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**DESK STUDY ON THE EVALUATION OF THE PREPARATORY PHASE OF THE PHASING
OUT OF HCFCs
(DECISIONS 68/9 AND 69/12)**

I. Executive Summary

1. This desk study is part of the 2013 monitoring and evaluation work programme of the Multilateral Fund¹ (MLF) and has the objective to evaluate how the guidelines for the preparation of HPMP have been used for the development of the stage I HPMPs, focusing on preparation process itself and the resulting HPMPs, in order to draw conclusions with a view to inform the Executive Committee in their decision making concerning the requirements for stage II HPMPs².

2. The study is based on the review of extensive Executive Committee documentation, about a sample of 15 countries selected from several regions; classified as low volume consuming countries (LVC) countries and non-LVC countries; with one or several HCFC consuming sectors; and assisted by one or several bilateral and/or implementing agencies. The countries selected were: Bolivia (Plurinational State of), Bosnia and Herzegovina, Brazil, Comoros (the), Cuba, Ghana, Haiti, Indonesia, Kenya, Maldives, Mongolia, Nigeria, Sudan (the), Thailand and Viet Nam. Among these, five cases (Ghana, Haiti, Indonesia, Maldives and Nigeria) have been analysed separately in order to provide complementary information to the main report. It is worth noting that while the analysis is based on the sample, whenever information is available reference is made to all countries with approved HPMP.

3. The study aims to cover the most important aspects of the preparation of stage I HPMPs taking into account the preparation process itself and the resulting HPMPs. It also reviewed the reasons for the delays in project preparation, the overarching strategy, main initiatives, policy and regulatory measures, and co-financing issues. The main findings are described below.

Delays in preparation of stage I HPMPs

4. The actual time for preparation of stage I HPMPs for the 15 selected countries ranged from 24 to 32 months. This was significantly higher than expected³, as compared to the time taken for the preparation of country programmes, RMPs and/or TPMPs. From this finding it may be concluded that countries that need to start preparation of their stage II HPMP in 2016 (6 LVCs and 17 non-LVCs) might already be under a tight schedule for its timely approval, although a recent study concludes that “the preparation of stage II should be easier to undertake”⁴.

5. The most important reasons for delay provided in progress reports were “data collection more challenging than originally envisaged”, “absence of HCFC policies and guidelines until the 60th meeting”, and “National Ozone Units (NOU) focused on CFC phase out completion prior to moving to HPMP issues”. While these are not likely to occur again as they are specific to the beginning of the HPMP preparation. The fact that the delays were more severe for smaller countries suggests that the preparation of stage II of the HPMPs would benefit from an increased and more focused technical assistance to countries with medium and low level HCFC consumption from bilateral and implementing agencies.

Issues identified during project review

6. The approval of 138 HPMPs took place between the 60th and the 69th meetings. During that period, twenty-two issues identified during HPMP related project review resulted in general policy decisions by the Executive Committee. Fifty per cent of those issues and decisions were related to extended commitments for HCFC phase-out and technology selection, which are and will continue to be

¹ Approved at the 68th meeting through decision 68/9.

² Terms of reference for the desk study of the evaluation of the preparatory phase for the phase-out of HCFCs. (UNEP/OzL.Pro/ExCom/69/13).

³ As per the “expected time for completion “included in the original design.

⁴ “Criteria for funding HCFC phase-out in the consumption sector adopted by decision 60/44” (document UNEP/OzL.Pro/ExCom/70/52).

interrelated given that earlier phase out commitments are likely to find fewer new technology developments.

Overarching strategy

7. One trend that appears evident in the overarching strategy of countries in the study is that an important number of them wanted to engage in more ambitious HCFC phase-out schedules than that proposed by the Montreal Protocol, since 6 out of 15 countries in the sample did just that. A similar trend seems to be present for all countries in general given that 44 out of 138 LVC countries (32 per cent) also adopted a more demanding phase out schedule than that of the Montreal Protocol.

8. Concerning the selection of HCFC alternatives all the countries in the sample mentioned low-global-warming potential (GWP) and environmentally friendly substances as their alternative of choice.

9. The challenges in the refrigeration and air –conditioning (RAC) servicing sector can be met with financial and technical assistance for a stepped up implementation since the phase-out strategy for the RAC servicing sector has been tested for many years. This will require updated and practical guidelines for technology selection, with the understanding that such guidelines would be used by the countries in the context of comprehensive programmes for training, demonstration, piloting and outreach.

Main initiatives

10. The main initiatives in the sample countries with several sectors concentrated around the foam and RAC manufacturing sector using HCFC-141b although out of thirteen investment initiatives five (38%) were solely directed to the RAC manufacturing sector using HCFC-22⁵; and 25 per cent of technology choices⁶ in the sample were for the adoption of HFC alternatives with an associated high impact on the climate. This is in spite of the countries' commitment and best efforts to adopt low-GWP and environmentally friendly alternatives. One reason could be the lack of lower GWP alternatives. Some non-LVC countries in the sample also initiated activities in the refrigeration and air-conditioning (RAC) servicing sector.

11. Concerning the non-investment components, all countries in the sample engaged in policy support, customs support and RAC servicing support programmes except for two non-LVC countries (Thailand and Viet Nam) where no activities were included for the RAC servicing sector. The HPMPs of LVC countries focused on what can be called the “first phase of the RAC servicing sector strategy” which concentrates on good servicing and containment practices and training of custom officers. Very little was oriented towards the “second phase of the RAC servicing sector strategy” which concentrates on technology change through retrofit, conversion or replacement, thus conveniently delaying the choice of alternative technology.

12. Some of these non-investment activities require a long time to be effective, e.g. regulations, or to have a significant impact, e.g. training, and in principle would entail an initial period of no return on investment or front-loading of activities and corresponding funding in order to produce results by a given

⁵ This is similar to the findings in the study UNEP/OzL.Pro/ExCom/70/52 “Criteria for funding HCFC phase-out in the consumption sector adopted by decision 60/44”: “The main activities included in stage I of the HPMPs of several non-LVC countries are related to reducing the consumption of HCFCs used in the manufacturing sector, mainly HCFC-141b used as a polyurethane foam blowing agent and, to a lesser extent, HCFC-22 used as a refrigerant in the manufacturing of refrigeration and air-conditioning equipment, and HCFC-22/HCFC-142b used in the production of extruded polystyrene foams.”

⁶ The percentage of ODP tonnes affected by these choices has not been calculated in this study

time. The viability of such front-loaded funding structure should be considered for the implementation of stage II HPMP.

Policy and regulations

13. All countries in the sample have prioritized the completion of their policy and regulatory framework with measures oriented to limiting the future growth of HCFC dependency⁷. Non-LVC countries have made it their second priority to support their overall HCFC phase-out strategy, while smaller countries continue to work on strengthening their licensing system with no attention for more far reaching measures to enable the use of low global warming alternatives, such as those oriented towards the support of energy efficiency, or the support of the safe use of natural refrigerants.

14. This would seem to suggest that policy assistance for smaller countries during stage II of the HPMPs should move towards measures that support energy efficiency, or facilitate and ensure safe use of natural alternatives, taking into account that such measures are part of a more complex array of initiatives covering standards, regulations and programmes. In addition this concerns many organizations such as energy, health, and work ministries, and fire-fighting departments, among others.

Co-financing issues

15. The majority of LVC countries in the sample have not been successful in identifying external co-funding opportunities for the optimization of the environmental benefits of their stage I HPMPs, in contrast with non-LVC countries. This may be due to the lack of the economies of scale that are characteristic of the Global Environment Facility (GEF) and other initiatives. There is however the possibility that a donor-driven initiative brokered through the highest levels of Multilateral Fund (MLF) and (GEF) authorities could engineer regional umbrella projects for the optimization of the environmental benefits of stage II HPMPs for LVC countries.

⁷ Which includes measures such as control of import and/or production of HCFC equipment, ban new installation and sales of HCFC equipment, ban new HCFC-based equipment or products manufacturing facilities or processes, limit new importers.

I. Introduction

1. In September 2007 the Parties to the Montreal Protocol at their nineteenth meeting agreed to accelerate the phase-out of the production and consumption of HCFCs through decision XIX/6. Subsequently, in April 2008, the Executive Committee at its 54th meeting approved the draft guidelines for the preparation of HCFC phase out management plans (HPMP) through decision 54/39.

2. Since their approval in April 2013, 138 countries have used the guidelines for the preparation of the first stage of their HPMPs. They covered the first two control measures (freeze in 2013 and 10 per cent reduction in HCFC consumption to take place in 2015) 40 countries⁸ may need to start preparing stage II HPMPs soon.

3. The Executive Committee at its 68th meeting approved the 2013 monitoring and evaluation work programme, containing, *inter alia*, the evaluation of the preparatory phase of phasing-out of HCFCs, through decision 68/9. Subsequently, at its 69th meeting, the Executive Committee approved the terms of reference for such evaluation through decision 69/12.

Objectives

4. The objective in this desk study is to evaluate how the guidelines for the preparation of HPMP have been used for the development of the stage I HPMPs, focusing on the preparation process itself and the resulting HPMPs, in order to draw conclusions with a view to inform the Executive Committee in their decision making concerning the requirements for stage II HPMPs.

Methodology

5. A sample of 15 countries was selected with a view to include LVCs and non-LVCs countries from several regions; some with one HCFC consuming sector only, some other with several sectors; as well as cases with projects assisted by either one or several implementing and bilateral agencies. The countries selected were: Bolivia (Plurinational State of), Bosnia and Herzegovina, Brazil, Comoros (the), Cuba, Ghana, Haiti, Indonesia, Kenya, Maldives, Mongolia, Nigeria, Sudan (the), Thailand and Viet Nam.

6. For the purpose of comparative analysis the countries were divided in three groups as follows:

- (a) Group A formed by non-LVC countries with several HCFC consuming sectors (Brazil, Indonesia, Nigeria, Thailand, and Viet Nam);
- (b) Group B formed by LVC countries with only one sector (Comoros (the), Haiti, Maldives, and Mongolia), and together with LVC countries with several sectors: Bolivia (Plurinational State of), Bosnia and Herzegovina; and
- (c) Group C with mid-volume consuming countries (both non-LVC and LVC) with one or several HCFC consuming sectors (Cuba, Ghana, Kenya)⁹, and Sudan (the).

⁸ Draft guidelines for funding the preparation of stage II of HCFC phase-out management plans, UNEP/OzL.Pro/ExCom/69/33 : “ ...it could be expected that funding for the preparation of stage II HPMPs be requested as follows:Prior to ... 1 January 2015 and no earlier than 12 months after the approval of their second to last tranche of the HPMP for the 23 countries with commitments to reduce their baseline consumption by 10 per cent,” ... and “Between 2013 and 2017 for the 17 non-LVC countries which committed to reduce HCFC consumption by more than 10 per cent of their baselines between 2015 and 2020” .

⁹ Ghana and Kenya were formerly classified as LVC but re-classified as non-LVC due to HCFC consumption above 360 metric tonnes.

7. Annex I of this document presents the main characteristics for selection of these countries.
8. The desk study was developed through the review of HPMP project proposals, HPMP progress reports, Executive Committee meeting reports and documents, Secretariat databases, and HPMP related policy papers and guidelines, including the “Draft guidelines for funding the preparation of stage II of the HPMPs” (UNEP/OzL.Pro/ExCom/69/33), “Draft guidelines for funding the preparation of stage II of HCFC phase-out management plans” (UNEP/OzL.Pro/ExCom/70/51), “Criteria for funding HCFC phase-out in the consumption sector adopted by decision 60/44” (UNEP/OzL.Pro/ExCom/70/52), and “Discussion paper on minimizing adverse climate impact of HCFC phase-out in the refrigeration servicing sector” (UNEP/OzL.Pro/ExCom/70/53), among others. This information was complemented with the feedback obtained through the review of the draft report by the Secretariat, and bilateral and implementing agencies.

