Planning, Designing and Implementing Policies to Control Ozone Depleting Substances under the Montreal Protocol

A HANDBOOK OF POLICY SETTING AT THE NATIONAL LEVEL

UNEP

UNEP DTIE OzonAction Programme
under the Multilateral Fund

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UNITED NATIONS PUBLICATION

ISBN 92-807-2311-1

Picture credits

Pages 22, 24 and 33 – UNEP; page 61 – Green Label Thailand, China SEPA, Nordic Council of Ministers; page 70 – Ghana EPA, National Ozone Unit; page 80 – US Defence Logistics Agency; page 93 – U.S. Department of Justice; front cover – NASA Total Ozone Mapping Spectrometer.

ACKNOWLEDGEMENTS

This document was produced by UNEP Division of Technology, Industry and Economics (UNEP DTIE) OzonAction Programme under the Multilateral Fund for the Implementation of the Montreal Protocol, in co-operation with the Center for International Environmental Law (CIEL).

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bounford.com

UNEP would like to thank all of the above for their contribution to the development of this publication.

Ultimately, implementation and compliance, and thus the effectiveness of Multilateral Environmental Agreements, depend primarily on the existence and effectiveness of the corresponding national legislation, institution and policies, including those that ensure access to judicial and administrative fora, national capacity and political will.

UNEP Global Environmental Outlook 2000

FOREWORD

By any measure, the Montreal Protocol is a shining example among global environmental accords. For the past thirty years, the story of ozone layer protection has highlighted the role of the development and transfer of alternative technologies. But more than that, it has singularly identified and demonstrated the role of policy development and implementation at the national level as a precursor to the implementation of multilateral environmental agreements at the global level.

Since 1974, scientists have demonstrated that man-made chemicals, such as chlorofluorocarbons (CFCs), carbon tetrachloride, halons and methyl bromide, destroy ozone molecules in the stratospheric ozone layer. The ozone layer protects life on earth from the sun's harmful ultraviolet radiation. The resulting increase in ultraviolet radiation reaching the earth's surface has potentially serious effects on human health, including causing skin cancers, cataracts, and diminished immune systems. Increased ultraviolet radiation may also disrupt the food cycle of the ocean and reduce the productivity of important agricultural crops.

Facing substantial potential harm to the environment and human health, the international community began in the early 1980s to negotiate science-driven policy leading to increasingly stringent rules and regulations regarding the manufacture and use of ozone depleting substances (ODSs). These negotiations resulted in the establishment of the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Depletes the Ozone Layer. As of March 2003, nearly every government in the world – 184 – has ratified the treaty and become party to the Montreal Protocol. While the Protocol and its subsequent amendments and adjustments have not eliminated the dangers of ozone depletion, they have established national commitments that lessen the threat in the future.

Pursuant to the Montreal Protocol regime, most industrialized countries have already taken significant measures to eliminate many ODSs. These measures were driven by alternative technologies and ozone-friendly policies. Beginning in 1999, developing country Parties to the Montreal Protocol are also required to control and phase out a variety of ODSs. Implementation of the Montreal Protocol has been challenging for all Parties, but particularly for smaller and less economically developed countries and those that use low volumes of the controlled substances. This Handbook helps guide decision-makers and other

relevant stakeholders in developing countries to design effective policies to enable them to meet their obligations under the Montreal Protocol.

Experience has shown that a strong national policy framework is necessary for the sustained, permanent reduction and phase-out of ODSs. Without such a framework, efforts to invest in alternative ozone-friendly technologies and/or to recycle and recover ODSs are likely to lead to failure in shifting the underlying economic incentives for the continued production and use of ODSs. Such projects and approaches must be complemented by a supporting policy framework that ensures the phase-out of ODSs according to the schedule set forth in the Montreal Protocol regime.

This Handbook provides guidance for planning, designing and implementing such policy frameworks at the national level. In providing this Handbook, we recognize that each country is unique in its governmental structure, economic circumstances, and cultural and social make-up. A one-size-fits-all model framework or template for ODS laws and policies may therefore be inappropriate. Laws and regulations reflect the cultural traditions, the economic circumstances, the interests of various stakeholders and the capacity of relevant institutions, to name a few variables. Rather than providing 'model' legislation or regulations, this Handbook aims to provide developing countries with a general framework for fashioning an ODS management programme that fits their institutional, economic, political and cultural context.

This Handbook is part of a series of publications designed to assist developing countries to develop, implement and enforce policies required for compliance with the Montreal Protocol. Each of these documents has been developed in co-operation with internationally renowned organizations with specific policy expertise.

Mr. Rajendra Shende, Head
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ABOUT THIS HANDBOOK

This Handbook provides developing countries operating under Article 5 of the Montreal Protocol with guiding principles and practical advice on planning, designing, implementing and sustaining appropriate and effective policies for complying with the Montreal Protocol regime. It is intended to support efforts to adopt public policies that can lead to the phase out of the production and use of ODSs, as required by the Montreal Protocol regime. This Handbook should be of particular interest to developing countries that are categorized as low-volume consuming countries (LVCs).

Planning, Designing and Implementing Policies to Control Ozone Depleting Substances focuses on regulatory control of ODSs and uses that are subject to phase-out schedules under the Montreal Protocol – including for example CFCs used in cooling applications, aerosols and foam manufacture, methyl bromide used in agricultural pest control, and halons used in fire suppression. It draws on the experiences of developed and developing countries, as well as the work of the Implementing Agencies for the Multilateral Fund.

This Handbook provides overview and guidance across many government and stakeholder activities, including public outreach and education, licensing, taxing, import controls, monitoring and reporting. It compares approaches that may be characterized at one end of the spectrum as traditional command-and-control, and on the other as negotiated or managed co-operation between regulators and those regulated. It also describes voluntary approaches to control and eliminate ODS consumption.

The Handbook further emphasizes a multi-stakeholder approach involving a wide range of interests in the design and implementation of regulatory regimes. Many benefits flow from designing and implementing laws and policies in consultation and partnership with industry, trade associations, local and regional governments, non-governmental organizations (NGOs) and civil society. Indeed, how a regulatory regime is established is often a more important determinant of its effectiveness, than what regulatory standards ultimately are chosen.

The Handbook is divided into seven chapters. Chapter 1 provides an introduction to the Montreal Protocol regime, with a particular emphasis on the obligations of developing countries. Chapter 2 introduces mechanisms for setting the stage for effective policy making with respect to ODS phase out. It highlights objectives and suggested strategies for engaging stakeholders, securing political commitment, and coordinating government agencies and resources. Chapter 3 discusses criteria policy-makers should apply when evaluating different potential policy measures. Chapter 4 provides a menu of different policy tools available for controlling ODS. Chapter 5 undertakes a review of several ODS sectors to aid the design and implementation of specific policy choices to meet developing country obligations under the Montreal Protocol. Chapter 6 addresses monitoring and enforcement. Finally, Chapter 7 summarizes the steps identified in the previous chapters in a step-by-step guide to effective policy making.

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1. INTRODUCTION TO THE MONTREAL PROTOCOL REGIME

The Montreal Protocol regime has been developed over decades of studies, meetings and negotiations. The regime is widely viewed today as a model, demonstrating that global environmental issues can be effectively addressed through international co-operation linked with national actions. The Montreal Protocol regime includes the 1985 Vienna Convention for the Protection of the Ozone Layer, the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, and then a series of amendments and adjustments that have been adopted over the years since 1987 (see *The Montreal Protocol Schedule and its Evolution* in Annex 2: Further Reading). The key to ensuring the ultimate effectiveness of the regime is its successful implementation at the national level, i.e. compliance with the phase out targets and other requirements.

BOX 1.1: THE MONTREAL PROTOCOL REGIME

Year	Name of Instrument	Entry Into Force[1]	Number of Parties
1985	Vienna Convention for the Protection of the Ozone Layer	22 September 1988	185
1987	Montreal Protocol to the Vienna Convention	1 January 1989	184
1990	London Amendments to the Montreal Protocol	10 August 1992	164
	London Adjustments to the Montreal Protocol	7 March 1991	
1992	Copenhagen Amendments to the Montreal Protocol	14 June 1994	144
	Copenhagen Adjustments to the Montreal Protocol	23 September 1993	
1995	Vienna Adjustments to the Montreal Protocol	5 August 1996	
1997	Montreal Amendments to the Montreal Protocol	10 November 1999	90
	Montreal Adjustments to the Montreal Protocol	4 June 1998	
1999	Beijing Amendments and Adjustments to the Montreal Protocol	25 February 2002	46

UNEP Ozone Secretrariat, Status of Ratification, as of March 2003

[1] Please note that the effective dates are not the same for amendments and adjustments. Amendments require a separate ratification procedure. Adjustments are effective to all Parties to the underlying agreement or amendment without any additional ratification procedures.

The United Nations Environment Programme (UNEP) has long taken a lead role in the development of the international response to the depletion of the stratospheric ozone layer (hereafter referred to simply as the "ozone layer"). Beginning in the late 1970s, UNEP supported a World Meteorological Organization study on this issue and produced a number of policy documents on ozone layer protection. In 1981, UNEP's Governing Council authorized the development of an international agreement to protect the ozone layer, and over the next three years an Ad Hoc Working Group of Legal and Technical Experts for the Preparation of a Global Framework Convention for the Protection of the Ozone Layer met to develop an international agreement. The deliberations led to a framework convention, which was adopted in Vienna in 1985. At this time, there was neither scientific consensus on the potential causes or the mechanisms of depletion, nor data clearly indicating whether any depletion of the stratospheric ozone layer (hereafter referred to simply as "ozone depletion") had actually occurred.

