Financing the Climate Co-Benefits of the HCFC Phase-out

A Guide for Low Volume Consuming Countries

United Nations Environment Programme

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Executive Summary

This document provides guidance for Ozone Officers in low volume HCFC-consuming countries (LVCs) to help them understand how to seek financing outside of the Montreal Protocol's Multilateral Fund to achieve the climate co-benefits indicated in their national HCFC Phase-out Management Plans (HPMPs).

LVCs have certain characteristics that are unique to their circumstances that can make accessing additional this financial support for HCFC phase-out projects particularly challenging, however the experience of some developing countries and the resource mobilisation projects of the Multilateral Fund's Implementing Agencies demonstrate thatit can be done successfully. The vast majority of the HCFCs consumed in LVCs still remains to be phased out , and since HCFCs both deplete the ozone layer and are greenhouse gases, LVCs have a clear opportunity to develop phase-out projects that meet both ozone and climate protection goals. Significant cost savings for equipment owners and governments can result when HCFC phase-out projects are designed to provide climate benefits.

In order to develop such funding proposals, it is important for HCFC-related activities to be expressed in terms understandable by organisations that are used to climate change concepts and terminology, i.e. describing HCFCs as greenhouse gases using carbon dioxide equivalent (CO_2-eq) emissions. When developing a resource mobilisation plan, Ozone Officers should identify the potential climate benefits in the servicing sector and understand who could benefit, i.e. the consumer, the equipment owner, the government and/or the environment. Climate co-benefits are frequently driven by increased energy efficiency in equipment using alternatives for HCFCs.

There is a range of potential sources of financial support for climate co-benefits projects that an Ozone Officer could consider, including mainstreaming through Official Development Assistance, global level financial institutions with climate programmes, regional financial institutions that support climate benefits, government support for climate benefits as bilateral donors, and private sector support. The steps an Ozone Officer should follow include understanding the refrigeration servicing sector, and identifying

the potential climate co-benefits and possible barriers; persuading management to seek climate co-financing for the HCFC phase-out; meeting with bilateral donors, international organisations and regional organisations that work in the country, making a compelling proposal, and preparing for discussions with potential donors.

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List of Acronyms

ACSP	African Carbon Support Programme
ADB	Asian Development Bank
AfDB	African Development Bank
CAS	Country Assistance Strategy
CDB	Caribbean Development Bank
CDM	Clean Development Mechanism
CER	Certified emission reduction
CFC	Chlorofluorocarbon
CFU	Carbon Finance Unit
CIF	Climate Investment Funds
CO_2-eq	Carbon dioxide equivalent emissions
EBRD	European Bank for Reconstruction and Development
ECA	Europe and Central Asia
EER	Energy efficiency rating
GEF	Global Environment Facility
GHG	Greenhouse gas
GWP	Global warming potential
HC	Hydrocarbon
HCFC	Hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
HFO	Hydrofluoroolefin
HPMP	HCFC Phase-out Management Plan
HVAC&R	Heating, ventilation, air conditioning, and refrigeration
IADB	Inter-American Development Bank
IDA	International Development Association
IDBI	Industrial Development Bank of India
IEA	International Energy Agency
IFC	International Finance Corporation
IPCC	Intergovernmental Panel on Climate Change
LVC	Low volume HCFC consuming country
MDG	UN Millennium Development Goal
MT	Metric tonnes
NOU	National Ozone Unit
ODA	Official Development Assistance

ODP	Ozone Depleting Potential
ODS	Ozone depleting substance
OECD	Organisation for Economic Co-operation and Development
PRSP	Poverty Reduction Strategy Paper
RAC	Refrigeration and air conditioning
SE4ALL	Sustainable Energy for All Initiative
SEFA	Sustainable Energy Fund for Africa
SIDS	Small Island Developing States
TEAP	Technology and Economic Assessment Panel
UNDAF	UN Development Assistance Framework
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	UN Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisation
VLVC	Very low volume HCFC consuming country

Foreword

Hydrochlorofluorocarbons (HCFCs) are gases used worldwide in refrigeration, air conditioning and foam applications, but they are being phased out under the Montreal Protocol on Substances that Deplete the Ozone Layer since they deplete stratospheric ozone that protects all life on Earth. In 2007, the Parties accelerated the HCFC phase-out schedule and at the same time encouraged countries to promote the selection of alternatives to HCFCs that minimise environmental impacts, in particular impacts on climate.

As countries began to respond to this decision and phase out HCFCs, hydrofluorocarbons (HFCs) began to spread as their replacements. HFCs are now widespread in refrigeration and air conditioners, foam production and other applications. While these chemicals do not deplete the stratospheric ozone layer, some of them have high global warming potentials. Overall HFC emissions are growing at a rate of 8% per year and annual emissions are projected to rise to 7-19% of global CO_2 emissions by 2050. Uncontrolled growth in HFC emissions therefore challenges efforts to keep global temperature rise at or below 2°C this century. Urgent action on HFCs is needed to protect the climate system.

One way to address the HFC issue is to reduce dependency on high GWP alternatives and increase the adoption of low GWP, energy efficient technologies as part of the HCFC phase out process under the Montreal Protocol. Such a "smart approach" can achieve the Montreal Protocol's objective of eliminating HCFCs while at the same time achieving energy efficiency gains and CO_2 emissions reduction — a "climate co-benefit."

The Multilateral Fund for the Implementation of the Montreal Protocol encourages developing countries and agencies to explore potential financial incentives and opportunities for additional resources to maximise the environmental benefits from national HCFC Phase out Management Plans (HPMPs). UNEP has developed this booklet to help Ozone Officers in low-volume consuming countries understand how to explore opportunities for mobilising additional resources to achieve climate co-benefits in the context of the HCFC phase out, and complement what is being provided for ozone protection under the Multilateral Fund. Ozone Officers have an excellent opportunity under the HPMPs to meet Montreal Protocol objectives and at the same time reduce energy consumption and help their country contribute to climate protection. The key factor will be the curiosity, motivation and hard work of the individual Ozone Officers to seek out these promising new opportunities for climate co-benefits.

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Introduction

During its 60th meeting, the Executive Committee of the Multilateral Fund agreed under Decision 60/44 that for HCFC phase-out projects to achieve the 2013 and 2015 HCFC phase-out compliance targets, it would provide additional funding of up to 25% above the cost effectiveness threshold for projects, when needed for the introduction of low global warming potential (GWP) alternatives. This provision thus encourages Article 5 countries to use replacements for HCFCs in their RAC investment projects that have less impact or no impact on climate – thereby achieving climate co-benefits.

Given that this additional funding of up to 25% related to climate benefits is not available to Parties with no HCFC manufacturing sector, the Parties that are LVCs need information and guidance on how to access additional funding and support for their HCFC phase-out. In recognition of this need, the Executive Committee, through Decision 63/22 (a), approved separate resource mobilization projects for each of the four implementing agencies: UNDP, UNEP, UNIDO and the World Bank. The project approved for UNEP, entitled "Resource mobilization to address climate co-benefits for HCFCs phase-out in LVCs with servicing sector only," includes two elements: a study on financing options (i.e. this document) and four regional workshops on co-financing.[3]

In preparation for the UNEP resource mobilisation project, the final reports of the resource mobilisation projects of UNDP, UNIDO and the World Bank proved to be useful. In addition, UNEP sought and received advice from the other Implementing Agencies in relation to their experiences working with National Ozone Units (NOUs) in LVCs who were seeking opportunities for resource mobilisation. The regional workshops on co-financing also provided an opportunity for participants in LVCs to voice their needs in relation to resource mobilisation and to provide their inputs to this document.[4]

This document is designed as guidance for Ozone Officers in LVCs to help them understand how to approach financing options to achieve climate co-benefits of the HCFC phase-out. Although this document is specifically targeted to assist LVCs that only consume HCFCs for servicing RAC equipment, the document should be useful to all LVCs. It is intended to provide practical steps to guide Ozone Officers on how to identify support for the climate co-benefits of their HPMPs. It describes LVCs and the challenges and opportunities Ozone Officers in LVCs may face in identifying and accessing support to address climate co-benefits. The publication then outlines what climate benefits are possible in refrigeration servicing sector. It introduces the concept of co-financing and the various

institutions that can provide support to LVCs as they phase out the HCFCs. Finally, it demonstrates how to prepare for discussions on co-financing with potential donors to address climate co-benefits during the HCFC phase-out.

The document is divided into the following six sections:

1. Phase-out schedule for HCFCs. The HCFC phase-out schedule for developing countries is outlined.

2. Description of LVCs with refrigeration servicing sector only. Countries with low or very low consumption of HCFCs, in particular those with RAC servicing sector only, are described, along with their unique challenges in relation to accessing financial support to implement their HPMPs.

3. Progress so far on HCFC phase-out in LVCs with servicing only and what that means in terms of climate. This section reviews the data available on HCFC phase-out in LVCs with a RAC servicing sector only and sets out how much more must be achieved. It also discusses how to express HCFCs as greenhouse gases to set the stage for seeking climate benefits in HPMPs.

4. An overview of alternatives for HCFCs in refrigeration and air-conditioning. The substitutes for HCFCs in the RAC sector are briefly introduced in this section along with a review of how to achieve climate benefits in the HCFC phase-out as it relates to the servicing sector. This section also makes the case for seeking financing to support climate benefits when implementing the HPMPs.

5. Financing options available to LVCs seeking support for climate benefits. This section introduces climate financing institutions that are options for LVCs, seeking support outside of the Multilateral Fund for climate co-benefits. It describes the kinds of support provided by the various financing institutions specific to an LVC.

6. Guide to Ozone Officers for accessing co-financing. This section presents a step-by-step guide for an Ozone Officer on how to move from understanding the opportunities that climate co-benefits can offer through to putting resource mobilisation into practice.

Phase-out Schedule for HCFCs

In September 2007, the Parties to the Montreal Protocol agreed to accelerate the phase-out schedule for HCFCs through Decision XIX/6. The schedule for developing countries operating under Article 5 of the Protocol (Article 5 countries[5]) is presented in table 1.

Schedule	Year
Baseline	Average of 2009 and 2010
Freeze	2013
90% (reduction of 10%)	2015
65% (reduction of 35%)	2020
32.5% (reduction of 67.5%)	2025
Annual average of 2.5%	2030 to 2040
0% (reduction of 100 %)	2040

Table 1: HCFC Phase-out Schedule for Article 5 Parties

Decision XIX/6 also:

• Directed the Executive Committee, in providing technical and financial assistance, to pay particular attention to Article 5 Parties with low volume and very low volume consumption of HCFCs;

• Encouraged Parties to promote the selection of alternatives to HCFCs that minimise environmental impacts, in particular impacts on climate, as well as meeting other health, safety and economic considerations[6]; and

• Agreed that the Executive Committee, when developing and applying funding criteria for projects and programmes, would give priority to cost-effective projects and programmes which focus on, *inter alia* substitutes and alternatives that minimise other impacts on the environment, including on the climate, taking into account global warming potential (GWP), energy use and other relevant factors.

Description of LVCs with Refrigeration Servicing Only

Countries with low or very low consumption of HCFCs are LVCs including those with refrigeration servicing only are the main focus of this financing options document. The characteristic of LVCs are described in this section, along with their unique challenges with respect to accessing financial support to implement their HPMPs.

During the current HCFC phase-out stage, for the purpose of Multilateral Fund projects, developing countries are classified according to their annual levels of HCFC consumption. Executive Committee decision 60/44 (xiii) defines an Article 5 country as a LVC if it has a total HCFC consumption of up to 360 metric tonnes (MT) or 19.8 Ozone Depleting Potential (ODP) tonnes in the servicing sector. The HCFC baseline established under the HPMP is used to determine whether the country meets the 360 MT threshold. If a country has HCFC consumption in the servicing sector and in manufacturing, and the total consumption is still less than 360 MT, then it is still considered an LVC.

The term "refrigeration and air-conditioning" includes equipment used in the domestic, commercial and industrial, and mobile air-conditioning sub-sectors. All countries consume HCFCs in the RAC sector for servicing existing equipment. The focus of this document is LVCs, which do not manufacture products containing HCFCs or have a foam manufacturing component. Special attention is provided to LVCs that consume HCFCs only for servicing in the RAC sector.

Out of the 147 Parties that operate under Article 5 of the Protocol, 89 of them are classified as LVCs (i.e. 61%). Furthermore, 59 of the LVCs only consume HCFCs for RAC servicing (i.e. 66%), as indicated in table 2.

Table 1. List of LVCs
(* indicates LVCs that only consume HCFCs in the servicing sector)

1. Albania *
2. Angola *
3. Antigua and Barbuda
4. Armenia
5. Bahamas *
6. Barbados *
7. Belize
8. Bhutan *
9. Bolivia
10. Bosnia and Herzegovina
11. Botswana
12. Brunei Darussalam *
13. Burundi *
14. Cambodia *
15. Cape Verde *
16. Central African Republic *
17. Chad *
18. Comoros *
19. Congo *
20. Cook Islands *
21. Costa Rica
22. Croatia
23. Cuba
24. Djibouti *
25. Dominica *
26. Ecuador
27. El Salvador
28. Equatorial Guinea *
29. Eritrea *
30. Ethiopia *
31. Fiji *
32. Gambia *
33. Georgia *
34. Grenada *
35. Guatemala
36. Guinea-Bissau *
37. Guyana *
38. Haiti *
39. Honduras
40. Jamaica
41. Kiribati *
42. Kyrgyzstan
43. Lao, PDR
44. Lesotho *
45. Liberia *
46. Macedonia, FYR
47. Malawi *
48. Maldives
49. Mali *
50. Marshall Islands *
51. Mauritius
52. Micronesia *
53. Moldova, Republic of *
54. Mongolia *
55. Montenegro *
56. Mozambique *
57. Myanmar
58. Namibia
59. Nauru *
60. Nepal *
61. Nicaragua
62. Niue *
63. Palau *
64. Papua New Guinea *
65. Paraguay
66. Rwanda
67. Saint Kitts and Nevis *
68. Saint Lucia *
69. Saint Vincent and the Grenadines *
70. Samoa *
71. Sao Tome and Principe *
72. Serbia *
73. Seychelles
74. Sierra Leone *
75. Solomon Islands *
76. South Sudan *
77. Sri Lanka
78. Suriname *
79. Swaziland
80. Tanzania, Republic of *
81. Timor Leste *
82. Tonga *
83. Turkmenistan *
84. Tuvalu *
85. Uganda
86. Vanuatu *
87. Yemen
88. Zambia *
89. Zimbabwe

In line with the Multilateral Fund document *Minimizing Adverse Climate Impact of HCFC Phase-out in the Refrigeration Servicing Sector*[7] the term "refrigeration servicing sector" principally describes only the service of existing refrigeration equipment. In reality, technicians' expertise is also frequently used for the additional task of assembly, installation, initial charging and commissioning of new refrigeration equipment, and in particular when such equipment is custom-made for specific installations (e.g. supermarkets, refrigerated transportation, etc). The initial refrigerant charge in new systems has an estimated share between 20 to 60% of HCFC servicing-sector consumption for most countries.[8] There is almost no data regarding the distribution of service-sector consumption between actual service and assembly/ installation/ initial charging/ commissioning. In fact, HCFC-22 uses related to the installation and initial charge of refrigeration equipment is absent from almost all HPMPs. The main difference between the two groups of tasks is that in many cases in which the service sector is performing assembly, installation, initial charging and commissioning, the choice of technology is not limited by an already existing system. In comparison, the actual servicing of refrigeration equipment provides only a limited possibility of changing the technology selected when the equipment was procured, as each refrigeration system has been specifically designed for one refrigerant. Despite this, for the purpose of this document on financing options, "servicing" includes retrofitting/ conversions.

