers and other enforcement officers on inter alia policies, regulations, import/export licensing and quota systems, preventing illegal trade of HFCs in support of the phase-down of HFCs);
- (d) Reporting (e.g., data reporting under Article 7 of the Montreal Protocol and under the progress report);
- (e) Development of national strategies; and
- (f) Demonstration projects.

(iii) Key aspects related to HFC-23 by-product-control technologies;

The emission of HFC-23 has been decreasing in Japan since 2004, when all production facilities were equipped with recovery and destructive device. The

substance is destroyed by the Liquid Injection Incineration technology.
(2014)

Production of HCFC-22: 51,753 ton

Ratio of HFC-23 as by-product: 1.46%

Emission ratio from HCFC-22 production: 0.003%

Emission amount: 2 metric ton (0.02 Million t-CO₂)

Source: National Greenhouse Gas Inventory Report of Japan 2016

(iv) Identification of the issues that the Executive Committee might want to consider in relation to existing HCFC phase-out activities;

We believe that the activities aimed at securing compliance of Article 5 countries with the HCFC phase-out schedule should not be delayed as they commence HFC phase-down activities.

(v) Information relevant to the development of the cost guidelines requested from the Executive Committee;

As evaluation criteria and standard for energy efficiency vary among countries, incorporating energy efficiency into the cost guidelines would be a complicated work. Therefore, it should be given very careful consideration.



United States Department of State

*Bureau of Oceans and International
Environmental and Scientific Affairs*

Washington, D.C. 20520

January 31, 2017

Eduardo Ganem
Chief Officer
Montreal Protocol Multilateral Fund
Suite 4100
1000, De La Gauchetière Street West
Montreal, Quebec H3B 4W5
Canada

Dear Mr. Ganem,

Please accept the U.S. response to Decision 77/59 of the Executive Committee of the Multilateral Fund requesting Executive Committee members to share relevant information to help the Fund Secretariat prepare a document containing preliminary information in response to the elements in decision XXVIII/2. I hope this information is helpful to the Secretariat in preparing for the 78th meeting of the Executive Committee in April 2017. Please let me know if you have any questions.

Global Mitigation of Non-CO₂ Greenhouse Gases: 2010-2030 (U.S. EPA, 2013).ⁱ This report lays out several strategies for reducing HFC emissions, among other non-CO₂ greenhouse gases, and then assesses the costs of those strategies. Specifically, the report assesses the cost of (1) transition to low-global warming potential (low-GWP) alternatives in several sectors, (2) servicing practices, and (3) HFC-23 capture and destruction. The following sections of the report are relevant:

- Section IV.2 – HFC Emissions from Refrigeration and Air Conditioning
- Section IV.3 – HFC Emissions from Solvent Use
- Section IV.4 – HFC Emissions from Foams Manufacturing
- Section IV.5 – HFC Emissions from Aerosol Product Use
- Section IV.6 – HFC and PFC Emissions from Fire Protection
- Section IV.8 – HFC-23 Emissions from HCFC-22 Production
- Corresponding Appendices D-II, and J.

In addition to the above report, a prior U.S. EPA document published in 2004 also covers abatement costs of substitutes for ozone-depleting substances. While the figures are outdated, the methodology used may be informative: *Analysis of Costs to Abate International Ozone-Depleting Substance Substitute Emissions* (U.S. EPA, 2004).ⁱⁱ

Analysis of Equipment and Practices in the Reclamation Industry, Draft Report (U.S. EPA, 2010).ⁱⁱⁱ This draft report provides an overview of the reclamation industry in the United States.

Greenhouse Gas Performance Analysis for Commercial Buildings with Large Refrigeration and Air Conditioning Systems (ICF International, 2012).^{iv} This report proposes twelve refrigerant leak reduction measures (outlined pages 3-8) and a handful of energy conservation measures (outlined pages 13-14) for commercial refrigeration and cold storage systems. The report provides relative

costs of implementing the various leak reduction measures and energy conservation measures and provides the net cost savings and environmental impacts avoided through these practices (provided in charts and tables).