1.1 THE VIENNA CONVENTION FOR THE PROTECTION OF THE OZONE LAYER

Forty-three nations (including 16 developing countries) and the European Economic Community participated in the initial negotiations that resulted in the 1985 Vienna Convention for the Protection of the Ozone Layer. The Convention was initially signed by twenty countries. The Convention did not control CFC consumption or production, but rather called for countries to take "appropriate measures" to protect the ozone layer and established an international mechanism for research, monitoring and exchange of information. No chemicals were specifically labeled as ozone-depleting substances (ODSs). Instead the annex listed chemicals "thought to have the potential to modify the chemical and physical properties of the ozone layer." At the end of the meeting, a non-binding resolution called for the next meeting of the Parties to work toward a legally binding protocol addressing controls of ODSs. This laid the groundwork for development of the Montreal Protocol.

1.2 THE MONTREAL PROTOCOL

In 1985, two months after the Vienna Convention negotiations ended, British scientists announced an "ozone hole" in the Antarctic, triggering enormous public concern about ozone depletion. The scientific data showed a 50% springtime reduction in the Antarctic ozone layer compared to levels in the 1960s. Sharp decreases, however, had only begun in 1979, suggesting the reduction was accelerating. The data showed such a dramatic decline, the British team had put off publishing their findings for three years to confirm their accuracy. Computers interpreting data from U.S. satellites had automatically rejected accurate readings of ozone depletion as clearly erroneous. When ultimately confirmed, the ozone hole findings were startling and focused public attention on the upcoming negotiations in Montreal.

Over sixty countries (more than half developing countries), as well as many industrial, environmental, and media groups, participated in the Montreal Protocol negotiations. The resulting 1987 Protocol reflected the heightened attention and concern over ODSs (see the *Handbook for the International Treaties for the Protection of the Ozone Layer* in Annex 2: Further Reading)

Whereas no chemicals had been positively identified as ODSs in the Vienna Convention, the Protocol froze production and consumption levels of the five most important CFCs (CFCs

11, 12, 113, 114, 115) for the developed countries six months after the Protocol entered into force (that is, by July 1, 1989) and halons (Halons 1211, 1301, 2402) three years later. It also established a reduction schedule for CFCs so that in 1998, a 50% reduction in CFC consumption was to be achieved in developed countries. Because monitoring real net consumption or emissions of ODSs was thought infeasible, a surrogate formula was adopted defining a country's consumption of CFCs or halons as:

consumption = production + imports – exports, in bulk

In order to give countries flexibility in their reduction of ODS production and use, the Protocol developed a "basket" strategy, grouping together similar substances. For example, the five CFCs were considered as one basket (Annex A, Group I) and the three halons as another one (Annex A, Group II). Each chemical's ozone-depleting potential (ODP) was compared to that of CFC 11 (arbitrarily given a value of 1). Since CFC 113 is less destructive of the ozone layer than CFC 11, its ODP is 0.8. Using the basket strategy, a country would achieve the same reduction either by using 8 tonnes less of CFC 11 or 10 tonnes less of CFC 113 (8 tonnes x ODP of 1 = 10 tonnes x ODP of 0.8 = 8 ODP tonnes). This arithmetic was important because CFC 113 was widely used as a solvent in the electronics industry.

The reduction schedules and basket strategy not only avoided chemical-by-chemical negotiations but also provided clear incentives for the development of alternatives. CFC producers could thus justify heavy research and development spending into alternatives that had lower ODPs. CFC users could also justify investments for recycling and recovery systems to reduce the future need for additional CFC stocks. For companies in ratifying countries, long-term investments in CFC production or CFC consumption technologies seemed less attractive.

If the Protocol's only teeth were scheduled phase-outs of controlled substances, countries would have a strong incentive not to sign in order to gain newly-freed market shares for themselves. To avoid this situation, and as an incentive for countries to join, the Protocol provides tough trade measures. Parties to the Protocol are prohibited from importing from non-Parties either controlled substances or certain products *containing* controlled substances. These products include domestic, commercial and vehicle air conditioners, refrigerators, and portable fire extinguishers. The Parties also decided to review the feasibility of banning the import of products *produced* with but not containing controlled substances. While Parties agreed on a list of products containing controlled substances, they had difficulty in drawing up a similar list for products produced with controlled substances and, as a result, have refrained from banning imports of such products from non-Parties. A country that is a non-Party can avoid the product's trade restrictions only if it demonstrates full compliance with the Protocol's requirements. Parties must similarly ban the export of controlled substances to non-Parties unless the country of destination can demonstrate full compliance with the Protocol. Exports to non-Parties that are in compliance are not counted as exports in the country's consumption calculation, so they must be offset by an equal reduction in production or imports.

Flexibility is one of the Protocol's most important innovations. Parties must assess and review controls at least every four years, ensuring among other things that the Protocol's international controls reflect scientists' improved understanding of the mechanisms and causes of ozone depletion. Further adjustments and reductions of the production or

consumption of the controlled substances is relatively easy, requiring only a decision by a Meeting of the Parties by a two-thirds majority, representing half of the Parties' total consumption. Such changes of the Protocol are called "Adjustments" and are binding for all Parties that have ratified the original Protocol or, in case of substances that have been added later, the Amendment whereby these substances were controlled for the first time. Adding new substances is more complicated. Such changes are called "Amendments". They require new ratifications and are binding only for those countries that have ratified the relevant Amendment. A country that has not ratified a certain Amendment is considered a "Non-Party" with regard to substances that are controlled under that specific Amendment.

Not only have the Parties met regularly since 1987, but each time they have sought to tighten reduction schedules and/or bring new compounds under control. The Parties have so far added new substances three times, by the London Amendment in 1990 (Annex B, Groups I, II and III, "Other CFCs", carbon tetrachloride and 1,1,1-trichloroethane); the Copenhagen Amendment in 1992 (Annex C, Groups I and II: HCFCs and HBFCs and Annex E: methyl bromide) and the Beijing Amendment in 1999 (Annex C, Group III: bromochloromethane). Adjustments to the phase-out schedules have been made five times, in London (1990), in Copenhagen (1992), in Vienna (1995), in Montreal (1997) and in Beijing (1999). An "Amendment" is also required for other substantial changes in the Protocol. Three examples of this are: the establishment of the Multilateral Fund to provide financial and technical support to the developing countries ("Article 5 countries") in London in 1990; the introduction of controls on the production of HCFCs in Beijing in 1999 (unlike all the other controlled substances, the Copenhagen Amendment covered only consumption of HCFCs); and the introduction of a requirement to establish import and export licensing systems, in the Montreal Amendment in 1997.

1.3 THE LONDON ADJUSTMENTS AND AMENDMENT TO THE MONTREAL PROTOCOL

One of the most important provisions in the Protocol is the provision for its regular reassessment. To facilitate an early reassessment, a resolution was taken at the same time as the adoption of the Protocol, urging interested Parties to contribute to a workshop on available alternative technologies, which was held in co-operation with UNEP in the Hague in October 1988. In parallel, some 100 scientists from 10 countries gathered to evaluate the current state of the science regarding ozone depletion. Their 1988 report concluded that ozone depletion had already occurred over populated areas of the Northern Hemisphere and that the ozone hole, a "large, sudden and unexpected" decrease in Antarctic ozone during Spring, had been regularly occurring over the last decade and could also be present in the Arctic. The study also presented the first solid data of chemical mechanisms linking halons and CFCs with ozone depletion. Perhaps most important, the scientific consensus underpinning the Montreal negotiations had estimated a 2% annual depletion of the ozone layer occurring by the year 2050 with no controls.

Based on the implications of the scientific assessment, the subsequent Meeting of the Parties in London adopted an accelerated goal for developed countries of 50% reduction for 1995 with a total phase-out by 2000 for CFCs and halons. The 1990 London Amendment also extended coverage to other ODS: carbon tetrachloride (Annex B, Group II) and 1,1,1-trichloroethane, also known as methyl chloroform (Annex B, Group III). It also called for a

scheduled phase-out of carbon tetrachloride by 2000 and of methyl chloroform by 2005 in developed countries. Included was also a group named "Other CFCs" (Annex B, Group I). Most of them have never been in commercial use – they were included in order to prevent them from becoming alternatives to any of the five controlled CFCs. The London Amendment established the Multilateral Fund, the primary financial mechanism to assist developing countries in meeting their Montreal Protocol obligations.

Considerable discussions were also held on hydrochlorofluorocarbons (HCFCs). These compounds are significantly less harmful to the ozone layer than CFCs and were viewed by the major chemical companies at the time as primary substitutes for CFCs. The ultimate compromise required reporting on the production, import and export of HCFCs and a non-binding resolution classifying them as transitional substances and discouraging their use while calling for regular review of their contribution to ozone layer depletion and the availability of alternative technology, with the view of final replacement not later than 2040.

1.4 THE COPENHAGEN AMENDMENT AND ADJUSTMENTS AND THE VIENNA ADJUSTMENTS

The Copenhagen Amendment in 1992 moved the CFC, carbon tetrachloride and 1,1,1-trichloroethane production bans forward to 1996 and instituted a halon ban by 1994 for the developed countries. The extent to which the accelerated phase-out schedule should apply to the developing countries was to be decided after a review of the available assistance provided to them through the Multilateral Fund in 1995.