All Article 5 countries face challenges in phasing out HCFCs – challenges that differ from those faced in the CFC phase-out. Actual consumption of HCFCs in MT has exceeded the peak of CFC consumption by 200%. In terms of impact, however, the ODP of HCFCs is only 10-20% that of the ODP of CFC-11/12. This implies that more phase-out interventions and investments will be required to accomplish the same level of ODP reductions achieved for CFCs. Further, because most HCFC consumption is in the RAC sector, the fleet of HCFC-dependent equipment world-wide will continue to be dependent on HCFCs for servicing, despite the fact that the upcoming control measures under the Montreal Protocol will limit HCFC supply. An added challenge is that many HCFC-using enterprises and households own equipment that is far from the end

of its product life as a result of recent conversion from CFC use.[9]

Other challenges to transforming HCFC consuming sectors are the low price of HCFCs as compared to alternatives and the degree of availability of affordable alternative technologies for developing countries. The price of HCFC-22 in particular has remained low and is expected to remain so in the foreseeable future.[10]

Unlike other Article 5 countries, LVCs have certain characteristics that are unique to their circumstances that can make accessing additional financial support for HCFC phase-out projects particularly challenging. A few of these circumstances are described below:

• It is difficult to design "one size fits all" solutions. As a group, LVCs vary widely with respect to geography, capacity to diagnose problems and design appropriate solutions, and economic, social, and environmental conditions.

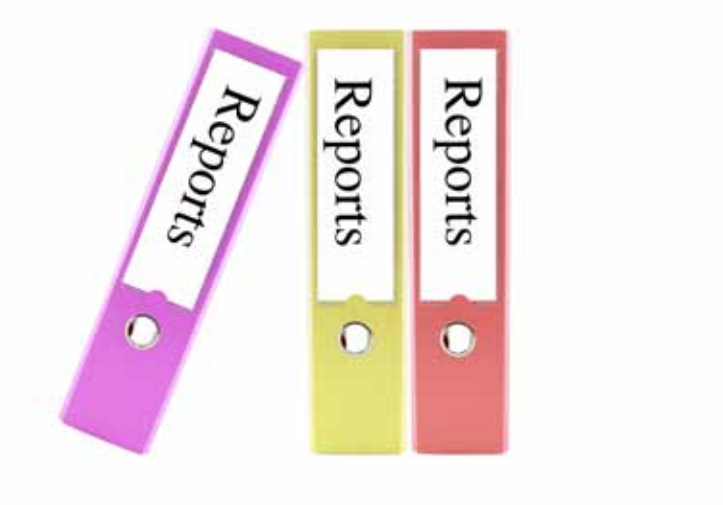
Possible solution: From the initial project concept through the proposal drafting stages, the Ozone Office should tailor the proposal to specific, articulated national need and circumstances, involving a wide consultative process with national stakeholders to ensure a proper design.

• Many LVCs do not have national or regional facilities for disposal/destruction of waste ODS. Waste ODS must be transported resulting in high costs, an important factor in project implementation.

Possible solution: If the resource mobilisation project includes ODS disposal, take such costs into consideration and determine if there are less expensive or alternative ways to address the waste issue. Alternatively, consider approaching the waste issue on a regional basis or finding private sector companies that are willing to take the waste at no cost (e.g. to reclaim and re-sell).

• LVCs by definition consume small amounts of ODS so there will be few, if any, "economies of scale" available to reduce the cost of implementation actions. The costs to reduce HCFCs in an LVC, on a per tonne basis, will be intrinsically more expensive than in a country that has higher consumption. From a climate change point of view, it also means that LVCs face a mitigation quandary due to low GHG emissions baselines that limit access to financing that is available from financial institutions devoted to supporting projects related to climate change.

Possible solution: Consider joint actions with other countries in the region to



achieve a sufficiently large level of consumption (e.g. a regional project). Alternatively, by joining other larger initiatives already underway (e.g. energy-efficiency programmes), the HCFC component could "tag along" with a larger project and thus avoid the need for an economy of scale related only to the HCFC component.

• LVCs rely heavily on costly petroleum-based fuels for power generation. Since refrigeration and air-conditioning alone accounts for 40%-60% of total electricity consumption in developing countries, the power requirements and cost of power for refrigeration and air-conditioning in a LVC can be prohibitive for the consumer and equipment owner. With projected increasing global demand for refrigerators and air-conditioners, governments in LVCs face power generation capacity issues along with the costs that developing more capacity brings.

Possible solution: Use this fact to your advantage when making the argument for a resource mobilisation proposal. By including energy-efficiency components in the project proposal, the project outcome will reduce the need for power generation and fuel. Alternatively, consider adding components on renewable energy to the HCFC project (e.g. solar air conditioning).

• An LVC may have difficulty attracting financial support for its projects. It can be difficult for financial institutions to support projects in an LVC if the institution's administrative fees assessed as a percentage against a small project are insufficient to cover the actual costs of the administrative support.

Possible solution: This is a reality and must be taken into account during the design stage. Discuss with your Director ways in which the project could be combined with other projects to have sufficient project size that is sufficient to justify the administrative costs. Donors may also have special administrative provisions for smaller countries.

• Ozone Officers in LVCs may not have experience in resource mobilisation since it is not their traditional role. Typically there are limited human and institutional resources available in LVCs for activities such as investigation into options, donor consultations, preparation of proposals and establishment of national mechanisms (if needed) to receive funds.

Possible solution: Within your limits, test the waters by pursuing one of the climate co-benefits activities indicated in your country's HPMPs. This will build your capacity and provide you with a baseline about how much time and effort is really involved. Consider it a learning experience.

HCFC Phase-out in Terms of Climate Change

This section reviews the available data on HCFC phase-out in LVCs with servicing only and sets out how much more must be achieved. It also discusses how to express HCFCs as greenhouse gases and makes the case for how seeking financing that has climate benefits when implementing the HPMP can open doors to financial support to supplement the Multilateral Fund.

According to Montreal Protocol Article 7 data, LVCs with servicing only consume four types of HCFCs for RAC servicing:

• HCFC-22 is used as a refrigerant in several applications such as unitary air-conditioners, cold storage, retail food refrigeration equipment, chillers, and industrial process refrigeration.

• HCFC-123 is used in the RAC sector mainly in centrifugal chillers for industrial process refrigeration and commercial comfort air-conditioning.

• HCFC-124 is minimally used as a refrigerant; its primary use as a refrigerant is in blends in industrial processes and transport refrigeration equipment. It is used as a component in mixtures in some CFC-12 drop-in replacements. It replaces CFC-114 in some heat pumps and special air-conditioning equipment.

• HCFC-142b is used as a refrigerant only as a component of a few refrigerant blends. While HCFC-142b refrigerant blends are approved as acceptable substitutes for CFC refrigerants in some end-uses, their use is small and declining. R-409A (composed of HFC-125, HFC-134a and HFC-142a) is the most common refrigerant blend using HCFC-142b.

Table 3 indicates the current status of consumption in LVCs with servicing only for the major HCFCs, based on the most recent data reported by countries under Article 7 of the Montreal Protocol. The table also presents the quantity of HCFCs planned to be phased out by Multilateral Fund-supported projects that are currently being implemented, plus the remaining quantity of HCFCs still to be phased out (i.e. the difference of the first two columns).

Substance	Consumption baseline (MT)	Quantity of HCFCs being phased out through approved projects (MT)	Quantity of HCFCs remaining to be phased out through approved projects (MT)
HCFC-22	209.36	82.23	127.13
HCFC-123	.02	0.00	.02
HCFC-124	.01	.01	.01
HCFC-142b	1.81	1.11	.70
Total	211.2	83.35	127.86

Table 3. HCFC consumption status in LVCs with servicing only
Source: Ozone Secretariat, Article 7 data

Based on these data, it is clear that 60% of the HCFC-22, which is the vast majority of the HCFCs in LVCs with servicing only, remains to be phased out through Multilateral Fund projects. Because HCFCs deplete the ozone layer and are greenhouse gases, LVCs with servicing only have a clear opportunity to develop phase-out projects for the remaining 60% of the HCFCs that meet both ozone and climate goals. As will be shown in Sections 4 and 5 of this paper, significant cost savings for equipment owners and governments result when HCFC phase-out projects are designed to provide climate benefits. The Montreal Protocol thus has a major opportunity to achieve even more significant climate co-benefits than it has already so far (see box 1).

Box 1. The Climate benefits of the Montreal Protocol.

The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer called for the phase-out of the global production, consumption, and emissions of ODSs that are also potent greenhouse gases that contribute to climate change. The Parties to the Protocol were conscious of the potential climatic effect of emissions of ODS, as stated in the Treaty's Preamble. Through the phase out of ODS since 1987, the climate protection already achieved by the Montreal Protocol alone is far larger than the reduction target of the first commitment period of the Kyoto Protocol.

In order to develop projects with climate benefits, as a first step, it is important for HCFCs to be expressed in terms understandable by organisations that are used to climate change concepts and terminology, i.e. describing HCFCs as greenhouse gases using "carbon dioxide equivalent" (CO_2-eq) emissions. To translate HCFCs into a metric that will be understood in relation to climate change, the global warming potential or GWP (see box 2) of each specific HCFC is used to calculate the CO_2-eq emissions of each HCFC.[11] Since some greenhouse gases are more potent and have a higher GWP than others, emissions of greenhouse gases are typically expressed as CO_2-eq emissions to allow a direct comparison of their impacts on climate.

Box 2. Global Warming Potential (GWP)

The GWP represents how long GHGs remain in the atmosphere and their relative effectiveness in absorbing outgoing thermal infrared radiation. It is a relative index that enables comparison of the climate effect of the emissions of various GHGs and other climate changing agents like ODS. Carbon dioxide is chosen as the reference gas and ODS that are greenhouse gases like HCFCs can be translated into carbon dioxide equivalent emissions (CO_2-eq). A GWP value calculated for a time horizon of 100 years is known as "100-year GWP."

Carbon dioxide has a GWP of 1, whereas the HCFCs consumed in LVCs have significantly higher global warming potentials:

For reference, the GWP of HFC-134a, which is one of the main alternatives for HCFC-22 identified in the HPMPs of LVCs, is 1430.

To calculate the CO_2-eq for HCFCs, the metric tonnes of the different HCFCs are multiplied by their specific GWP.

HCFC MT x GWP = CO_2-eq

Table 4 presents the total CO_2-eq emissions for HCFCs in the LVCs with servicing only in terms of the baseline, the quantity of HCFCs already being phased out through approved projects and the remaining quantity of HCFCs that can be incorporated into phase-out projects that can achieve climate benefits.

Substance	Consumption baseline (MT)	Consumption baseline expressed in CO_2-eq emissions	HCFCs being phased out through approved projects expressed in CO_2-eq emissions	HCFCs remaining to be phased out through approved projects expressed in CO_2-eq emissions
HCFC-22	209.36	378,942	148,836	230,105
HCFC-123	.02	2	0.0	2
HCFC-124	.01	6	6	6
HCFC-142b	1.81	4,181	2,564	1,617
Total	211.20	383,130	151,406	231,730

Table 4. CO_2-eq emissions of HCFCs in LVCs with servicing only, based on their GWPs[12]

The 59 LVCs with servicing only have a significant quantity CO_2-eq emissions of HCFCs remaining to be phased out and from which climate benefits would be worth pursuing. To support Ozone Officers in their efforts to design projects that bring climate benefits and attract financial assistance for their projects, the next two sections present information and guidance on the current status of HCFC alternatives, potential climate benefits from the HCFC phase-out and sources of financial support outside of the Multilateral Fund.

Overview of Alternatives for HCFC in Refrigeration and Air-Conditioning

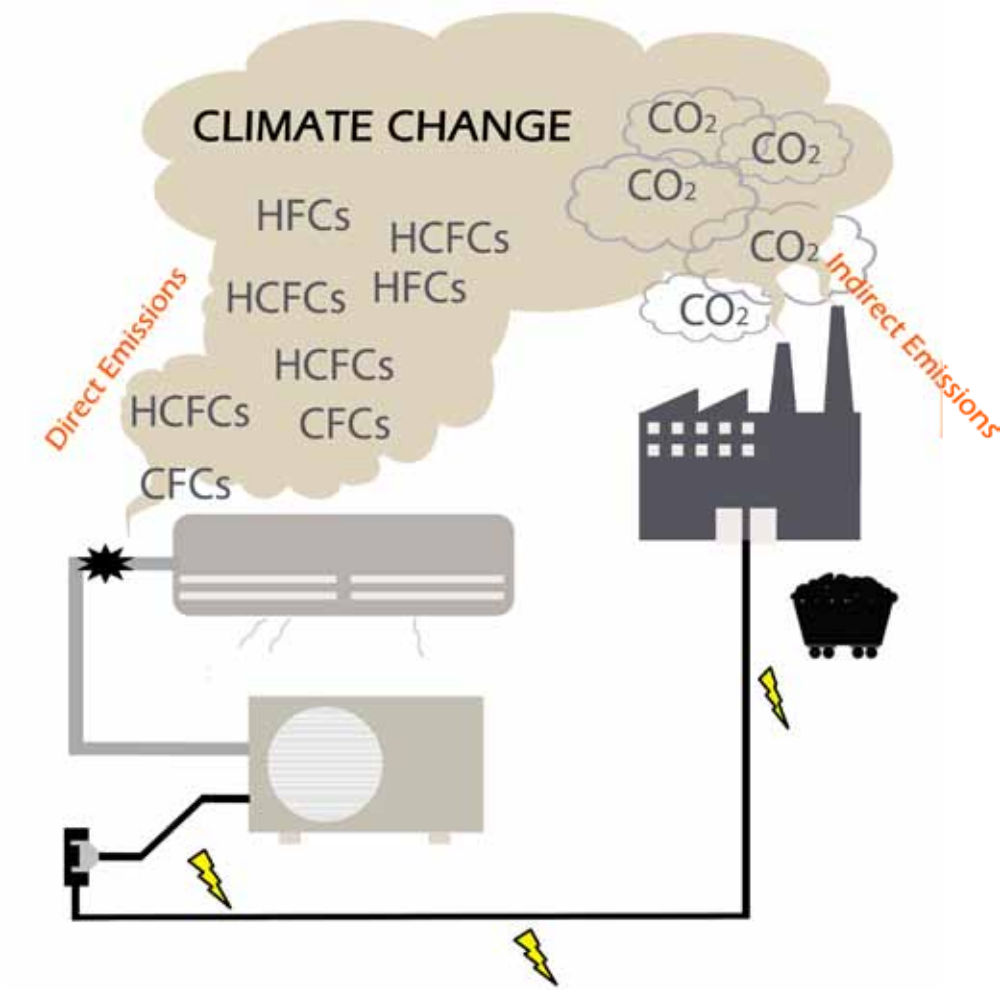
The alternatives for HCFCs in the RAC sector are briefly introduced in this section along with a review of how to achieve climate benefits in the HCFC phase-out as it relates to the servicing sector, through the selection of appropriate alternatives. This section makes the case for seeking financing to support climate benefits when implementing the HPMP.

