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**REVISED DESK STUDY FOR THE EVALUATION OF HCFC PHASE-OUT MANAGEMENT
PLAN PREPARATION ACTIVITIES TO ASSIST WITH THE IMPLEMENTATION OF THE
KIGALI AMENDMENT**

1. At its 82nd meeting, the Executive Committee considered the Desk study for the evaluation of HCFC phase-out management plan preparation activities to assist with the implementation of the Kigali Amendment¹ submitted by the Senior Monitoring and Evaluation Officer.
2. During the discussions, some members indicated that some questions in the terms of reference had not been answered fully. Specific examples included: the extent to which broader policies relating to incentives, co-funding modalities and approaches for inter-ministerial coordination had been considered during HCFC phase-out management plan (HPMP) preparation; the most useful activities during HPMP project preparation, including guidance on not-in-kind refrigeration technologies projects; how much consideration had been given to whether Multilateral Fund activities or processes could be related to those of other institutions; and whether data collected for project preparation had included the prices of HCFCs and their alternatives. One member also highlighted the lack of information in the desk study on how to ensure compliance with the rapidly approaching HFC-23 phase-down target. The Senior Monitoring and Evaluation Officer explained that some of the questions in the terms of reference had remained unanswered because the information was not available. Some members added that even though the report contained some gaps, the desk study provided a number of useful insights and suggestions that the Secretariat would be able to consider when developing draft guidelines for the preparation of HFC phase-down plans.
3. In light of the different opinions on whether the desk study should be revised and resubmitted to the 83rd meeting, and following further discussions, the Executive Committee took note that an extension of the desk study had been included in the monitoring and evaluation work programme for the year 2019.

¹ UNEP/OzL.Pro/ExCom/82/12

4. In response to concerns expressed by some members regarding incomplete answers to some questions in the terms of reference, the Senior Monitoring and Evaluation Officer has submitted to the 83rd meeting a revised desk study for the evaluation of HCFC phase-out management plan preparation activities to assist with the implementation of the Kigali Amendment, based on the desk study submitted to the 82nd meeting. Changes made to the document submitted to the 82nd meeting are shown in **bold** text below.

Background

5. In September 2007, the Ninetieth Meeting of the Parties to the Montreal Protocol agreed to accelerate the phase-out of the production and consumption of HCFCs through decision XIX/6. Subsequently, the Executive Committee approved, at its 54th meeting, the draft guidelines for the preparation of HCFC phase-out management plans (HPMPs) covering three aspects: timing and approach, policy issues related to HPMPs and a draft format for the HPMPs (decision 54/39).

6. The guidelines discussed the need to approve HPMPs early to meet the freeze in 2013 and the 10 per cent reduction from the HCFC baseline out in 2015. The main policy issue discussed was the need to establish an ODS import/export licensing system which also covered HCFCs. This would be a requirement for the approval of HPMP funding. The draft format for HPMPs requires a description of existing legislation, regulations and policy in place and how it operates. It also requires a description of the quota system, bans on imports of ODS-based equipment and ODS refrigerants in place or proposed, and any other Government initiatives related to HCFC phase out.

7. Furthermore, the Kigali Amendment to the Montreal Protocol, agreed by the Twenty-Eighth Meeting of the Parties (Kigali, 10-15 October 2016), will enter into force on 1 January, 2019.

8. Between the 55th and 58th meetings, the Executive Committee approved funding for 227 project preparation requests, which included the development of the overarching strategy and individual sector plans. As of the 80th meeting, the Executive Committee had approved stage I of HPMPs for 144 Article 5 countries and stage II for 30 countries.

9. At its 81st meeting, the Executive Committee approved the terms of reference for the desk study to evaluate the HPMP preparation activities (decision 81/6)² and the provisions included therein for the development of HCFC import/export licensing and quota systems and other relevant policies, which constituted the framework to support HCFC phase-out. The report would contain an analysis of the activities undertaken during HPMP preparation that had resulted in the establishment of licensing and quota systems to enable the monitoring of HCFC imports and exports, and other policies that supported compliance with the Montreal Protocol (e.g., data surveys, establishment of information management systems, establishment of industry and intergovernmental consultation mechanisms and preparation of initial plans.

Objective of the desk study

10. The objective of the desk study is to evaluate HPMP preparation activities for the development of HCFC import/export licensing and quota systems and other relevant policies in order to assess the number, type and value of these activities, and to draw out lessons to facilitate the implementation of the Kigali Amendment.

² The terms of reference are contained in Annex III to the present report.

11. The desk study examines how, during the preparation of HPMPs, the components identified in the guidelines for the preparation of HPMPs were implemented, taking into consideration the preparation of stages I and II of HPMPs that have been approved. The components evaluated are namely:

- (a) Assistance for policy and legislation;
- (b) Survey of HCFC use and analysis of data; and
- (c) Development and finalization of the HPMP, including consultations.

12. Since the Executive Committee specifically requested that the desk study focus on the development of HCFC import/export licensing and quota systems and other relevant policies during HPMP preparation, the desk study does not include a review of preparation of investment activities.

Methodology

13. Based on the terms of reference, a consultant analysed the existing documentation (i.e., progress reports, project completion reports, and project proposals) for a sample consisting of 29 low-volume consuming (LVC) and non-LVC countries. Annex I to the present document lists the countries evaluated.

14. The desk study was based on the progress reports for each HPMP preparation project and stage I of the HPMP that was submitted for approval; however, the detailed information required in the terms of reference was often not available in these documents.

Assistance for policy and legislation

Development of HCFC import/export licensing and quota systems

15. At its 54th meeting, the Executive Committee decided to adopt the guidelines for the preparation of stage I of HPMPs (decision 54/39),³ establishing *inter alia* that the HPMPs for countries with consumption only in the servicing sector should be consistent with the guidelines for the preparation of refrigerant management plans (RMPs)/RMP updates pursuant to decisions 31/48 and 35/57, and terminal phase-out management plans (TPMPs) pursuant to decision 45/54. Furthermore, the HPMPs of countries with manufacturing sectors using HCFCs should contain a national performance phase-out plan consistent with decision 38/65 and provide a starting point with annual reduction targets.