The Copenhagen Amendment also introduced controls on HCFCs (Annex C Group I), HBFCs (Annex C Group II) and methyl bromide (Annex E). Unlike all the other ODSs, the controls on *HCFCs* were on consumption only. The developed countries should phase out the HCFC consumption gradually, starting with a freeze in 1996 at their 1989 baseline and ending with the last 0.5% being phased out during 2020 and 2030. The baseline took into account that some of the HCFCs (in particular HCFC 22) had been used traditionally in the refrigeration sector, but also that HCFCs were being introduced to replace CFCs. The countries were therefore allowed to include a certain percentage of their CFC consumption in the HCFC baseline. *HBFCs* were not yet in widespread commercial use, but were increasingly being introduced as alternatives to halons. To prevent this, production and consumption of HBFCs were banned completely by 1996. The controls on *methyl bromide* involved only a freeze on consumption and production by 1995, at the 1991 level, with the usual exemption on production to satisfy the basic domestic needs of the developing countries. The applicable controls in developing countries on HCFCs, HBFCs and methyl bromide would also be decided after a review of the assistance given to them through the Multilateral Fund.

The Seventh Meeting of the Parties in Vienna in 1995 decided that the developing countries should be allowed to continue to count their 10-year grace period on CFCs, halons, "other CFCs", carbon tetrachloride and 1,1,1-trichloroethane from the dates agreed in London. The final phase-out date for the developing countries for CFCs, halons, "other CFCs" and carbon tetrachloride is therefore 2010 and the final phase-out date on 1,1,1-trichloroethane is 2015.

The Meeting of the Parties in Vienna in 1995 decided also that HCFC consumption in developing countries should be frozen in 2016 at its 2015 level and then totally phased out

by 2040 (with no intermediate steps). The phase-out schedules for HCFCs have been under discussions at almost every meeting since the Vienna meeting. Continued discussions are likely on an accelerated phase-out schedule for HCFCs in developed and developing countries.

The Vienna meeting also decided on a phase-out schedule for methyl bromide in developed countries, with a first reduction step in 2001 and a final ban in 2010 except for "critical agricultural uses" and "quarantine and pre-shipment applications". Developing countries agreed to freeze methyl bromide consumption by 2002. The immediate ban on production and consumption of HBFCs was made applicable to both developed and developing countries.

1.5 THE MONTREAL AND BEIJING AMENDMENTS AND ADJUSTMENTS

The Meeting of the Parties in Montreal in 1997 accelerated the phase-out of methyl bromide in developed countries, with a final phase-out in 2005, and introduced a phase-out schedule on methyl bromide also for developing countries, with a 20% reduction in 2005 and a final phase-out in 2015. The Montreal Amendment introduced a requirement for all Parties to set in place licensing systems for imports and exports of controlled substances.

The Beijing Amendment, agreed at the Meeting of the Parties in 1999, introduced controls on HCFC production and a total phase-out of production and consumption of bromochloromethane (Annex C Group III), an ODS that was not yet widely in commercial use. The freeze on HCFC production is particularly important, as the adjustment procedure can be used for the future control of HCFC production, in addition to consumption. Adjustments made at the Beijing meeting limited the exemption on production to satisfy the needs for basic domestic consumption in developing countries, in order to avoid worldwide over-capacity in production of ODSs.

1.6 MAJOR OBLIGATIONS FOR COUNTRIES UNDER THE MONTREAL PROTOCOL REGIME

The main obligation under the Montreal Protocol regime can be summarized as follows:

A Party must comply with the control measures to phase out the production and consumption of controlled substances in accordance with Article 2 of the Montreal Protocol. If a Party operates under paragraph 1 of Article 5, a ten-year delay is allowed for complying with the control measures.

Article 5 of the Montreal Protocol addressed the situation of developing countries. Given their relatively low contribution to global ozone layer depletion, developing countries with low per capita usage of ODSs (i.e. less than 0.3 kg per capita) secured a ten-year grace period for meeting the phase-out obligations under the Protocol regime. Article 5 countries' obligations under the Montreal Protocol are outlined in Table 1.2. The obligations of countries not operating under Article 5 are outlined in Table 1.3.

BOX 1.2: CURRENT ODS PHASE OUT SCHEDULE APPLICABLE TO ARTICLE 5 PARTIES

Year beginning and thereafter[1]	Control Measures	Applicable to Consumption[2]	Applicable to Production[3]
1996	HBFCs[4] phased out[5]	●	●
1999	Freeze of Annex A CFCs[6] at 1995–97 average level[7]	●	●
2002	Freeze of halons[8] at 1995–9[7] average level[7]	●	●
	Freeze of methyl bromide[9] at 1995–1998 average level		
	Bromochloromethane phased out[5]		
2003	Annex B CFCs[10] reduced by 20% from 1998–2000 average consumption[7]	●	●
	Freeze of methyl chloroform at 1998–2000 average level		
2005	Annex A CFCs reduced by 50% from 1995–97 average level[7]	●	●
	Halons reduced by 50% from 1995–97 average level[7] Carbon tetrachloride reduced by 85% from 1998–2000 average level[7]		
	Methyl chloroform reduced by 30% from 1998–2000 average level[7]		
	Methyl Bromide reduced by 20% from 1995–1998 average level		
2007	Annex A CFCs reduced by 85% from 1995–1997 average level[7]	●	●
	Annex B CFCs reduced by 85% from 1998–2000 average level[7]		
2010	Annex A and Annex B CFCs, halons and carbon tetrachloride phased out[5, 7]	●	●
	Methyl chloroform reduced by 70% from 1998–2000 average level[7]		
2015	Methyl chloroform[7] and methyl bromide phased out[5]	●	●
2016	Freeze HCFCs[11] at the base line figure of year 2015 average level	●	
	Freeze HCFC production at the average of 2015 HCFC consumption and 2015 HCFC production[7]		●
2040	HCFCs phased out	●	

[1] The effective date for every year is 1 January, except 1999, which is 1 July. [2] The Protocol defines "consumption" as production + imports – exports of controlled substances. [3] The Protocol defines "production" as the amount of controlled substance produced – [amount destroyed + used as feedstock in the manufacture of other chemicals]. [4] 34 hydrobromofluorocarbons. [5] With possible essential use exemptions. [6] Annex A CFCs 11, 12, 113, 114, 115. [7] With an allowance for production to meet the basic domestic needs of Article 5 Parties. Please see the Montreal Protocol for detail. [8] Halons 1211, 1301, 2402 [9] Amounts used for quarantine and preshipment applications exempted. [10] Annex B: CFCs 13,111, 112, 211, 212, 213, 214, 215, 216, 217. [11] 40 hydrochlorofluorocarbons

BOX 1.3: CURRENT ODS PHASE OUT SCHEDULE APPLICABLE TO NON-ARTICLE 5 (DEVELOPED) PARTIES

Year beginning and thereafter[1]	Control Measures	Applicable to Consumption[2]	Applicable to Production[3]
1989	Freeze of Annex A CFCs[4] at 1986 level[5]	●	●
1992	Freeze of halons[6] at 1986 level[5]	●	●
1993	Annex B CFCs[7] reduced by 20% from 1989 level[5]	●	●
	Freeze of methyl chloroform at 1989 level[5]		
1994	Annex A CFCs reduced by 75% from 1986 level[5]	●	●
	Halons phased out [5, 8]		
	Annex B CFCs reduced by 75% from 1989 level[5]		
	Methyl chloroform reduced by 50% from 1989 level[5]		
1995	Freeze of methyl bromide[9] at 1991 level[5]	●	●
	Carbon tetrachloride reduced by 85% from 1989 level[5]		
1996	Annex A and B CFCs phased out [5, 8]	●	●
	HBFCs[10] phased out[8]		
	Carbon tetrachloride phased out [5, 8]		
	Methyl chloroform phased out [5, 8]		
	Freeze of HCFC11 consumption at 1989 levels of HCFC consumption + 2.8% of 1989 CFC consumption (base level)	●	
1999	Methyl bromide reduced by 25% from 1991 level[5]	●	●
2001	Methyl bromide reduced by 50% from 1991 level[5]	●	●
2002	Bromochloromethane phased out[8]	●	●
2003	Methyl bromide reduced by 70% from 1991 level[5]	●	●
2004	HCFC consumption reduced by 35% from base level	●	
	Freeze of HCFC production at the average of (a) 1989 HCFC consumption level + 2.8% of 1989 of the CFC consumption level (b) 1989 HCFC production level + 2.8% of 1989 of the CFC production level[5]		●
2005	Methyl bromide phased out [5, 8]	●	●
2010	HCFCs reduced by 65% from base level	●	
2015	HCFCs reduced by 90% from base level	●	
2020	HCFCs reduced by 99.5% from base level	●	
2030	HCFCs phased out	●	

[1] The effective date for every year is 1 January, except 1989, which is 1 July. [2] The Protocol defines "consumption" as production + imports – exports of controlled substances. [3] The Protocol defines "production" as the amount of controlled substance produced – [amount destroyed + used a feedstock in the manufacture of other chemicals]. [4] Annex A CFCs 11, 12, 113, 114, 115. [5] With an allowance for production to meet the basic domestic needs of Article 5. Parties. Please see the Montreal Protocol for detail. [6] Halons 1211, 1301, 2402. [7] Annex B: CFCs 13,111, 112, 211, 212, 213, 214, 215, 216, 217. [8] With possible essential use exemptions. [9] Amounts used for quarantine and preshipment applications exempted.
[10] 34 hydrobromofluorocarbons. [11] 40 hydrochlorofluorocarbons

In addition to the phase out obligations, all Parties must also report statistical data on the production, import and export of each controlled substance annually and for the base years: 1986 (Annex A); 1989 (Annex B and Annex C, Group 1); 1991 (Annex E).