It is important that the HCFC phase-out under the Montreal Protocol does not add to the deterioration of the climate through the use of HFCs that are potent greenhouse gases. The May 2011 *Progress Report of the Technology and Economic Assessment Panel* stated that "the challenge is to phase out HCFCs while avoiding high-GWP HFCs and while achieving high energy-efficiency using technology that is safe and environmentally acceptable."[13] The Executive Committee encourages Article 5 countries during the implementation of their HPMPs to consider measures to facilitate the introduction of energy-efficient and climate-friendly alternatives.[14]

According to *Minimizing Adverse Climate Impact of HCFC Phase-out in the Refrigeration Servicing Sector*, when it comes to HCFC phase-out in the refrigeration servicing sector, adverse impacts on the climate refers to an increase in emissions of GHGs (expressed in CO_2-eq. emissions) with respect to whatever is the current situation.

Emissions can change with respect to "direct" emissions from the refrigeration sector that occur when GHG refrigerants are released in substantial quantities during manufacturing, installation, servicing and decommissioning/ replacement of refrigeration equipment. The emissions per system tend to increase with increasing refrigerant charge of the equipment and increasing repair of the refrigeration cycle. Many of the refrigerants that are GHGs have high global warming potential.

Emissions can also change with respect to "indirect" emissions from the refrigeration sector. Indirect emissions are those released by the power source when electricity is generated to run the RAC equipment. Indirect emissions can be very significant in terms of GHGs when the electric power used to power RAC equipment is generated by fossil fuel combustion (e.g. oil, diesel, coal), which is most often the case in LVCs (see box 3).


CLIMATE CHANGE
HFCs
HCFCs
HCFCs
HFCs
HCFCs
HCFCs
CFCs
CFCs
CO_2
CO_2
CO_2
CO_2
CO_2
Direct Emissions
Indirect Emissions

Box 3. Lesson learned

Savings related to electricity, whether at the individual consumer level or from avoided generation capacity, dominate. When comparing the direct climate benefit arising from reductions in emissions associated with the replacement of HCFCs (given the intrinsic global warming potential of the refrigerant) with the indirect benefit associated with energy savings from new equipment (from the lower electricity consumption), the value of the indirect benefit is larger… from a country perspective, it is energy security benefits that drive policy making directed at the RAC sector, with climate mitigation and ODS phase-out as secondary objectives only.[15]

— World Bank resource mobilization project

In meeting the Montreal Protocol requirement to phase out HCFCs, HFCs, hydrofluoroolefins (HFOs) including HFO-1234yf, HFO-1234ze, -1233zd(E), blends containing HFOs and natural refrigerants are the major replacements in many RAC applications. As a general differentiation, "natural refrigerants" are substances that exist naturally in the environment, while "non-natural refrigerants" or "synthetic refrigerants" such as HFCs and HFOs are man-made chemicals, not naturally occurring in nature. The most commonly used natural refrigerants today are ammonia (NH_3, R717), carbon dioxide (CO_2, R744), and hydrocarbons (HCs) such as propane (R290), isobutane (R600a), and propylene, also known as propene (R1270). Water and air are also used, to a lesser extent, for example in adsorption chillers and deep-freezing applications.

The alternatives for HCFC refrigerants in the RAC sector differ in terms of their GWP, energy-efficiency, toxicity, flammability and cost both as refrigerants and in terms of system or design change costs required to accommodate them in existing equipment. Discussions about the alternatives and comparisons between them are being updated constantly as industry and governments look for ways to best meet the HCFC phase-out challenge.

A number of websites maintain and provide up-to-date information on the technology options for alternative refrigerants in the refrigeration sector including the following:

- UNEP Ozone Secretariat Technology and Economic Assessment Panel (*TEAP*) http://ozone.unep.org/Assessment_Panels/TEAP/Reports/TEAP_Reports
- Regional Networks of Ozone Officers http://www.unep.org/ozonaction/RegionalNetworks/tabid/6203/Default.aspx
- OzonAction Contacts Partnerships and Information Resources http://www.unep.org/ozonaction/InformationResources/Contacts/tabid/6549/Default.aspx
- Information Clearinghouse (including the OzoNews electronic news service) http://www.unep.org/ozonaction/Home/tabid/5467/Default.aspx
- United States Environmental Protection Agency Greenchill partnership with food retailers to reduce refrigerant emissions and decrease their impact on the ozone layer and climate change http://www2.epa.gov/greenchill
- Wikipedia lists all the refrigerants with all the technical data http://en.wikipedia.org/wiki/List_of_refrigerants

To add to these useful information sources are studies such as the November 2013, UNIDO *Guide 2013: Natural Solutions for Developing Countries including UNIDO Atmosphere Summary Report*[16] prepared to facilitate the exchange of knowledge to help drive the uptake of low-GWP technologies among businesses and policy makers in developing countries and economies in transition. The *Guide* focuses on the benefits of natural low-GWP substances in the RAC sectors that can achieve both direct emissions savings and energy efficiency in support of "leapfrogging" directly from HCFCs to low-GWP options.

In relation to the refrigeration servicing sector specifically and how the HCFC phase-out can be implemented with as little impact on climate as possible, the document *Minimizing Adverse Climate Impact of HCFC Phase-out in the Refrigeration Servicing Sector* provides a comprehensive set of strategies that include:

(a) Influencing a shift in technology choice toward technologies with lower climate impact for new, factory-charged refrigeration systems;

(b) Influencing a shift in technology choice toward lower climate impact technologies for new refrigeration

systems where the servicing sector performs, in particular, initial charging and commissioning, but frequently also assembly and/or installation. This strategy must include awareness raising as well as training in use and servicing of new technologies, undertaken as part of service-related activities;

(c) Reducing charge size, thus reducing the amounts of refrigerants emitted in particular for systems where the service sector performs assembly and/or installation;

(d) Reducing refrigerant emissions during servicing;

(e) Improving product quality, installation quality and service quality, thus reducing the frequency of occurrence of leaks, ruptures and repairs;

(f) Improving energy efficiency of equipment through better maintenance (e.g. adjustment of controls and cleaning of systems components); and

(g) Retrofitting refrigeration equipment to technologies with a lower GWP, when feasible, assuming the following preconditions are met: safe conversion is possible; the emissions of refrigerant during conversion, plus the future emissions of refrigerant with a lower GWP through the remaining lifetime, measured in CO_2 equivalent tonnes, are lower than those associated with continuing to operate the existing system without changes; indirect emission increases due to possible increases in energy consumption related to the retrofit are not overcompensating any direct emission savings; and there are sufficient incentives (regulatory and/or economic) to avoid reversing the retrofit back to HCFCs.

Table 5 translates these strategies into the potential climate benefits and who could benefit – the equipment owner, the government and/or the environment.

Activity	Potential benefit	Beneficiary		
		Equipment owner	Govern-ment	Environ-ment
Good refrigeration servicing practices	Reduced purchases of refrigerant and cost savings	✔	✔	✔
	Reduced or avoided direct GHG emissions		✔	✔
Replacement of high-GWP refrigerants with low- or zero-GWP refrigerants	Reduced GWP of refrigerants		✔	✔
Replacement of vapour-compres-sion equipment with equipment based on different cycles (e.g. adsorption)	Reduced or avoided direct GHG emissions		✔	✔
	Reduction of energy consumption (cost savings)	✔	✔	✔
	Reduced need for additional electricity generation capacity (power plants) and/or fuel imports		✔	✔
Improved energy efficiency of replacement technology	Reduction of energy consumption (cost savings)	✔	✔	✔

Table 6: Climate co-benefits from the servicing sector

It is clear that the main benefits of the range of activities to phase out HCFCs within the refrigeration servicing sector are fewer GHG emissions and cost savings for the consumer or equipment owner and governments. These benefits are driven by increased energy efficiency in equipment using alternatives for HCFCs that are low in GWP or are neither GHGs nor ODS (see box 4).

Box 4. Lesson Learned

A high and fluctuating cost of electricity is a considered to be a strong economic driver for the replacement of some types of RAC equipment, e.g. chillers.[17]

— Multilateral Fund chiller project desk study

A 2007 study by the International Energy Agency (IEA) examined the potential for reducing energy use in the air-conditioning sector in an importing country that had to overcome barriers from a lack of standards enforcement or advanced technologies to market penetration of air conditioners with higher energy-efficiency ratings (EER).

Table 6 estimates the potential decrease in GHG emissions in two Article 5 countries that would result from improving the energy efficiency rating of air conditioners.[18]

Country	Baseline EER	Targeted EER	Units Sold/Yr	CO_2 Emission Reduction (MT)
Ghana	2.55	2.8	100,000	3 million
China	3.4	5.00	4-18 million	28-61 million

Table 6. Potential GHG emission reductions from reducing energy use in air-conditioners

Added to the decrease in CO_2 emissions due to the increased EER in the air-conditioners, would be a reduction in costs for the equipment owner in relation to power consumption and reduced costs for the government in terms of power generation including imports of fuel. Some LVCs have begun exploring opportunities along these lines. For example, the Cook Islands has a programme designed to reduce energy consumption and costs to governments and consumers by replacing refrigerators and freezers with energy efficient appliances (see box 5).

Box 5. Fridge and Freezer Replacement Program in Cook Islands to Reduce Energy Consumption

A program announced in May 2012 for the Cook Islands is intended to reduce energy consumption in the residential, commercial and public sectors through the implementation of energy-efficiency measures, and to establish policy frameworks to help Cook Islands move away from fossil fuel dependency. The program will reduce electricity consumption in the Cook Islands by promoting high energy-efficient fridge/freezers. The Fridge and Freezer Replacement Program will encourage households to replace old inefficient fridges and freezers of 5 years or older with high energy efficient equipment. Participating retailers in the Cook Islands are being subsidised to offer rebates between US$ 125 and US$ 410 to customers purchasing selected high efficient fridge/freezer models, in exchange for their old, working fridges and freezers of similar capacity. Estimates are that approximately 40% of household electricity costs in Cook Islands are for refrigeration and that energy-efficient fridges and freezers will save the average household an estimated US$ 165 to US$ 245 per year on electricity bills which would be a reduction of electricity consumption of approximately 20-30% for each participating household. The fridge/freezer replacement programme seeks to initially target 325 households in Cook Islands over a one year period. Significant cost savings in household electricity bills and increased awareness of energy appliance labeling and the benefits of using energy-efficient appliances are also expected benefits of the program. The program is co-financed by the Asian Development Bank (ADB), the Government of Australia, the Global Environment Facility (GEF) and the Asian Clean Energy Fund under the Clean Energy Financing Partnership and includes the participation of the Government of the Cook Islands, and the white goods retailers -Motor Centre and the Cook Islands Trading Corporation Limited.

Financing Options Available to LVCs Seeking Support for Climate Benefits

The preceding sections of this document highlighted that LVCs with servicing only have unique characteristics that can make accessing financing for HPMPs challenging. They also explained how the potential climate benefits could be derived from phase-out projects for the refrigeration servicing sector. Finally, they made the case that there are real benefits in terms of both GHG emissions reductions and cost-savings when projects for HCFC phase-out are designed to have both ozone and climate benefits.

During the four regional workshops on resource mobilisation organised by UNEP in 2013-2014,[19] Ozone Officers expressed that their traditional roles focus on implementing the Montreal Protocol and that they do not have experience with mobilising resources or approaching donors to initiate discussions about possible co-financing. Accordingly, this section provides an introduction to financing institutions that support climate-related projects. It then describes the eligible activities the various financing institutions fund that could be relevant to an LVC with servicing only seeking support outside of the Multilateral Fund to support achievement of climate co-benefits. To supplement the information in this section, useful background contact lists and web sites are provided in Annex 2.

Financial Support for Climate-related Projects

Following is a brief description of key sources of financial support for climate co-benefits that are relevant to the Montreal Protocol and may be available to an LVC.

1. Mainstreaming through Official Development Assistance

Every LVC is already receiving some level of Official Development Assistance (ODA)" based on its priorities and plans for development and poverty reduction. "Official Development Assistance" is defined by the Organisation for Economic Co-operation and Development (OECD) as flows of official financing administered with the promotion of the economic development and welfare of developing countries as the main objective, and which are concessional in character with a grant element of at least 25 % (using a fixed 10 % rate of discount). By convention, ODA flows comprise contributions of donor government agencies, at all levels, to developing countries ("bilateral ODA") and to multilateral institutions.

As a first step in achieving financial support outside of the Multilateral Fund, it is important that an LVC work to integrate the HPMPs including both ozone and climate benefits as one of the priorities for assistance from ODA. By integrating or "mainstreaming" ozone and climate goals into the planning process that underpins ODA, it is possible to gain financial support from bilateral and multilateral donors for climate-related projects such as those in an HPMP (see box 6).

Box 6. Lesson learned

Good strategic planning and inter-sectoral coordination at the country level are crucial to ensure that policies are aligned and possibilities to leverage financing are optimised. Parties should be encouraged to ensure that their second phase HCFC Phase-out Management Plans include a broad and strategic overview of on-going and planned investments for climate mitigation and energy-efficiency so that the Montreal Protocol interventions can be mainstreamed within these larger on-going programs. The overall domestic climate change and energy policy and regulatory environment, including Nationally Appropriate Mitigation Actions (NAMAs) where relevant, should be providing the framework for the mainstreaming of HCFC phase-out.[20]

— World Bank resource mobilization project

The process used to prepare the development planning documents that underpin ODA are important to understand in order to identify the potential entry points that would enable an LVC to integrate or "mainstream" the ozone and climate goals from its HPMPs. As a foundation for ODA, the developing country government creates a Poverty Reduction Strategy Paper (PRSP) or a Country Assistance Strategy (CAS) to define and communicate the country's priorities. The PRSP or CAS is considered by most multilateral or bilateral donors as the avenue to identify opportunities for providing financial support to a developing country, since ODA is usually country-driven. Depending on the country, the PRSP or CAS assesses and diagnoses a country's policies, institutions and capacity using as a basis, work by the country or development partners that include sector analyses and strategies such as impact assessments and evaluations from prior or ongoing operations. Priorities are then identified in consultation with all relevant stakeholders, including civil society and donors. The PRSP or CAS is subsequently laid out with attention placed on macroeconomic policies, governance, sector policies, and costing and budget for proposed programs, as well as a monitoring and evaluation component.