16. The guidelines also established that consideration should be given to providing funding for assistance to include HCFC control measures in legislation, regulations and licensing systems as part of the funding of HPMP preparation as necessary, and that confirmation of the implementation of the same should be required as a prerequisite for funding for the implementation of the HPMP.

17. Subsequently, at the 55th meeting, the Secretariat received a total of 144 requests for the preparation of HPMPs from bilateral and implementing agencies for 107 countries, including China, at a total level of requested funding of approximately US \$36.4 million. The Secretariat proposed a standard cost model to ensure equivalent funding for countries with similar characteristics, which included three main areas of cost: policy assistance for the HCFC licensing system, survey data collection and analysis, and strategy development and finalization.⁴

³ Based on document UNEP/OzL.Pro/ExCom/54/53.

⁴ Annex IV to document UNEP/OzL.Pro/ExCom/55/17.

18. Further to discussions on these submissions and their review by the Secretariat, the Executive Committee has since approved preparatory funding for HPMPs (decisions 55/13 and 55/14). At its 56th meeting the Executive Committee defined the elements of a cost structure for funding the preparation of an overall HPMP (in line with decision 54/39), comprising: assistance for policy and legislation to develop new or extend existing legislation regarding HCFCs, products containing HCFCs, quotas, and licences; survey of HCFC use and analysis of data; development and finalization of the HPMP including stage I to address the 2013 and 2015 control measures; and development of investment activities for the HCFC-consuming manufacturing sectors for stage I of an HPMP, if such activities were necessary (decision 56/16).

19. HPMP preparatory activities included specific funding for policy assistance including the development of HCFC licensing systems, which was used in most countries for legal consultants, and consultation meetings to develop rules, and information dissemination for enforcement. All the countries that received approval of an HPMP, developed a licensing and quota system for imports (and in some cases production and exports) of HCFCs.

20. To ensure that adequate measures would be undertaken at the national level, at its 63rd meeting, the Executive Committee decided to add a paragraph both to the template for draft Agreements and to the draft Agreements between Article 5 countries and the Executive Committee indicating that for all submissions from the 68th meeting onwards, confirmation had been received from the Government that an enforceable national system of licensing and quotas for HCFC imports and, where applicable, production and export controls were in place and that the system was capable of ensuring the country's compliance with the Montreal Protocol HCFC phase-out schedule for the duration of this agreement.

21. This decision was instrumental in ensuring that Article 5 countries prioritized the development of an operational licensing and quota system for imports of HCFCs during the preparatory stage of the HPMPs. While it cannot be concluded from the project reports to what extent the funding approved for the preparation of HPMPs directly contributed to the development of licencing systems, it is reported that it facilitated the process of consultation and awareness at the national level and provided resources for legal expertise. Most countries used HPMP preparatory funding to undertake major stakeholder consultation workshops with the participation of the private sector and key government bodies to explain the HCFC phase-out commitments and their national implications. By the time Article 5 countries completed the HPMP preparation and received funding approval for implementation of an HPMP, they had already developed a licensing and quotas system for the import of HCFCs.

22. While some countries encountered delays in adopting HCFC import/export licensing and quota systems, having it as a precondition for the approval of funds helped to expedite the process. No indication has been found in the reviewed information that the establishment of these systems suffered delays due to insufficient funding in the preparatory process. Delays are generally related to the time required to obtain approvals for regulatory measures and for consultation with stakeholders. Reasons for delays are contained in Annex II to the present document.

23. Nearly all the countries in the study had legislation, regulations and a licensing system in place at the time of submission of stage I of their HPMP except for: Egypt where importers are required valid permits starting in 1 June 2012 and Namibia where valid permits are required from 1 January 2011; Nigeria (the approval of the new comprehensive bill covering HCFCs was pending at the time of submission); and Tunisia (needs policy measures that contribute to curbing the growth in service consumption and eventually in reducing consumption from baseline levels). Several countries were planning to update/enhance their legislation and licensing system to make it more comprehensive. Any such changes require local governmental approval, which may take some time.

24. Regarding the quota system, all countries had submitted their HPMPs before 2013 when the first control (freeze) on HCFC consumption was to take place. Several countries (Albania, Bahrain, Bolivia, Brazil, Ghana, Mexico, Mongolia and Nepal) specifically reported that they have a quota system in place for HCFC and they use the issuance of licenses as a way to monitor HCFC imports.

25. In at least two regions, Economic Community of West African States (ECOWAS) with the assistance of the UNEP Compliance Assistance Programme (CAP), and the Gulf Cooperation Council for Arabian Gulf States (GCC), relevant Article 5 countries also developed during HPMP preparation harmonized ODS regulatory frameworks that served as a basis for developing local licensing and quotas systems. It cannot be concluded to what extent the funding provided under preparation of HPMPs influenced those regional processes, but it is clear that it influenced national policy development.

26. Activities undertaken to adapt and strengthen the legal and institutional framework and build technical capacity include awareness workshops addressed to stakeholders in the public sector, customs departments and environmental authorities.

27. Several countries proposed some form of incentive programmes. For example, Bolivia, Grenada, Maldives and Nepal proposed using tax incentives for import and use of non-HCFC-based refrigerants and equipment; while Mexico and Jordan respectively proposed taxes as disincentives for import of HCFC-based equipment and for use of HCFC refrigerant. Nine of the 29 countries evaluated proposed incentives for conversion (i.e., retrofits⁵) of existing HCFC-22-based equipment to zero-ODS and/or low-GWP refrigerants, five countries for recovery, recycling and reuse of refrigerants and others planned end-users incentives programmes to demonstrate equipment based on low-GWP alternatives. However, details on these programmes were generally vague in the preparatory stage, and very few countries included the incentive funding in their budget. Nine of the countries evaluated did not address the issue of incentives at all in their project documents.