II. Effectiveness of the use of the guidelines for preparation of stage I HPMP

9. The guidelines cover three aspects related to the preparation of the HPMPs: timing and approach, policy issues related to HPMPs and a draft format for the HPMPs, which are described below.

10. The timing and approach section of the guidelines discusses the desired timing to start HPMP preparations based on the historic times taken for preparation and implementation of previous phase-out plans. It also discusses the staged approach as the best option for HPMP implementation in view of the uncertainties that some countries may face with regards to alternative technologies due to their variation in key respects including availability, maturity, cost-effectiveness, energy efficiency, and other environmental considerations. The staged approach envisages the development of an overarching strategy that provides an overall direction and a series of sequential stages where specific action plans can be developed and implemented progressively thus allowing time for pending policy issues to be resolved.

11. The section on policy issues provides an overview of previous guidelines for the preparation of national or sector wise phase-out plans and their applicability to the development of HPMPs, the legal and regulatory framework needed for approval of funding for HPMPs implementation, the concept of starting point for aggregate consumption reduction, cost considerations for HCFC phase-out, climate change benefits and related technologies, sources of funding and financial incentives, and institutional arrangements. The guidelines also provide an indicative outline and contents for the HPMPs. This desk study will analyse the salient points of the application of these guidelines.

Delays in preparation of stage I HPMPs

12. The sample of 15 countries selected had a total of 44 HPMP project preparation approvals where the number of approvals depends on the number of agencies involved and on whether there are individual project preparations approved for sectors. The documents analysed show that the average expected time for completing¹⁰ these HPMPs was 12.14 months but the average actual time for completion was 26.60 months¹¹, with an average delay of 14.62 months or 120 per cent of the originally planned duration.

13. A similar analysis for Group A countries shows an average expected time for completion of 12.4 months and an average actual time for completion of 23.83 months, with an average delay of 11.82 months or 95 per cent of the originally planned duration. For Group B the expected time is 11.8 months, the actual time is 31.25 months and the delay is 19.24 months or 163 per cent, while for Group C the expected time is 12 months, the actual time is 31.53 months and the delay is 19.53 months or 163 per cent. The delay in Group A countries is significantly lower than in Groups B or C, which might

¹⁰ Expected time for completion as per original project design.

¹¹ The dates registered in the inventory were corrected with actual date of project preparation completion or date of approval of HPMP for countries with deferred submissions or delayed project preparation closure when applicable.

be explained by the fact that the former have much higher HCFC consumption usually associated with higher Gross Domestic Product (GDPs) and consequently Government infrastructures with more resources to put into international cooperation projects.

14. On the other hand, the average funds approved by the MLF for project preparation were quite similar US \$84,592, US \$79,667, and US \$69,097 for countries in group A, B and C respectively, which rules out any influence of funding level on project preparation outcome. This would support the idea that Multilateral Fund assistance for the preparation of Stage II of the HPMP would benefit from a greater focus on technical and institutional support for low and mid volume consuming countries which have the greatest delays in stage I. Table 1 below summarizes this information.

Table 1: Preparation of stage I of HPMP in desk study countries

Countries	Expected time to completion in months	Actual time to completion in months ¹² (1) (2)	Delay in months	Delay as % of original expected time	Average funding approved (US\$)
Group A (Non-LVC countries, several sectors)	12.40	23.83	11.82	95%	84,592
Group B (LVC countries)	12.01	31.53	19.52	163%	69,097
Group C (MVC countries)	11.67	31.03	19.03	163%	85,833

15. These results are different from those for the preparation of country programmes, refrigerant management plans (RMPs) and/or other terminal phase-out management plans (TPMP) which have typically taken over 15 months¹³. The cause may be that the majority of countries had the HCFC using sector surveyed for the first time and this sector is much more extended and complex than the CFC using sector; but this significant delay certainly calls for closer scrutiny. The countries (40) that need to start stage II of the HPMP in 2016 might already be under a tight schedule for its preparation. However this may be offset by an experience gained and the ground work done during the preparation of Stage I. Several reasons have been presented for this delay.

16. The document “Criteria for funding HCFC phase-out in the consumption sector adopted by decision 60/44”¹⁴ states “In comparison to stage I, it appears that preparation of stage II and subsequent stages of HPMPs would be easier to undertake considering that at the time of preparation of stage I HPMPs, there were no guidelines and/or criteria for funding HCFC phase-out. Indeed, there was a high level of uncertainty as the HCFC baselines for compliance were unknown, and no up-to-date and reliable data on HCFC consumption per sector was available. Also, in many cases the ODS licensing system in operation did not extend to control HCFC imports and exports. Furthermore, the availability of mature, cost-effective and energy-efficient alternatives to replace HCFCs in some applications was limited, and the engagement from stakeholders to phase out HCFCs on an accelerated schedule was also limited”. Presently, however, operational licencing systems are in place, HCFC consumption is phased-out in manufacturing sector, surveys have been or are being conducted, data reporting is more accurate the majority of countries are implementing activities in the servicing sector, additional support has been approved for PMU.

¹² The dates registered in the Inventory were corrected with actual date of project preparation completion or date of approval of HPMP for countries with delayed project preparation closure or deferred submissions when applicable.

¹³ UNEP/OzL.Pro/ExCom/54/53: Draft guidelines for the preparation of HCFC phase-out management plans.

¹⁴ UNEP/OzL.Pro/ExCom/70/52

17. The progress reports mention several reasons for the delays in HPMP project preparation:
- (a) Data collection more challenging than originally envisaged (22 per cent);
 - (b) Absence of HCFC policies and guidelines until the 60th Meeting (17 per cent);
 - (c) National Ozone Unit (NOU) focused on CFC phase-out completion prior to moving to HPMP issues (16 per cent);
 - (d) Delay in government internal procedures (14 per cent);
 - (e) Changes in government (11 per cent);
 - (f) Delay in recruitment of national experts (8 per cent);
 - (g) Political situation in the country (4 per cent);
 - (h) Security conditions (4 per cent); and
 - (i) Delay in identification of local institutions (3 per cent).

18. The three first reasons account for 55 per cent of the total and are circumstantial. They are therefore expected to be resolved before the preparation of stage II of the HPMPs. Similarly, national experts (f) and local institutions (i)), already identified may continue to be engaged during the preparation of stage II of HPMP and will not constitute a reason for delay.

19. Reasons d) and e), which account for 25 per cent of delays, are often beyond the control of implementing agencies and can cause inordinate delays in project implementation. Likewise are reasons g) and h). This allows to infer that countries could prepare stage II of HPMP faster than they did stage I since the reasons for delay more probable to occur again are those with less impact. This finding stresses the need to increase and focus the technical and institutional assistance for preparation of stage II of the HPMP.

Issues identified during preparation of stage I of HPMPs

20. Two countries in the desk study, Indonesia and Thailand, had their HPMP proposals deferred for two consecutive Executive Committee meetings. Indonesia was first submitted at the 62nd and approved at the 64th meeting only and Thailand was submitted at the 64th (June 2011) and approved at the 66th meeting (March 2012). These delays, (7 months for Indonesia and 9 months for Thailand) were very specific to these countries and were not factored in the calculation of project delays.

21. In both cases the most important issues under discussion were related to: the extended commitments for phasing-out HCFC and the selection of technologies (i.e. the high percentage of the baseline to be addressed by the project; the planned transition to HFC-410A rather than a lower-GWP alternative in the air-conditioner manufacturing sector; and the selection of HFC-245fa as one of the alternatives for HCFC-141b used in the foam sector).

22. Similarly, for all the 138 HPMPs approved between the 60th and the 69th meetings, there were a total of 22 issues identified during project review that required policy decisions. A list of these issues is presented in Annex IV of this document. Among the most important issues identified and discussed, seven were related to technology selection and 4 were related to extended commitments for HCFC phase out. Other issues discussed were sector related (2) and data related (2). Details of this categorization are included in Annex IV of this document.

23. As of the writing of this document, only two countries, Brazil and Ghana, have answered a questionnaire providing additional feedback on the preparation of stage I HPMP. Brazil for instance, reported that the preparation of stage I HPMP was delayed due to the complexity of the survey on HCFC use which involved many sectors and subsector and a great number of enterprises, as well as a comprehensive consultation and official approval process. Brazil also reported that the main challenge for stage I was to choose the strategy concerning HCFC alternatives given the short time frame and the need to avoid market distortions while for Ghana it was the difficulty in identifying all HCFC users and accurately determining the country's use of HCFCs, and to choose the type of interventions needed in terms of programmes and activities in order to achieve the projected phase-out targets.

24. Similarly Brazil envisages that the main challenge for stage II will be to select the sectors to be converted and the low-GWP alternatives, while for Ghana it will be to meet the objectives established in stage I in order to have the capacity to implement stage II. In this respect Brazil summarizes the minimum requirement for a smooth and timely preparation of stage II of the HPMP as follows: a) good guidelines, b) sufficient time and funding to prepare stage II HPMP, c) experts in the implementing and bilateral agencies, not just managers and d) economic and environmentally sound ODS alternatives. Ghana, on the other hand reports that since the original funds requested for implementation of stage I were reduced during the approval process, this has created restraints for implementing the devised interventions, hence an upward revision of the funding levels would ease the pressure on the implementation of activities.

Overarching strategy

Accelerated phase out

25. One of the most important elements of the overarching strategy for HCFC phase-out is the actual phase-out schedule the country will select. In this respect document UNEP/OzL.Pro/ExCom/69/33 provides a summary of actual phase-out schedules in the 138 HPMPs approved by the Executive Committee to date of which 86 have been for LVC countries and 52 for non-LVC countries.

26. Among the LVC countries, 6 have undertaken to reduce 10 per cent of HCFC consumption by 2015, 71 have chosen to pursue 35 per cent reduction by 2020 and 9 have committed to total phase-out ahead of the Montreal Protocol schedule. Concerning the non-LVC countries, 17 have engaged to achieve 10 per cent reduction by 2015 and 35 have agreed to more than 10 per cent reduction beyond 2015. Tables 2 and 3 summarize these results including the corresponding details for the countries included in the desk study. On closer examination, the countries in the sample embarking in phase-out of more than 10 per cent beyond 2015 are still within the boundaries of the 2020 35 per cent reduction under the Montreal Protocol. Table 2 and 3 summarize these results.

Table 2: Phase-out schedules in approved HPMPs

Category	HPMPs	Reduction schedule	Number of countries in total	Number of countries in desk study	Countries in desk study
LVCs	86	10% by 2015	6	0	None
		35% by 2020	71	6	Bolivia (Plurinational State of), Bosnia and Herzegovina, Comoros (the), Cuba, Haiti, Mongolia
		Total advanced phase-out	9	1	Maldives (100% by 2020)
Non-LVCs	52	10% by 2015	17	3	Brazil, Nigeria, Viet Nam
		More than 10% beyond 2015	35	5	Ghana, Indonesia, Kenya, , Sudan (the), Thailand,
Total	138		138	15	

Table 3: Phase-out schedules for non-LVC countries in the desk study agreeing to more than 10 per cent reduction beyond 2015

Country	Sector	Target year	Agreed reduction
Ghana	Non-LVC, One Sector	2020	35%
Indonesia	Non-LVC, Several sectors	2018	20%
Kenya	Non-LVC, One Sector	2017	21.1%
Sudan (the)	Non-LVC, Several sectors	2017	30%
Thailand	Non-LVC, Several sectors	2018	15%

27. Six out of 15 countries submitted to a more ambitious HCFC phase-out schedules than that proposed by the Montreal Protocol. A similar trend seems to be present for all countries given that 44 out of 138 LVC countries (32 per cent) and the 35 out of 53 (67 per cent) of non-LVC countries also adopted a more demanding phase out schedule than that of the Montreal Protocol.