The nature and level of stakeholder participation has a significant impact on proposed priority actions in a PRSP or CAS.

The development planning process in most (though not all) developing countries is typically on a 4-5-year cycle, with a mid-term review to allow for adjustments to changing circumstances. Development planning is an intensive cross-sectoral effort for any country, usually led by a central agency, such as the Ministry of Finance and/or Development Planning, a National Planning Commission, a Prime Minister or President's Office, etc. The major development plan of the government is a key (but not exclusive) driver of national budgetary decisions and expenditures, and is the main basis for discussions with development partners (donor countries) regarding assistance for the development of the country.

Opportunities to integrate ozone and climate benefits of the HPMP into the PRSP or CAS development planning documents can be initiated at the following stages in the process:

1. During analytical and diagnostic work to increase awareness
2. Through discussions with relevant government ministries, in particular ministries of finance
3. Through the mobilisation of environment and health constituencies, including civil society
4. When coordination, decision-making and monitoring are established for institutional and technical aspects of the development plan
5. Through overall coordination and partnerships at various levels.

2. Global Level Financial Institutions and Partnerships with Climate Programmes

There are certain global level financial institutions that offer support for climate-related projects. These are introduced below.

The World Bank (www.worldbank.org). Financing climate change is an important part of the World Bank Group's business. This focus has resulted in financing flowing to support low-emissions and resilient development. For example, mitigation support for the world's poorest countries through the Bank's International Development Association (IDA)[21] reached US$ 2.3 billion during fiscal year 2013, while the International Finance Corporation's (IFC)[22] mitigation financing increased 50 % to US$ 2.5 billion. The World Bank has demonstrated innovative ways to mobilise additional resources to finance climate action by working with partners. The most notable success has been the US$ 7.3 billion Climate Investment Funds (CIFs),[23] which are playing a key role in meeting international objectives regarding climate change. The World Bank is trustee of 15 carbon finance initiatives. The Carbon Finance Unit (CFU)[24] supports more than 150 projects through purchase of about 220 million metric tonnes of CO_2-equivalent emissions.

The World Bank helps countries to assess and manage climate risks and provide analytical guidance.

Portals such as the Climate Change Knowledge Portal[25] and the Climate Finance Options Platform[26] provide cutting edge information, analysis, and tools on climate change. Increasingly, the Bank is engaging in strategic partnerships to both deepen the climate change knowledge base for clients and to address critical issues such as low-GWP refrigerants.

Within the context of Climate Finance is the certified emission reduction (CER) which is a unit representing one tonne of carbon dioxide-equivalent (CO_2-eq) sequestered or abated. CERs are issued to project participants in Clean Development Mechanism (CDM) projects pursuant to Article 12 of the Kyoto Protocol and the CDM modalities and procedure[s.27] CERs have, in the past, been important sources of financial support for climate-related projects. In August 2008 prices for CERS were US$ 20 per tonne but by October 2012, CER prices had fallen to €1.36 per tonne on the London ICE Futures Europe exchange. In October 2012 Thomson Reuters Point Carbon calculated that the oversupply of units from the CDM and Joint Implementation would be 1,400 million units for the period up to 2020.[28] It is unlikely, therefore, that CERs will prove to be a feasible source of financial support for an HPMP for the coming years.

Global Environment Facility (GEF) (http://www.thegef.org/gef/). The GEF has served as the largest provider of grants to address climate change for the past 20 years. Its goal is to transform the market development paths for eligible countries into trajectories with lower GHG emissions in energy, industry, transport and land-use sectors. The way the GEF achieves its climate-related goals is by removing barriers to sustainable market development and through pilots and demonstration projects. Support is provided as grants and limited non-grant instruments. Over the 2010-2014 period, US$ 350 million per year has been allocated to this area - US$ 2.7 billion since the GEF's inception. The size of the GEF grants for projects range from US$ 5 million to US$ 50 million.[29] An example of a project supported by the GEF that has both ozone and climate benefits is provided in box 7.[30]

Box 7. Swaziland SolarChill project

In support of technology transfer to increase energy independence, the GEF has approved USD 2.7 million for the further development of "SolarChill", combining the use of solar energy with "Greenfreeze" hydrocarbon refrigeration in Kenya, Swaziland and Colombia. The "Solar-Chill Development, Testing and Technology Transfer Outreach" project is intended to increase the market potential of SolarChill technology in vaccine and food refrigeration applications in areas without electricity. The technology integrates the use of solar energy with hydrocarbon refrigeration and eliminates the need for lead storage batteries by using solar direct drive compressors to create an ice bank, thus storing the energy of the sun in ice. The intent of the GEF funding is a large-scale demonstration of SolarChill technology, to give it higher global recognition, especially in developing countries. A second aim is to encourage companies, especially in Southern African and Latin American regions, to take up production of the technology.

The Climate and Clean Air Coalition (www.unep.org/ccac/). This broad coalition of State and non-State partners was launched by UNEP and six countries — Bangladesh, Canada, Ghana, Mexico, Sweden and the United States — in 2012. The CCAC aims to catalyse rapid reductions in short-lived climate pollutants to protect human health, agriculture and the environment. The CCAC's HFC Initiative works with governments and the private sector to address rapidly growing HFC emissions. The initiative aims to bring together a high-level global roundtable to establish private sector and government pledges to promote climate-friendly alternatives and technologies; minimise HFC leaks; and encourage recovery, recycling, reclamation, and destruction of HFCs. The CCAC has supported certain pilot projects in countries, including several LVCs, that can be considered as resource mobilization for the climate co-benefits of the HCFC phase out (see box). The initiative has so far worked with Bangladesh, Chile, Colombia, Ghana, Indonesia and Nigeria to conduct HFC inventories in their countries, and UNEP

recently received approval to support. The initiative has also sponsored two major conferences on HFC alternatives and developed case studies for commercial refrigeration technologies (see box 8).

Box 8. Lesson learned

The CCAC experience was successful with the approved feasibility study for Maldives, with an "out of the box" approach regarding technology choices, such as District Cooling. UNDP believes that once the study is finalized this demonstration project could be used by other countries, especially SIDS. [31]

— UNDP resource mobilization project

3. Regional Financial Institutions that Support Climate Benefits

Financial institutions at the regional level that support climate-related goals are very important to LVCs with servicing only. As discussed in Section 3, the fact that individual LVCs have less HCFCs to phase-out and therefore less CO_2 equivalent emissions to avoid can make access to financial support difficult. An LVC by itself may, therefore, not be able to find support for its own ozone and climate-related projects. On the other hand, a regional approach for LVCs could attract more interest among financial institutions. There is, therefore, value in exploring a regional approach by collaborating with other LVCs to seek support from a financial institution that has a regional focus.

Regional-level financial institutions can also be a valuable source of advice and can bring together a number of public and private sources of finance for support in project development and implementation. An example of this is the project to promote energy-efficiency in Cook Islands, Samoa, Tonga, Vanuatu and Papua New Guinea (see box 9).[32]

Box 9. Promoting Energy-Efficiency in the Pacific

The Cook Islands, Samoa, Tonga, Vanuatu and Papua New Guinea have developed an innovative project for the GEF to be co-financed by the Asian Development Bank (14%), Governments of Cook Islands, Samoa, Tonga, and Vanuatu (26%), Power Utilities & Private Sector (24%), Government of Australia (14%) and Government of Japan (22%). The proposed project will result in the reduction in electricity and fuel consumption due to higher energy-efficiency. The electricity and fuel saved from the successful implementation of the project will lead to a reduction of carbon dioxide emissions, which is estimated at 42,851 tons of CO_2 annually and an emissions reduction impact of 642,765 tons CO_2 over a 15-year period. Such an innovative regional project should provide inspiration for other countries to consider similar approaches related to the climate benefits of the HCFC phase-out.

Regional Development Banks through which LVCs could find support for mitigation projects with climate co-benefits as well as support regionally in coordinating donors and mobilising co-financing.

• The Asian Development Bank (ADB)[33] based in Manila, is dedicated to reducing poverty in Asia and the Pacific through inclusive economic growth, environmentally sustainable growth and regional integration. Established in 1966, it is owned by 67 members – 48 from the region. In 2012, ADB assistance totaled US$ 21.6 billion, including co-financing of US$ 8.3 billion. The ADB is providing financial and other assistance to implement solutions, providing technical assistance, grants, and loans, in combination with access to mitigation funds (e.g., the in-house Asia Pacific Carbon Fund and Future Carbon Fund) and adaptation funds (e.g., the Water Financing Partnership Facility, and Adaptation Fund). ADB is an implementing agency of the GEF. ADB plays an important role in the Pacific region in donor coordination and mobilisation of co-financing.

• Inter-American Development Bank (IADB)[34] In IADB's International Climate Programs and Finance, the Bank has a capacity to facilitate access to international sources of climate finance.

Key sources of finance include: funds under the UN Framework Convention on Climate Change (UNFCCC) such as the GEF (particularly its climate window); carbon finance including the Kyoto Protocol's CDM; the CIF and the Adaptation Fund.

• Caribbean Development Bank (CDB)[35] The CDB Strategic Plan 2010-2014 outlines the climate change focus for the bank. Since many of the LVCs in the Caribbean region are Small Island Developing States (SIDS) that are particularly vulnerable to the effects of climate change, the CDB views assistance to its member States as support "to develop and implement mitigation and adaptation measures as a pro-growth strategy for the longer term." The CDB also sees the value of mainstreaming climate risk-management in CAS papers and sector policies and strategies and of developing internal capacity within CDB to take on board climate change risk-management, prepare and use climate risks tools, and develop external partnerships and networks.

• African Development Bank (AfDB)[36] The AfDB plays a role in backing climate change mitigation initiatives with its own resources, including leveraging financing from other sources, to incite investor confidence and participation in this emerging area. AfDB is working alongside other development partners including other Multilateral Development Banks (MDBs), UN organizations and bilateral development agencies to implement interventions that help Africa adapt to a changing climate as well as mitigate its risks.

The AfDB has embarked on an ambitious program at powering a low-carbon pathway in Africa. Through the Energy, Environment and Climate Change Department, the Bank serves as a platform to deliver advisory services necessary to mobilise transformative environment and climate finance, including assisting countries with projects to access carbon markets. Funds channeled through financing windows such as the CIF, the GEF, a recently created Sustainable Energy Fund for Africa (SEFA), the first phase of African Carbon Support Programme (ACSP), and the new Africa Hub of the Sustainable Energy for All Initiative (SE4ALL) are directly invested to support the transport, communications, agriculture, water and energy sectors. The goal is to ensure that climate finance effectively reaches the continent and is tailored to Africa's needs.[37]

• European Bank for Reconstruction and Development (EBRD)[38] The overall goal of the EBRD is to foster transition to market economies in countries from Central and Eastern Europe to Central Asia and the Southern and Eastern Mediterranean. Underlying the work of the Bank is its Environmental and Social Policy in which the EBRD states its intention to "support climate change mitigation and adaptation, in particular by investing in energy efficiency and renewable energy projects and by supporting best practices in climate change adaptation." In addition to support for projects, the EBRD also is developing financing instruments that could be of interest to an NOU seeking support for climate co-benefits.

4. Government Support for Climate Benefits as Bilateral Donors

Funding organisations from other governments also play an important role in financial support to LVCs. Bilateral projects that are organised under the auspices of the Multilateral Fund as part of a Party's contributions to Multilateral Fund funding are not described here, since that assistance is officially part of the ODA provided to developing countries. Rather, this sub-section describes government organisations that provide funding assistance for environmental protection measures on a bilateral or regional basis outside of the Multilateral Fund.[40]

• Government funds for bilateral development and technical assistance. Many developed countries, and an increasing number of developing countries, such as China, offer bilateral financial and technical assistance to support goals such as economic development, health and environmental protection in LVCs and other developing countries. Some of these bilateral funding organisations allocate specific funds to environmental protection programmes under which projects relevant to the Montreal Protocol and climate benefits of the HCFC phase-out can qualify. In a number of cases, national funding agencies already support work related to ODS phase-out under the Multilateral Fund. For example, the governments of Japan and Australia are co-funding, with the national governments in the Cook Islands, Samoa, Tonga, and Vanuatu, the project to increase energy-efficiency described in Box 3.

There is potential for a group of Montreal Protocol donor Parties to consider organising coordinated or bilateral support for Montreal Protocol-related activities that are beyond the scope or remit of the Multilateral Fund, e.g. for the adoption of low-GWP alternatives to HCFCs. If several such Parties were willing, there could be potential for formally or informally developing a strategic plan for such activities.

5. Private Sector Support

Industry can be an important player in providing financial support to projects in an LVC particularly where there is an opportunity to increase market share for products including continuing the provision of parts and labour. The private sector participates in every aspect of the RAC sector including the design of RAC equipment, development of HCFC alternatives and substitutes, helping to design minimum standards for safety, health and environment, and setting costs of refrigerants and equipment. If there is an opportunity for a private sector firm to profitably participate in an LVC's HCFC phase-out project, there is a potential for private sector financial support (see box 10).

Box 10. Lesson learned

Over 90 % of climate change finance is sourced from private markets (venture capital, asset financing, etc.), however, public finance is critical to removing barriers to climate technologies and attracting direct investment.[41]

— UNDP resource mobilization project

The private sector actively participated in the regional workshops on resource mobilisation organised by UNEP in Australia, Macedonia and Jamaica and in each case, their contributions were related to introducing or extending their equipment and refrigerant product lines into the countries in the region. For instance, a Canadian company, Sustainable Options Limited, presented its experience with retrofitting hydrocarbon refrigerants within the English-speaking Caribbean. In the Australia workshop, the Australian Institute of Refrigeration Air Conditioning and Heating presented "PRIME," which is an initiative developed by a coalition of stakeholders from within the Australian heating, ventilation, air conditioning,

and refrigeration (HVAC&R) industry to help reduce the environmental impact of HVAC&R. A 2012 report showed that Australian refrigeration and air-conditioning was responsible for 11.7 % of total national CO_2-eq emissions, with more than 45 million individual pieces of equipment consuming about 22% of all electricity used nationally. Among the outcomes of PRIME will be changes within the sector that are low cost, low carbon and low environmental impact – all of which are important components for an HCFC phase-out project in an LVC.

What can be Funded

All government institutions that provide funding to developing countries have limitations with respect to what types of activities their financial support can be directed towards. While this is not the case for private sector assistance, any financing proposals to industry may need to demonstrate how the proposed activities could benefit business, at least in the long-term.

With respect to the HCFC phase-out, the Multilateral Fund supports Article 5 countries for both the preparation and implementation of their HPMPs including projects to phase-out HCFCs, strengthening their regulatory frameworks, building capacity and increasing awareness, training custom officers and refrigeration servicing technicians, promoting alternatives, recovery and recycling of ODS, etc. The Executive Committee has produced guidelines for HPMPs for Article 5 countries that includes specific criteria for LVCs.[42]

Co-funding with the Multilateral Fund is necessary to achieve climate benefits since these are not supported by the Multilateral Fund. For instance, energy-efficiency gains or a country's energy independence may be outcomes of an HCFC phase-out project but support for these benefits must be found among the financial institutions that support climate benefits.