For the purposes of the phase out schedule for Article 5 countries, the base years used to establish the phase out "starting points" are:

- Annex A: the average of 1995-1997
- Annex B: 1998 – 2000
- Annex C, Group I: 2015
- Annex E: 1995-1998.

Best estimates may be reported for the base years if actual data are not available.

A Party must also ban the imports from and exports to non-Parties of the controlled substances listed in Annexes A and B. The following table summarized the detailed requirements:

BOX 1.4: CONTROL OF TRADE WITH NON-PARTIES

Starting from this date	Ban imports of these substances/products from non-Parties	Ban exports of these controlled substances to non-Parties	MP	LA	CA	MA	BA
1 January 1990	Annex A		✓				
1 January 1993		Annex A	✓				
26 May 1993	Products of Annex D		✓				
10 August 1993	Annex B			✓			
11 August 1993		Annex B		✓			
14 June 1995	Group II of Annex C				✓		
15 June 1995		Group II of Annex C			✓		
10 November 2000	Annex E				✓		
11 November 2000		Annex			✓		
24 February 2003	Group III of Annex C				✓		
24 February 2003	Group III of Annex C				✓		
1 January 2004	Group I of Annex C				✓		
1 January 2004	Group I of Annex C				✓		

From 10 February 2000, a Party must establish and implement a licensing system for the import and export of new, used, recycled and reclaimed controlled substances in Annexes A and B. For Annexes C and E, the Article 5 countries may delay taking those actions until 1 January 2005 and 1 January 2002 respectively.

A Party must also report on the activities undertaken pursuant to Article 9 of the Protocol (research, development, public awareness and exchange of information).

1.7 SUPPORT FROM THE MULTILATERAL FUND

The availability of financial and technical support has been critical to the implementation of the Montreal Protocol regime in developing countries. In 1991, the Parties established the Multilateral Fund for the Implementation of the Montreal Protocol ("Multilateral Fund") to provide financial and technical assistance, including the transfer of technologies, to developing countries. Under Article 10 of the London Amendment, the Multilateral Fund's Executive Committee is comprised of seven developed and seven developing countries. The chair rotates annually between developed and developing countries. The Fund has four implementing agencies: UNEP, the World Bank, UNIDO and UNDP. A separate Multilateral Fund Secretariat based in Montreal is responsible for assisting the operations of the Executive Committee (see Annex 1: Useful Contacts). As of the end of December 2002, the Fund had disbursed over US$ 1.56 billion supporting 3,810 projects and activities in 121 developing countries, which when implemented will result in the phase out of the consumption of 165,600 tonnes and the production of nearly 90,000 tonnes of halons and CFCs in developing countries.

The policies, procedures and guidlelines of the Multilateral Fund may be obtained from the Multilateral Fund Secretariat website (see Publications Available from Other Sources in Annex 2: Further Reading).

1.8 THE COMPLIANCE ASSISTANCE PROGRAMME (CAP)

Under the Multilateral Fund, a special, dedicated resource is available to help Article 5 countries meet their obligations under the Montreal Protocol: the Compliance Assistance Programme.

In 2002, UNEP made a conscious departure from the past in assisting developing countries to enable them to implement the Montreal Protocol. This departure emerged from the new

A Jordanian enterprise that converted its aerosol filling line from CFCs to LPG thanks to support provided by the Multilateral Fund. The Multilateral Fund's mission is to assist developing countries to achieve compliance with the control measures of the Montreal Protocol.

context in which developing countries now operate under the compliance regime of the Montreal Protocol. The new context of compliance regime requires countries to:

- Achieve and sustain compliance
- Promote a greater sense of country 'ownership'
  - Promote greater ownership and management of the phase-out
  - Secure ongoing commitment of Government, industry and public
  - Ensure putting in place and enforcement of policies and legislation
- Implement the agreed Executive Committee framework for strategic planning
  - Improve reliability/accuracy reported data
  - Focus on SMEs/informal sector
  - Transition from project to sector approach

The programme implementation and delivery is organised through the Regional CAP teams consisting of one or two Regional Network Co-ordinators (RNCs), supported by a Policy Advisory Team that includes:

- Policy/Enforcement Officers who provide advice on legislation, policy design and enforcement;
- RMP Implementation Officers who provide advice to countries and assist with preparing RMPs;
- Methyl Bromide Phase-out Officers who provide advice about phase-out strategies for this substance and sector and
- One Halon Banking Officer who assists countries with halon alternatives, halon banking and halon management strategies.

A core team in Paris is also available to assist Article 5 countries. This includes:

- Programme Head who advises on policy and programme strategies;
- Network and Policy Manager who advises on policy development;
- Capacity-Building Manager who assists with development of training and other capacity-building activities;
- Information Manager who assists with development of information, education and communication strategies, awareness and information activities;
- Information Officer who delivers clearinghouse and awareness services; and an
- CP/IS/RMP Officer who assists countries with the development of those national/sectoral strategies and institutional strengthening projects

This team is available to work with National Ozone Units (NOUs) in developing countries to help them meet their compliance commitments under the Montreal Protocol. NOUs wishing to receive specific assistance may contact the appropriate CAP team member(s) through www.uneptie.org/ozonaction/aboutus/staff.html.

1.9 THE COMPLIANCE CHALLENGE

With nearly universal ratification of the original Protocol and coverage, including the Amendments, of over 90 ozone-depleting compounds, the Protocol must be regarded as a significant success for international co-operation. Assuming that all countries meet the Protocol's reduction and phase-out schedule for ODSs, scientists predict the ozone layer will stabilize by around 2050. The key is gaining full implementation by all countries.

Most developing countries have already begun to address the technical, legal and economic issues raised by compliance with the Montreal Protocol's schedule of freezes and phase-outs. Much of the actual investment in developing countries thus far has addressed production and manufacturing sectors, where economies of scale and ease of project implementation make such investments relatively cost-effective for reducing ODSs. The main challenge now is to reduce consumption in sectors where ODS use is distributed across many uses and many small and medium enterprises (SMEs), such as for example the installation and servicing of refrigeration and air-conditioning equipment, solvent applications and the use of methyl bromide for fumigation.

In recognition of this, the Executive Committee has been discussing a new strategy for the Multilateral Fund – one that does not focus on conversion of individual factories but rather focuses on sector-wide and country-wide approaches, taking into account the often widely distributed nature and small size of the targeted ODS uses. Rather than one conversion of a large manufacturing facility, these uses require comprehensive, sectoral approaches, backed up by supportive and sustainable policy frameworks.

Members of the South East Asia Network of ODS Officers examine refrigeration servicing practices in Hanoi, Vietnam. All NOUs are faced with the challenge of developing policy measures to assist small and medium-sized enterprises.

2. SETTING THE STAGE FOR EFFECTIVE POLICY-MAKING

The regulation of ODSs, like any other set of regulations, cannot be considered in isolation from the socio-economic, political, legal and cultural context of any particular country. Nonetheless, some general principles about how laws can be made more effective can help to increase the chances of a successful programme for reducing ODSs in most countries under most circumstances. This chapter presents general guidelines to assist policymakers in setting the stage for successful environmental policymaking, including the control of ODSs. To be effective, laws and policies must be part of a broader culture that is supportive of the rule of law and of implementing policies. Laws and policies can also help create that broader culture – in a reinforcing circle between the context and the law. The following then are several steps that are critical for developing a socio-economic and political context to make ODS policies more effective.

BOX 2.1: SETTING THE STAGE FOR EFFECTIVE POLICY-MAKING

- Survey ODS production and use patterns
- Identify major stakeholders
- Choose a strategy and set the priorities
- Create and sustain political will
- Strengthen the institutional framework
- Expand access to information
- Prepare and implement a public participation plan
- Promote regulatory independence
- Develop an effective feedback loop

2.1 SURVEY ODS PRODUCTION AND USE PATTERNS

The ultimate goal of the ODS policy framework is already set by the Montreal Protocol's schedule for phase-out of ODS consumption (taking into account whether the country has ratified the various amendments). The authority in charge of ODS issues and, within it, the unit in charge of the daily work (the National Ozone Unit or NOU) will need to target and allocate limited resources strategically and proactively, always with the aim of complying with the Montreal Protocol's timeframe for phase-out of ODSs. This process will require the collection and analysis of data regarding the country's ODS consumption and production, including imports. Good information forms the basis for good policy frameworks.

The NOU must survey the production and use patterns of ODSs in the country to identify how ODS consumption is distributed by sector, including identifying those that are most easily addressed. This is an essential early step in the design of an effective ODS phase-out policy strategy. Countries should form a clear picture not only of ODS use, import, export, etc., but of the kinds of economic and other values at stake in phasing out ODSs.

Most countries have already developed Country Programmes and will have already conducted much of the required survey as an initial stage in outlining a policy strategy to control ODSs. What is now required for many countries is to update the existing Country Programmes and/or specific sector plans, notably Refrigeration Management Plans (RMPs), and in some cases, develop strategies for other important sectors (e.g. halons, methyl bromide). Assessment of ODS use should continue to be an important part of ongoing activities at the national level. Moreover, an accurate and updated profile of the regulated community is necessary for policy-makers to develop appropriate policies and form an appropriate compliance strategy. In order to plan the phase-out strategy and measures, NOUs must be able to estimate the distribution of ODS consumption by sector and the reductions that can be achieved within each sector and within what timeframe. In that way, the NOU can compare the results to the country's Protocol requirements and begin the urgent task of identifying the strategy of ensuring compliance.