Role of the national ozone unit (NOU)

28. In all Article 5 countries with an approved institutional strengthening project, the NOU took the lead role in developing the HPMP and ensured that the main stakeholders, particularly the government agencies such as Customs, were involved in the preparatory activities, such as the elaboration and enforcement of the licensing and quota system where applicable. Because of the previous experiences in developing legislation and regulations for CFC phase-out, training was not necessary. In some countries, the experts doing the data collection had discussions with the implementing agencies involved with the collection of information. In most countries the various associations, particularly those related to the refrigeration and air-conditioning manufacturing and servicing and foam manufacturing, were directly involved in the collection of data related to HCFC use.

29. NOUs have also played a central role with regard to regulations. In several countries the import permits are issued by the NOU or by an authority in the environmental department upon clearance by the NOU. Preparation of HPMPs was benefited by the existing infrastructure from the implementation of TPMPs and national phase-out plans (NPPs), which in some cases were still ongoing as the HPMPs were being prepared. Resources from those plans were used to increase awareness and undertake preliminary activities directed at starting control of HCFCs. Some of the project management unit (PMUs) from national plans still active at the time of preparation of HPMPs facilitated the process of reaching out to the private sector and assisted with the logistical arrangements of HPMP preparation.

⁵ Following decisions 72/17 and 73/34, several countries decided to propose other activities instead of retrofits.

30. In larger countries where the licensing system and the quota system are implemented by different departments in the government, the participation of the NOU was also critical to mobilize the respective bodies in the formulation and approval of these policies. Some of these countries requested additional funding for regulatory actions under stage I of the HPMP in order to continue the process of updating regulations for HCFC control.

Stakeholder participation

31. Stakeholders were involved in workshops that set the stage for data collection for the preparation of the HPMP.⁶ Stakeholders included Government, industry and commercial actors, implementing agencies, and professional associations. Every country discussed the draft HPMP at a final workshop before it was submitted to the Executive Committee. In several cases⁷, the progress report states that a stakeholders' meeting was held, although it is not clear whether the draft HPMP was discussed at a stakeholders meeting. The progress reports state that a stakeholder workshop was planned to finalize the HPMP. Some countries (e.g., Armenia), developed institutional frameworks indicating the role and responsibility of each actor.

32. Most countries have consulted and/or involved refrigeration and/or air-conditioning associations in the preparation of the HPMPs. The associations have been particularly helpful in the identification of HCFC users, especially SMEs that are scattered and difficult to find. An example in the foam sector has been the involvement of the systems houses (as suppliers of blowing agent and associated chemicals to SMEs) in the design, technology selection and delivery of assistance to a large number of beneficiaries.

33. Issues with the division of work and the coordination between the lead agency and the cooperating agency are not commonly reported during the implementation of projects. However, there were instances where cooperating agencies submitted their components of HPMPs without consulting the lead agency or vice versa. These instances were more common at the initial stages of the HPMPs and it is perceived that coordination among agencies has continuously improved.

Other issues and relevant policies

34. It does not appear that there was any issue of inadequate funding related to the development of HCFC control measures in legislation, regulations and licensing systems. None of the documents studied indicated that there were any concerns related to the coordination of activities between the lead agency and cooperating agencies where more than one agency was involved.

35. During the preparatory process, in addition to developing the licensing and quota systems, Article 5 countries identified other relevant policies for consideration during the implementation of their HPMPs, namely: amending existing regulations for controlling use, imports, manufacturing, assembly and installation of products containing HCFCs; licensing re-export of HCFCs; prohibiting the establishment and expansion of new HCFC-based manufacturing capacities, establishing an incentive system for promoting the use of alternatives to HCFCs; the certification of technicians for handling HCFCs; prohibiting the manufacturing, assembly and import of HCFC-based air-conditioners once local manufacturers have been converted; prohibiting imports of pre-blended polyols with HCFCs once local polyurethane (PU) foam manufacturers have been converted to non-HCFC formulations; standards and

⁶ Exceptions appear to be Albania, Grenada, Jordan, Namibia, Senegal, South Africa, Thailand, the former Yugoslav Republic of Macedonia and Tunisia as there was no reference to initial stakeholder consultations in their HPMPs, or in the progress reports submitted by the lead agency.

⁷ Georgia, Jordan, Kuwait, Maldives, Mexico, Namibia, Nepal, Nigeria, Panama, Senegal, South Africa, the former Yugoslav Republic of Macedonia, and Tunisia.

labelling programmes; instituting an enabling environment for the safe use of hydrocarbons and other natural refrigerants; issues surrounding non-refillable HCFC containers; mandatory leak detection and containment of all controlled substances used in refrigeration and air-conditioning systems; training in and maintenance of a log book to record all leaks, repairs and top ups; making the recovery and recycling of refrigerants mandatory; and mandatory reporting of recovered/recycled and reused refrigerant and stocks of unusable refrigerant.

36. At its 70th meeting, the Executive Committee approved the guidelines for the preparation of stage II of the HPMPs. Given the progress achieved by Article 5 countries in establishing their licensing and quotas systems and the existing infrastructure operating under stage I of the HPMPs, the updated guidelines for the preparation of stage II did not include funding for policy assistance and included reduced funding for updating survey and strategy finalization.