The World Bank's India Chiller Energy Efficiency Project is an interesting example of a project focused on energy-efficiency and ODS phase-out. In that project, the Multilateral Fund, the GEF and Climate Finance under the World Bank have been combined with the Industrial Development Bank of India (IDBI) to support a common objective – sector-wide chiller replacement – for global environmental co-benefits.[43] The four financial institutions together are able to financially support the following activities:

• First component supported by the GEF: provision of incentives for investment in energy-efficient chillers including providing the following incentives to remove market and techno-economic barriers: (a) chiller owners with either: (i) an upfront financial incentive to subsidise the cost of the replacement of centrifugal chillers before end of technical life; or (ii) an annual payment from a share of certified emission reductions to be generated from the actual energy savings achieved by the new chillers; (b) an incentive for chiller manufacturers, suppliers and energy service companies to actively participate in the project.

• Second component supported by the GEF and Carbon Finance: measurement, monitoring and verification of the power-output function of old chillers to be replaced, electrical consumption of new chillers, and cooling output in order to measure energy savings and emission reductions. The methodology for this measurement is from the CDM Executive Board.[44]

• Third component supported by Multilateral Fund: technical assistance to support project readiness and sustainability through enhancing the awareness of relevant stakeholders in energy conservation measures, enhancing the understanding of the impact on the servicing sector of the decision to accelerate the phase-out of production of CFC, and strengthening the capacity of chiller owners and other stakeholders to monitor the performance of new chillers and to undertake refrigerant management.

• Fourth component: project management through a Project Management Unit established at IDBI which is a financial intermediary and responsible for implementing all activities under the project.

Figure 1 depicts how the three financial institutions – the Multilateral Fund, the GEF and Climate Finance have been designed to work together within the project to achieve the results. In this particular example, the Climate Finance

support is in the form of payments for CO_2-equivalent CERs which are only provided after project implementation. This means that the Multilateral Fund and the GEF provide the crucial upfront financing to initiate the replacement program, put in place the operational framework and policies and deliver technical assistance.

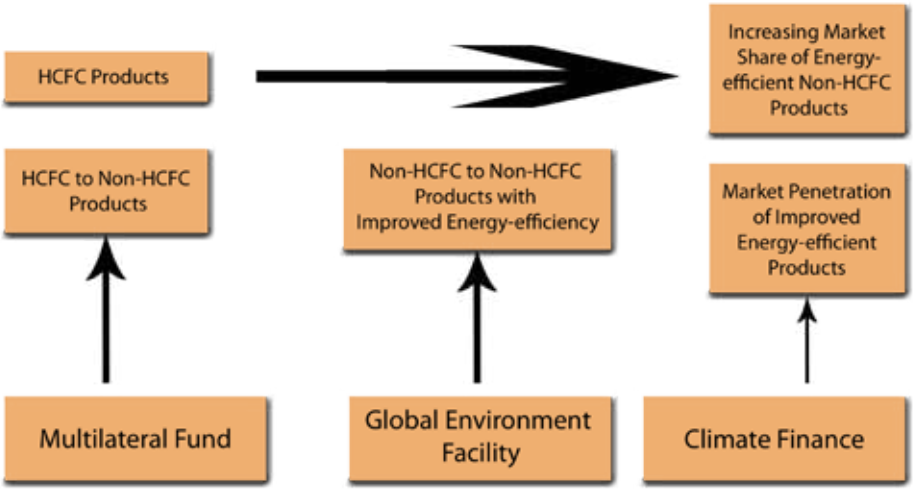


Figure 1: Funding Sources and Objectives[45]

A good discussion of how various financing instruments support different aspects of a project can be found in *Beyond the Sum of Its Parts Combining Financial Instruments for Impact and Efficiency Beyond*[46]. Table 7 is adapted from this publication suggests which financing instruments are able to finance the various components of a potential project.

Project financing needs	Available financing instruments
Creation of enabling environment	
To initiate and/or continue a relevant policy dialogue To make adjustments to policy or regulatory framework To provide project development funds To undertake technology piloting and demonstration To build capacity and train personnel To increase awareness	• GEF • Multilateral Fund • Trust funds such as Energy Sector Management Assistance program (ESMAP), Asia Sustainable and Alternative Energy Program (ASTAE), Public Private Infrastructure Advisory Facility (PPIAF) • Bilateral donor funds • IBRD resources also available
Investment resources	
Private financing: To invest in those projects that have a favorable risk-return profile for private sector financiers Regional Development Banks or government financing: To invest resources for short-to medium term investments with rate of return at or near market levels	• International private sector resources • National private sector resources • International Finance Corporation (IFC) resources • IBRD (Specific investment loan (SIL) or Development Policy Loan (DPL)) • Government resources • GEF (limited incremental investment resources)

(continued...)

Risk mitigation	
To cover risks or enhance credits associated with new technology, business models, resource certainty and country or currency risks	• Clean Technology Funds (partial risk guarantees) • GEF (limited resources or non-grant risk coverage) • Carbon finance (may help defray currency risks) • Multilateral Investment Guarantee Agency (MIGA)
Revenue enhancement	
To provide additional revenue stream to improve financial viability of investment	• Carbon finance funds • Output-based aid (Global Partnership for Output-Based Aid) • Non-World Bank carbon funds • Voluntary carbon markets

Table 7: Climate change financing instruments to meet potential LVC needs in project design[47]

The *Desk Study on the Evaluation of Chiller Projects*[48] makes some further observations with respect to seeking financial support since it evaluated the funding and financial mechanisms used in the chiller projects. These observations, which are compiled in table 7, add some practical detail that could be useful for an Ozone Officer seeking co-funding to supplement support from the Multilateral Fund.

Co-funding Mechanisms	Time to Secure Co-financing	Availability of Funds	Observations
Appliance Owners or Users			Incentives are often required for purchase of replacement equipment.
Climate-oriented ODA	ODA funds are typically available within three months		
Bilateral ODA	Bilateral ODA funds typically are made available annually for Developing Country support which means that approved projects can be funded quickly.	Only a small number of countries are selected by donor countries to receive bilateral ODA. The reasons for choice of countries may be based on the current priorities of the donor country.	
GEF	GEF funding took up to two years after project approval.		
Private sector funds using innovative funding such as mandated contributions from national third party utility companies	National private sector funds could be secured on average in about 16 months		Innovative funding arrangements (ODA + private sector and/ or carbon funding) possess a superior leveraging capacity, in particular where projects create tangible benefits for the co-financing entities.
Private sector funds using globally certified emission reduction credits in carbon markets (CDM)	Approval of a related globally applicable CDM methodology took about 30 months, but in exchange for the time lag, it created the potential for carbon market funding from verified energy savings in the future.		

Table 7: Co-funding mechanisms involved in chiller projects

Finally, further observations of practical interest came from the 2010 Joint Network Meeting for Ozone Officers of the Europe and Central Asia and South Asia Regional Networks in which lessons learned in the chiller projects were discussed.[49] Among the key messages given at the meeting that could be useful for Ozone Officers in LVCs who are interested in seeking financing outside of the Multilateral Fund for climate co-benefits includes:

- The Multilateral Fund and GEF have different project cycles (see box 11).
- Working with two GEF implementing agencies – the UNDP and the IADB, is difficult; and
- The performance guarantee fund and management structures are complex particularly considering the number of players involved and the detail in the management structure.

Box 11. Lesson learned on GEF

In average, GEF full size project development processes may take 3 to 8 years, depending on many factors, including but not limited to GEF availability of resource to respond to large pipeline of climate mitigation projects, including from previous replenishment cycles. In view of the long waiting list of projects, prioritisation of pipeline entry by implementing agencies is an issue to overcome[50]

— UNDP resource mobilization project

Guide For Ozone Officers

This part of the financing options publication is intended to build on the information provided in Sections 1 through to 5, presenting a step-by-step guide for an Ozone Officer seeking to take advantage of climate co-benefits during the HCFC phase-out.

It should be noted that the suggestions in this guide are intended to supplement, not replace, the actions taken by an Ozone Officer in an LVC with servicing only when developing phase-out projects to replace, recycle or destroy HCFCs in accordance with the obligations under the Montreal Protocol.

STEP I – What you need to know: Understand your refrigeration servicing sector, potential climate co-benefits and possible barriers

It is important for the Ozone Officer to have the following kinds of information in order to prepare for discussions with national partners and potential donors for co-funding. While some of the information may already be in the HPMP, it may be necessary to collect other data in order to make the climate benefits case.

Understanding the refrigeration and air-conditioning servicing sector in your country

• *Existing Refrigeration*/Air Conditioning *appliances* - What RAC equipment is used in the country? How many units are used in the commercial and domestic sectors? What are their capacities and efficiencies? What is the average remaining life of the equipment? What is the refrigerant leak rate? What is the current and forecast availability of different refrigerants? What is the estimated running time and average electricity consumption of the existing appliances? At what ambient temperature does the equipment operate?

• *Socio-economic context* – What is the cost of electricity? Who owns the equipment? If the equipment is owned by commercial enterprises, what is the solvency of the companies? Are the owners willing to co-fund? What is the motivation for owners to replace their RAC equipment – is it the end of life of the appliance, the lack of ODS

refrigerant supply, or some other reason?

• *Regulatory context* – Are their existing national standards for RAC equipment? Does the country's import/export licensing system restrict imports of HCFC-based equipment imports? Are there any regulations or policies that promote the adoption of energy-efficient, low-GWP RAC technology?

• *Replacement refrigeration and air conditioning* – What are the energy efficiency ratings for the equipment? What are the refrigerants and their GWPs? How much electricity does the equipment consume? What is the cost of the equipment? What is the cost and availability of refrigerants? Do servicing technicians have the skills and know-how required for servicing equipment using alternatives to HCFCs?

Estimates of potential climate co-benefits

• What are the estimated climate benefits if the existing equipment is replaced with new equipment with higher energy efficiency ratings that also use low- or zero-GWP refrigerants? Such estimates could include, for example, avoided GHG emissions and cost savings for equipment owners and governments. Such estimates would depend on the specific RAC equipment and could be developed on the basis of the discussion in Sections 3 and 4 of how to calculate the CO_2-eq emissions and the potential climate benefits from the refrigeration servicing sector.

Understanding possible barriers to taking action[51]

While developing a program with national partners and potential donors about co-financing opportunities, Ozone Officers should identify potential barriers and consider strategies to overcome them. The common types of barriers include:

• *Technical (refrigeration)* – Where there are specific technical issues that will not allow the use of a certain refrigerant, e.g. when the properties or characteristics of a refrigerant mean that it cannot be applied to a specific type of system or application.

• *Technical (safety)* – When there are specific safety issues that will not allow the use of a certain refrigerant, e.g. where the safety characteristics of a refrigerant are such that it cannot be applied to a particular application.

• *Supply and availability* – When a particular "part", be it material, equipment, component or fluid or even a particular service (or activity), that is necessary for the operation (in-use

or service/maintenance) of a system is not physically available or will not be or cannot be supplied to the user, thereby preventing the use of a specific refrigerant.

• *Commercial (investment, profit, financial incentives)* – Where an enterprise establishes that the cost of adopting a specific refrigerant will incur additional costs that will reduce profits beyond what is acceptable or where insufficient funding is available for investment or adequate financial incentives are unavailable.

• *Market* – Where an enterprise believes that there is no customer demand for a product that uses a particular refrigerant, or where the end-user or consumer would not accept a given refrigerant.

• *Information resources* – When insufficient information, know-how, guidance, or technical data either in the form of literature or training, is available to enterprises or technicians that need the know-how before they can embark on using a particular refrigerant.

• *Regulations and standards* – Where existing regulations prohibit the use of a particular refrigerant and where necessary standards do not exist within the country, or where the requirements of a regulation or standard are very restrictive thereby physically or financially (through stringent demands) prohibiting the use of the refrigerant.

• *Psychological and sociological aspects* – Where individuals, management of an enterprise or broader industry organisations hold a general resistance to change for the use of a particular refrigerant on the basis of rumour, influence of peer groups, or unwillingness to change to alternative technologies.

STEP II – Who you need to convince: Persuade your management that your country should seek climate co-financing for the HCFC phase-out

Armed with an overview of the scope and nature of HCFCs in the country's refrigeration servicing sector, an estimate of the potential climate benefits both in terms of GHG emissions avoided and cost savings to the consumer, equipment owners and governments and a realistic view of any barriers to be overcome, an Ozone Officer can make a compelling case within the NOU and with key decision-makers that his/her government should seek climate co-financing for the HCFC phase-out.

STEP III - Who you need to meet: Bilateral donors, international organisations and regional organisations that work in your country

An important first step in accessing co-funding for climate co-benefits is for an Ozone Officer to become familiar with the key officials within the country and in other agencies in the government where actions of interest to the implementation of the HCFC phase-out may be underway. Examples include actions to implement standards, labeling and energy efficiency programmes. Among the contacts with whom Ozone Officers may want to engage include the following:

1. National focal points for the GEF and any other contacts or focal points in Climate-type Funds described in Section 5.[52] In an effort to promote «working with your partners on climate co-benefits», this should be the first order of business for an Ozone Officer in a NOU seeking financial support for climate co-benefits. Not only can there be complementary funding programmes available but discussion and engagement may also reveal potential synergies or scope for cooperation between Multilateral Fund and GEF programs and projects.

2. Key individuals in central government agencies who are involved in the development of the country's CAS or the PRSP for the purposes of receiving ODA. As is described in Section 5, the major development plan of the government serves as the main basis for discussions with donor countries regarding assistance for the development of the country. Therefore donors could be looking for climate-related priorities in PRSPs or CASs to which their financial assistance can be targeted. The preparation of the PRSP or CAS is usually led by a central agency, such as the Ministry of Finance and/or Development Planning, a National Planning Commission, a Prime Minister or President's Office.

Experience from around the world indicates that extensive interagency and public consultation is critical to conclude a successful national development planning effort. The end result of the development planning process is the 5 year plan – the CAS or the PRSP depending on the development planning process.

Through consultation with the central agencies that are developing the HPMP, it may be possible for an Ozone Officer to integrate or "mainstream" the HPMP and climate co-benefits into the country's sustainable development objectives and targets which could lead to support from IDA or IBRD and other global financial institutions.

Typically, development planning work starts at least 12-18 months in advance of the conclusion of the 5-year development plan that is in place.

The following generic elements of development planning are typical:

• Diagnostics to determine the highest development priorities for the country and the key issues related to those priorities (e.g. poverty assessments, sector and sub-sector papers, assessments of technical and financial assistance needed to achieve the Millennium Development Goals (MDGs) over the long term, etc.);

• Identifying policy options and choices to move towards national development objectives and targets (e.g. sectoral and cross-sectoral policy reforms and frameworks needed to accelerate growth with equity and promote long-term human development, etc.);

• Identifying national capacity development needs to support implementation of priority actions to achieve national development objectives and targets (e.g. enable effective service delivery at the national and local levels, institutional changes, training needs, etc.);

• Development of implementation plans and schedules for high priority objectives and targets; and

• Investment planning and resource mobilisation (costing infrastructure investments, equipment investments, micro-finance initiatives, assessing national budgetary implications, awareness raising and discussion with development partners, etc.).