28. This element of the strategy entails many other decisions such as the case of Indonesia that sets out priorities for applications and subsectors where mature technologies are available. The complete phase-out is targeted at sub-sector level to avoid market distortion and to facilitate clear regulation, voluntary compliance and effective enforcement. HCFC-141b is prioritized for phase-out to the extent it is implementable in a cost-effective manner. In addition, selecting financially sound and viable enterprises with good technical and managerial capacity and relatively higher consumption was also prioritized to ensure cost-effectiveness and maximum impact, as reported in the corresponding case study. These details will not be discussed in this document.

29. Another important element of the overarching strategy is the overall selection of HCFC alternatives. In this respect, all the countries in the study mentioned low-GWP and environmentally friendly substances as their HCFC alternative of choice. Nevertheless, among the eight countries in the desk study with approved sector phase-out plans, six had to choose less than ideal alternative technologies¹⁵ for the manufacturing sector (HFC-410A for air-conditioning, HFC-245fa for foam) for the lack of a more environmentally safe, sustainable and commercially available alternative. Both elements of the strategy are interrelated in the sense that new HCFC alternative technologies take time to be developed, tested and become commercially available.

30. An interesting example is the case study for Ghana who adopted an integrated strategy that addresses the refrigeration sector as a whole. It focuses on the establishment of safe hydrocarbon and natural refrigerant to enable their safe long term use; it includes activities to curb growing phase-in of HCFC-based refrigerant blends as well as an incentive programme to retrofit HCFC-based equipment to environmentally sound alternatives. The HPMP is one component of this overarching strategy. The other components are two separate but related projects: a project for the promotion of energy efficiency through an early retirement scheme of refrigerators and freezers with funding from the Global Environment Facility (GEF); and an ODS destruction pilot project funded by the MF. The three projects are interlinked, share information and avoid duplication of efforts.

31. Since very early in the ODS phase-out process, there was a clear strategy for the RAC servicing sector¹⁶ which is being followed by the sample countries as discussed in the following section. This strategy consists in optimizing refrigerant consumption through good installation and servicing practices, refrigerant containment and recovery and recycling, ideally until the end of the useful lifetime of the equipment or the end of refrigerant availability, in what could be called the first stage of the RAC

¹⁵ In terms of their impact on the climate

¹⁶ UNEP 1998 Report of the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee

servicing sector strategy. Once this point is reached (the end of the useful lifetime of the equipment or the end of refrigerant availability) the strategy becomes more challenging in what could be called a second stage, when the end-user is faced with four options: a) use of drop in refrigerant change, b) equipment retrofit to an alternative refrigerant, c) equipment conversion for the same purpose or d) equipment replacement. Any of these options requires the selection of an alternative refrigerant or technology and thus the servicing sector is faced with the same challenges as the manufacturing sector. It is at this point that up-to-date, simple and practical guidelines for technology selection and environmental impact evaluation of alternatives in the RAC servicing sector would be extremely useful to assist in overcoming these challenges.

32. The relatively straightforward measures and guidelines need to be adopted by a target audience. The audience however is composed of a large and dispersed and often informal number of enterprises and individuals. Conveying the message to such target groups requires carefully designed outreach activities and the assistance of organized stakeholders such as refrigerant distributors, technical training schools, and trade and industry associations, among others.

III. Sector-related initiatives

33. There are nine countries in the desk study that have HCFC consumption in several sectors. These include all five countries in Group A, two countries in Group B (Bolivia (Plurinational State of) and Bosnia and Herzegovina), and two countries in Group C (Cuba and Sudan (the)). All the countries in group A included foam sector plans as priorities for stage I of the HPMP, and three included four plans for the RAC manufacturing sector as well, for a total of nine sector plans. In group B, only Bosnia and Herzegovina has a foam sector plan approved, and in Group C both countries have a foam sector plan approved. In summary all nine countries with several sectors except one (Bolivia (Plurinational State of)) had manufacturing sector umbrella projects or phase-out plans approved within the stage I of their HPMPs for a total of 13 approvals. Annex III of this document presents the list of such approvals.

34. Within the thirteen approved phase-out projects there were 28 different technology choices, 36 per cent of which were for hydrocarbon technologies and 14 per cent for water blown technologies for a total of 61 per cent of technology choices towards low-GWP and environmentally friendly alternatives which are the strategic choice of all the countries in the desk study.

35. Twenty five per cent¹⁷ of choices also leaned towards HFC alternatives which have an associated high impact on the climate in spite of the best efforts to the contrary by the countries and the Executive Committee, as explained in the section on “Issues identified during project review” of this document. Table 4 shows the alternative technologies selected in the sample countries

Table 4: Technology choices in HCFC manufacturing phase out approvals in desk study countries

Technology	Number of choices	Percentage
Hydrocarbon	10	36%
Methyl formate	7	25%
Water blown technology	4	14%
HFC-32 technology	4	14%
HFC-410A technology	2	7%
HFC-245fa technology	1	4%
Total	28	100%

¹⁷ The percentage of ODP tonnes affected by these choices has not been calculated in this study

36. Concerning non-investment initiatives all countries in Group A included a policy support and a customs support programme. Only three countries included a RAC servicing sector support programme. The policy support programmes consist of specific policy and regulatory measures, including those directed at strengthening or optimizing the licensing system. The customs support programmes include activities such as training of customs and enforcement officers and strengthening of customs control points with refrigerant identifiers. All these programmes rely and build upon the framework and infrastructures established by the preceding ODS phase-out efforts. Tables 4 and 5 show the distribution of support programmes among the three groups of countries.

Table 5: Support programmes by groups of countries in the sample

Support programmes	Group A (5 countries)	Group B (6 countries)	Group C (4 countries)	Total
Policy	5	6	4	15
Customs	5	6	4	15
RAC servicing sector	3	6	4	13
Total	13	18	12	43

Table 6: RAC servicing sector support programmes by groups of countries in the desk study

Measures	Groups of countries					
	A	%	B	%	C	%
Training of technicians	3	38	6	30	4	31
Provision of tools and equipment			4	20	1	8
Support to training centres and /or trade Assoc.			4	20	1	8
Development of Code of GP and / or certification system			2	10		
Strengthening of RRR system			1	5	2	15
HCFC Reclaiming or regeneration programme	1	13	1	5		
Technical support to large end-users			1	5		
Demonstration programme on refrigerant containment	1	13				
Pilot end user retrofit programme			1	5	2	15
Forward looking programmes	3	38			3	23
Total	8	100	20	100	13	100
Percentage of total number of initiatives (41)	20		49		32	
Average number of measures per country	1.6		.33		3.25	

37. All countries in the sample except Thailand and Viet Nam have started the training of RAC servicing technicians and will need to continue doing so during stage II of the HPMP as it happened during CFC phase-out. Group B countries have the highest percentage (49 per cent) of the total number of measures taken by all the countries and the highest number of measures per country (3.33). Additionally, 95 per cent of all the measures taken by countries in Group B are oriented towards the “first phase of the RAC servicing sector strategy” which concentrates on good servicing and containment practices, while the remaining 5 per cent is oriented towards the “second phase of the RAC servicing sector strategy” which concentrates on the change of technology,(retrofit, conversion or replacement). This latter category of initiatives ranks very high among groups B and C countries with 38 per cent and 23 per cent, respectively. This difference could be due to resource availability.

38. Many initiatives within the policy and RAC servicing sector support programmes take some time to become effective and/or produce a noticeable impact. For instance, policy and regulatory measures take at least a year before going for approval because of the consultative process needed for their viability and the extensive number of official instances involved; similarly, training on good practices or any other technical skill do not have a sizeable effect on consumption until a significant percentage of the target

audience has been reached; and the same rationale applies to pilot and demonstration projects. As each stage of the HPMP is bound to strict time-dependent results, many of these time-dependent initiatives would need to be front-loaded within the stage II HPMP which would require a corresponding front-loading of funding.

Special considerations

39. It is not of less importance the isolated actions some countries may need to take to reinforce the main initiatives. In Haiti, during the implementation of stage I, the NOU will work closely with international organizations to strengthen coordination and cooperation and promote information-sharing to support HCFC phase-out. This is because international aid programmes, NGOs activities and family donations contributed greatly to the HCFC consumption growth. Indeed second-hand equipment and obsolete technology frequently were donated to the country.

IV. Policy and regulatory measures

40. Institutional arrangements were based on those set for the phasing out of CFC with some adjustment, and on the creation of some managerial and organizational tools. In Indonesia for example there were four Technical Working Groups as a coordination device among industry, government and other stakeholders; in Ghana, a Technical Management and Monitoring Commission was established as a support to the NOU and a monitoring body. In Nigeria a new PMU replaced the old one.

41. The policy and regulatory measures taken within the HPMPs of the selected countries have been categorized as per their main objectives, namely:

- (a) Support for HCFC phase-out, comprising all the measures oriented towards the improvement of the HCFC import/export quota system;
- (b) Support for the specific strategy and action plan, including measures such as voluntary agreements for sector wise HCFC phase-out, ban on use of HCFCs in manufacturing sectors, establishment of safety and other standards for safe use of alternatives, environmental labelling for HCFC alternatives, among others;
- (c) Regulation of use of HCFCs to promote consumption and/or emission reduction, involving measures such as including refrigeration and air-conditioning (RAC) good practices as regulations, raising HCFC import and other taxes for HCFCs;
- (d) Limit future growth of HCFC dependency, with measures such as control of import and/or production of HCFC equipment, ban new installations of HCFC equipment, ban sales of HCFC equipment, ban new HCFC-based equipment or products manufacturing facilities or processes, limit new importers; and
- (e) Support energy efficiency, with the understanding that as part of an ODS phase out strategy these measures take into account environmental considerations and are conducive towards the strategic choices of alternatives.

42. The countries in Group A have proposed of 31 policy and regulatory measures during stage I of the HPMPs where the majority of them (38 per cent) are directed at limiting the future growth of HCFC dependency. The second type of measures (25.81 per cent) is intended to support the specific strategy and action plan undertaken by the countries; while the third type of measures (16.13 per cent) promotes the reduction of HCFC consumption by regulating their use.

43. The countries in Group B will undertake 24 policy and regulatory measures during stage I of the HPMPs where two types of measures are intended to directly support HCFC phase-out and to limit further growth of HCFC dependency (41.67 per cent of the total for each), while a third type intends to support the specific strategy and action plan.

44. The countries in Group C will undertake 14 policy and regulatory measures during stage I of their HPMP. The majority of the measures (42.86 per cent) have the objective of limiting future growth of HCFC consumption followed by supporting phase-out (28.57 per cent), and measures designed to support the specific strategy and action plan (21.43 per cent). Annex II of this document provides additional details.

45. One example is Maldives who opted for an accelerated HCFC phase out strategy for 2020. Under the HCFC policy component, a ban is planned from 2013 onwards on imports of new equipment containing HCFCs. The existing licensing system was strengthened to establish an import quota for bulk HCFC-22 as well as HCFC blends from 2010 onwards. In addition, these measures will also include strict reporting requirements for importers in relation to the total quantities of imported or exported goods under the permits. Furthermore, the Government also envisages a tax incentive for the import and use of non-HCFC equipment.

46. The percentage of measures to support HCFC phase-out is the lowest for Group A and the highest for Group B, which may indicate that HCFC import/export licensing and quota systems are already at a more completed and mature stage in countries with higher consumption (and more resourceful Government infrastructures, among others). Measures oriented to support the specific strategy and action plan have the highest percentage for Group A countries and the lowest for Group B which may be due to the fact that Group A countries have a more complex HCFC consumption structure which requires a more elaborate strategy with corresponding supporting policy and regulatory measures.

47. The measures to regulate the use of HCFCs to promote consumption and/or emission reductions are aimed at the RAC servicing sector and rank the highest for Group A countries which may be due to more formal nature of this sector in non-LVC countries in contrast with smaller countries. The measures to limit future growth of HCFC dependency do not present significant variations among the three groups and rank the highest for all of them, which indicates the high priority given to these measures by all countries. Concerning measures to promote energy efficiency only one among the 15 countries selected such measures. Table 7 below summarize these findings.