37. **At the time of the HPMP preparation for stage I, no requirements were made to include co-financing in the programmes. However, the Executive Committee decided to request the implementing agencies to explore the possibilities to seek synergies and possibilities of co-financing.⁸ In the case of Bahrain, Egypt, and Kuwait, UNIDO had done a detailed study as part of the HPMP, which suggested options for obtaining subsidized loans during implementation. This was discussed in the HPMP, however, it appears that no countries took this up at the national level. Co-financing was, however, provided for the implementation of some investment projects when the value of the conversions was estimated above the cost-effectiveness thresholds. In addition, in order to ensure complete phase-out of the HCFCs in certain sectors, non-eligible enterprises were informed about the phase-out plans at the preparation stage to coordinate the phase-out in parallel with the eligible enterprises that received funding (e.g., the PU foam sector in South Africa). The HPMPs for India and Malaysia mentioned that substantial counterpart funding was provided by enterprises converting to non-HCFC-141b technologies, while in Nigeria there was substantial counterpart funding from the beneficiary in the manufacturing of hydrocarbon to be used as a refrigerant. Several countries mentioned in their documents that they were seeking co-financing for some of the activities planned.**

Survey of HCFC use and analysis of data

38. The information collected during the surveys conducted for the preparation of TPMPs or NPPs were useful to some extent in facilitating HPMP preparation because in the majority of countries the specific applications where HCFC-22 was used (mostly residential and commercial air-conditioning followed by commercial refrigeration systems) differed from those where CFC-12 and CFC-11 had been used in the past (domestic and stand-alone commercial refrigeration, and mobile air-conditioners). However, the relationships created and maintained with refrigeration associations, training institutes and customs departments facilitated the collection of data.

39. Most of the countries collected comprehensive data at the national level through “top down” surveys of importers and distributors, and “bottom up” surveys at the enterprise level. For example, Egypt concentrated on identifying HCFC-141b consumption, both pure and in premixed polyols. The initial data at the enterprise level for manufacturing and other users (i.e., manufacturers, importers, distributors and systems houses) were initially collected through surveys by experts in foam and refrigeration. For the refrigeration and air-conditioning (RAC) servicing sector data was collected from the known service workshops. The data was cross-checked against national level consumption data for bulk HCFCs, collected

⁸ Decision 54/39(h).

through the licensing system; similarly, in Grenada the survey began with large consumers and then focused on the smaller consuming facilities by parish.

40. The surveys of HCFC use and the summation of use data was done by several entities in the countries, such as the NOU, industry associations, refrigeration servicing associations, specialized servicing enterprises, refrigeration experts and consultants, and staff from national electricity enterprises. In Ghana for example, the RAC Association carried out a door-to-door survey through its members. The data collected was validated using the HCFC import data compiled annually and the data reported by the chemical importers through the permit system.

41. No information was available on whether sufficient training was provided to local consultants, as well as assistance on HCFC control and quota issues, implementation activities and guidance on Montreal Protocol issues. However, it has been noticed during the implementation of the HPMPs, and in particular as a result of the independent verification of HCFC consumption required for the release of funding tranches, that initial estimations and recording of HCFC consumption during the baseline years were not always accurate and that the licensing and quotas systems had deficiencies in their design (e.g., licenses with a duration of longer than a year) or in their implementation (e.g., incorrect use of codes for import, or use of the same codes for different substances). These issues have been gradually identified and corrected by the Governments.

42. All HPMPs provided an up-to-date analysis of the levels of consumption of HCFCs in the country as well as distribution among the consumption sectors based on comprehensive surveys undertaken in the country valid at least up until 2011. The surveys provided the basis for starting points for aggregate reduction in HCFC consumption agreed by the relevant governments. In a number of cases, these surveys were used to adjust Article 7 data and subsequently countries' baselines.

43. Enterprise-level data surveys identified the types and quantities of HCFCs used by various manufacturers and end-users, the types of products manufactured with HCFCs, trends in their use and factors influencing such trends. This included the foam sector and the RAC manufacturing and servicing sectors. The collated survey data was compared against official data available (i.e., licenses issued, imports reported and customs data).

44. **Most countries in the sample provided the prices of HCFCs and their alternatives at the time of HPMP preparation, except for Egypt, India, Lebanon, Malaysia, Panama, the Pacific Island countries and Tunisia. However, the HPMP for Egypt stated that the prices were being reported annually to the MLF in the country programme (CP) data report, while the HPMPs for India and Malaysia indicated that the prices had been collected during the surveys on ODS alternatives. There is no systematic approach however for tracking the prices of HCFC and their alternatives. The CP data report includes prices of ODS alternatives on a voluntary basis, while prices were required only in the preparatory activities for investment projects to calculate incremental operating costs, which were not always consistent with those reported under the CP data reports. Therefore, at its 79th meeting, the Committee requested the Secretariat “to include in the “Overview of issues identified during project review” document issued at each meeting a summary of the prices of the controlled substances and the alternatives to be phased in, as communicated by enterprises requesting funding in any new project proposals, including clarification of any differences between those and the prices reported in the CP data reports” (decision 79/4(c)).**

Development and finalization of the HPMP including consultations.

45. At the time of approval of funding it was expected that most HPMPs would be submitted within 12 months of approval of preparatory funding. Implementing agencies mentioned in their progress reports

that 12 months was not adequate, due to reasons such as delays in signing contracts/agreements between the Governments and the agencies; delays in contracting experts; difficulty in obtaining survey data from the field; change of staff in the NOU; and Government procedural.

46. Engagement from the HCFC user sectors and other stakeholders to implement the agreed overarching strategy was ensured due to an extensive consultation process done during HPMP preparation. There were consultations with the NOU and relevant stakeholders (e.g., the industry and trade associations) for the identification of key inputs for the preparation of the HPMP. It is not mentioned in the documents whether specific terms of references were developed, but each group worked on a precise aspect of the development of the HPMP. In the case of countries which used HCFCs in the foam and refrigeration manufacturing sectors, projects were developed and presented within the HPMP. The projects were prepared with the close collaboration of the relevant stakeholders and agreed to by the NOU.