3. Regional Development Banks operating in the region and in particular those that are implementing agencies for the GEF usually have contacts that can be engaged either by email or in person to discuss needs and ideas. They may be willing to develop projects including seeking public and private co-funding. For LVCs, a regional approach that is developed with several LVCs and implemented through a regional development bank such as the Asia Development Bank can be much more feasible than one operating individually

as a country. An Ozone Officer should be able to contact their finance or development ministry for assistance in identifying representatives from these organisations.

4. Bilateral donors with an interest in assisting the countries of the region will often be national governments with a presence in the LVC and officials within the embassy or consulate that can be engaged to discuss and develop projects. Bilateral donors have specific countries that they have identified as priorities. The Ozone Officer can find this information on the national governments aid agency websites that are provided in the Annex 2. Any of these governments that are operating in an LVC could be approached by an Ozone Officer in a NOU for discussion of the HPMP implementation and achieving climate co-benefits. Another avenue through which bilateral donors can be identified is through discussions in the margins of the Meetings of the Parties, Open-ended Working Group, Executive Committee, and Regional Networks of Ozone Officers, as well as "corridor discussions" during climate negotiations and other regional environmental meetings and conferences.

5. Internationally-recognised and reputable appliance manufacturers and their representatives that are operating in the developing country may become important players in a projects to achieve climate co-benefits, for example for replacing refrigeration equipment. The example of the efforts of the company *Dybvad Stål Industri* (DSI) in the Solomon Islands is described in box 12.[53] The national RAC association is an extremely important partner for the Ozone Officer in the RAC sector, and it can provide ideas and contacts for reputable RAC companies that could be approached. Additionally, an Ozone Officer can identify companies that are both active in the region and have interests in low-GWP or zero GWP technology by researching the websites of RAC appliance manufacturers. By emailing or calling a customer relations contact in a RAC company, it should be possible to begin explorations of possible collaborations.

Box 12. Private sector assists with RAC investments in Solomon Islands

The company Dybvad Stål Industri (DSI) has sold many freezers for the seafood industry in Asia. In a recent project, a freezer was installed in a fish processing plant in the Solomon Islands, freezing tuna loins. The self-contained plate freezer DSI PFP 2810 operates on ammonia. It is equipped with a refrigeration system and needs only a power connection and cooling water to operate. The end-users are mainly fish factories that are exporting some of their products to the USA and Europe. The DSI 2000 series has a high freezing rate and low power consumption and meets new strict hygienic standards. It is suitable for marine and land installation. Primary use is to freeze seafood such as fish, fish fillets, shrimps, roe, squid, etc.; vegetables such as chopped spinach, broccoli, carrots, pulp and concentrates.

STEP IV - Make a compelling proposal: Calculate the climate co-benefits of the HPMP

To convince a potential donor that its support would be an effective and appropriate use of funds, Ozone Officers should link their project proposals with the national priorities and plans such as the national development strategy, the PRSP, the CAS, or UNDAF. In addition, it is important to demonstrate any benefits (especially climate benefits) from energy efficiency gains is an important tool to obtain financial support from potential donors. If possible, get the endorsement from the appropriate line ministries. An example of how to calculate the benefits is as follows:

1. Forecast the growth rate of HCFC-22 consumption

Note: For small countries where HCFC-22 is consumed solely for servicing refrigeration and air conditioning, an increase of HCFC-22 consumption could mean increasing numbers of RAC units that will require servicing in the future.

2. Develop the "Case" for climate co-benefits

• Determine the popular model size of RAC appliances in kW (or Btu) and the average charge size in kg per unit.
- Assume average charge for servicing in kg/year.

• Outline the HCFC Phase-out Strategy: Describe Assumptions
- Refrigeration and air conditioning charge size
- Refrigeration Recharge (Service) in kg/unit/year
- Useful Life in Years

• Current Regional Market of refrigeration and air conditioning: Number of replacement units + Number of units for growth = Number of units in the regional market

• Develop Assumptions to define climate co-benefits of more energy efficient appliances:
- Carbon Intensity Factor – in Kg CO2/kWh
- Baseline Energy Efficiency Rating (EER)
- New EER
- Cooling Capacity (for Air Conditioning) in kW
- Operating Hours in hours/day
- CDM No. of Days in Days/Year
- Cost of electricity in US$ per kWh
- If appropriate - Carbon Revenue in US$ per tCO_2

• Determine the cost and specifications for the existing stock of HCFC-based RAC equipment:
- An example of costs for HCFC-22 residential air conditioning units

Capacity (Btu)	Capacity (kW)	Voltage	Price (US$)	EER (Btu)	EER (SI)
9,000	2.93	220	379	10	2.93
13,000	3.81	220	450	10	2.93
18,000	5.28	220	599	10	2.93
24,000	7.03	220	732	10	2.93

• Estimate the cost and specifications of the new energy efficient low-GWP RAC equipment that could be introduced:
- An example of costs for R-410A residential air conditioning units

Capacity (Btu)	Capacity (kW)	Voltage	Price (US$)	EER (Btu)	EER (SI)
9,000	2.64	110	450	14.5	4.25
13,000	3.52	220	525	13.5	3.96
18,000	5.28	220	659	13.5	3.96
24,000	7.03	220	895	13.5	3.96

3. Ban imports/production of R-22 refrigeration and air conditioning with CDM (0% and 20% Growth) if appropriate

• Example of Benefits Calculation
- R-22 Consumption:

• R-22 consumption for the servicing sector will

be phased out within 10 years.
- Energy Savings

• 1.5 – 5.5 million MWh in 2018

• 450 – 1,680 MW of Electricity Generation Saved (US$ 0.9 - US$ 3.4 billion deferred investment)
- Additional Revenues if appropriate

• Energy Savings -US$ 0.6 - US$ 1.7 billion

• CDM Revenue If available - US$ 50 - US$ 138 million

4. Sensitivity Analysis

• Example of a sensitivity analysis for residential air conditioning units

Growth Rate per Annum	0%	10%	15%	20%
Energy Consumption Reduction	1.45 million MWh	2.9 million MWh	4 million MWh	5.5 million MWh
Reduced Demand for Electricity Generation Capacity	450 MW	890 MW	1,200 MW	1,670 MW
Deferred Investment for New Capacity	$1 billion	$1.7 billion	$2.4 billion	$3.4 billion
Energy Savings (7 years)	$0.6 billion	$1 billion	$1.3 billion	$1.7 billion
CDM Revenues (7 years) If this is available	$50 million	$84 million	$108 million	$138 million

STEP V – "Making the case": Prepare yourself for discussions with potential donors

The situation faced by each Ozone Officer in preparing for discussions with potential donor partners will be unique; therefore they should consider the following suggestions in their own national and regional contexts:

1. The most important preparations will be around understanding in detail your country's HPMP and refrigeration sector, as outlined in Step I.

2. "Do your homework" on which potential partners exist inside your own country is equally as important as knowing the technical details of what is contained in the HPMP and in the refrigeration sector. This "homework" includes having formal and informal discussions with colleagues who are national focal points for the GEF or other international agreements as well as public servants in other government

agencies responsible for the CAS, PRSPs or UNDAF processes described in Section 5, and who may be willing to include the HPMP in those strategies as a priority. The Ozone Officer's "homework" also includes identifying any other governments with embassies in the country, regional development banks or other international development agencies that might be willing to discuss partnering or co-funding – or other financial assistance to support climate co-benefits of the HPMP. When researching the potential partners, do not forget to note any international private sector organisations or companies in the refrigeration sector that might be able to participate in a partnership.

3. It is important to try to estimate what the climate co-benefits might be in improving energy-efficiency of refrigeration in your country. In many LVCs, the number of appliances may be so small that the value of the climate co-benefits may not be sufficient to interest potential partners. In that case, a regional approach, such as that which was created with the assistance of the ADB for Cook Island, Samoa, Tonga, Vanuatu and Papua New Guinea (See Box 3) may be a worthwhile line of attack to pursue.

At this point, you should be ready to engage potential national, bilateral, regional and multilateral public and private partners to seek financial support for the climate co-benefits of the HPMP. During the engagement, there will be certain issues and constraints that will add to the effort and time that an Ozone Officer will need to set aside to undertake the engagement. These may require strategic and targeted discussions with potential partners beyond the discussion of how to financially support climate co-benefits of the HPMP. It may be important to discuss support for the resources required for mobilisation, time required for applications, and length of time from application through to receipt of financing.[54]

As with the development of any projects to implement the HPMP,[55] when developing project concepts and speaking with a potential financing institution or implementing partner about your project ideas, there are certain elements that should be kept in mind:

• *Ensure additionality.* "Additionality" is a term frequently used in relation to project proposals that means the measurement of an intervention (i.e., doing something), when the

intervention is compared to the baseline or status quo situation (i.e., doing nothing). This term is frequently used in relation to climate change, however it applies equally to any type of projects, including ODS phase out, chemicals and energy efficiency projects.

• *Transparency and good governance*.[56] These key principles are familiar to most civil servants, including Ozone Officers and other professionals working under international financial mechanisms like the Multilateral Fund. Design any resource mobilization project for

• *Avoid "perverse incentives."* This term, which is usually applied in the context of climate change, describes a situation where an action that is supposed to achieve one result (positive) accidentally creates a problem somewhere else (negative). It is a type of unintended consequence when the impacts and outcome of a project are not considered carefully. In the context of resource mobilization related to climate co-benefits of HPMPs, practically speaking this means that the Ozone Officer should be particularly careful during the project design stage to consider all possible outcomes (intended and unintended).

• *Explore possibilities of profit-sharing, including return of funds to the Multilateral Fund*. When designing a co-funding proposal, if the project includes potential profit generation (e.g. from private sector involvement), try to consider what would happen to any new funds that might be generated. The Multilateral Fund has traditionally collected any funds generated from projects that it has financially supported (notably the chiller replacement programme), and used those new resources to finance new Multilateral Fund projects (the resource mobilization projects of all Implementing Agencies are good examples of this "recycling" process). Accordingly, when designing your resource mobilization project, consider whether any funds might be generated and if so, make a plan for how they will be collected and informed to the Multilateral Fund.

• *Ensure sustainability of the projects proposed*. As with any good project design, the resource mobilization proposal should consider ways and means to sustain the outcome of the project after the initial funding is used. Try to identify and build such approaches into the original proposal.

• *Avoidance of duplication of similar projects*. This is part of the due diligence process you should follow for any project proposal. It is part of your "homework" to ensure that whatever

resource mobilization proposal related to climate co-benefits of HPMPs does not duplicate any other existing project, either inside or outside of the Multilateral Fund. Make sure that what you are proposing does not duplicate activities currently funded or eligible for future funding under the Multilateral Fund (consult the Implementing Agency working with you).

• *Information on transaction costs.* Developing, submitting and negotiating project proposals takes resources takes expertise, time, and energy. Sometimes it takes considerable effort to do it right. It is important to keep track of your estimated "transaction costs" from the start of the project concept until the project is approved (or not approved). This information is useful to provide as feedback to both your Director/management, the organization from which you are seeking financing, and also to and even the Executive Committee. Such information could be reported under the HPMP in terms of activities/resources undertaken to seek climate co-benefits for the HCFC activities.

STEP VI - Next Steps

Finally, undertake the necessary final internal discussions within the country and with partners either in the public or private sector to establish the agreed terms and conditions of the project and financial support including management, monitoring, evaluation, reporting.

During the project development and submission process — and even during implementation — UNEP encourages Ozone Officers to share the project experience with other NOUs through presentations and discussions at the Regional Network meetings (see box 13). Such exchanges can inform and inspire colleagues to achieve similar results.

Box 13. Lesson learned

Experience shows that Regional networking plays an important role in helping replicate the successful features of well-designed co-financing projects into future or on-going projects. During meetings and workshops, project managers and country office personnel discuss both technical and administrative issues, share experiences and best practices, and gain a sense of how the portfolio functions at a regional level. [57]

— Multilateral Fund chiller project desk study

Annex 1: Overview of UNEP's resource mobilisation project

UNEP submitted a project proposal for "Resource mobilization to address climate co-benefits for the HCFC phase-out in LVC countries with servicing sector only" as part of its 2011 Work Programme Amendment for the consideration of the 63rd Executive Committee.[58] The original project sought to prepare a detailed study outlining specific financing options, complete five regional workshops on resource mobilisation, and prepare a pilot application for one LVC for funding for activities in HPMP not covered by the Multilateral Fund, at a budget of US$ 250,000 plus programme support costs.

Following discussions, the Executive Committee through Decision 63/22 (a) approved a project for UNEP[59] as follows:

"a) To approve funding at the level of US$ 100,000, plus agency support costs of US$ 13,000 for UNEP, for a study on financing options, regional workshops on co-financing, and/or one or more pilot applications of co-financing for one or more low-volume-consuming countries with an approved HCFC phase-out management plan, to be funded as resource mobilisation activities on the condition that an interim report would be provided at the 66th meeting, which would include an update on the activities so far undertaken and address the following elements:

(i) Additionality of the projects proposed;

(ii) Transparency and good governance, as well as covering the cash flow;

(iii) Assurance that these projects would avoid perverse incentives for countries;

(iv) Exploring possibilities of profit-sharing, including return of funds to the Multilateral Fund;

(v) Ensuring sustainability of the projects proposed;

(vi) Avoidance of duplication of similar projects;

(vii) Information on transaction costs;

(b) To request UNEP to ensure that the regional workshops were held in the context of the network meetings under UNEP's Compliance Assistance Programme so as to ensure cost-effectiveness, and that the timing of the workshops would be such to allow the experiences of other agencies' resource mobilisation activities to be incorporated;

(c) To note that the funds approved would be taken from the budget

reserved for unspecified projects that had been set aside from the funds returned from the Thai chiller project; and

(d) To request UNEP to provide a final report for consideration by the Executive Committee at its 69th meeting."

Under this revised project scope and resources, and following consultations within the CAP team and with select Ozone Officers, UNEP selected the first option in the decision, i.e. the study and regional workshops, instead of developing a pilot application the former option would have a wide impact on many LVCs.

UNEP engaged an international expert in the field of resource mobilisation to research and draft the study on financing options (i.e. this document), and arranged for quality review by two experts, one of whom is an Ozone Officer from an LVC. UNEP conducted the workshop component of the project over the period May 2013 to March 2014 (see Annex 2) in a way that was mutually supportive with the development of this document.