Table 7: Portfolio of policy and regulatory measures for countries in the desk study

Objective of measures	Group A	Group B	Group C
Support HCFC phase-out	16.13%	41.67%	28.57%
Support strategy and action plan	25.81%	12.50%	21.43%
Regulate use of HCFCs to promote consumption and/or emission reduction	16.13%	4.17%	7.14%
Limit future growth of HCFC dependency	38.71%	41.67%	42.86%
Support energy efficiency	3.23%	0%	0%

48. After more than twenty years of ODS phase-out efforts, it is expected that all countries have a comprehensive body of basic policies and regulations to support those ODS phase-out efforts. However this may not to be the case for smaller countries in the desk study, in particular for more far reaching measures such as those oriented towards the support of energy efficiency, or the support of the safe use of natural or low GWP refrigerant alternatives, because those measures should be part of a more complex array of initiatives covering standards, regulations and programmes affecting many organizations such as the energy, health and work ministries, and the fire-fighting department, among others.

49. These findings may suggest a direction for policy assistance to smaller countries for stage II of the HPMPs. The document “Discussion paper on minimizing adverse climate impact of HCFC phase-out in the refrigeration servicing sector”¹⁸ reaches a similar conclusion¹⁹.

V. Co-financing issues

50. The five countries in Group A have identified a total of 14 co-financing opportunities, six of them in the form of project grants from the Global Environment Facility (GEF) or bilateral agencies, valued at US \$38.4 million, three of them in the form of loans from national and international development agencies, valued at US \$162 million, and five in the form of counterpart contributions from the project beneficiaries themselves (including two from the government) valued at US \$45.2 million. Only two of these are current initiatives and the remaining are planned for stage II of the HPMP. This latter fact is undoubtedly, at least in part, a consequence of the lengthy procedures for developing such kind of initiatives.

51. On the other hand, none of the six countries in Group B was able to identify any co-financing opportunity although one was offered bilateral co-funding assistance for the future, and two of them are planning to undertake government-driven energy related initiatives that will certainly assist in maximizing the environmental benefits of the HPMP. The Maldives will provide counterpart funding to promote ozone and climate co-benefit activities, which will include a standards and labelling programme. These will be implemented at the same time as the other activities funded under the HPMP. This undertaking by the Government also includes a commitment to provide initial counterpart funding and to seek significant levels of co-financing from non-MLF sources for climate benefits associated with the HCFC phase-out. It should be noted however, that such counterpart funding from Governments and private enterprises has always been part of MLF projects.

52. Concerning the four countries in Group C, they have identified five co-financing opportunities, two in the form of project grants from the GEF, one of them valued at US \$1.7 million under an umbrella regional project for several countries, scheduled for stage II of the HPMP, and three in the form of counterpart funding from the project beneficiaries valued at approximately US \$1.2 million.

53. In summary, Group A countries, averaged almost three co-funding opportunities per country at a total level of more than US \$200 million, while Group B countries did not secure any co-funding opportunity. The countries in Group C with mid-level HCFC consumption are somewhat in the middle. These results may point that LVCs countries do not have the economies of scale that are cost-effective under GEF, or any other similar financial mechanisms. It is to be expected that this situation will not change in the future and probably the best opportunity these countries will have is donor-driven initiatives for regional umbrella projects that will assist in maximizing the environmental benefits of the HPMP initiatives²⁰. Such donor-driven endeavours require initial stewardship at the highest level that can only be exercised by the leading figures within the Montreal Protocol regime.

¹⁸ UNEP/OzL.Pro/ExCom/70/53)

¹⁹ "... it appears meaningful for Article 5 countries to start giving due consideration to addressing the barriers to enable the proper introduction of low-climate impact technologies. Some of them can be locally addressed through a number of activities that are already or could be components of the HPMPs, such as training, codes of practice, development of regulations, adoption of standards, use of incentives, technology demonstration projects and awareness rising."

²⁰ Some comments have pointed out the value of private initiatives and the difficulties of regional projects where countries have each their own pace.

VI. Conclusions

Delays in preparation of stage I HPMPs

54. The preparation of stage I HPMPs has taken significantly longer than the preparation of country programmes, RMPs and/or TPMPs thus indicating that the preparation of stage II for some countries may be already under a tight schedule. Although the most important reasons for delays such as the lack of experience with HCFC data collection, the lack of guidelines, and the need to complete the tail end of CFC-related activities are not likely to occur again, the evidence seems to suggest that the timely preparation of stage II of the HPMPs would benefit from an increased and more focused technical assistance to countries with low and medium level of HCFC consumption.

Issues identified during project review

55. During the approval of the HPMPs between the 60th and the 69th meetings, there were a total of twenty two issues identified that resulted in general policy decisions by the Executive Committee. Fifty per cent of those issues and decisions were related to extended commitments for HCFC phase-out and technology selection, which in some cases originated significant delays in HPMP approvals. These issues are interconnected in the sense that sound technology options take time to be developed and become commercially available.

Overarching strategy

56. The phase-out strategy for the RAC servicing sector has been under test for many years and the challenge for the years ahead can be met with financial and technical assistance for a stepped up implementation. The technical assistance for the RAC servicing sector will require updated, simple and practical guidelines for technology selection and assessment of associated environmental impact, with the understanding that such guidelines would be used by the countries in the context of comprehensive programmes for training, demonstration, piloting and outreach. This approach will ensure the minimization of the costs both in financial and environmental terms, of the HCFC phase-out in the RAC servicing sector.

Sector-related initiatives

57. Many of the initiatives expected to form an important part of stage II HPMPs for the RAC servicing sector take some time to become effective and/or produce a noticeable impact. For instance, policy and regulatory measures take at least a year before going for official approval because of the consultative process needed for their viability and the extensive number of instances involved. Similarly, training on good practices or any other technical skill, do not have a sizeable effect on consumption until a significant percentage of the target audience has been reached. The same rationale applies to pilot and demonstration projects. This characteristic would require that in order to obtain a time-dependent result such initiatives would need to be front-loaded within the stage II HPMP which in turn would necessitate a corresponding front-loading of funding. The viability of such funding structure should be considered for stage II HPMPs.

Policies and regulations

58. The evidence seems to suggest that policy assistance for stage II of the HPMPs for smaller countries should concentrate on more far reaching measures such as those oriented towards the support of energy efficiency, or the support of the safe use of natural refrigerant alternatives, taking into account that such measures are part of a more complex array of initiatives covering standards, regulations and programmes affecting many organizations such as energy , health and work ministries, and fire-fighting departments, among others.

Co-financing issues

59. LVC countries have not been as successful as bigger countries in identifying and securing co-financing opportunities to maximize the environmental benefits of their stage I HPMPs. This situation is not expected to change in the future since it is very probably the direct result of the inherent lack of economies of scale desirable for such funding opportunities. There is however the possibility of donor-driven initiatives for regional umbrella projects for LVC countries, which can only be brokered at the highest level.

VII. Suggestions for preparation of Stage II HPMP

60. The desk study concludes that in the formulation process of the guidelines for the preparation of stage II HPMPs the following should be taken into account:

- (a) That implementing and bilateral agencies provide an increased and more focused technical assistance to countries with medium and low level of HCFC consumption in order to ensure the timely preparation of stage II HPMPs;
- (b) That concerned actors ensure the timely preparation of up to date, simple and practical guidelines for technology selection in the RAC servicing sector, with the understanding that such guidelines would be used by the countries in the context of comprehensive programmes for training, demonstration, piloting and outreach;
- (c) That implementing and bilateral agencies when providing policy assistance for the preparation of stage II HPMPs for smaller countries to concentrate on measures oriented towards the support of energy efficiency initiatives and the safe use of natural and low GWP refrigerant alternatives, taking into account the complex array of initiatives that such measures entail covering standards, regulations and programmes; and
- (d) The viability of brokering donor-driven initiatives for regional umbrella projects for co-funding opportunities to maximize the environmental benefits of stage II HPMPs for LVC countries.

VIII. Recommendation

61. The Executive Committee may wish to note the desk study on the Evaluation of the Preparatory Phase of the Phasing-Out of HCFC and its recommendations contained in document UNEP/OzL.Pro/ExCom/70/14.

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**Annex I
COUNTRIES SELECTED FOR DESK STUDY**

Country	Agency	Category	Sector (1)	HCFC Baseline (2)	GROUP
Brazil	UNDP/Germany	Non-LVC	Several sectors	1,327.30	A
Indonesia	Australia/UNDP/UNIDO/IBRD	Non-LVC	Several sectors	403.90	
Nigeria	UNDP/ UNIDO	Non-LVC	Several sectors	398.20	
Thailand	IBRD/Japan	Non-LVC	Several sectors	927.60	
Viet Nam	IBRD	Non-LVC	Several sectors	221.20	
Bolivia (Plurinational State of)	Germany	LVC	Several sectors	6.10	B
Bosnia and Herzegovina	UNIDO	LVC	Several sectors	4.70	
Comoros (the)	UNEP	LVC	One Sector	0.10	
Haiti	UNEP/UNDP	LVC	One Sector	3.63	
Maldives	UNDP/UNEP	LVC	One Sector	4.60	
Mongolia	UNEP/France	LVC	One Sector	1.40	C
Cuba	UNDP	LVC	Several sectors	16.90	
Ghana (3)	UNDP/Italy	Non-LVC	One Sector	57.30	
Kenya (3)	France	Non-LVC	One Sector	52.20	
Sudan (the)	UNIDO	Non-LVC	Several sectors	52.70	

(1) One sector refers to consumption of HCFCs only in the RAC servicing sector, while several sectors refer to consumption of HCFCs both for servicing and manufacturing.

(2) ODP tonnes.

(3) Country formerly classified as LVC but re-classified as non-LVC due to HCFC consumption above 360 metric tonnes.

Annex II
POLICY AND REGULATORY MEASURES IN STAGE I OF HPMPs

GROUP A

Objective	Type of measures	Number of measures	% of total
Support HCFC phase-out	Improvement of HCFC import/export quotas	5	16.13
Support strategy and action plan	Voluntary agreements for sector wise HCFC phase-out, ban on use of HCFCs in manufacturing sectors, establish safety and other standards, environmental labelling for HCFC alternatives	8	25.81
Regulate use of HCFCs to promote consumption and/or emission reduction	RAC good practices as regulations, raising HCFC import and other taxes for HCFCs	5	16.13
Limit future growth of HCFC dependency	Control import/production of HCFC equipment, Ban on new installations of HCFC equipment, ban on sales of HCFC equipment, ban on new HCFC manufacturing facilities, limit on new importers	12	38.71
Support energy efficiency	Establish technical standards	1	3.23
Totals		31	100.00

GROUP B

Objective	Type of measures	Number of measures	% of total
Support HCFC phase-out	Improvement of HCFC import/export quotas, Monitoring and reporting systems	10	41.67
Support specific strategy and action plan	Ban on use of HCFCs in manufacturing sectors, establish safety and other standards	3	12.50
Regulate use of HCFCs to promote consumption and /or emissions reduction	Regulations for disposal of contaminated ODSs	1	4.17
Limit future growth of HCFC dependency	Tax benefits for sound alternatives, Tax on HCFC and HCFC equipment, Control import of HCFC equipment, Ban on import and / or sales of HCFC equipment	10	41.67
Totals		24	100.00

GROUP C

Objective	Type of measures	Number of measures	% of total
Support HCFC phase-out	Improvement of HCFC import/export quotas	4	28.57%
Support strategy and action plan	Ban on use of HCFCs in manufacturing sectors, establishment of safety and other standards	3	21.43%
Regulate use of HCFCs to promote consumption and/or emissions reduction	RAC good practices as regulations	1	7.14%
Limit future growth of HCFC dependency	Ban on import of HCFC equipment, Ban on new installations of HCFC equipment, ban on new HCFC manufacturing facilities, Import duties benefits for non-HCFC equipment	6	42.86%
Totals		14	100.00%