47. Most of the HPMPs had to undergo a process of consultation with key stakeholders. In large countries the strategy was agreed with the most important stakeholders and submitted to formal processes of public consultation to ensure formal national endorsement. This made it very difficult to undertake changes based on feedback from the Executive Committee, as some of those changes would have to undergo the same process of national endorsement, if applied.

48. **All HPMPs in the desk study, described the extent to which the NOU interacted with other Ministries and governmental departments, during the development of the HPMPs. The Ministries were, *inter alia*, the equivalents of Customs, Finance, Education, Industry, Trade, Legal and Environment (when then NOU was situated in another Ministry). However, coordination with other departments, such as those related to energy efficiency policies, was not fully developed.**

49. **The MLF's activities and processes have so far been focused on the phase-out of ODS. Over the years, and with instructions from the Meetings of the Parties, the MLF has developed guidelines and criteria for funding projects to phase out ODS. In that respect, its activities and processes are singularly focused. Other multilateral funding institutions, such as the Global Environment Facility (GEF) provides funding for the phase-out of ODS phase out in countries with economies in transition.**

Lessons to facilitate the implementation of the Kigali Amendment

50. Starting 1 January 2019, the Kigali Amendment will enter into force. The Amendment categories Article 5 countries into two groups with different phase-down target dates. Group 1 of these countries, including the majority of Article 5 countries, will freeze the use of HFCs by 2024, while Group 2,⁹ will freeze the use of HFCs by 2028.

51. The Thirtieth Meeting of the Parties decided that in order to allow Article 5 parties to report actual HFC baseline data, requested the Implementation Committee and the Meeting of the Parties to defer, for each year of the applicable baseline period, consideration of the status of the reporting of HFC baseline data under Article 7 until nine months after the end of each baseline year as applicable to the group of Article 5 parties in question (decision XXX/11).

52. The aspects that should be different in implementing preparatory activities for HFC phase-down preparation as compared to HPMPs are:

- (a) As of 2018, the Harmonized System customs code specific to HFCs and their blends had

⁹ Bahrain, India, Iraq, Kuwait, Oman, Pakistan, Qatar, Saudi Arabia, the Islamic Republic of Iran and the United Arab Emirates.

only been provisionally adopted; the Harmonized System Committee is expected to consider those codes at its sixty-third meeting, in March 2019, and could be approved by the World Customs Organization Council, in June 2019, in which case the harmonized system codes would enter into force on 1 January 2022.¹⁰ In this situation, enforcement of a control on a specific HFC could be difficult. Given that the Harmonized System of customs codes has not yet been formally adopted and would enter into force at the earliest on 1 January 2022, countries will need to think of establishing, on a temporary basis, a reliable system to record imports of HFCs. Such a temporary system could be based on the provisionally adopted codes, noting that the Harmonized System codes had not yet been formally adopted. Most countries are currently implementing stage I or stage II of their HPMPs (some of them are currently implementing both at the same time), which include budgets for monitoring and implementation. This available infrastructure and the available resources could help facilitate the additional work required for the preparation of HFC phase-down plans, provided that the primary objective of these resources is maintained for compliance with HCFC control measures and implementation of HCFC phase-out activities;

- (b) At the time of preparation of stage I of HPMPs, HCFCs had already been controlled substances and countries had been reporting consumption and production data for many years. Obligations such as having a licensing system in line with Article 4B of the Montreal Protocol applied to HCFCs. In contrast, HFCs will become controlled substances under the Montreal Protocol only by 1 January 2019, and although in many cases importers and user sectors are the same, a systematic data collection and reporting on this group of substances has not taken place yet, except for the one-time exercise of the survey of ODS alternatives. The experience of allocating funding for policy development during the preparation of stage I provided positive results, and although no funds were approved for this purpose for the preparation of stage II of HPMPs, the preparation of the first HFC phase-down plans would be more similar to the preparation of stage I, and countries could benefit from starting formal recording and control of HFC influx as soon as possible;
- (c) A solid basis of licensing and quota systems for imports, and when applicable, exports and production of HCFCs is already in place. This will potentially facilitate the process of establishing licensing systems and other control measures related to HFCs as the overall regulatory framework is already established;
- (d) Given the experience gained in ODS regulatory frameworks, and the demonstration that some regulatory measures beyond licensing and quota systems have an impact on the influx of controlled substances, during the preparatory process of HFC phase-down plans, Article 5 countries could give due consideration to establishing additional regulatory measures that would assist them in the implementation of their plans (e.g., recording and possibly licensing of imports of HFC-based equipment, ban on non-refillable cylinders, ban on intentional venting of refrigerants for the cases in which a recovery and reclamation project will be included in the HFC phase-down plan);
- (e) Stage I of HPMPs were formulated for most countries between the 55th and the 68th meetings, so the HCFC consumption surveys were done between 2009 and 2012 (between four years and one year before the first control measure). In many cases the data collected in the surveys coincided with at least one base year. Starting points for agreed reductions on consumption were based on estimated future baselines, which were later

¹⁰ UNEP/OzL.Pro.30/INF/7 and MOP30-L1.

adjusted as countries reported consumption data under Article 7 of the Protocol. Considering that under the Kigali Amendment more than 30 Article 5 group 1 countries could request preparatory funding for HFC phase-down plans in 2019 (5 years before the first control measure), the HFC consumption baselines may be more challenging to estimate. Additional efforts may be required in the collection of consumption data to have a better understanding of the behaviour of HFC consumption (e.g., estimate data from a larger number of years). Therefore, enough time should be given for all influencing factors to be taken into account and successfully implemented in order to prepare the phase-down of HFCs;