2.2 IDENTIFY MAJOR STAKEHOLDERS

The NOU should identify all major stakeholder groups that would be impacted by, or would influence, the policies being considered to implement the Montreal Protocol. The NOU should strive to design policies that are realistic, fair and workable and it is important that the parties that will be affected by the policies have an opportunity to voice their concerns, advice and perspective. The major groups of stakeholders should be clearly identified from the outset of the policy design process. These groups may include government departments (development, economy, planning, industry, environment), industry and private sector groups, and NGOs. Whenever possible, the NOU should contact organized associations that represent broad groups of stakeholders to involve them in the policy design process.

2.3 CHOOSE A STRATEGY AND SET THE PRIORITIES

With the overall objective set by the Montreal Protocol regime – to phase out all ODS consumption – the NOU may still be faced with how to apply limited resources over time to meet the various requirements of the Montreal Protocol. In most cases, a top priority should be to prevent current consumption from growing. Other priorities may depend on a number of factors, including: (1) the relative amounts of each ODS consumed in each sector and thus the contribution of that ODS or use to the country's compliance with the Montreal Protocol; (2) which sectors of existing ODS consumption will be most difficult and need the longest time to phase out; (3) the relative importance of that ODS to the economy and quality of life of the country, and the relative availability of alternatives to the ODS; and (4) the potential effectiveness of government efforts to control, regulate or otherwise modify the specific use of the ODS.

In some sectors, notably methyl bromide but also in some solvent uses, a priority for countries that currently report zero or extremely low consumption should be to establish policies needed to ensure that consumption does not grow in the future (i.e. avoid future problems).

The NOU may face several conflicting considerations in making priority choices. Some ODS uses, for example those like refrigeration or air conditioning, which are diffused throughout the economy, may take longer to achieve the phase-out schedule under the Montreal Protocol. The NOU will need to begin those difficult tasks earlier rather than later. At the same time, however, early successes in an ozone programme are likely to demonstrate the government's resolve in addressing ozone depletion and will help to build momentum for addressing more difficult ODS uses. This might lead NOUs to target larger or more easily controlled ODS uses first.

2.4 CREATE AND SUSTAIN POLITICAL WILL

Many good laws and policies are written, but never implemented effectively, resulting in non-sustainability of the established objectives. Failures in implementation can result from many different problems, including a lack of clarity in the law, a lack of thorough consideration when designing the law or regulation, a lack of legal authority or institutional or technical capacity. Often, however, the failure to implement a law reflects a basic lack of political commitment or will to tackle the environmental problem. Environmental problems are rarely perceived as being as urgent as economic or national security challenges. This is particularly true of long-term and global issues like that of ozone depletion.

So any sustained effort to address environmental issues like ozone protection requires substantial effort to build support. No matter how talented, well-informed or well-intentioned, national ozone co-ordinators will find it difficult to create effective policy structures alone. They need consistent leadership from the top levels of the government. The ultimate goal is to build political commitment and then translate this political commitment into clear and consistent support over the long-term for meaningful and effective national response to ozone depletion. Such political support will help sustain policy efforts when they elicit opposition from industry, conflict with other competing regulatory priorities, or face other forms of institutional resistance.

Supporting and strengthening the commitment of political leaders to prioritize environmental regulation and enforcement is thus very important. Regulators need to think strategically and pro-actively about how to build the political will to adopt, and then implement, strong regulatory programmes. In particular, much less political commitment is necessary to write a strong regulation or policy on paper than to implement the regulation on the ground. Writing a law or regulation is comparatively easy, but implementing it can have real economic costs and can generate serious political and socio-economic opposition.

Moreover, explicit efforts to build political will from within government agencies can be controversial. In many circumstances, NOUs and other government officials cannot be seen as acting politically. Fortunately, many activities that can work to build political will have little to do with acting politically and more to do with doing one's job effectively and enthusiastically.

The first step is to recognize the importance of thinking strategically about gaining the political support of top government officials early. This can be done by providing positive opportunities to speak publicly about the importance of meeting the country's international commitments and of addressing such an important issue as ozone depletion. Also important is to relate the protection of the ozone layer to quality of life issues important to the government officials' constituency. Impacts on human health, fisheries or agriculture to the

extent such data exists could help the official gain political rewards for his support of the ODS programme. It can also help to have positive press coverage of the initial stages of the national ozone programme. All other things being equal, policy approaches should be selected that build and reinforce the political will of top government officials. Laws and policies thus must be seen as both the product, and a source, of political will, in a pro-active and comprehensive strategy.

Particular attention should be paid to reaching out to parliamentarians and other recognized leaders. Introducing parliamentarians to the importance of the Montreal Protocol and involving them in the development of a country programme can enhance their support for developing and implementing subsequent laws and regulations.

Many of the other principles discussed in this chapter, as well as the criteria for effective policies described in Chapter 3, are also effective for building political will. Some of these, such as public education and outreach or the use of public participation processes, can build and identify popular support for ODS regulations, which in turn can bolster the political will of elected and other top officials. Similarly, highlighting the linkage of domestic ODS policies to the international Montreal Protocol regime can help to build political will domestically. Indeed, the best way to lay the groundwork is to secure clear, meaningful and public commitments by the highest officials in every relevant part of government to ODS phase-out according to the schedules contained in the Montreal Protocol and its amendments and adjustments.

BOX 2.2: MECHANISMS FOR SUPPORTING AND STRENGTHENING POLITICAL WILL

- Recognize that political will is necessary and think strategically about building it;
- Design policy approaches that support political will;
- Involve top government leaders (e.g., parliamentarians) in designing and launching the national ozone programme;
- Create or recognize opportunities for top government leaders to endorse and speak effectively on the response to ozone depletion;
- Disseminate scientific information to the press, NGOs and government officials on the causes and the impacts of ozone depletion;
- Implement public awareness and education campaigns that make responses to ozone depletion more attractive politically and inclusive to main stakeholders;
- Work cooperatively with industry to demonstrate and replicate success stories;
- Support to the extent appropriate NGO efforts to promote action on ozone depletion; and
- Support other government initiatives that highlight the importance and value of protecting the environment, generally.

2.5 STRENGTHEN THE INSTITUTIONAL FRAMEWORK

Perhaps most important for establishing effective regulatory systems is that the policy approach taken must ultimately 'fit' institutional authorities, structures and capacities. As a country begins to modify existing environmental policies substantially (as may be the case with the management of ODSs in many developing countries), institutional questions will arise almost immediately. These questions are made more difficult because of the tendency

for entrenched institutional interests to guard their 'turf' and protect or expand their institutional mandates.

Although many of the basic institutional arrangements for managing ODSs, including the placement of the NOUs, will already have been created, some attention to institutional arrangements can enhance the chances of successful policy implementation. In this context, appropriate planning, priority setting and inter-agency co-ordination become critical. Indeed, assessing whether regulatory and oversight agencies have the capacity to develop, implement and monitor the policy and regulatory framework required by the ODS management plan constitutes a key initial task in order to avoid the risk of trying to do too much with too few resources in too short a time.

2.5.1 ASSESS THE EXISTING INSTITUTIONAL FRAMEWORK

A comprehensive and realistic appraisal of the institutional capacity for implementing any environmental regulatory programme is thus essential for its success. The first step in designing or revising an ODS management programme is to conduct a thorough analysis of the existing legal and institutional terrain in the country. Such a comprehensive mapping exercise can set the framework for effective changes in the existing policy approach.

BOX 2.3: GOALS FOR INSTITUTIONAL MAPPING

- Clearly set the parameters of the review in light of the national goal of phasing out ODSs;
- Identify existing legal and institutional authorities and activities supporting that goal;
- Identify policy gaps in the existing legal and regulatory system for achieving that goal;
- Identify gaps and overlaps in the regulatory authority of existing institutions;
- Identify significant weaknesses in administrative, financial and human resource capacity at key institutions; and
- Prioritize actions for filling gaps, eliminating overlaps and building capacity.

The mapping exercise should guide a general strategy for strengthening the institutional setting for achieving the implementation of the Montreal Protocol regime[2]. The strategy should allocate responsibilities, authority and resources according to the different functions and needs that occur in the policy continuum of preparing, implementing and enforcing an ODS plan. As the policy-making process evolves – including as stakeholders get involved and regulatory objectives are clarified – responsibilities may be adjusted so as to reflect the overall agreed approach within the country.

Each country will typically have designated a government department as its ODS Focal Point, and established an NOU under an Institutional Strengthening project supported by the Multilateral Fund. Most countries designate that task to the environment ministry or its equivalent. Some countries create a special body, encompassing a number of relevant

[2] This Handbook uses the term "institutional strengthening" to reflect any of a number of steps that can be taken to build the institutional capacity of relevant agencies. "Institutional Strengthening" under the Multilateral Fund has a more precise meaning, referring to specific categories of funded costs (including, for example, staffing, equipment purchases and office space). Unless the context clearly indicates otherwise, a more general concept of institutional strengthening is intended in this book.

ministries but chaired by, for example, the Environment Ministry (India). Some countries, for example Brazil and Japan, have designated their industry or trade ministry (or the equivalent). Finally, some developing countries (e.g., Brunei) have designated their development ministries. Strong arguments can be made for either approach; placing the ozone authority in an environmental or an economic ministry. In some ways, the environment ministry is the natural location, as environmental protection is at the core of its mission, but such ministries are often less powerful than their trade or industry counterparts.