Annex III
SECTOR PHASE-OUT PLANS APPROVED FOR COUNTRIES IN THE DESK STUDY

Country	Project Title	Technology choice
GROUP A		
Brazil	HPMP (foam sector plan)	<ul style="list-style-type: none"> • Conversion of 273 flexible moulded/integral skin enterprises through 6 systems houses to methyl formate; • Conversion of 11 flexible moulded/integral skin individual companies to methyl formate • Conversion of 4 continuous panel manufacturers to hydrocarbon • Conversion of 98 small rigid foam enterprises to methyl formate through their systems houses.
Indonesia	HPMP (foam sector plan)	<ul style="list-style-type: none"> • Conversion of 26 enterprises to HFC-245fa and water-based technologies and to hydrocarbon technology
Indonesia	HPMP (refrigeration sector plan)	<ul style="list-style-type: none"> • Conversion from HCFC-22 to HFC-32 and from HCFC-141b to cyclopentane at PT. Sumo Elco Mandiri, PT. Alpine Cool Triutama and PT. Rotaryana Prima; • Conversion from HCFC-22 to HFC-32 and/or hydrocarbon and or CO2 at 12 enterprises • Conversion from HCFC-141b to methyl formate at 6 other enterprises
Indonesia	HPMP (umbrella project to phase-out HCFC-141b)	<ul style="list-style-type: none"> • Conversion to HC technology at 4 enterprises
Indonesia	HPMP (air-conditioning sector plan)	<ul style="list-style-type: none"> • Conversion of 5 enterprises to HFC-32 • Conversion of 6 enterprises to HFC-410A;
Nigeria	HPMP (refrigeration air-conditioning manufacturing)	<ul style="list-style-type: none"> • Conversion of more than 30 enterprises to the use of methyl formate systems;
Nigeria	HPMP (foam)	<ul style="list-style-type: none"> • Conversion of system house to methyl formate • Conversion of a first group of foam enterprises
Thailand	HPMP (foam sector plan)	<ul style="list-style-type: none"> • Conversion of 23 enterprises to hydrocarbons • Conversion of 103 enterprises to HFC-245fa technology • Conversion of 5 enterprises to water blown technology • Technical assistance to convert 53 micro enterprises and systems houses.
Thailand	HPMP (residential air-conditioning group project)	<ul style="list-style-type: none"> • Conversion of 12 air-conditioner manufacturers to HFC-32 technology
Viet Nam	HPMP (foam sector plan)	<ul style="list-style-type: none"> • Conversion of the 12 largest foam enterprises to hydrocarbon and water blown technologies.
GROUP B		
Bosnia and Herzegovina	HPMP (foam and commercial refrigeration sector plan)	<ul style="list-style-type: none"> • Conversion to cyclopentane at Alternativa, • Conversion of 6 commercial refrigeration enterprises to methyl formate (foam) and HFC-410A (refrigeration)
GROUP C		
Cuba	HPMP (foam sector)	<ul style="list-style-type: none"> • Conversion to hydrocarbon for Refrigeracion Caribe and Lancomet. • Conversion to water blown systems for three companies

Sudan (the)	Umbrella project (domestic and commercial refrigerators and PU insulated composite panels)	<ul style="list-style-type: none">• Conversion to hydrocarbon technology
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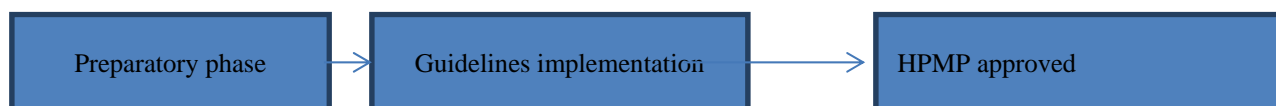
Annex IV
ISSUES IDENTIFIED DURING PROJECT REVIEW OF HPMPs AND RELATED PROJECTS

Excom	Issues
60	<ul style="list-style-type: none"> • HCFC phase-out projects in domestic and commercial refrigeration enterprises, (decision 60/13) • Accelerated phase-out of HCFCs, (decision 60/15)
62	<ul style="list-style-type: none"> • Accelerated phase-out of HCFCs beyond 2020 for LVC countries and increase in HPMP funding (decision 62/10) • High levels of recorded HCFC consumption in submitted HPMPs for LVC countries (decision 62/11) • Prioritization of HCFCs (decision 62/12) • Sub-sector on the assembly of refrigeration equipment in addition to refrigeration manufacturing and service sectors (decision 62/14) • Funding of institutional strengthening projects as part of an HPMP (decision 62/15) • Guidance on the justification for second-stage conversion (decision 62/16) • Last funding tranche of multiyear HCFC phase-out plans (decision 62/17)
63	<ul style="list-style-type: none"> • Discrepancies between data reported under Article 7 and in HPMPs (decision 63/14) • Additional funding requests for HCFC phase-out outside approved HPMPs (decision 63/15) • Funding for conversion of eligible enterprises with very little or no current consumption of HCFCs (Previous decisions applied) • Applicability of HCFC cost-effectiveness thresholds for low-volume-consuming countries (Previous decisions applied) • Flexibility provision under HCFC phase-out management plans (decision 63/16) • Amending agreements between the Executive Committee and countries on HCFC phase-out management plans to help ensure compliance with the 2013 control measure (decision 63/17) • Countries that have total HCFC consumption above 360 metric tonnes and should address consumption in the manufacturing sector first to meet the 2013 and 2015 control measures (as per decision 60/44)
64	<ul style="list-style-type: none"> • HPMPs that proposed to address more than 10 per cent of the baseline by 2015 (decision 64/14)
65	<ul style="list-style-type: none"> • Flexibility provision under HCFC phase-out management plans (decision 65/11) • Provision of relevant information in project documentation (decision 65/12)
66	<ul style="list-style-type: none"> • Maximizing the climate benefits from the phase-out of HCFCs in the refrigeration servicing sector (decision 66/20)
67	<ul style="list-style-type: none"> • Maximizing the climate benefits from the phase-out of HCFCs in the refrigeration servicing sector (decision 67/16)
68	<ul style="list-style-type: none"> • Maximizing the climate benefits from the phase-out of HCFCs in the refrigeration servicing sector (decision 68/11)

Category	Decision
Sector related	HCFC phase-out projects in domestic and commercial refrigeration enterprises, (decision 60/13)
	Sub-sector on the assembly of refrigeration equipment in addition to refrigeration manufacturing and service sectors (decision 62/14)
Extended commitments for HCFC phase out	Accelerated phase-out of HCFCs, (decision 60/15)
	Accelerated phase-out of HCFCs beyond 2020 for LVC countries and increase in HPMP funding (decision 62/10)
	HPMPs that proposed to address more than 10 per cent of the baseline by 2015 (decision 64/14)
	High levels of recorded HCFC consumption in submitted HPMPs for LVC countries (decision 62/11)
Various	Funding of institutional strengthening projects as part of an HPMP (decision 62/15)
	Guidance on the justification for second-stage conversion (decision 62/16)
	Last funding tranche of multiyear HCFC phase-out plans (decision 62/17)
	Additional funding requests for HCFC phase-out outside approved HPMPs (decision 63/15)
	Funding for conversion of eligible enterprises with very little or no current consumption of HCFCs (Previous decisions applied)
	Applicability of HCFC cost-effectiveness thresholds for low-volume-consuming countries (Previous decisions applied)
	Amending agreements between the Executive Committee and countries on HCFC phase-out management plans to help ensure compliance with the 2013 control measure (decision 63/17)
Data related	Provision of relevant information in project documentation (decision 65/12)
	Discrepancies between data reported under Article 7 and in HPMPs (decision 63/14)
Technology selection	Prioritization of HCFCs (decision 62/12)
	Countries that have total HCFC consumption above 360 metric tonnes and should address consumption in the manufacturing sector first to meet the 2013 and 2015 control measures (as per decision 60/44)
	Maximizing the climate benefits from the phase-out of HCFCs in the refrigeration servicing sector (decision 66/20)
	Maximizing the climate benefits from the phase-out of HCFCs in the refrigeration servicing sector (decision 67/16)
	Maximizing the climate benefits from the phase-out of HCFCs in the refrigeration servicing sector (decision 68/11)
	Flexibility provision under HCFC phase-out management plans (decision 63/16)
	Flexibility provision under HCFC phase-out management plans (decision 65/11)

Annex V
INDIVIDUAL CASES

1. The analysis of five individual cases (Indonesia, Nigeria, Maldives, Haiti and Ghana) aims at bringing complementary information to the main report about how the preparation of the HPMP took place. Among these countries three are non-LVC (Indonesia, Nigeria, and Ghana) and two are LVC (Maldives and Haiti) countries. Indonesia and Nigeria belong to the group A analysed in the main report, Maldives and Haiti to group B and Ghana to group C. In each country the process of elaboration of the HPMP had its own particularities. Maldives was the first LVC to submit a HPMP and to opt for an accelerated phase-out; in Indonesia several bilateral and implementing agencies were involved in the drafting of the HPMP; Haiti had to cope with a very difficult economic and humanitarian situation that arose during the preparatory phase; Nigeria adopted an approach that was different from other countries, as it tackled all the issues related to HCFC phase-out simultaneously; and Ghana has an overarching strategy that includes projects that do not belong to HPMP.



2. Issues related to the preparatory phase concern projects submitted by the implementing and bilateral agencies and their activities as well as the context they operated for a successful implementation of the HPMP. Their dealings with the institutional setting, the existing legislation, the collection and analysis of information are analysed as well as various factors related to project implementation. The analysis of cases is therefore not exhaustive.

Table 1. Issues and indicators used in the assessment

Outputs of the preparatory phase	Indicators	Sources of information	Remarks
Institutional framework adapted to HCFC phase-out	Description of changes in the HPMP, project documents	Progress reports, HPMP document	Institutions that participate in the HPMP preparation, their new roles and responsibility
Legislation and regulation amended	Projects dealing with legislation; Description of the legislation amendment	Progress reports, HPMP document	Changes in the existing legislation
Availability of data and information about HCFC	Evidence of survey for data collection	Project documents; Progress reports	How HCFC-related data were obtained
Use of CFC phase-out experience in the implementation of HPMP	Projects or activities that use the results of TPMP, NPP or demonstration projects or use the guidelines.	Project submissions, final ExCom meetings reports, Progress reports	Are there activities based on previous CFC phase-out activities?
Adoption of a staged approach in HPMP	Mention of the staged approach in the HPMP	HPMP document	
Existence of an overarching strategy	Description of the strategy in the HPMP	HPMP document	
Effective co-financing	Mention of projects or activities with funds from various sources other than MLF		Are other non-MLF organizations involved?

GHANA

Country	Agency	LVC	Sector	HCFC Baseline
Ghana	UNDP/Italy	Non-LVC	One Sector	57.30

I. The preparatory phase

Roles of implementing and bilateral agencies

3. UNDP is the lead agency for the preparation and implementation of HPMP in Ghana while the Government of Italy is the cooperating agency. The preparatory phase was approved at the 55th meeting for an amount of US \$82531.71.

UNDP			
Project	Project title	Budget	Activities
GHA/PHA/55/PRP/2 7	Preparation of the HPMP	US \$82531.71	Preparation of the HPMP including assistance for policy and legislation; survey of HCFC use and analysis of data; and development and finalization of the full HPMP including consultations.

Institutional arrangements

4. The National Ozone Unit (NOU) has the sole responsibility for monitoring the implementation of the HPMP. A Technical Management and Monitoring Committee will be established under the existing inter-ministerial/interagency National Committee on ODS (NACODS) to assist the NOU in its implementation and monitoring role. In addition a National Committee on ODS has been created under the Environmentally Protection Agency (EPA) that serves as an advisory body to EPA on all ODS related matters. The Committee is headed by the Executive Director of EPA and includes representatives from various ministries and departments.

5. Various professional associations have an active role in the implementation of the HPMP. The cooperation between Ministries, departments of Government and private sector organizations facilitates the formulation and adoption of policies and strategies for the control of ODS use.