- (f) In several countries it has been found over time that the estimated HCFC baselines for compliance were not accurate due to different reasons such as large stockpiles or lack of knowledge about the real demand for HCFCs in the user sectors. In consequence, starting points had to be reviewed during the implementation of HPMPs. Therefore, to prevent major readjustment of the estimated consumption data, a review of the historical consumption of CFCs and HCFCs, together with an analyse of key socio-economic parameters of the countries (e.g., distribution of the population in urban and rural areas; location of economic activities demanding refrigeration and air conditioning equipment; population connected to the electricity grid) could be undertaken during the preparatory phases for HFC phase-down;
- (g) While the majority of HCFC was concentrated in HCFC-22 in every country, and to a lesser extent HCFC-141b and HCFC-142b, mainly used in the foam and refrigeration and air-conditioning sectors, HFCs, on the other end, are found in a diversified selection of pure chemicals and blends, which are used in all sectors. This difference and variety needs to be taken into account during the preparatory activities for the implementation of the Kigali Amendment;
- (h) Control measures for HFCs are determined in CO₂ equivalent tonnes, which is a different metric than the ODP factor used for all other groups of controlled substances. This requires additional analysis and adaptation on the part of local institutions. A larger variety of substances and the fact that many of them are blends would also represent additional complexities for the collection and recording of data;
- (i) Stakeholders' participation has proven effective to provide the required information from the end-users and the industry's point of view. Including the stakeholders in the process is also an efficient way of providing them with a sense of ownership of these projects and is a great awareness-raising mechanism. This inclusive approach should be maintained for the implementation of the Kigali agreement; and
- (j) Activities in the refrigeration servicing sector will have synergies between HCFC phase-out and HFC phase-down, as many of those activities (e.g., training of technicians, recovery and reclamation of refrigerant, development of standards for the installation and operation of low-GWP equipment) have an impact on all refrigerants and alternatives use in the countries. Therefore, the preparatory funding for HFC phase-down plans must give due consideration to the existing activities already being implemented in the sector under HCFC phase-out.

53. An issue that is already being faced by countries in their phase-out of HCFC activities is technically proven, commercially available, reasonably priced technologies using zero-ODP, low-GWP, energy-efficient technologies. For example, while R-290 is one refrigerant that can be used for air

conditioners, there are limitations to the quantity of refrigerant that can be charged into the system because of its flammability. Alternatives to HFC for medium-range and large refrigeration and air-conditioning systems are not easy to come by and they are still very expensive or have other limitations such as safety issues in using ammonia as a refrigerant, or high-pressure carbon dioxide systems.

54. HFC-23 is a by-product of the production process of HCFC-22 and is also consumed in a limited number of applications (low-temperature refrigeration and as a fire extinguisher).¹¹ The Kigali Amendment includes obligations to both the reporting and control of by-product emissions and the consumption of HFC-23. Measures to control HFC-23 by-product emissions targets the manufacturing of HCFC-22 and not the HPMP preparation projects. At the 79th meeting, the Secretariat presented the document entitled “key aspects related to HFC-23 by-product control technologies (decision 78/5)”, which addresses this issue in details.¹² In the event of any consumption of HFC-23 by Article 5 countries, it should be addressed in their respective HFC phase-down plans, and the preparatory activities would need to consider such consumption.

Suggestion to move forward

55. Instead of a second phase of the present desk study, the Secretariat should be requested to prepare guidelines for the preparation of HFC phase-down plans following a similar approach to that used for HCFC phase-out, and taking into consideration the lessons learned from the desk study.

Recommendation

56. The Executive Committee may wish:

- (a) To take note of the desk study for the evaluation of the HCFC phase-out management plan preparation activities to assist with the implementation of the Kigali Amendment contained in document UNEP/OzL.Pro/ExCom/83/8;
- (b) To invite the bilateral and implementing agencies to apply, where appropriate, the findings and recommendations of the evaluation; and
- (c) To request the Secretariat to prepare guidelines for the preparation of HFC phase-down plans following a similar approach to that used for HCFC phase-out, and taking into consideration the lessons learned from the desk study.

¹¹ Information on HFC consumption was made available in surveys of ODS alternatives conducted in 119 Article 5 countries in response to paragraph 4 of decision XXVI/9, 22 of which were submitted to the 80th meeting.

¹² UNEP/OzL.Pro/ExCom/79/48.

Annex I

LIST OF COUNTRIES EVALUATED AND DELAYS

Regions	Countries	LVC/Non-LVC	Implementing agencies	Project Code	Approved	Date HPMP Approved (Meeting)	Months
Africa	Burkina Faso	LVC	UNEP/UNIDO	BKF/PHA/55/PRP/25	July 2008	Dec 2010 (62)	29
	Egypt	Non-LVC	UNDP/UNIDO/UNEP	EGY/PHA/55/PRP/96	July 2008	Nov 2011(65)	40
	Ghana	LVC	UNDP	GHA/PHA/55/PRP/27	July 2008	July 2010 (61)	24
	Namibia	LVC	Germany	NAM/PHA/55/PRP/14	July 2008	Apr 2011 (63)	33
	Nigeria	Non-LVC	UNIDO/UNDP	NIR/PHA/55/PRP/119 NIR/PHA/56/PRP/121 NIR/PHA/56/PRP/120	July 2008 Nov 2008 Nov 2008	Dec 2010 (62) Dec 2010 Dec2010	29
	Senegal	LVC	UNIDO/UNEP	SEN/PHA/55/PRP/26	July 2008	Nov 2011 (65)	40
	South Africa	Non-LVC	UNIDO	SOA/PHA/55/PRP/01	July 2008	Jul 2012 (67)	48
	Tunisia	Non-LVC	UNIDO/France	TUN/PHA/55/PRP/48	July 2008	May 2014 (72)	70
Asia-Pacific	India (Overarching Strategy)	Non-LVC	Germany/UNDP/UNEP/UNIDO	IND/PHA/56/PRP/426 IND/PHA/56/PRP/428 IND/PHA/56/PRP/429	Nov 2008 Nov 2008 Nov 2008	Apr 2012 (66)	41
	Malaysia	Non-LVC	UNDP	MAL/PHA/55/PRP/161	July 2008	Nov 2011 (65)	40
	Maldives	LVC	UNEP/UNDP	MDV/PHA/55/PRP/16	July 2008	Apr 2010 (60)	21
	Mongolia	LVC	Japan/UNEP	MON/PHA/55/PRP/14	July 2008	Apr 2011 (63)	33
	Nepal	LVC	UNEP/UNDP	NEP/PHA/55/PRP/23	July 2008	Dec 2010 (62) Approved in principle till signing of Copenhagen. Reapproved Nov 2011 (65)	29/40
	Thailand	Non-LVC	World Bank/Japan	THA/PHA/55/PRP/151	July 2008	Dec 2012 (68)	53
Eastern Europe	Albania	LVC	UNIDO/UNEP	ALB/PHA/55/PRP/17 ALB/PHA/57/PRP/18	July 2008 Mar 2010	July 2011 (64) July 2011	36
	Armenia	LVC	UNDP/UNEP	ARM/PHA/55/PRP/03	July 2008	Dec 2010 (62)	29
	Georgia	LVC	UNDP	GEO/PHA/55/PRP/26	July 2008	Apr 2011 (63)	33
	The Former Yugoslav Republic of Macedonia	Non-LVC	UNIDO	MDN/PHA/55/PRP/25	July 2008	Apr 2010 (60)	21