Technical Support Document: Analysis of the Economic Impact and Benefits of Final Revisions to the National Recycling and Emission Reduction Program (U.S. EPA, 2016).^v This report analyzes the costs and benefits of refrigerant servicing practices being proposed in a U.S. regulation. In Section 3.1.1.3 (page 45) of the report there is a description of unit costs and savings for leak inspections and repair activities based on U.S. median earnings for HVAC mechanics and installers. In addition, the document estimates costs and savings for the implementation of the proposed servicing practices by "do-it-yourself" technicians (found in Appendix E, page 117).

With respect to the HFC-23 byproduct control obligations, the United States would draw the attention of the Secretariat to the Parties approval in 2011 of the technology for Conversion by Chemical Reaction with Hydrogen and Carbon Dioxide. To date, we are aware of HFC-23 being handled at HCFC production facilities at the commercial scale using conventional destruction technology, but we believe the Secretariat should consider the full range of available technologies in helping inform the Executive Committee at its 78th meeting, and we want to draw attention to the conversion technology noted above that has been developed by Midwest Refrigerants. In contrast to destruction technology, this conversion technology allows for production of anhydrous hydrogen fluoride, with small amounts of anhydrous hydrogen chloride. These outputs can either be put back into the production cycle or sold as high purity chemicals. There are other possible products with commercial value that can also be produce in this process with commercial value that can help offset capital and operating costs of the technology. Operating costs of the technology are similar to a thermal oxidizer, and while capital costs may be somewhat higher, they will be offset by the sales of the products noted above. We request the Secretariat include information on this technology in documents being prepared for the 78th meeting as it relates both to byproduct control provisions of the amendment as well as demonstration projects, and further information can be found at <http://www.midwestrefrigerants.com/>.

The United States has identified several best practices and standards documents related to servicing that may be useful to the Fund Secretariat. These provide information on the proper installation and maintenance of refrigeration and air-conditioning equipment. As documented in the first article listed below, proper installation and maintenance practices can reduce refrigerant leakage and maintain a system's energy efficiency. The below list is just a sample of the many resources that are available.

The National Institute of Standards and Technology (2014) authored a report on the *Sensitivity Analysis of Installation Faults on Heat Pump Performance*. Of particular interest, sections 5.2.2 and 5.2.3 articulate and quantify the effects of heat pump sizing and duct leakage on HVAC equipment.^{vi}

"Smart Maintenance for Rooftop Units," *ASHRAE Journal* (Breuker et al. 2000).^{vii} This article provides the decrease in rooftop unit capacity and coefficient of performance resulting from various problems with a system that can be addressed by servicing (e.g., refrigerant leakage).

ENERGY STAR[®] *Program Requirements for Room Air Conditioners, Version 4.0* (U.S. EPA).^{viii} Section D of the Certification Criteria on page 7 of 11 of this document provides specific installation requirements for window air conditioners to minimize air leakage and thermal losses. We are also providing the Fund Secretariat with an Excel spreadsheet titled "ENERGY STAR Draft 1 Version 4.0 Room Air Conditioners Data Package.xlsx,". Tab 5 shows the additional cost of more energy efficient equipment that meets the criteria and the payback time for the consumer in annual energy

savings. Currently for room air conditioners, the initial purchase price of the more energy efficient appliance is higher than less efficient products in most cases. However, the payback period is only three to four years. For many ENERGY STAR products, there is little to no price increase. ENERGY STAR specifications are set so that if there is a cost differential at time of purchase, that cost is recovered through utility bill savings within the life of the product—generally between two and five years.

GreenChill Best Practices Guideline: Commercial Refrigeration Leak Prevention and Repairs and *GreenChill Best Practices Guideline: Ensuring Leak-Tight Installations of Commercial Refrigeration Equipment* (U.S. EPA).^{ix} These guides provide food retailers with information on best practices for reducing refrigerant leaks from commercial refrigeration systems. Reducing leaks saves equipment owners money on refrigerant and energy costs, and in the case of commercial refrigeration prevents food spoilage.