UNEP submitted an interim report on the project to the 66th Executive Committee meeting, which noted the report and requested UNEP to submit a more substantial report to the 68th meeting (Decision 66/15(m)). At the 68th meeting, UNEP submitted another interim report. During the discussions of the resource mobilisation projects of all Implementing Agencies, the Executive Committee noted the important information on resource mobilisation provided in the *Desk Study on the Evaluation of Chiller Projects*[60] and the 68th meeting report,[61] and requested that UNDP, UNEP, UNIDO and the World Bank take into account the information provided the desk study, where relevant, and incorporate such information in the final reports on resource mobilisation for in the context of the terms of reference set out in decisions 63/20, 63/22, 63/23 and 63/24 (Decision 68/4 (c)).

For both project components, UNEP considered the Multilateral Fund *Desk Study on the Evaluation of Chiller Projects* during the project development insofar as its recommendations apply to the LVC context, as per Executive Committee decision 68/4(c). UNEP also considered the information contained in the final reports on resource mobilisation for climate co-benefits submitted by UNDP,[62] UNIDO,[63] and

World Bank[64] as they became available.

UNEP submitted an interim report on the project[65] to the 69th meeting, which the Executive Committee noted and then urged UNEP to provide a draft of the study in the form of an information paper to the Executive Committee's 70th meeting; to submit the final study to the 71st meeting, taking into account guidance provided by the Executive Committee at the 70th meeting; and to complete the regional workshops on co-financing by December 2013 with a view to providing a report on their conclusions to the first meeting in 2014 (Decision 69/4 (c)).

UNEP submitted to the 70th meeting of the Executive Committee (1-5 July 2013) the *Draft Annotated Outline of the Study on Financing Options to Address Climate Co-Benefits for HCFC Phase-out in LVCs with Servicing Sector Only*.[66] In that detailed submission, UNEP noted that the project was a work in progress and it welcomed any guidance or inputs (e.g. examples of successful resource mobilisation in LVCs) from Executive Committee members or others to consider during the finalisation of the document. During the Committee's deliberations, a member noted the relation between the *Discussion Paper on Minimizing Adverse Climate Impact of HCFC Phase-Out in the Refrigeration Servicing Sector*[67] and the study being prepared by UNEP. He encouraged the Secretariat to conduct further analysis of the issue and to engage in further discussion with UNEP and the other implementing agencies in order to exchange ideas and strategies to address the servicing sector in the most effective way possible to achieve compliance and minimise adverse climate impact.[68] The Executive Committee agreed to defer consideration of the draft annotated outline of the study.[69]

As the consideration of the outline was not continued during the 71st or 72nd Executive Committee meetings, UNEP proceeded with the finalisation of the document on the basis of the previously-submitted outline, the comment received during the 70th meeting, and inputs from Ozone Officers and others received during the four resource mobilisation workshops. UNEP submitted the final version of the study to the Executive Committee for consideration at its 73nd Meeting.

Annex 2: Summary of the regional resource mobilisation workshops

As part of the project on "Resource mobilization to address climate co-benefits for the HCFC phase-out in LVC countries with servicing sector only,"[70] UNEP organized four regional workshops on co-financing with the objective of bringing stakeholders and representatives of the various appropriate funding mechanisms together to build the capacity of the participating Ozone Officers from Article 5 countries on accessing these financial mechanisms. UNEP also used the workshops as an opportunity for Ozone Officers from LVCs to share their experiences/inputs and voice their needs in relation to the guidance document on financing options that UNEP was preparing in parallel to the workshops. Thus, the workshops and the document were integrated throughout the project duration.

In accordance with Decision 63/22 (b), UNEP ensured that the regional workshops were held in the context of the 2013/2014 meetings of the Regional Networks of Ozone Officers under UNEP's Compliance Assistance Programme so as to ensure cost-effectiveness, and that the timing of the workshops would be such to allow the experiences of other agencies' resource mobilisation activities to be incorporated. Accordingly, the four workshops on "Opportunities for resource mobilization and climate benefits related to refrigeration servicing sector" were held as follows:[71]

- Asia-Pacific: The workshop on was organised on 8 May 2013 in Gold Coast, Australia, back to back with the Joint Meeting of the South Asia (SA), South East Asia and the Pacific (SEAP) and the Pacific Islands Countries (PIC) Regional Networks of Ozone Officers.
- Europe and Central Asia: The workshop on was organised on 21 May 2013 in Ohrid, Macedonia FYR, back to back with the Annual Meeting of the ECA Network of Ozone Officers.
- Latin America and the Caribbean: The workshop on was organised in Kingston, Jamaica on 30 September 2013 back to back with the Meeting of the Latin American and Caribbean Networks of Ozone Officers.
- Africa: The workshop on was organised in Addis Ababa, Ethiopia on 28 March 2014, back to back with the Joint Meeting of French-Speaking and English-Speaking Africa.

The workshops were one half day or one day in length, depending on the preference and schedule of the respective Network meetings. Model agendas were prepared to ensure

some level of standardisation across the Networks, with the provision that each region could adapt the agendas as per its local requirements. The workshops were designed to be inter-active to encourage discussion and brainstorming on the subject, and included both presentations, discussion panels, and roundtable exchanges.

The workshop participants were all of the National Ozone Officers who participated in the associated Regional Network meetings. UNEP also invited the following organisations as speakers share their resource mobilisation experiences: Multilateral Fund Secretariat, Ozone Secretariat, Implementing Agencies, bilateral agencies/non-Article 5 countries, and selected Ozone Officers with relevant co-financing experience. In all of the workshops, UNDP, UNIDO and the World Bank conveyed the results to-date of their own resource mobilisation projects separately-approved under the Multilateral Fund, shared their extensive experiences with resource mobilisation with respect to both LVCs and non-LVCs, and participated actively in the ensuing roundtable discussions.

UNEP retained external experts familiar with resource mobilisation to moderate the workshops in a neutral and unbiased manner, and to make the framework presentations. During some of the workshops, other organisations also delivered presentations or moderated sessions during some of the workshops, such as the Asia-Pacific Technical College (APTC), Colombia, Croatia, Macedonia (Former Yugoslav Republic of), Saint Lucia, United States and private sector companies. In some of the workshops, other UNEP staff members working on related issues outside of Montreal Protocol (i.e. climate change and financing) also participated as speakers or moderators.

The agendas of the four workshops covered a range of topics, such as:

- Overview of financing options for LVC countries with servicing sector only.
- Resource mobilisation to address climate co-benefits for HCFC phase-out in the context of Multilateral Fund decisions and policies.
- Experiences of the implementing agencies and bilateral agencies.
- Clean Development Mechanism.
- Global Environment Facility.
- Case studies or experiences (Caribbean, Colombia, Gambia, Ghana, Macedonia FYR, Croatia, Vietnam, etc.)
- European financing instrument for pre-

accession countries.

• NAMAs in the refrigeration, air conditioning and foam blowing sector.

• Prospects for regional development banks to contribute to resource mobilization related to the HCFC phase out in Article 5 countries.

The Africa workshop provided the Implementing Agencies with a good opportunity to share the results of their resource mobilisation projects, particularly the experiences with Gambia, Ghana and Vietnam projects co-financed with the GEF. The workshop also discussed the fundamentals of resource mobilisation including development and submission of grant proposals, mobilisation of national resources, and fundraising principles. The Asia-Pacific workshop provided a good opportunity for Australia, Italy and the United States to share their experience in offsetting costs in their own domestic HCFC phase-out program. A few countries like Fiji, Cook Island, Bangladesh noted efforts in attracting financing for the climate co-benefits. The Europe and Central Asia workshop highlighted the keen interest by Ozone Officers in better understanding the resource mobilisation opportunities with Macedonia and Croatia mentioning the creation of funding opportunities to support their Montreal Protocol programs. The Latin America and the Caribbean meeting clarified that there is a need to have a system in place that provides the most up to date information on technologies in terms of performance and alternative gases. There was also an interesting discussion on the need for a few pilot countries to demonstrate how this financing could take place.

Some of the common messages received from Ozone Officers during the workshops include:

• The subject of resource mobilisation and climate co-benefits is new to virtually all Ozone Officers and is not traditionally an area in which they have worked. Ozone Officers need assistance to develop their own expertise in project financing and designing project proposals. They also need assistance to further develop their capacity for making the linkages between the HCFC phase out, energy efficiency and climate co-benefits.

• Due to the shortage of human resources in NOUs, as well as lack of skills and knowledge in this area, resource mobilisation for the climate benefits of the HCFC phase out needs more efforts. National Ozone officers

highlighted the need for continued assistance from all agencies on this subject.

• Resource mobilisation does not necessarily mean just funds, but can also mean human resources such as training and knowledge sharing.

• Ozone Officers expressed the need for project preparation funds that focus on the climate co-benefits.

• Ozone Officers should explore as a priority the opportunities for internal (i.e. domestic) resource mobilisation. This can include the use of economic instruments, other government programmes and private sector resources.

Annex 3: Useful contacts and background information

Final reports of Implementing Agency resource mobilization projects

• UNDP, Final report on resource mobilization for climate co-benefits (UNEP/OzL.Pro/ExCom/71/6/Add.1), http://www.multilateralfund.org/71/English/1/7106a1.pdf

• UNIDO, Final report on development of pilot proposals for possible co-financing for HCFC activities, to be be funded as resource mobilization activities (UNEP/OzL.Pro/ExCom/69/5) http://www.multilateralfund.org/69/English/1/6905.pdf

• World Bank, Final report on resource mobilization for HCFC phase-out and climate mitigation co-benefits (UNEP/OzL.Pro/ExCom/71/6/Add.1), http://www.multilateralfund.org/71/English/1/7106a1.pdf

Multilateral Fund documents

• Multilateral Fund Senior Monitoring and Evaluation Officer, Desk Study on the Evaluation of Chiller Projects (UNEP/OzL.Pro/ExCom/68/10), http://www.multilateralfund.org/68/English/1/6810.pdf

• Multilateral Fund Secretariat, Minimizing Adverse Climate Impact of HCFC Phase-out in the Refrigeration Servicing Sector (UNEP/OzL.Pro/ExCom/72/42), http://www.multilateralfund.org/72/English/1/7242.pdf

GEF Focal Points

GEF Focal Points play a critical coordination role regarding GEF matters at country level as well as serving as the liaison with the GEF Secretariat and Implementing Agencies while representing their constituencies on the GEF Council. The GEF Political Focal Points and Operational Focal Points have different functions, although the exact specifications of the two designations may vary from country to country. All GEF member countries have Political Focal Points, while only recipient member countries eligible for GEF project assistance have Operational Focal Points. GEF Political Focal Points are concerned primarily with issues related to GEF governance including policies and decisions, as well as relations between member countries and the GEF Council and Assembly. GEF Operational Focal Points are concerned with the operational aspects of GEF activities, such as endorsing project proposals to affirm that they are consistent with national plans and priorities and facilitating GEF coordination, integration, and consultation at country level. The list of focal points is found at http://www.thegef.org/gef/focal_points_list

Climate-related programs

- Clean Development Mechanism (CDM), http://cdm.unfccc.int/
- Climate and Clean Air Coalition (www.unep.org/ccac/).
- Sustainable Energy for All, http://www.sustainableenergyforall.org/
- The World Bank, http://www.worldbank.org/en/topic/climatechange/overview
  - Climate Investment Funds (CIFs), https://www.climateinvestmentfunds.org/cif/
  - Climate Finance and Carbon Finance Unit, http://www.worldbank.org/en/topic/climatefinance
  - Climate Change Knowledge Portal, http://sdwebx.worldbank.org/climateportal/index.cfm
  - Climate Finance Options Platform, http://www.climatefinanceoptions.org/cfo/index.php

Regional Development Banks

- The Asian Development Bank (ADB), http://www.adb.org/
- Inter-American Development Bank (IADB), www.iadb.org/
- Caribbean Development Bank (CDB), www.caribank.org/
- African Development Bank (AfDB), http://www.afdb.org/en/
- Climate Investments Funds (CIF), http://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/climate-investment-funds-cif/
- the Global Environment Facility (GEF), http://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/global-environment-facility-gef/
- Sustainable Energy Fund for Africa (SEFA), http://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/sustainable-energy-fund-for-africa/
- African Carbon Support Programme (ACSP), http://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/african-carbon-support-program/
- European Bank for Reconstruction and Development (EBRD), http://www.ebrd.com

Funding Organisations of National Governments

- Australia: Australian AID (AUSAID), http://www.ausaid.gov.au/Pages/home.aspx
- Austria: Austrian Development Agency, http://www.entwicklung.at/en/
- Belgium: Belgian Development Cooperation (DGDC), http://diplomatie.belgium.be/en/policy/development_cooperation/
- Belgium: Belgian Technical Cooperation (BTC), http://www.btcctb.org/

• Canada: Canadian International Development Agency (CIDA), http://www.acdi-cida.gc.ca/acdi-cida/acdi-cida.nsf/eng/home

• Denmark: Danish International Development Assistance (DANIDA), http://um.dk/en/danida-en/

• Denmark: Danish Ministry of Foreign Affairs (MOFA), http://um.dk/en

• European Commission: DG Development (DG DEV) also EU Enlargement-related funds, http://ec.europa.eu/trade/policy/countries-and-regions/regions/africa-caribbean-pacific/

• France: Ministère des Affaires étrangères et européennes (MAEE), http://www.diplomatie.gouv.fr/en/

• France: Direction générale de la Coopération internationale et du Développement (DGCID), http://www.irc.nl/page/6890

• Finland: Ministry of Foreign Affairs (MoFA), http://formin.finland.fi/public/default.aspx?culture=en-US&contentlan=2

• Germany: Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), http://www.giz.de/en/

• Germany: Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung (BMZ), http://www.bmz.de/en/index.html

• Ireland: Irish Aid, http://www.dci.gov.ie/

• Italy: Cooperazione Italiana allo Svililuppo, http://www.cooperazioneallosviluppo.esteri.it/pdgcs/

• Japan: International Cooperation Agency (JICA), http://www.jica.go.jp/english/

• Japan: Official Development Assistance (ODA), Ministry of Foreign Affairs (MoFA), http://www.mofa.go.jp/policy/oda

• Japan: Bank for International Cooperation (JBIC), http://www.jbic.go.jp/en/

• Luxembourg: Ministère des Affaires Étrangères, http://www.mae.lu/en

• Luxembourg: Agence Luxembourgeoise pour La Coopération Luxembourgeoise au Développement, http://luxdev.lu/en

• Netherlands: Ministry of Foreign Affairs (MoFA), http://www.government.nl/ministries/bz

• New Zealand: New Zealand Aid (NZAid), http://www.aid.govt.nz/

• Norway: Ministry of Foreign Affairs, http://www.regjeringen.no/en/dep/ud.html?id=833

• Norway: Norwegian Agency for Development and Cooperation (NORAD), http://www.norad.no/en/front-page;jsessionid=0D0F0A6AF492616F55F671C9D9D94F11

• Portugal: Instituto Português de Apoio Ao Desenvolvimento (IPAD), http://ns1.ipad.mne.gov.pt/

• Spain: Agencia Española de Cooperación Internacional (AECI), http://www.aecid.es/en/aecid/