Regions	Countries	LVC/Non-LVC	Implementing agencies	Project Code	Approved	Date HPMP Approved (Meeting)	Months
Latin America and Caribbean	Bolivia, (Plurinational state of)	LVC	Germany/UNDP/UNIDO/Italy	BOL/PHA/55/PRP/31	July 2008	Jul 2011 (64)	36
	Brazil	Non-LVC	Germany/UNDP/UNIDO	BRA/PHA/55/PRP/282 BRA/PHA/55/PRP/283	July 2008 July 2008	Jul 2011 (64) Jul 2011	36
	Grenada	LVC	UNEP/UNIDO	GRN/PHA/55/PRP/13	July 2008	Dec 2010 (62)	29
	Mexico	Non-LVC	UNDP/UNIDO/ Germany/Italy	MEX/PHA/55/PRP/140 MEX/PHA/55/PRP/139	July 2008 July 2008	Jul 2011 (64) Jul 2011	36
	Panama	Non-LVC	UNDP	PAN/PHA/55/PRP/28	July 2008	Nov 2011 (65)	40
	Saint Lucia	LVC	UNEP/UNIDO	STL/PHA/55/PRP/13	July 2008	Jul 2011 (64)	36
Regional approach	PIC countries under one single project - Region ASP: Cook Islands, Kiribati, the Marshall Islands, the Federated States of Micronesia, Nauru, Niue, Palau, Samoa, the Solomon Islands, Tonga, Tuvalu and Vanuatu	LVC	UNEP	ASP/PHA/60/PRP/54	Apr 2010	Apr 2011	12
West Asia	Bahrain	LVC	UNEP/UNIDO	BAH/PHA/55/PRP/19 BAH/PHA/55/PRP/20	July 2008	Nov 2011 (65)	40
	Jordan	Non-LVC	UNIDO/World Bank	JOR/PHA/55/PRP/82	July 2008	Jul 2011 (64)	36
	Kuwait	Non-LVC	UNEP/UNIDO	KUW/PHA/55/PRP/14 KUW/PHA/55/PRP/13	July 2008	Apr 2012 (66)	45
	Lebanon	Non-LVC	UNDP	LEB/PHA/55/PRP/67	July 2008	Jul 2011 (64)	36

Annex II

REASONS FOR DELAY IN SUBMISSIONS OF HPMPs

Country	Reason for delay in submission of HPMP	Months
Albania	Delay in HCFC survey report. Delay in identifying local institution to prepare the country strategy and the HPMP	36
Armenia	HPMP was completed and submitted in advance of the planned August 2010 submission timeframe	29
Bahrain	Delay in the start-up of the project. Delay in completing survey	40
Bolivia, Plurinational state of	Due to change of National Ozone Officer (NOO) the original plan of submission had to be revised as the new NOO had to get to know all procedures. Furthermore, new consultants have been involved in the process of HPMP preparation, which is time consuming	36
Brazil	Data collection resulted in more challenging work than originally envisaged	36
Burkina Faso	Opted to wait for guidelines of HPMP preparation	29
Egypt	Inconsistencies in data reporting, in particular data on system houses were missing	40
Georgia	Delay due to the need for HCFC data verification at the HCFC importer/distributor and end-user levels	33
Ghana	No major delay described	24
Grenada	Due to uncertainties related to HCFC eligible costs by MLF and on the near CFC total phase out goal, the Government decided to stress efforts on TPMP implementation and substantive progress for HPMP preparation would be achieved in 2009-2010	29
India	Delay due to difficulty of putting together the proposal without proper HPMP guidelines. Delay in sector surveys and developing sector strategies	41
Jordan	Since investment project has been submitted and approved by the Committee, the Government is not in a hurry to finalize the HPMP as it is expected that through individual or sectoral projects country would be in compliance	36
Kuwait	The most important delay in Kuwait's HPMP is the change of NOO and the change of Head of the Environmental Protection Agency, which delayed several administrative and contracting steps. Also, the national survey was delayed	45
Lebanon	Overall schedule moved ahead as planned	36
Malaysia	Data collection and reconciliation took longer than expected	40
Maldives	Planned date of completion changed to December 2010	21
Mexico	The contractor for data collection faced difficulties in getting the required information from the enterprises. While the data collected for the manufacturing sector was reliable, additional activities were necessary to verify the consumption in the service sector	36
Mongolia	Delay in finalization of survey data	33
Namibia	Delay in completing draft	33
Nepal	Planned date of completion changed to December 2010. Approved in principle after 29 months until signing of Copenhagen Amendment reapproved after 40 months in November 2011 (65 th meeting)	29/40
Nigeria	The original completion date was only an estimate, which turned out to be impracticable, unrealistic and out of tune	29
Panama	Change in government in 2009 caused delays in the whole HPMP process	40
Saint Lucia	Due to uncertainties related to HCFC eligible costs by MF and on the near CFC total phase out goal, government decided to stress efforts on TPMP implementation and substantive progress for HPMP preparation would be achieved in 2009-2010.	36
Senegal	No reason provided in progress report	40
South Africa	Delays due to internal approval procedures of Government	48