Installation and Maintenance Standards from numerous organizations are also available.

- ANSI/ASHRAE/ACCA Standard 180-2012: Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems^x
- ACCA Standard 4: Maintenance of Residential HVAC Systems^{xi}
- ACCA Standard 5: HVAC Quality Installation Specification^{xii}
- ACCA Standard 14: Quality Maintenance of Commercial Refrigeration Systems^{xiii}

Additionally, we would like to note that minimum energy conservation standards by the United States Department of Energy, combined with our highly-successful ENERGY STAR labeling program have resulted in significant benefits in the United States, both for consumers in lower energy bills and for the environment in fewer greenhouse gas emissions. Without a minimum energy efficiency standard for equipment, the manufacturers of refrigeration and air-conditioning manufacturers are likely to continue to produce least-cost, low-energy efficient equipment because there will continue to be a consumer market for it, even while they convert production lines to manufacture energy efficient units. We request that the Secretariat include consideration of the role that adequate and enforceable minimum energy efficiency standards can play in meeting the Parties' goals outlined in Decision XXVIII/2 in documents being prepared for the 78th meeting. Several resources are listed below that may be useful in preparing for the 78th meeting of the ExCom:

Energy Conservation Standard Technical Support Documents: The U.S. Department of Energy's Building Technology Office is responsible for establishing energy conservation standards for numerous appliances. When updating the minimum standard, the program develops detailed technical support documents evaluating the costs and benefits of the department's actions. These documents contain useful information on the various options for improving energy efficiency in a product, the incremental manufacturing production cost of meeting the new standard, and the payback period for consumers, among other topics. One example is listed below. If the Fund Secretariat finds this type of document useful, the United States will provide a more complete list of relevant Technical Support Documents.

Technical Support Document: Energy Efficiency Program for Consumer Products and Commercial and Industrial Equipment: Small, Large, and Very Large Commercial Package Air Conditioning and Heating Equipment (U.S. Department of Energy, 2015).^{xiv} Chapter 8 of this report provides cost and consumer payback estimates associated with increasing the efficiency standard. This includes the incremental manufacturer production costs, among other elements. Chapter 12, which measures the impacts on manufacturers may also be relevant.

Lessons Learned from Incenting Programs for Efficient Air Conditioners (U.S. Department of Energy, 2015).^{xv} As shown through this report there are a number of different ways to incentivize more energy efficient appliances. Of particular note, there are a variety of case studies described which cover many countries across the world.

Achievements of appliance energy efficiency standards and labelling programs (International Energy Agency, 2016).^{xvi} Based on evidence from a wide cross-section of countries with energy efficiency standards and labelling programs, this report finds that energy efficiency standards and labeling programs deliver energy and CO₂ reductions while also reducing total appliance costs as articulated in chapters 3 and 4.

Cost-Benefit of Improving the Efficiency of Room Air Conditioners in India (Lawrence Berkeley National Laboratory, 2016).^{xvii} In an evaluation of improving the efficiency of room-AC in India, this report found that, despite a small cost increase for manufacturing more energy efficient units requiring a modest increase in retail price, consumers are able to easily recoup the modest retail price increase through significant energy savings leading to short payback periods of 1.2 to 2.4 years.

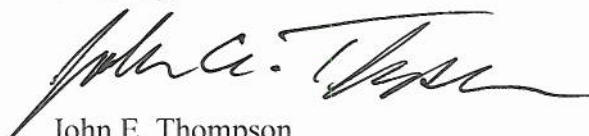
The Future of Air Conditioning for Buildings (U.S. Department of Energy, 2016).^{xviii} This report provides several useful data points. Section 4.2 shows that many of the low-GWP refrigerant alternatives under consideration can increase energy efficiency with only soft optimization, even in high ambient temperature conditions. Section 6 provides historical equipment cost information for the United States—showing decreasing inflation-adjusted costs even as minimum energy efficiency standards increased and the ODS phaseout took hold—and ways that equipment manufacturers are reducing transition costs.