Policy and regulations: Changes in legislation, regulation, licensing and quota system

6. During the preparatory phase a Senior Legal Consultant was recruited to review all the institutional arrangements and relevant laws that could impact on activities to phase-out HCFCs in the country. The objective was to identify areas that could be addressed in the short term to facilitate successful implementation of the HPMP. After analysing the situation the consultant concluded that there was no need for immediate action to address any implementation issues. Ghana already has a legislative framework among which three laws that are most relevant to the management of ODS consumption. These are Export and Import Act, 1995 (Act 503); CEPS (Management) Law, 1993 (PNDC L330); Management of Ozone Depleting Substances and Products Regulations, 2005 (LI 1812).

7. Ghana is also required to comply with the ECOWAS Harmonised Regulation which is binding in the sub-region).

Fulfilling the data and information requirements

8. The NOU organized two data collection teams to gather data on both domestic and light commercial refrigeration units and industrial and commercial refrigeration and residential and commercial air-conditioning units. The data collected were analysed and the results obtained used as the basis for the preparation of the HPMP.

9. Additional data were obtained from various sources. Since 2006 the NOU undertook an accurate monitoring of import, distribution and use of HCFCs in the country. In the absence of a quota system for regulating HCFC import, a survey of chemical importers registered under the licensing system is undertaken each every year to determine the import and distribution of refrigerants and cross check with customs data.

10. The refrigerants targeted in the survey of importers include HCFC-22 (R22), HFC-134a (R134a), R406a, R409a, R410a, and R600a.

11. In addition, the EPA contracted professional associations to carry out surveys and collect data on the equipment in use as well as the use of HCFCs at the enterprise and residential user levels for their repair and servicing.

12. Another source of information is the customs office which has comprehensive data base. Information generated includes the names and addresses of the importers and exporters, country of export, description of the items, HS Codes, quantities imported and their FOB and CIF prices. The information is provided to the NOU which reviews and processes it for the ODS management programme.

Communication and coordination mechanisms

13. The HPMP preparation started following an Inception Workshop for stakeholders organized in Accra, NOU with the support of UNDP from 15 - 16 June 2009. Similarly, the final draft of the HPMP was discussed at a stakeholders' workshop held in Accra on 11th and 12th March 2010 which was attended by local refrigeration and air-conditioning technicians and engineers, chemicals importers and dealers, air-conditioning equipment suppliers, representatives of key Government agencies, UNDP and the Government of Italy. Results and conclusions from the analysis of the data were discussed and resource requirements for implementing the HPMP were calculated by teams of refrigeration experts with the assistance of international experts with knowledge of Multilateral Fund guidelines.

Use of TPMP and NPP experience

14. During the HPMP preparation several mechanisms used during TPMP will be adapted and used especially in the area of assessment of results. For example a monitoring and technical management committee which served as an advisory panel to TPMP projects was proposed to HPMP as well. Technical Management and Monitoring Committee (TMMC) will be established with specific terms of reference under NACODS to examine all applications and requests for funding for activities under the HPMP and make recommendations to NACODS. The TMMC will also assist the NOU in the monitoring of the implementation of activities under the plan.

II. Submission of HPMP

15. UNDP submitted the HPMP for Ghana to the Executive Committee for consideration at its 61st meeting. The Executive Committee decided to approve Ghana's plan to reduce HCFC consumption by 35 per cent of the baseline by the end of 2019. The total funding was of US \$1,356,311, plus agency support costs of US \$77,348 for UNDP, and US \$325,000, plus agency support costs of US \$42,250 for Italy.

16. The HPMP includes a staged approach to the phase-out of HCFCs in its servicing sector. Stage I of the HPMP was planned to start in 2010 and end by end of 2015, while preparation for stage II is envisaged start in 2014.

Overarching Strategy

17. Ghana adopted an integrated strategy that addresses the overall refrigeration sector. It focuses on the establishment of safe hydrocarbon and natural refrigerant use culture to enable their general long term use; it includes activities to curb growing phase-in of HCFC-based refrigerant blends as well as an incentive programme to retrofit HCFC-based equipment to environmentally sound alternatives. The HPMP is one component of this overarching strategy. The other components are two projects: a project for the promotion of energy efficiency through an early retirement scheme of refrigerators and freezers with funding from the Global Environment Facility (GEF); and an ODS destruction pilot project funded by the Multilateral Fund. The three projects are interlinked, share information and avoid duplication of efforts.

18. Because about 40 per cent of the existing 1.9 million refrigeration and air-conditioning units using HCFC-22 in Ghana are 10 - 40 years old it is expected that a large percentage of the stock of HCFC-22 in the serviced and replaced units would not be recyclable and would have to be destroyed using the facilities funded under Multilateral Fund. A separate project will deal with these specific issues.

Co-financing

19. The Ghana HPMP is developed as an HCFC phase-out programme integrated with the two other projects, mentioned above which have sources of funding other than the Multilateral Fund.

Relevance to the Guidelines

20. Ghana adopted a staged approach as requested by the guidelines. Its overarching strategy however is somehow larger than the limits of the HPMP by including two different projects which are not part of the HPMP but work towards the same objective.

HAITI

Country	Agency	LVC	Sector	HCFC Baseline
Haiti	UNEP/UNDP	LVC	One Sector	3.63

I. The preparatory phase

21. In Haiti the 2010 earthquake was extremely destructive and for a while both UNEP, the lead agency for HPMP and UNDP the cooperating agency strived to assist Haiti to return to the pre-earthquake implementation level of the Montreal Protocol.

22. Funding for the preparatory phase was approved at the 68th meeting of the Executive Committee. The support for the preparation of HPMP included assistance for policy and legislation; survey of HCFC use and analysis of data; and development and finalization of the full HPMP.

UNEP			
Project	Project title	Budget	Activities
HAI/PHA/57/PRP/13	Preparation of the HPMP	US \$85,000	Preparation of the HPMP including assistance for policy and legislation; survey of HCFC use and analysis of data;

23. The preparation process was one of the most challenging in the region due to the socioeconomic and political situation in the country. Preparation activities however applied lessons learnt from the previous projects that helped adapt the national strategy, in terms of capacity building, technology decision making and fund transfer.

24. An additional challenge concerned the country's non-ratification of the Beijing amendment mostly because of political instability and frequent changes in the Government. According to Article 4 of the Montreal Protocol, starting from 1 January 2013, any Article 5 Party that has not ratified the Beijing amendment will be considered as a State not party to the Protocol and not able to import HCFCs from (or export to) a Party. While UNEP had informed Haiti of the implications for the country and the HPMP, if the amendment was not signed, the process of ratification was still on-going during the preparatory phase. The amendment was eventually ratified in May 2013.

Policy and regulations; Changes in legislation, regulation, licensing and quota system

25. Initially the Government of Haiti, through a national decree issued in 2008, established a licensing and quota system to control the imports of ozone depleting substances (ODS) including HCFCs. The system was successful in phasing-out all CFCs by the end of the 2009. The Government amended the Decree to include HCFC exports and HCFC-based blends in the licensing system. The quota system was to be applied starting in January 2013. Furthermore the Government requested the Parties to approve the revision of Haiti's baseline, following which it would issue quotas for HCFC imports according to the maximum allowable consumption approved for Haiti.

Institutional arrangements

26. The Ministry of Environment is the focal point for the implementation of the Montreal Protocol, under which a National Ozone Unit (NOU) has been established to coordinate activities at the operational level. The institutional functioning was however, complicated not only by the social and economic situation but also by the existence of a wide number of humanitarian actors helping with the reconstruction of the country. Other MLF funded projects (the Institutional Strengthening Project (ISP), Refrigerant Management Plan (RMP) and Total Phase-Out Management Plan (TPMP)) encountered difficulties at the implementation level as a result of a series of political unrest, UN peacekeeping presence in the country, frequent changes in the Government of Haiti and natural disasters. This negatively impacted the ability of the NOU and implementing agencies (UNEP, UNDP) to manage the Multilateral Fund project activities.

27. Furthermore the international aid programmes, NGOs activities and family donations contributed greatly to the increase in HCFC consumption growth as often second-hand equipment and obsolete technology was frequently donated to the country. The government had special agreements with many international organizations allowing them to easily import equipment and to speed up the reconstruction process. This was a major factor for HCFC consumption increase. It was therefore decided that during the implementation of stage I, the NOU will work closely with international organizations in Haiti to strengthen coordination and cooperation and promote information-sharing to support HCFC phase-out. Concerning the HCFCs used by the United Nations Stabilization Mission in Haiti (MINUSTAH), UNEP clarified that MINUSTAH has adopted an internal policy to cease importing ODS as of 30 June 2011.

Fulfilling the data and information requirements

28. A survey took place during the preparatory phase that provided the most reliable information about ODS consumption in Haiti as the data collection system had been gravely damaged by the 2010 earthquake. The data collected during the survey yielded the best possible estimate for 2009 onwards, as records for previous years were lost. According to the survey all HCFCs consumed in Haiti were imported, and were consumed solely in the refrigeration and air-conditioning (RAC) servicing sector. The sector however, is highly unstructured and became further disorganized. The survey concluded that the HCFC consumption levels reported under Article 7 for 2009 and 2010 were underestimated. Consequently Haiti submitted to the Ozone Secretariat a request for revision of the consumption data for the baseline years. The request was forwarded by the Implementation Committee to the Twenty-fourth Meeting of the Parties for its consideration (recommendation 48/5).

Communication and awareness

29. During the preparatory phase of HPMP, discussions at the national level were organized with various stakeholders. The information conveyed was in connection with alternative technology and awareness to lead to international assistance being received. The issues discussed were with regard to how to avoid the installation of obsolete technology in the refrigeration and air-conditioning equipment and how to promote energy efficient equipment.

Use of TPMP and NPP experience

30. Haiti achieved a successful CFC phase-out through the implementation of the Refrigerant Management Plan (RMP) and the Terminal Phase-out Management Plan (TPMP). During this phase technicians and customs officers were trained and RAC servicing manuals were developed and incorporated into professional training curriculum. Servicing technicians also received equipment (although most of this equipment was damaged in the 2010 earthquake). To implement the training a professional training institution (APEX) was selected and prepared with tools and manuals for the training of technicians. In addition, a refrigeration and air-conditioning association (ADIFH) had been formed.

This infrastructure established by the RMP and the TPMP during the CFC phase out will be used for HCFC phase-out. In addition the HPMP adopted some implementation mechanisms used for TPMP successfully such as funds disbursement via UNDP office in Haiti.

II. Submission of HPMP

31. UNEP, as the lead implementing agency, submitted to the Executive Committee stage I of the HCFC phase-out management plan (HPMP) for Haiti at its 68th meeting on December 2012. The Executive Committee decided to approve, in principle, stage I of the HCFC phase-out management plan (HPMP) for Haiti for the period 2012 to 2020 to reduce HCFC consumption by 35 per cent of the baseline, at the amount of US \$312,516, consisting of US \$182,881, plus agency support costs of US \$23,775 for UNEP, and US \$97,119, plus agency support costs of US \$8,741 for UNDP (Decision 68/30).

32. The HPMP for Haiti adopted a staged approach to completely phase-out HCFCs by 2030. Stage I of the HPMP aims at achieving the 35 per cent reduction in HCFC consumption by 2020. In addition, the Government committed to promote technologies with low global-warming potential (GWP) and high energy-efficiency to achieve ozone climate co-benefits.

The overarching strategy

33. The HPMP is based on an overarching strategy, according to which a series of activities will be implemented during stage I. These consist of technical assistance to servicing sector, training strengthening of the licensing system as well as of the capacity of the training institute and of the refrigeration and air-conditioning association. Awareness and educational programmes are also included in addition monitoring and evaluation of the HPMP to ensure ensuring timely implementation of proposed HCFC phase-out activities.