Country	Reason for delay in submission of HPMP	Months
Thailand	Delay in starting the HPMP preparation because of uncertainty of whether other IAs would be involved in developing sector plans. HPMP was deferred in April 2012 by the Committee to its next meeting in July 2012 due to concern of donors of the proposed replacement technology	53
The Former Yugoslav Republic of Macedonia	The HPMP was submitted to the 59 th meeting, but deferred to the 60 th meeting.	21
Tunisia	Unable to establish a realistic date for completion of the survey and the HPMP due to political condition in the country.	70
Pacific Island Countries	No delay were reported	12

Annex III

TERMS OF REFERENCE FOR THE DESK STUDY FOR THE EVALUATION OF HCFC PHASE-OUT MANAGEMENT PLAN PREPARATION ACTIVITIES TO ASSIST WITH THE IMPLEMENTATION OF THE KIGALI AMENDMENT (DECISION 80/9(b))

Objective and scope

1. The objective of the desk study would be to evaluate HPMP preparation activities for the development of HCFC import/export licensing and quota systems and other relevant policies in order to assess the number, type and value of these activities, and to draw out lessons to facilitate the implementation of the Kigali Amendment.

2. The desk study will examine how, during the preparation of HPMPs, the assistance for policy and legislation, the survey of HCFC use and analysis of data and the development and finalization of the HPMP including consultations, were implemented, taking into consideration the preparation of stages I and II of HPMPs that have been approved. Since the Executive Committee had specifically requested that the desk study focus on the development of HCFC import/export licensing and quota systems and other relevant policies during HPMP preparation, the desk study will not include preparation of investment activities. The desk study will also identify the lessons learned during the preparatory stages I and II of the HPMPs that could facilitate the implementation of the Kigali Amendment.

Assistance for policy and legislation

3. What preparation activities were undertaken to adapt and strengthen the legal and institutional framework, and build technical capacity for an effective licensing and quota system and complementary regulations? How can HFC phase-down activities build on these experiences?

4. When countries undertook preparation activities, to what extent were broader policies considered in relation to incentives, co-funding modalities and approaches for inter-ministerial coordination?

5. What were the delays, constraints and difficulties or gaps in adopting legislation on HCFC import/export licensing and quota systems that could be related to the (or absence of) preparatory activities?

6. Were the main stakeholders in the elaboration and enforcement of the licensing and quota system involved in the preparatory activities? How was an effective communication and consultation among stakeholders ensured? Were there preparatory activities that aimed at improving coordination and collaboration among the stakeholders?

7. How was the National Ozone Unit (NOU) involved in the preparatory activities concerning the adoption, enforcement and reporting of the licensing and quota systems? What kind of training, if any, did National Ozone Officers (NOOs) and customs officers receive on HCFC licensing and quotas issues?

8. Was there training provided to national consultants, as well as assistance on HCFC control and quota issues, implementation activities and guidance on Montreal Protocol issues?

9. Were professional associations involved or consulted regarding the preparatory activities? Were they involved in capacity building activities (e.g., training and workshops)?

10. Where there any issues with the division of work and the co-ordination between the lead agency and the co-operating agency (if appropriate)?

11. What activities, during project preparation, were most useful to develop the HPMP, including guidance on not-in-kind projects, and to what extent were activities or processes undertaken by the MLF can be related to other institutions (e.g., Green Climate Fund and Global Environment Facility) considered during preparation?

12. Were the funds for HPMP preparation activities provided at the right time? Were there any issue or delays related to the provision of such funding? Were these funds used for other preparation activities than those specified for HPMP preparation?

Survey of HCFC use and analysis of data

13. Was the information collected during the surveys conducted for the preparation of terminal phase-out management plans (TPMPs) or national phase-out plans were used to facilitate the HPMP preparation?

14. How were the surveys organized in terms of funding, infrastructure, and data analysis?

15. Did data collection include prices of HCFCs and their alternatives, and the related environmental impacts considered?

16. What were the challenges in organizing these surveys?

17. How can they be improved to face the challenges of the Kigali Amendment?

Development and finalization of the HPMP

18. Was there a schedule for the finalization of HPMP established in cooperation with the NOU, the Government and other stakeholders?

19. Were there consultations with the Government and relevant stakeholders (e.g., the industry, trade associations and academia) for the identification of key inputs and terms of reference for the preparation of the HPMP?

20. Was there an identification of needs for the formulation of the individual project proposals?

21. Were there consultation with Government and relevant stakeholders on this issue.

Lessons learned

22. What lessons learned from the preparatory activities for the HPMP could be used for those related to the implementation of the Kigali Amendment? What were the challenges and shortcomings, successes and achievements of these activities?

23. What were the lessons learned from carrying out surveys on HCFCs?

24. What can be learned from the preparatory activities for HPMP relatively to funding for amending regulations, legislation and licensing systems to be applied for the preparation of the implementation of the Kigali Amendment?

Methodology

25. A consultant will be hired to undertake the desk study. The consultant will prepare a document analysing the information gathered from documents, discussions with various stakeholders and

questionnaires as appropriate. This document, highlighting the main findings and the recommendations, will be shared with the Secretariat and bilateral and IAs for comments, and presented to the 82nd meeting.