“A Retrospective investigation of energy efficiency standards: policies may have accelerated long term declines in appliance costs,” *Environmental Research Letters* (Buskirk et al., 2014).^{xix} This article also finds decreasing long-term costs for certain refrigeration and air-conditioning equipment while energy efficiency standards became more stringent.

The Greenhouse Gas Performance Analysis for Commercial Buildings with Large Refrigeration and Air Conditioning Systems report (ICF 2012) that is referenced above also provides useful information on nine specific energy conservation measures for commercial refrigeration and cold storage, including estimates of costs of installation or implementation of practices, and the environmental and cost savings from these energy efficiency actions over the life of the equipment.

EPA Energy and Environment Guide to Action (U.S. EPA, 2015).^{xx} Starting on page 4-72, section 4.4 provides an overview of the benefits and best practices when implementing an appliance energy efficiency standard.

Sincerely,



John E. Thompson
Deputy Director
Office of Environmental Quality and
Transboundary Issues

- ⁱ Available at https://www3.epa.gov/climatechange/Downloads/EPAactivities/MAC_Report_2013.pdf and https://www3.epa.gov/climatechange/Downloads/EPAactivities/MAC_Report_2013-Appendixes.pdf
- ⁱⁱ Available at <https://www.epa.gov/sites/production/files/2015-08/documents/odssubstituteemissions.pdf>
- ⁱⁱⁱ Available at https://www.epa.gov/sites/production/files/2015-08/documents/analysis_of_equipment_and_practices_in_the_reclamation_industry.pdf
- ^{iv} Available at <https://www.arb.ca.gov/research/apr/past/09-306.pdf>
- ^v Available at <https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0453-0225>
- ^{vi} Available at <http://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.1848.pdf>
- ^{vii} Available at <http://alpinems.com/pdfs/Smarter-Maintenance.pdf>
- ^{viii} Available at <https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Version%204.0%20Room%20Air%20Conditioners%20Program%20Requirements.pdf>
- ^{ix} Available at <https://www.epa.gov/sites/production/files/documents/leakpreventionrepairguidelines.pdf>
- ^x Available at http://resilientenergymanagement.com/ASHRAE_180_0010.pdf
- ^{xi} Available at http://www.transductiontechnologies.com/uploads/2/7/5/4/27547719/acca_standard_4_quality-maintenance.pdf
- ^{xii} Available at <http://www.acca.org/communities/community-home/librarydocuments/viewdocument?DocumentKey=b1d2a39d-fda8-4af9-b8de-0ae579bfe24a>
- ^{xiii} Available at <http://www.acca.org/communities/community-home/librarydocuments/viewdocument?DocumentKey=12319f89-e8d1-401c-ba48-e7e5607c9511>
- ^{xiv} Available at <https://www.regulations.gov/document?D=EERE-2013-BT-STD-0007-0105>
- ^{xv} Available at <http://www.superefficient.org/Research/PublicationLibrary/2015/Lessons%20Learned%20From%20Incentive%20Programs%20for%20Efficient%20Air%20Conditioners>
- ^{xvi} Available at <http://www.superefficient.org/Research/PublicationLibrary/2016/IEA-4E-Achievements-of-national-EESL-programs-report-2016>
- ^{xvii} Available at <http://www.superefficient.org/Research/PublicationLibrary/2016/India%20AC%20Cost%20Benefit%20report%202016>
- ^{xviii} Available at <https://energy.gov/eere/buildings/downloads/future-air-conditioning-buildings-report>
- ^{xix} Available at <http://iopscience.iop.org/article/10.1088/1748-9326/9/11/114010/pdf>
- ^{xx} Available at https://www.epa.gov/sites/production/files/2015-09/documents/guide_action_chapter4.pdf