34. In addition the strategy also tackled technology transfer that will take into account climate implications of those technologies, health and safety considerations. The alternatives to be promoted need to be cost-effective and the market must be comfortable with the technology choices;

35. The implementation of the HPMP will take into account, as far as possible, the activities and influence of humanitarian actors such as MINUSTAH, other agencies and NGOs involved in the rebuilding effort in Haiti.

Co-financing

36. The Government of Haiti continues to explore potential sources of funding for activities that will contribute to both ozone protection and mitigate the impact of the climate. According to UNEP, however, co-financing has not been identified at this stage.

Relevance to the Guidelines

37. Despite a very difficult social economic and political situation Haiti succeeded in submitting an HPMP that includes the majority of the requirements of the guidelines. The non-ratification of the Beijing amendment at the time of the HPMP preparation was however a factor that put the approval at risk. The ratification eventually took place in May 2013.

INDONESIA

Country	Agency	LVC	Sector	HCFC Baseline
Indonesia	Australia/UNDP/UNIDO/IBRD	Non-LVC	Several sectors	403.90

I. The preparatory phase

Role of bilateral and implementing agencies

38. Three agencies, UNDP, the lead agency, the World Bank and UNIDO, as cooperating agencies, implemented projects for the preparatory phase of the HPMP in Indonesia. These projects were approved by the Executive Committee between its 55th and 57th meetings.

39. Together these projects helped preparing the HPMP by strengthening the existing legislation, carrying out a survey of HCFC, undertaking consultation and communication activities as well as preparing the HCFC phase-out investment activities.

UNDP			
Project	Project title	Budget	Activities
IDS/PHA/55/PRP/183	Preparation of the HPMP	US\$173,750	Assistance for policy and legislation; survey of HCFC use and analysis of data; development and finalization of the full HPMP
IDS/REF/57/PRP/185	Preparation for HCFC phase-out	US \$70,000	Investment activities (refrigeration manufacturing sector except air-to-air air-conditioning)
IDS/REF/57/PRP/188	Preparation for HCFC phase-out	US \$20,000	Investment activities (air-to-air air-conditioning sector)
World Bank			
IDS/PHA/57/PRP/186	Preparation of HCFC phase-out	US \$100,000	Foam sector
UNIDO			
IDS/SOL/61/PRP/190	Preparation for HCFC phase-out investment activities	US \$9,647	Solvent sector

40. The allocation of HCFC consuming sectors among the agencies was:

- UNDP: lead agency; refrigeration, air-conditioning, (both manufacturing and servicing) and fire fighting sectors;
- World Bank: foam sector;
- UNIDO: solvents sector and one group project in the foam sector; and
- Australia: Technical Assistance for refrigerant management.

Policy and regulations, licensing and quota system

41. Indonesia had legislation concerning HCFC phase-out since 2006. This allowed the Government to mandate import quotas when needed. Nevertheless further regulations prohibiting HCFC-22 in domestically manufactured and imported air-conditioners with effect from 01 January 2015 will be enacted. In addition, the Indonesian government would work closely with the industry to ensure appropriate regulations, standards and infrastructure for managing the safe use of technology throughout the product lifecycle. The proposed regulations may also include restrictions on import of products and substances with high GWP.

Fulfilling the data and information requirements

42. Several surveys were conducted in Indonesia as part of the HPMP preparation. They were elaborate and intensive, focusing on baseline information at enterprise/end-user level.

43. Therefore almost 95 per cent of the HCFC consumption was tracked in each sub-sector. Furthermore HCFC consumption and growth patterns were modelled at the sub-sector level. This aimed at ensuring that phase-out required in each subsector was established as reliably and realistically as possible in order to meet the national-level compliance targets.

Institutional arrangements

44. The Government of Indonesia instituted a partnership with the industry for the preparation of the HPMP. In April 2009 through a decree of the Deputy Minister for Natural Resources, Conservation Enhancement and Environmental Degradation Control four Technical Working Groups (TWGs) were established. These comprised designated members of industry, government and other stakeholders. The TWG played an important role in developing sector-level HCFC phase-out strategies, which would inform Indonesia's overall HPMP. It is worth noting that this statutory mandate for a government-industry partnership for HPMP was among the first of its kind in the world.

45. Following the data collection and analysis, the TWGs decided upon prioritizing sub-sectors/applications for HCFC phase-out as follows:

- (a) Segregation of eligible and ineligible enterprises (and consumption);
- (b) Segregation of first and second conversions as applicable (and related consumption);
- (c) Availability of zero-ODP and low-GWP mature alternative technology options for each sub-sector/application; and
- (d) Implementability of the conversions within the available timeframe of about 3 years.

Use of TPMP and NPP experience

46. During the preparatory phase a methodology for establishing funding levels for HCFC phase-out in the servicing sector, based on the main components of TPMPs and NPPs, was also elaborated with the help of the implementing agencies.

Communication and coordination mechanisms

47. The four TWG organized about 52 consultations meetings for data reconciliation and to prepare sectoral and national strategies. Bottom up inputs from all stakeholders were taken into account. In addition, a workshop attended by 400 participants was organized with the support of Australia and

ASHRAE, Indonesia chapter. The objective was to raise awareness of Indonesia's new obligations under the Montreal Protocol, arising from the accelerated phase-out schedule for HCFC, to disseminate and exchange information on alternative technology and to develop consensual and stakeholders-driven plan of action for preparation of Indonesia's HPMP for compliance of 2013/15 targets. The key recommendations of this workshop pointed out a proactive partnership between government and industry for HPMP preparation and implementation.

Implementation issues

48. Some delays in implementation of the preparatory phase projects occurred for both UNDP and World Bank while UNIDO finished earlier than planned.

49. A change took place from the preliminary submission in an effort to seek a more environmentally sound alternative technology. The decision was to replace the initially selected R-134a with hydrocarbons, CO₂, ammonia, etc. as feasible for each application. In addition R-32 was the choice for replacing 2.92 ODP tonnes used for factory-manufactured refrigeration units for small and medium sized walk-in cold rooms.

50. Another issue was related to the difference between the HCFCs that were phased in and the estimated amount consumed in 2009. The World Bank stated that during the preparation of the foam and refrigeration components of the HPMP, some enterprises that were previously converted to HCFC-141b technology were closed or moved to other countries; others changed their business products and others converted to a final solution on their own. Furthermore, the levels of production have decreased significantly due to the economic crisis.

51. The World Bank also indicated that, during the preparation of the Foam Sector Plan, consideration was given to selecting more enterprises that had not received assistance from the Fund. Since commitments to phase-out HCFC-141b consumption were secured only from enterprises manufacturing domestic refrigerators and freezers and integral skin products, it was necessary to include second-stage conversion enterprises in phase 1 of the Foam Sector Plan to comply with the Protocol's HCFC phase-out targets.

52. Indonesia expects to encounter challenges for meeting the control targets for HCFC consumption in accordance with the phase-out schedule. The main cause is the very limited time available to implement actions for achieving the objectives of Stage-I (2011 to 2015), Stage-II (2015 to 2020) and subsequent stages.

II. Submission of the HPMP

53. UNDP as lead agency submitted for consideration Indonesia's HPMP Stage-I for compliance with the 2013 and 2015 control targets on behalf of the Government of Indonesia at the 62nd meeting of the Executive Committee (Excom) in December 2010. It is only at the 64th meeting that the Executive Committee decided "to approve, in principle, stage I of the HCFC phase-out management plan (HPMP) for Indonesia for the period 2011 to 2018 to reduce HCFC consumption by 20 per cent of the baseline, at the amount of US\$ 12,692,684, plus agency support costs of US \$968,452" (Dec. 64/42).

54. The HPMP adopted a staged approach within the context of an overarching strategy. The stage I of the HPMP would focus on compliance with the 2013 freeze and 2015 reduction targets. The subsequent stages would focus on HCFC phase-out in compliance with the future reduction of control targets. The government of Indonesia therefore committed to achieve the 2013 and 2015 control milestones through performance based agreements. The main components of the HPMP are: foam sector plan (World Bank); umbrella project covering four foam enterprises (UNIDO); air-conditioning sector

plan (UNDP); refrigeration sector plan (UNDP); technical assistance for refrigerant management (Australia); management components (UNDP).

The overarching strategy

55. As requested in the guidelines the document includes an overall long-term strategy. The strategy aims at facilitating Indonesia's compliance with the control targets for HCFC consumption with minimal impacts on the national economy, on environment and on occupational health.

56. The strategy includes the implementation of a combination of interventions and is composed of the following components: Investment, comprising of four sector plans and a group project as below. Concerning the sectors plans, these are: Air Conditioning Sector Plan, which will aim to phase out HCFC consumption in the manufacturing of air conditioning products and equipment by 2015. Refrigeration Sector Plan, which will aim to phase out HCFC consumption in the manufacturing of refrigeration products and equipment by 2015; the Firefighting Sector will not contribute to the Stage-I phase out target, however would be instrumental in eventual phase-out HCFC-123 in this sector ; Foams Sector Plan which will phase out HCFC consumption in selected foam manufacturing sub-sectors by 2015.

57. In addition, the strategy includes a series of activities concerning technology transfer investments, policies and regulations, technical assistance, training and capacity building, awareness and education, and monitoring and management in the HCFC consuming sectors. It aims at contributing to achieve sustainable reductions and phase-out of HCFC consumption.

58. It sets out priorities such as manufacturing as well as applications and subsectors where mature technologies are available. The complete phase-out is targeted at sub-sector levels to avoid market distortion and to facilitate clear regulation, voluntary compliance and effective enforcement. HCFC-141b is prioritized for phase-out to the extent it is implementable in a cost-effective manner. In addition, selecting financially sound and viable enterprises with good technical and managerial capacity and relatively higher consumption was also prioritized to ensure cost-effectiveness and maximum impact.

Co-financing

59. Co-financing efforts concern issues related to energy-efficiency related interventions. At the time of the HPMP submission, Indonesia was pursuing co-financing opportunities for energy-efficiency related interventions in conjunction with HPMP implementation. For example, UNDP was implementing a GEF-approved project: "*Barrier removal for cost-effective development and implementation of energy-efficiency standards and labelling*" (BRESL), covering six countries in Asia-Pacific, of which Indonesia is one (Indonesian component amounts to US \$1.8 million in GEF grant). This project helps update energy-efficiency standards and labelling programme.

60. In addition, Indonesian Ministry of Environment and UNDP were jointly developing a project for enhancing energy-efficiency of refrigeration and air-conditioning equipment, for funding by GEF.

Approval of HPMP

61. Indonesia's HPMP was considered during the 62nd Executive Committee meeting but the approval was twice deferred. Eventually the Executive Committee approved the HPMP at its 64th meeting. The reason for postponement was that several Executive Committee members felt they need more time to assess the HPMP.

62. During the 63rd Executive Committee meeting, a contact group of interested Executive Committee members discussed HPMPs from non-LVC countries, among which Indonesia HPMP was one. The comments of the contact group on the Indonesia HPMP addressed mainly the total amount of

HCFC phase-out, prioritization of sectors and selection of alternative technologies in the refrigeration and air-conditioning sectors for stage I compliance. Some comments required further information from the national stakeholders and therefore a final decision on the HPMP could not be reached immediately.

Relevance of HPMP to Guidelines

63. While the HPMP followed the guidelines recommendations its complexity and the amount of data to be reviewed made its approval to be postponed twice.

MALDIVES

Country	Agency	LVC	Sector (1)	HCFC Baseline (2)
Maldives	UNEP/UNDP	LVC	One Sector	4.60

I. The preparatory phase

Roles of Implementing and bilateral agencies

64. HPMP preparation started with the approval of the funding by the 55th Executive Committee through its Decision 55/22. UNEP was the Lead Agency with UNDP as the Coordinating Agency.

UNEP			
Project	Project title	Budget	Activities
MDV/PHA/55/P RP/16	Preparation of the HPMP	\$85,000	Assistance for policy and legislation; survey of HCFC use and analysis of data;

65. The role of UNEP was to provide technical assistance and further guidance towards successful implementation of the HPMP and work with UNDP in preparation of investment projects proposals to be submitted to the Executive Committee.