At a general level, an institution-strengthening strategy should address four broad categories of issues: (1) do the ODS focal point and other implementing agencies have the necessary legal authority; (2) do the NOU and other relevant agencies have the necessary financial and administrative resources as well as sufficient information, skills, and knowledge; (3) how should all of the agencies that have roles in the implementation of a comprehensive ODS management strategy co-ordinate, including how should diverging interests and opinions among various agencies be addressed; and (4) how to enhance co-ordination between national, regional and local governments.

2.5.2 THE NATIONAL OZONE UNIT

Under the Montreal Protocol regime, the NOU is the central operating unit for ensuring that each country meets their commitments. Given its importance, the Multilateral Fund's Executive Committee has urged countries receiving support for institutional strengthening to ensure, among other things, that:

(i) the NOU is given a clear mandate and responsibility to carry out the day-to-day work in order to prepare, co-ordinate and, where relevant, implement the government's activities to meet its commitments under the Montreal Protocol; this also requires access to decision-makers and enforcement agencies;

(ii) the NOU's position, capacities, and continuity of officers, resources and lines of command within the authority in charge of ozone issues are such that the NOU can carry out its task satisfactorily;

(iii) a specified high-level officer or a post within the authority is given overall responsibility for supervising the work of the NOU and ensuring that action taken is adequate to meet commitments under the protocol;

(iv) necessary support structures, such as steering committees or advisory groups are established;

(v) annual workplans for the NOUs are prepared and integrated into the authorities' internal planning processes;

(vi) a reliable system to collect and monitor data on ODS import, exports and production is established; and

(vii) measures taken and problems encountered are reported to the Montreal Protocol Secretariat and/or the implementing agency in charge.

(Multilateral Fund Executive Committee Decision 30/7)

Many of these issues are discussed further below.

2.5.3 OBTAIN THE NECESSARY LEGAL AUTHORITY

Public agencies responsible for the design and implementation of environmental policies must have a clear mandate and sufficient legal authority to match their role. Whether the authority is placed in an environment or a development ministry matters less than whether the ministry has the appropriate mandate and authority. For example, it does no good to place sole responsibility with an environmental ministry that lacks legal authority to issue the necessary regulations or to oversee its enforcement.

At this point in the implementation of the Montreal Protocol regime, basic authorizing legislation already exists in many countries (see *Update of Regulations to Control ODS* in Annex 2: Further Reading). As with most environmental issues, the authorizing laws typically take the form of either a new general law or an amendment to, or interpretation of, an existing general law. Ideally the authorizing laws should set as an objective, protection of the stratospheric ozone layer and compliance with the Montreal Protocol, as amended from time to time. In addition, the authorizing law should ensure adequate authority to pursue the broadest range of policy options contemplated immediately and in the foreseeable future. There are two approaches to creating this adequate authority, and the choice between them may depend on the structure of government institutions and the hierarchy of legal instruments in each country. It can either authorize general approaches, including for example market-based and command-and-control measures, or list specifically authorized policy approaches (e.g. taxes, quotas, transferable and non-transferable licenses, permit requirements, production and use bans, etc.).

In connection with the creation of overall authority to regulate ODS, there are good examples from both developed and developing countries alike of both adapting existing laws and creating new ones to address ozone depletion. Canada, China, and the United States are examples of countries that have amended their existing air pollution laws to accommodate the goals of reducing ODSs. China, for example, amended its existing national air pollution law to empower the control of production and import of ODSs through quotas and licensing systems. The details of such policy approaches were left to the ministries themselves, which included China's State Environmental Protection Administration and the ministries of Foreign Trade and Economic Co-operation, Customs and Public Security and other authorities. In the United States, lawmakers added legal authority for compliance with the Montreal Protocol to existing national legislation addressing air pollution – the Federal Clean Air Act. Although the Clean Air Act initially focused on preventing the toxic effects of air pollutants, it was seen as an appropriate extension of the Act's scope to protect the stratospheric ozone layer from ODSs. Using existing laws in this way not only simplifies the creation of an authorizing law, but also facilitates the use of existing agencies and other regulatory resources to address the new challenges of ODS control. Nonetheless, some countries have adopted wholly new laws to address implementation of the Montreal Protocol; for example, Colombia, India, Jamaica, New Zealand, St. Lucia and South Africa. In those cases the existing legal framework may not have been adequate for addressing ozone depletion.

Ultimately, it may matter less whether the legislation is an amendment or a separate new law. The decision will probably depend on the existing legislative structure and political context. What does matter is how the legislation, and amendments to it, must be adopted.

The necessary actions can be delayed considerably if legislation has to be adopted or amended in the Parliament. Obviously, changing or amending Parliamentary laws is beyond what an NOU can do in its own capacity. Nonetheless, the authority in charge of ozone layer protection issues, and within it the individual Ozone Officers, can initiate change, where gaps in statutes or laws are hindering their ability to ensure compliance with the Montreal Protocol. However, using existing laws as the basis can save time and might often be necessary in order to meet the schedule set forth in the Protocol regime.

In this respect, the NOU should keep in mind two basic rules: (1) form should follow function and (2) clarity reduces conflict. Form must follow function in that whatever legal authority and responsibility is provided in laws or regulations must be backed up by appropriate institutional capacity and structure. It makes no sense, for example, to ask a high-level co-ordinating agency with little staff to be responsible for enforcement of a set of technical rules and regulations. Likewise, one cannot reasonably expect an ozone unit that is buried deep inside an environmental agency to co-ordinate the policies of many different agencies, without specific authorization and support from the top levels of government. This relates as well to the second rule. Clarity in defining respective responsibilities and authorities is the most important way to empower an agency and reduce co-ordination conflicts.

2.5.4 OBTAIN THE NECESSARY FINANCIAL, ADMINISTRATIVE AND HUMAN RESOURCES

Ensuring that an agency has the legal authority to carry out its mandate is a relatively straight-forward and technical process. Much more difficult is ensuring that the agency has sufficient financial, administrative, technical and human resource capacity. The greater the capacity of the political unit to implement a treaty, the more likely it is that the country will comply.

Institutional capacity is particularly critical in developing countries with poor economies. The financial resources to staff and support an agency simply may not be available without outside support. The Multilateral Fund strengthens Article 5 Parties' institutional capacities particularly through its "Institutional Strengthening" projects and other "non-investment" support.

To obtain assistance from the Fund, countries must prepare a Country Programme detailing their production and consumption of ODSs and a work programme that details the planned steps for reducing ODSs (including technical assistance and pre-investment activities). The Country Programme is typically prepared and implemented in co-operation with the Fund's Implementing Agencies. The Fund also continues its support for investment activities to assist countries in making the industrial conversion to non-ODS technologies. Non-investment technical assistance is also available from the Fund's Implementing Agencies.

Institutional capacity clearly depends on financial resources, but it also depends on other factors such as the policy framework and the education, technical training, skills and even cultural context of staff. One important consideration is to avoid overloading bureaucracies with regulatory mandates. Policy makers should involve regulators early and take seriously their input about amounts of responsibility they can handle. Administrative overload has taken place often in developed countries with regard to environmental regulation, and can paralyze developing countries' efforts for years. In particular, environmental and other agencies should be involved from the outset in the design of environmental policies so that

their capacities and abilities are appropriately considered. This will also ensure 'buy-in' from those officials who must subsequently implement the resulting programme.

In addition to looking for financial support for institutional strengthening, NOUs in developing countries may want to identify new and different techniques for strengthening institutional capacity (with limited budgetary impacts). For example, as a relatively minor step, developing countries should consider also sending officials other than diplomats to Montreal Protocol meetings – subject to availability of funds, including from relevant donors. By attending such meetings, where key and significant aspects of ODS policy are addressed in a cooperative way between Parties, developing country officials may become more exposed to how other countries implement their respective commitments under the Protocol. Most developed countries regularly include officials from various ministries and departments. Such officials, some of whom are charged with designing and overseeing the implementation of the country's commitments, have thus become acquainted with the Protocol's requirements at close range, and exchanged experiences with other country representatives, the Protocol's Secretariat and donors.

Active participation in the Regional Networks of ODS Officers for co-operation and exchange of experience between NOUs (ODSONET) will also assist in strengthening the NOUs' institutional capacity.

First meeting of the Regional Network for English-speaking Africa. Dr Omar El Arini, Chief Officer of the Multilateral Fund Secretariat (6th from left), Mr Michael Waite, former Network Manager (7th from left), Mrs. Jacqueline Aloisi de Larderel, UNEP Assistant Executive Director (8th from left). Regional Networks strengthen the institutional capacity of NOUs to meet national compliance obligations.

BOX 2.4: CREATIVE WAYS TO BUILD CAPACITY WITH MINIMAL RESOURCES

- Recruiting interns from local universities and law schools;
- Enlisting assistance in research or analysis from universities;
- Seeking volunteers from abroad with substantial relevant experience;
- Orienting policies to take advantage of major initiatives in civil society and industry both nationally and abroad;
- Sending regulators to international Montreal Protocol meetings of the parties;
- Identifying potential training opportunities and scholarship opportunities for studying abroad or at home; and
- Seeking capacity-building resources outside of the Multilateral Fund from bilateral donors, international organizations, charitable trusts and NGOs.