• Sweden: Swedish International Development Cooperation Agency (SIDA), http://www.sida.se/english/

• Switzerland: Swiss Agency for Development and Cooperation (SDC), http://www.sdc.admin.ch/en/Home

• Switzerland: State Secretariat of Foreign Affairs (SECO), http://www.seco.admin.ch/index.html?lang=en

• United Kingdom: Department for International Development (DFID), https://www.gov.uk/government/organisations/department-for-international-development

• United State: United States Agency for International Development (USAID), http://www.usaid.gov/

• United States: Millennium Challenge Corporation (MCC), http://www.mcc.gov/

Clean Development Mechanism approved methodologies

• AMS-II.O.: Dissemination of energy efficient household appliances --- Version 1.0, http://cdm.unfccc.int/methodologies/DB/OE502PQ0NA9ETZ5IB6HL0ZT2BBKZ35

• AMS-III.X.: Energy Efficiency and HFC-134a Recovery in Residential Refrigerators --- Version 2.0, http://cdm.unfccc.int/methodologies/DB/983EQY2RSIYT5Q1KN4FIWHU2FL3MHP

• AMS-III.AB.: Avoidance of HFC emissions in Standalone Commercial Refrigeration Cabinets --- Version 1.0, http://cdm.unfccc.int/methodologies/DB/

Annex 4: Multilateral Fund eligible incremental costs of HCFC phase-out projects[72]

Eligible incremental costs of HCFC phase-out projects (Decision 60/43)

(f) To apply the following principles in regard to eligible incremental costs of HCFC phase-out projects for the first stage of HPMP implementation to achieve the 2013 and 2015 HCFC phase-out compliance targets, subject to a review in 2013:
(i) When preparing HCFC phase-out projects in the foam, refrigeration and air-conditioning sectors, bilateral and implementing agencies shall use the technical information contained in document UNEP/OzL.Pro/ExCom/55/47 as a guide;

(ii) The current cost-effectiveness threshold values used for CFC phase-out projects in paragraph 32 of the final report of the 16th Meeting of the Executive Committee (document UNEP/OzL.Pro/ExCom/16/20), to be measured in metric kilogrammes, shall be used as guidelines during the development and implementation of the first stage of HPMPs;

(iii) That countries will have the flexibility to allocate the approved funding from incremental operating costs to incremental capital costs and to allocate up to 20 % of the approved funding for incremental capital costs to incremental operating costs, as long as the use of the flexibility does not change the intent of the project. Any reallocation should be reported to the Executive Committee;

(iv) Funding of up to a maximum of 25 % above the cost effectiveness threshold will be provided for projects when needed for the introduction of low global warming potential (GWP) alternatives;

HCFC phase-out in the refrigeration and air-conditioning manufacturing sector

(viii) Incremental operating costs for projects in the air conditioning sub-sector will be considered at US$ 6.30/metric kg of HCFC consumption to be phased out at the manufacturing enterprise;

(ix) Incremental operating costs for projects in the commercial refrigeration sub-sector will be considered at US$ 3.80/metric kg of HCFC consumption to be phased out at the manufacturing enterprise;

(x) Consistent with decision 31/45 of the Executive Committee, incremental operating costs will not be considered for enterprises categorised under the refrigeration equipment assembly, installation and charging sub-sector;

HCFC phase-out in the refrigeration servicing sector

(xi) Article 5 countries that have total HCFC consumption of up to 360 metric tonnes must include in their HPMP, as a minimum:

a. A commitment to meeting, without further requests for funding, at least the freeze in 2013 and the 10 % reduction step in 2015, and if the country so decides, the 35 % reduction step in 2020. This shall include a commitment by the country to restrict imports of HCFC-based equipment if necessary to achieve compliance with the reduction steps to support relevant phase-out activities;

b. Mandatory reporting, by the time funding tranches for the HPMP are requested, on the implementation of activities undertaken in the refrigeration servicing sector and in the manufacturing sector when applicable, in the previous year, as well as a thorough and comprehensive annual work plan for the implementation of the following activities associated with the next tranche;

c. A description of the roles and responsibilities of major stakeholders, as well as the lead implementing agency and the cooperating agencies, where applicable;

(xii) Article 5 countries that have total HCFC consumption of up to 360 metric tonnes will be provided funding consistent with the level of consumption in the refrigeration servicing sector as shown in the table below, on the understanding that project proposals will still need to demonstrate that the funding level is necessary to achieve the 2013 and 2015 phase-out targets, and if the country so decides, the 2020 phase-out targets:

Consumption (metric tonnes)*	Funding up to 2015 (US$)	Funding up to 2020 (US$)
>0 <15	51,700	164,500
15 <40	66,000	210,000
40 <80	88,000	280,000
80 <120	99,000	315,000
120 <160	104,500	332,500
160 <200	110,000	350,000
200 <320	176,000	560,000

(*) Level of baseline HCFC consumption in the refrigeration servicing sector

(xiii) Article 5 countries that have total HCFC consumption of up to 360 metric tonnes and that receive funding consistent with the above table, will have flexibility in utilizing the resources available to address specific needs that might arise during project implementation to facilitate the smoothest possible phase-out of HCFCs;
(xiv) Article 5 countries that have total HCFC consumption of up to 360 metric tonnes, used in both the manufacturing and refrigeration servicing sectors, could submit HCFC phase-out investment projects in accordance with prevailing policies and decisions of the Multilateral Fund, in addition to funding for addressing HCFC consumption in the servicing sector;
(xv) Article 5 countries that have total HCFC consumption above 360 metric tonnes should first address consumption in the manufacturing sector to meet the reduction steps in 2013 and 2015. However, if such countries clearly demonstrate that they require assistance in the refrigeration servicing sector to comply with these targets, funding for these activities, such as training, will be calculated at US$ 4.50/metric kg, which will be deducted from their starting point for aggregate reductions in HCFC consumption.

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[2] Although there are sometimes considerable differences between low-volume and very-low volume consuming countries, for the purposes of this document the term LVC will be used henceforth as a generic term for both types of countries.

[3] For background about UNEP's resource mobilization project, see Annex 1.

[4] See Annex 2.

[5] Any Party to the Montreal Protocol which is a developing country and whose annual level of consumption of chlorofluorocarbons (CFCs) and halons is less than 0.3 kilograms per capita.

[6] See Section 4.

[7] Document UNEP/OzL.Pro/ExCom/72/42, http://www.multilateralfund.org/72/English/1/7242.pdf . This document provides useful information and considerations about the refrigeration servicing sector that is relevant for current and future HPMPs. UNEP recommends that all Ozone Officers read this document.

[8] Executive Committee Decision 72/17 states that "anyone engaging in retrofitting HCFC-based refrigeration and air-conditioning equipment to flammable or toxic refrigerants and associated servicing, does so on the understanding that they assume all associated responsibilities and risks." New equipment that is specifically designed to use flammable refrigerants can be appropriate options to replace HCFCs in developing countries, and should be considered. However, due to safety concerns, UNEP's Compliance Assistance Programme cautions on the conversions (i.e. retrofits or drop-ins) of existing refrigeration and air conditioning equipment - or any existing equipment with large charge size - to use flammable refrigerants which include, but are not limited to, hydrocarbons.

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[13] Progress Report of the Technology and Economic Assessment Panel, May 2011, Volume 1 http://ozone.unep.org/Assessment_Panels/TEAP/Reports/TEAP_Reports/TEAP_Progress_Report_May_2011.pdf

[14] Multilateral Fund Secretariat, Minimizing Adverse Climate Impact of HCFC Phase-out in the Refrigeration Servicing Sector (UNEP/OzL.Pro/ExCom/72/42), para 44(c)(ii).

[15] *World Bank Final Report on Resource Mobilization for HCFC Phase-out and Climate Mitigation Co–Benefits*, p. iii (UNEP/OzL.Pro/ExCom/71/6/Add.1).

[16] United Nations Industrial Development Organization, SHECCO SPRL. *Guide 2013: Natural Solutions for Developing Countries including UNIDO Atmosphere Summary Report. November 2013*

[17] Multilateral Fund Desk Study on the Evaluation of Chiller Projects (UNEP/OzL.Pro/ExCom/68/10), para 11.

[18] *Leveraging Support for HCFC Phase-out: Opportunities and Modalities for Pursuing Linkages with the Climate Change Agenda*. Montreal Protocol Operations, Environment Department, The World Bank. www.worldbank.org/montrealprotocol www.carbonfinance.org

[19] See Annex 2.

[20] *World Bank Final Report on Resource Mobilization for HCFC Phase-out and Climate Mitigation Co–Benefits*, p. iv (UNEP/OzL.Pro/ExCom/71/6/Add.1).

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[24] http://www.worldbank.org/en/topic/climatefinance

[25] http://sdwebx.worldbank.org/climateportal/index.cfm?page=why_climate_change

[26] http://www.climatefinanceoptions.org/cfo/index.php

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[28] Wikipedia, the free encyclopedia. http://en.wikipedia.org/wiki/Certified_Emission_Reduction

[29] The World Bank. Beyond the Sum of Its Parts Combining Financial Instruments for Impact and Efficiency. ISSUES BRIEF #3, June 2010. Table 1. http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/06/25/000334955_20100625030802/Rendered/PDF/553290BRI0Box349445B01PUBLIC1.pdf.

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[54] UNIDO, Chiller demonstration projects: Achievements & lessons learnt. Joint meeting of the Regional Ozone Networks for Europe & Central Asia (ECA) and South Asia (SA). Istanbul, Turkey. 26-30 April 2010; Chiller Demonstration Projects: Achievements and Lessons Learnt. The Global Chiller Replacement Project. Mary-Ellen Foley. Montreal Protocol Operations, The World Bank. 26-30 April 2010. Istanbul, Turkey; Viraj Vithoontien, Montreal Protocol Operations, The World Bank Group, Strategies for HCFC Phase-out Management Plan. Regional Workshop of Caribbean Ozone Officers. 25 March 2009.

[55] UNEP/OzL.Pro/ExCom/63/L.1 7 April 2011. Para 84 (a) (ii). http://www.multilateralfund.org/63/Draft%20Report%20English/1/63L1draft-8-April.doc

[56] Good governance has 8 major characteristics. It is participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive and follows the rule of law. It assures that corruption is minimized, the views of minorities are taken into account and that the voices of the most vulnerable in society are heard in decision-making. It is also responsive to the present and future needs of society. http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.asp

[57] Multilateral Fund *Desk Study on the Evaluation of Chiller Projects* (UNEP/OzL.Pro/ExCom/68/10), para 14.

[58] UNEP/OzL.Pro/ExCom/63/19.

[59] GLO/SEV/63/TAS/308.

[60] UNEP/OzL.Pro/ExCom/68/10.

[61] UNEP/OzL.Pro/ExCom/68/53, paragraphs 48 to 54.

[62] UNEP/OzL.Pro/ExCom/71/6/Add.1.

[63] UNEP/OzL.Pro/ExCom/69/5.

[64] UNEP/OzL.Pro/ExCom/71/6/Add.1.

[65] UNEP/OzL.Pro/ExCom/69/5.

[66] UNEP/OzL.Pro/ExCom/70/Inf.3.

[67] UNEP/OzL.Pro/ExCom/70/53.

[68] UNEP/OzL.Pro/ExCom/70/59, para 117.

[69] UNEP/OzL.Pro/ExCom/70/59, para 149.

[70] See Annex 1.

[71] UNEP did not organize a resource mobilization in West Asia since the region does not have any low-volume consuming country, and it is therefore outside of the scope of the approved project. However, discussions on resource mobilization for the climate co-benefit of the HCFC phase out have taken place during the region's Network and thematic meetings, to a certain extent.

[72] Excerpt from UNEP/OzL.Pro/ExCom/60/54 www.multilateralfund.org/sites/60/Document%20Library2/1/6054.pdf

About the UNEP DTIE OzonAction Programme

Under the Montreal Protocol on Substances that Deplete the Ozone Layer, countries worldwide are taking specific, time-targeted actions to reduce and eliminate the production and consumption of man-made chemicals that destroy the stratospheric ozone layer, Earth's protective shield.

The objective of the Montreal Protocol is to phase out ozone depleting substances (ODS), which include CFCs, halons, methyl bromide, carbon tetrachloride, methyl chloroform, and HCFCs. One hundred ninety seven governments have joined this multilateral environmental agreement and are taking action.

The UNEP DTIE OzonAction Branch assists developing countries and countries with economies in transition (CEITs) to enable them to achieve and sustain compliance with the Montreal Protocol. With our programme's assistance, countries are able to make informed decisions about alternative technologies, ozone-friendly policies and enforcement activities.

OzonAction has two main areas of work:

- Assisting developing countries in UNEP's capacity as an Implementing Agency of the Multilateral Fund for the Implementation of the Montreal Protocol, through a Compliance Assistance Programme (CAP).
- Specific partnerships with bilateral agencies and Governments.

UNEP's partnerships under the Montreal Protocol contribute to the realisation of the Millennium Development Goals and implementation of the Bali Strategic Plan.

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About the UNEP Division of Technology, Industry and Economics

The UNEP Division of Technology, Industry and Economics (DTIE) helps governments, local authorities and decision-makers in business and industry to develop and implement policies and practices focusing on sustainable development.

The Division works to promote:

> sustainable consumption and production,
> the efficient use of renewable energy,
> adequate management of chemicals,
> the integration of environmental costs in development policies.

The Office of the Director, located in Paris, coordinates activities through:

> The International Environmental Technology Centre - IETC (Osaka), which implements integrated waste, water and disaster management programmes, focusing in particular on Asia.

> Sustainable Consumption and Production (Paris), which promotes sustainable consumption and production patterns to contribute to human development through global markets.

> Chemicals (Geneva), which promotes sustainable development by catalysing global actions and building national capacities for the sound management of chemicals and the improvement of chemicals safety worldwide.

> Energy (Paris), which fosters energy and transport policies for sustainable development and encourages investment in renewable energy and energy efficiency.

> OzonAction (Paris), which supports the phase-out of ozone depleting substances in developing countries and countries with economies in transition to ensure implementation of the Montreal Protocol.

> Economics and Trade (Geneva), which helps countries to integrate environmental considerations into economic and trade policies, and works with the finance sector to incorporate sustainable development policies.

UNEP DTIE activities focus on raising awareness, improving the transfer of knowledge and information, fostering technological cooperation and partnerships, and implementing international conventions and agreements.

For more information
see **www.unep.org**

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Multilateral Fund
for the Implementation of the Montreal Protocol

Hydrochlorofluorocarbons (HCFCs) are being phased out worldwide under the Montreal Protocol on Substances that Deplete the Ozone Layer. The Parties to this treaty encouraged countries to promote the selection of alternatives to HCFCs that minimize environmental impacts, in particular impacts on climate. The Protocol's Multilateral Fund encourages developing countries to explore potential financial incentives and opportunities for additional resources to maximize the environmental benefits from HCFC Phase out Management Plans (HPMPs). This booklet explains how Ozone Officers in low-volume consuming countries can explore such opportunities for climate co-benefits.