Institutional arrangements

66. Maldives has already implemented a large number of ozone-related projects in the past. Therefore the country had experience in coordination and management of such projects.

67. The National Ozone Unit (NOU) was the central national body under the Ministry of Housing, Transport and Environment (MHTE), responsible for coordinating and implementing ozone related activities during the CFC phase-out. It will continue to be responsible for the coordination of the national activities towards HPMP phase-out plan implementation in cooperation with UNEP. At the time of the preparatory phase the Ozone Unit was been placed under the direct supervision of the Ministry THE. This action highlights the mainstreaming of ozone protection activities within the mandate of the Ministry.

68. In addition, during the HPMP implementation it is planned to strengthen stakeholders' involvement during the HPMP implementation as HCFC phase-out will see involvement of new stakeholders especially in the energy and climate change sector involving additional ministries engaged in standard settings, energy, climate change, planning, chemicals and waste.

Fulfilling the data and information requirements

69. The preparatory phase included a HPMP initiation mission and various stakeholder consultations. In addition a survey on annual consumption of HCFCs in Maldives took place to establish the HCFC baseline for the country based on the average consumption in 2009-2010. The survey covered the whole of Maldives and surveyors physically visited and inspected more than 20 resorts and servicing workshops.

70. The HPMP is based on a survey assessing the use of HCFCs in the country, the number of HCFC refrigeration and air-conditioning systems, and the situation of the refrigeration servicing sector.

71. HCFCs have been in use as a refrigerant in Maldives for more than 30 years in the refrigeration and air-conditioning and servicing sector. HCFC-141b, HCFC-123 and HCFC-22 are the most used in the country, but HCFC-141b and HCFC-123 were used in very minor quantities for flushing of equipment. Maldives does not produce HCFCs therefore the only source of HCFC and other refrigerant used in the Maldives is through imports. HCFCs are used in the Maldives only for servicing of equipment in the fishing, tourism and food processing industry and servicing of household/commercial refrigeration and air-conditioning units.

Policy and regulations, licensing and quota system

72. According to a UNEP progress report at the 61st meeting the overall ODS national regulation as well as the existing import and export licensing system cover HCFC. There was therefore no need for any further update of the national regulation or licensing system during the preparatory phase. During HPMP implementation, the country will strengthen enforcement of the existing licensing system to ensure pre-import and pre-shipment permit issuing.

Use of TPMP and NPP experience

73. The institutional framework for the ODS phase-out was created and strengthened during the CFC phase-out process. Furthermore the conversions that took place in Maldives were greatly helped by the good practices and trainers training provided through RMP and TPMP as well as the market availability of alternatives. Therefore institutional strengthening will continue during HPMP implementation to keep the good practices going on.

II. Submission of HPMP

74. The HPMP was submitted at the 60th meeting. It was the first HPMP from an LVC country. It intends to address the complete phase-out of HCFCs following an accelerated phase-out schedule and achieving an HCFC phase-out ten years before the target date. The total cost of implementation was US \$1,100,000, plus agency support costs of US \$129,900. The Executive Committee decided to approve in principle, and on an exceptional basis, the HCFC phase-out management plan (HPMP) for Maldives noting that the level of funding was for an accelerated HCFC phase-out up to 2020 (decision.60/37).

Overarching strategy

75. The plan is developed in a single stage approach aimed at achieving complete phase-out of HCFCs by 2020 and keeping an allowance of 2.5 per cent of the baseline consumption for meeting servicing needs till 2025.

76. The plan will impose a ban on the import of HCFC based equipment by 2013. The activities that will be undertaken in the country will be a combination of non-investment activities (policy instruments, training and awareness-raising) and investment activities (refrigerant reclaim programme, retrofitting and pilot end-user replacement programme) to be implemented by UNEP and UNDP respectively. The strategy includes the establishment of HCFC phase-out policies and their enforcement; Enhanced awareness and outreach; Plan for gradual reduction of HCFC; Technical assistance for the servicing sector; HCFC reclaim programme; End-user retrofit/pilot investment programme; and Project Management & Monitoring.

77. Under the HCFC policy component, a ban is planned from 2013 onwards on imports of new equipment containing HCFCs. The existing licensing system will be strengthened to establish an import quota for bulk HCFC-22 as well as HCFC blends from 2010 onwards. In addition, these measures will also include strict reporting requirements for importers in relation to the total quantities of imported or exported goods under the issued permits. Furthermore the Government also envisages a tax incentive for the import and use of non-HCFC equipment.

Co-financing

78. Discussion on the feasibility of Maldives HPMP also addressed government commitment. According to the HPMP the Government of the Maldives took a firm commitment to provide initial counterpart funding and to seek significant levels of co-financing from non-Multilateral Fund sources for climate benefits associated with the HCFC phase-out. In addition because Maldives has declared its intention to become a carbon neutral country within ten years, it will initiate activities for the promotion of ozone and climate co-benefit, which will include a standards and labelling programme as well as the development of a framework for efficient and low HCFC economic development. These will be implemented at the same time as the other activities funded under this HPMP.

Relevance of the HPMP to Guidelines

79. Except for being an accelerated phase out, the HPMP follows the recommendations of the guidelines. During the meeting several members of the Executive Committee expressed however their reticence to the approach adopted by the government of Maldives. One Member expressed his concern on the delays being experienced in the implementation of the TPMP for Maldives and asked whether it would be possible for the funding that had been approved for the TPMP to be merged into the funding for the HPMP. He also observed that one of the essential components of the plan was the inclusion of elements to address the ozone and climate benefits of HCFC.

NIGERIA

Country	Agency	LVC	Sector	HCFC Baseline
Nigeria	UNIDO/UNDP	Non-LVC	Several sectors	398.20

I. The preparatory phase

Role of implementing and bilateral agencies

80. Projects included in the preparatory phase were submitted to the Executive Committee between its 55th and 61st meetings. UNDP was the lead while UNIDO the cooperating agency. In addition, a bilateral agency, Japan was in charge of preparing a demonstration project (which eventually did not become part of the HPMP).

UNDP			
Project	Project title	Budget	Activities
NIR/PHA/55/FIN	Preparation of a HCFC phase-out management plan	US \$85,000	Preparation of the HPMP including assistance for policy and legislation; survey of HCFC use and analysis of data;
NIR/PHA/56/PRP/12 1	Preparation of a HCFC phase-out management plan (additional funding)	US \$45,000	Additional funding for the preparation of the HPMP approved at the 55th Meeting.
NIR/FOA/57/PRP/12 3	Preparation for HCFC phase-out investment activities (foam sector)	US \$50,000	Preparation of phase-out activities in the foam sector
UNIDO			
NIR/PHA/56/FIN	Preparation of a HCFC phase-out management plan (additional funding)	US \$19,996	Additional funding for the preparation of the HPMP approved at the 55 th Meeting.
NIR/REF/58/PRP/12 4	Preparation for HCFC phase-out investment activities (refrigeration manufacturing sector)	US \$47,658.44	Preparation of an HCFC phase-out plan for the refrigeration manufacturing sector.
Japan			
NIR/REF/61/PRP/12	Preparation of	US \$30,000	Preparation of a proposal to evaluate the

7	project proposal		technical and commercial viability of the use of CO ₂ as a refrigerant to replace HCFC-22 in split-type commercial refrigeration equipment, in particular at low temperatures (freezing).
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81. As lead agency UNDP is in charge to coordinate the overall development of the HCFC phase-out management plans, while UNIDO covers the RAC manufacturing, aerosol and solvent sectors.

Policy and regulations; Changes in legislation, regulation, licensing and quota system

82. During the preparatory phase of the HPMP Nigeria decided to update legislation in order to facilitate the implementation of the HCFC phase-out. The focus of the changes was on strengthening the existing legal framework for the control of the ODS (including HCFC) export, import and other related issues that will contribute to the successful HCFC phase-out. The new legislative framework included a series of penalties for infringement and also covered the consequences of converting HCFC-consuming enterprises in phases.

83. A concern of the Secretariat expressed during the submission of the HPMP was related to the specific ways, documented in previous verification reports, in which Nigeria has implemented its licensing system and whether this would be effective to ensure compliance with the 2013 and 2015 control measures. Eventually UNDP and the Secretariat agreed to make the submission of the third tranche in 2012 of the HPMP depended on the existence of a functioning licensing/quota system encompassing HCFCs. The functionality of that licensing/quota system is expressed in its ability to control the imports of, in particular, HCFCs into the country to a level predefined by the quota.

Fulfilling the data and information requirements

84. To assess the HCFC consumption in the servicing sector, a survey was conducted in four main-use sectors: domestic, commercial, mobile and industrial. Because of the import of pre-blended polyol there were some difficulties in obtaining accurate growth estimation, in particular in the foam sector; the HPMP therefore estimates growth based on information obtained during a bottom-up survey.

Institutional arrangements

85. All activities for the implementation of the Montreal Protocol are coordinated and monitored by a National Ozone Office (NOO), established within the Federal Ministry of Environment. Other governmental institutions are also involved in the implementation of the Montreal Protocol, such as the National Agency for Food and Drug Administration (NAFDAC) and the National Customs Service (NCS). A Project Management Unit (PMU) created for the national phase out plan (NPP) was replaced with a PMU for HPMP. The PMU was placed under the supervision of the National Ozone Officer, and has the responsibility to assist the National Ozone Unit in the monitoring of the implementation of activities under the Plan.

Use of TPMP and NPP and demonstration projects experience

86. Preparation funding for a demonstration project for Japan was approved at the 61st meeting. The project aimed to validate a new technology (the transcritical CO₂ refrigeration technology for application to ice-blockmakers at Austin Laz). The funding request for the project was submitted in parallel with the HPMP document at the 62nd Meeting.

II. Submission of HPMP

87. UNDP submitted the HPMP document for the consideration of the Executive Committee at its 62nd meeting. The Executive Committee decided to approve, in principle, stage I of the HCFC phase-out management plan (HPMP) for Nigeria for the period 2010-2015, at the amount of US \$5,309,242 (decision 62/67).

88. The HPMP presented a staged approach with a particularity. Unless other countries that prioritized specific activities and scheduled them throughout different stages, Nigeria adopted a holistic approach addressing the reinforcement of all of sub-sectors, in order to ensure not only that they build on what has been achieved, but also and more importantly, that none of the hard gained momentum and achievements are lost. The logic of this choice was the risk of phasing in cheaper alternatives against acceptable alternatives and “loss of momentum” with detrimental consequences.

The overarching strategy

89. While focused on achieving the immediate phase-out targets of a 2013 freeze at the baseline level, and for 2015, the subsequent 10 per cent reduction in the baseline the HPMP also presents the main principles of Nigeria’s overall strategy up to the year 2040. There are four main strategic lines that the HPMP follows: phase-out of HCFC-141b in the polyurethane foam sector; conversion of companies in the commercial refrigeration and air-conditioning manufacturing sector, where HCFC-22 is used and some of which use HCFC-141b; refrigeration and air-conditioning servicing sector and project monitoring.

90. In addition, the Government of Japan submitted a request for a “demonstration project to validate the trans-critical CO₂ refrigeration technology for application to ice-block makers at Austin Laz, Nigeria. This project is not an integral part of the HPMP although its justification is that it will contribute to the HCFC phase-out. The preparation process for this project was done in cooperation with the preparation of the HPMP.

Approval of HPMP

91. The Executive Committee decided to approve, in principle, stage I of the HCFC phase-out management plan (HPMP) for Nigeria for the period 2010-2015, at the amount of US \$5,309,242.

Relevance to the HPMP guidelines

92. While the document presented to the Executive Committee covers the recommendations of the guidelines the strategy is original in the sense that it adopts a holistic approach, unlike the other countries. In addition the demonstration project submitted by Japan is not considered part of HPMP although their result aims at contributing to the HCFC phase-out.