2.5.5 ENHANCE CO-ORDINATION BETWEEN RELEVANT NATIONAL AGENCIES

Whenever a government decides to address an environmental issue with as many economic and practical aspects as ODS control, new institutional structures or even new mandates for existing institutions must fit into the existing institutional framework. This will require co-ordination and co-operation with agencies and individuals that may not share the same general objectives or interests in environmental protection. Several types of co-ordination problems are generic and common to many different policy areas. These include, for example, duplication and overlapping jurisdictions and mandates, lack of communication between agencies, and rivalry for international donors or prestige. Moreover, these agencies may have competing interests and may view new players or initiatives as threats. Strategies should be developed early for enhancing co-ordination and co-operation and for minimizing the potential for deep conflict between agencies. Co-ordination questions are more likely to arise as the NOU's activities become more specific.

Regulating chemicals as widely used as ODSs will require co-operation between several agencies and branches of government. Each agency that touches on ODS production, import/export, purchase, sale, use, emission and/or disposal should be involved as early as possible in designing a regulatory framework, and throughout its implementation as a dynamic policy. Examples of other agencies that may need to be involved include those relating to customs, trade and finance, agriculture, industry, commerce, education and training, and consumer protection in addition to the environmental agencies. Parliaments, too, will have to be involved where new legislation is required. The greater the co-operation between these groups in the beginning, the greater the prospects for practical and sustainable successes over time.

The way countries have chosen to address these co-ordination problems in the ozone protection context varies considerably. Several countries (e.g., India and Brazil) have either established or used existing inter-agency task forces to prepare the ODS plan and regulations. One particular department (ideally the ozone focal point, which is in most cases the environment ministry) is usually charged with leading such co-ordination efforts. Such mechanisms are particularly useful in terms of sharing information and expertise and resolving conflicts, with the ultimate goal to present a unified policy approach. In any event,

the role of such inter-agency mechanisms should be clarified, including whether they are merely advisory or have decision-making authority and their role relative to the agency in charge of ozone issues on a daily basis.

In addition to the use of inter-agency task forces, other mechanisms can enhance communication and co-ordination. For example, China has created joint offices between the state Environmental Protection Administration and each of the ministries responsible for particular phase-out policies, including: the Chemical Industry Ministry, for CFC-related initiatives; the Public Security Ministry, for halon use in fire suppression; and the Foreign Trade and Economic Co-operation Ministry and Customs, for import and export licenses and other controls. Each of these separate departments has expertise and capabilities appropriate to the control of ODSs in each of their respective sectors. But the environmental ministry, as the focal point for compliance with the Montreal Protocol, works with each in joint offices. Other arrangements may work as well or better in other contexts. Some potential options for coordinating between agencies are included in Box 2.5.

BOX 2.5: COMMON TECHNIQUES FOR ENHANCING NATIONAL INTER-AGENCY CO-ORDINATION

- Clarifying respective roles and responsibilities, including who is the 'lead' agency;
- Establishing and conducting regular meetings of Inter-Agency Task Forces or Working Groups;
- Identifying contacts in each relevant agency or ministry;
- Sharing joint offices;
- Issuing joint policy statements or memoranda of understanding;
- Establishing informal contact group meetings;
- Preparing publications that describe institutional niches; and
- Encouraging interaction through notice and comment rulemaking and other participatory procedures.

2.5.6 ENHANCE CO-ORDINATION BETWEEN NATIONAL AND SUB-NATIONAL LEVELS OF GOVERNMENT

Another level of co-ordination and clarification may be necessary between national and sub-national levels of government. Typically, the broad outlines of the relationship between the national and sub-national levels are set in a country's constitution or in general framework legislation. Thus, many basic issues relating to the structures and mechanisms of regulatory authority will be determined by the country's overall governmental structure. Nonetheless, significant although more narrow issues may exist regarding the relationship between national and sub-national entities.

As with inter-agency co-ordination, form should follow function and clarity will reduce conflict when it comes to distributing authority regarding environmental regulation. In addition, environmental decisions should generally be made at the lowest appropriate level of government activity that can effectively address the issue.

2.6 ENSURE PUBLIC ACCESS TO INFORMATION

Providing public access to information regarding environmental protection is increasingly recognized as fundamental to effective environmental governance. Many countries, international institutions, and even individual companies are adopting "access- to-information" policies or laws that lead to the release of information to the public. Moreover, advances in information technologies, particularly the Internet, are revolutionizing how information is made publicly available. Access to the Internet is also expanding in developing countries and provides new opportunities for low-cost information dissemination. From the regulators' perspective, informing the public can be a critical and effective strategy for building an educated and concerned constituency to support steps to protect the environment. Providing broad access to information can dispel and counter many concerns, because often the public or the regulated community will assume the worst if they are not receiving any information directly from the government. Greater transparency will also lessen the chance of corruption, bribery or undue political pressure.

BOX 2.6: VALUE OF PUBLIC ACCESS TO INFORMATION

- Enhances the environmental awareness, education and interest of the public;
- Builds support in civil society for government regulators;
- Strengthens the relationship and dialogue between governments and their citizens;
- Provides the industry with valuable information to facilitate their compliance;
- Serves as a check on the activities of the government;
- Reduces the chance and opportunities for corruption, if the process is open to a larger number of stakeholders;
- Fulfills a right of the public to have information;
- Prepares the public, including industry, to participate in decisions effectively;
- Enables non-governmental organizations and the media to push for stronger implementation and enforcement; and
- Helps develop an informed civil society that can effectively influence government policy.

Many countries now have "access-to-information" laws or policies on environmental information held by the government. Where such policies do not exist, the NOUs should consider adopting clear and explicit information disclosure policies/guidelines for the purposes of ODS policymaking and implementation. In this regard, some NOUs are experimenting with innovative and strategic use of the Internet. Box 2.7 suggests some general elements for developing an information disclosure policy.

BOX 2.7: GENERAL ELEMENTS FOR ACCESS-TO-INFORMATION POLICIES

- Information should generally be presumed to be accessible, unless it falls within an explicit exception (see next box);
- Anyone in the public should be able to request information;
- Government responses to public requests should be made within a short period of time, preferably within a month;
- Denials of requests for information should be in writing and should state the grounds for refusal;
- Grounds for refusal should be narrowly construed, balancing interests to be protected against the public's interest in open and transparent government;
- Rather than withholding entire documents, where possible, public authorities should remove confidential portions from documents and disclose the remaining parts;
- Actual copies of documents and not summaries should be provided when possible;
- Reasonable charges or fees for supplying information can be charged, subject to a schedule publicized before hand and consistently applied;
- Public authorities should proactively collect and disseminate environmental information that may be of broad interest; and
- Public authorities should broadly inform the public of their right to information and of their right to participate in decision-making.

Access to information is, of course, never absolute, and public authorities may reasonably choose to keep selective information from the public. For example, most access-to-information systems include an exception for material that is not yet final and information considered proprietary or protected by concerns for business confidentiality. Exceptions to the general presumption of information disclosure, however, should be narrowly tailored to meet the specific purposes of the exemption.

BOX 2.8: COMMON EXCEPTIONS TO INFORMATION DISCLOSURE

- The public authority does not have the information;
- The request is manifestly unreasonable or overly general;
- The request concerns materials that are not yet final;
- Disclosure would aversely affect:
  a) Confidentiality of the proceedings of public authorities;
  b) Internal relations, national defense, public security;
  c) Confidentiality of business, commercial or industrial information;
  d) Intellectual property rights;
  e) Confidentiality of personal data; or
  f) The interests of a third party that has supplied the information voluntarily.

2.7 ENGAGE THE PUBLIC, INCLUDING INDUSTRY, IN ODS DECISION-MAKING PROCESSES

As confirmed by Principle 10 of the Rio Declaration on Environment and Development, "environmental issues are best handled with the participation of all concerned citizens, at

the relevant level." (see the *Rio Declaration* in Annex 2: Further Reading). The most effective environmental regulation involves from the outset all interested parties – the regulated industries, environmental groups, local communities, the general public, etc. Rules written in consultation with affected parties have better prospects for compliance and enforcement than do those imposed on them without prior consultation. They will also, in all likelihood, better reflect specific economic and commercial realities. By involving key stakeholders in the formative stages of policy making, regulators will achieve a variety of important objectives. For these reasons, public participation is increasingly seen as a critical element of effective environmental policy-making, and participation mechanisms are now a routine part of the regulatory process in many developing countries.

BOX 2.9: BENEFITS FROM BROAD PUBLIC PARTICIPATION

- Providing a reality check on proposed policies and strategies, perhaps alerting the government to particularly controversial elements of the plan;
- Gaining the advice of a wide range of interests and expertise, including local knowledge and experience;
- Gaining the 'buy-in' of affected parties, including the regulated industry, environmental groups, other government agencies, etc., whose co-operation can be essential to effective implementation;
- Providing advance notice of regulatory targets and goals, so that potentially affected industries can anticipate the need for changes and begin planning appropriate investments;
- Increasing the plan's transparency, which in turn facilitates co-ordination between and among regulators and the regulated, informs and reassures firms that regulations will be applied to all competitors; and
- Reducing the opportunities for corruption (as more people participate transparently).

Although many regulators understand the value of public participation in theory, they are nonetheless reluctant to try to create public participation opportunities with respect to their particular issues. Common excuses include: the issue is too complex or technical; there is no time for process; the decision is already made; and the public will abuse the process. Often, however, reluctance to attempt some forms of public participation simply reflects the regulator's lack of confidence that they can manage a public participation process.

From the perspective of the national ozone co-ordinator, the critical objective is to manage public participation effectively, so it is a constructive and supportive process for achieving the ODS management goals. This can be achieved by designing and implementing a public participation plan that makes appropriate use of various public participation mechanisms to target specific categories of stakeholders. In this way, public participation is not an open free-for-all ordeal for the NOU, but a managed process for educating the regulated community and obtaining valuable feedback (see *Five Steps for Raising Awareness on Ozone Depletion: A Handbook for National Ozone Units* in Annex 2: Further Reading). Box 2.10 describes the steps for developing and implementing a public participation plan, which are further discussed in the following sections.

BOX 2.10: STEPS TO DEVELOPING AND IMPLEMENTING A PUBLIC PARTICIPATION PLAN

- Selecting the purpose and targets of the public participation strategy;
- Providing proper and effective notice to the public regarding the proposed decision;
- Scheduling sufficient time frames for decision-making;
- Selecting the appropriate mechanisms for the public to participate;
- Considering public input in the final decision; and
- Providing written responses to public comments and stating the reasons for the decision.

2.7.1 SELECT THE PURPOSE AND TARGETS FOR PUBLIC PARTICIPATION

From the outset, all major stakeholders, including for example the regulated communities and environmental organizations, should be involved in setting standards and policies for ODS management. The NOU should explicitly identify the primary stakeholders and target them proactively for their participation in the process. In some cases, the regulated community (and thus a primary target for public participation) may be large and easily identifiable industries. In other cases, ODS users may be small and medium sized enterprises (SMEs) that may or may not be collectively organized by professional or trade societies. Once the targeted community is identified, selecting the most effective methods for reaching those communities either to provide notice or conduct some form of consultation becomes much easier.

2.7.2 PROVIDE PROPER NOTICE

Meaningful and effective participation requires that the public know both that a decision is to be made and that they have a right to participate in the making of that decision. Notice of the pending decision-making process should come early enough in the process for the public to review relevant documents and prepare their input. Notice must also be made in a way reasonably calculated to reach the public in general, but more importantly that portion of the public, including industry and labor, that is most directly interested in and affected by the decision to be made. In developing countries, for example, radio and other forms of oral or informal communication may be the most appropriate means for notice.

BOX 2.11: ELEMENTS OF GIVING NOTICE TO ENSURE EFFECTIVE PUBLIC PARTICIPATION

- The notice should explain the nature and scope of the decision to be made;
- The notice should be provided in sufficient time to inform the public and for the public to prepare and participate in the decision-making process;
- The notice should be provided in an effective manner (calculated to reach the target audience); and
- The notice should describe the opportunities and procedures for public participation.

2.7.3 SCHEDULE SUFFICIENT TIME FOR DECISION-MAKING

Effective policy-making involving full public participation takes time and can result in delays when compared to decision-making without any public involvement. The additional time can be minimized, through effective management of the public consultation process, but there is still no escaping the fact that decision-making with widespread public consultation is less efficient. By recognizing that additional time will be needed from the beginning, however, the NOU and others can build the timing into their own schedules, reducing any additional costs or hardship due to the delay.

2.7.4 SELECT APPROPRIATE PUBLIC PARTICIPATION MECHANISMS

Stakeholder participation in the formative stages of policies and regulations can take several forms, ranging from (1) advisory committees (reflecting a wide range of interests at play); (2) solicitation of stakeholder input and comments before issuance of the policy; (3) negotiated rulemaking (most suited where there are few and easily identifiable affected parties); and (4) consultation with affected parties (more focused on gathering input from parties instead of negotiating an agreement between them); and (5) in some cases the right to petition for consideration of new rules or modification of existing rules.

Each participatory mechanism, such as notice-and-comment, public hearings, or informal meetings, fulfills a different purpose. Box 2.13 identifies examples of different forms of mechanisms for public participation.

BOX 2.12: PUBLIC PARTICIPATION MECHANISMS

- Informal consultations;
- Public hearings;
- Consumer forums;
- Advisory committees or working groups;
- Field testing and pilot projects;
- Negotiated rule makings;
- Formal notice and comment procedures;
- Right to petition for rules; and
- Public interest litigation through citizen suits or similar access to justice.

There are many examples of stakeholder involvement in the formulation of environmental policy in general and ODS plans in particular. Japan, for example, has historically relied on consensual policy-making between government, industry, academia and other Parties that may be affected by policy measures. Typically, the relevant government agencies establish “deliberation councils” or committees composed of a variety of relevant affected Parties. In the ozone protection context, a 20–30 member council was established in 1987 with informal functions, such as discussing policies, after major international meetings, gathering data and channeling information. Another advisory council, the Council of Chemical Substances, was also active in building a consensus between a wide range of parties with regard to the implementation of Japan’s ODS plan and regulations. For instance, the

administration frequently used the council to present specific regulatory proposals and receive notice and input with regard to implementation problems encountered by industry (the Council meetings are open to the public). Although some observers consider such a rulemaking process as being unique to Japan, variants of this negotiated rulemaking have been used in environmental matters in the United States, and the use of advisory councils is widespread in many countries. Because the consensus-based approach is generally more appropriate in the context of few and easily identifiable policy measures and actors, it may run into structural and practical challenges when applied to ODS uses among a variety of actors especially SMEs.

Part of the value of stakeholder involvement is the opportunity to determine who should be regulated, and by whom. If local and regional government units are better able to identify and regulate SMEs, then they need to be brought into the planning and implementation process. If SMEs are too diffuse and small to be effectively regulated, governments should look at the chains of goods and services that they rely on to find concentrations of economic activity that can be targeted. Wholesalers, equipment repair and service providers, and importers of ODSs and ODS-reliant technologies, all may be more easily identified and influenced (and incorporated into consultative processes) than the SMEs that are their ultimate customers.

2.7.5 CONSIDER AND RESPOND TO PUBLIC INPUT

The process must also allow adequate time for the decision-makers to receive, consider and respond to public input, thereby incorporating it into their decision-making process. For the public to be willing or interested in participating they must be certain that their views will be taken into account in the decision-making process. Providing that final decisions be written and include an explanation of the reasons for the decision ensures both that the decision-makers do adequately consider public input and that the public feels their input has been treated seriously. In some circumstances, failure to take public input into consideration may be a basis for challenging the outcome of the decision-making process in a judicial or administrative proceeding, and in any event ignoring the public's view altogether may lead them to reduce their support for the regulators over time.

2.8 ENSURE REGULATORY INDEPENDENCE

An effective regulator should be independent from the regulated community and protected from undue political pressures driven by self-interest. See Box 2.13 for ways to enhance regulatory independence.

BOX 2.13: ENSURING REGULATORY INDEPENDENCE

- Fair and transparent procedures and decisions;
- Separation of the regulatory function and regulated interests;
- Reliable and predictable sources of funding for the NOU;
- Clear "Conflict of Interest" standards; and
- Separation of responsibility of regulation and enforcement functions.

To ensure that the regulator is, in fact, impartial, the regulatory body and its staff should not have a direct or indirect financial or controlling interest in any of the entities being regulated. Inevitable conflicts of interest arise when a government both controls the regulatory agency and is a dominant player in the market. Where this is a problem, it has tended to be in economic sectors that are highly nationalized, for example, oil development or some mining operations. It is rare that the government is the dominant player in the chemicals industry, except with respect to the relationship between the regulator and military uses. Another potential source of pressure can come where the regulator feels that the budget may be vulnerable to undue political pressure. Thus the NOUs should ideally be adequately funded from reliable and predictable revenue sources.

As already discussed, the process of arriving at regulatory processes and specific rulings should be open, consistent and predictable. Agencies should announce proposed decisions in public and make written records of their proceedings available to the public. Transparency in decision-making allows investors, service providers, and the public the opportunity to have knowledge of, and participate in, the formulation of policies and regulations. This builds public trust in the integrity of agency decisions.

A final component of ensuring agency independence is adopting and following clear and explicit rules regarding conflicts of interest such that officials involved in regulating an industry should not have any financial or other interest in that industry. Any potential conflicts of interest should be disclosed. Government officials should not be offered, solicit or receive any gifts or thing of value from anyone with an interest in the agency's decisions.

BOX 2.14: COMMON CONFLICTS OF INTEREST STANDARDS

- No one should be permitted to offer government employees money or anything else of value in exchange for performing any official act;
- Government employees should be prohibited from requesting any payment or gift in exchange for performing or failing to perform any official act; and
- Government employees should be prohibited from participating in any official matter that could affect their personal financial interest or those of their family members.

All agency employees should be subject to restrictions and disclosure requirements regarding financial interests. Depending on the employees' salaries, duties and responsibilities, they may also be required to file annual reports disclosing certain financial interests. The purpose of confidential financial disclosure is to prevent conflicts of interest and to identify potential conflicts, by providing for the systematic review of the financial interests of both current and prospective employees. These reports assist agencies in administering their ethics programmes and providing counseling to employees.

2.9 DEVELOP AN EFFECTIVE FEEDBACK LOOP

From the outset and in each component of the development and implementation of an ODS programme, the NOU should be thinking about how to evaluate the success of the various policies and approaches. In this way, adjustments can be made to the policy mix to improve the overall effectiveness of the programme. Such a major focus on evaluation will require

establishing baselines and identifying indicators for measuring success.

The overall effort to evaluate success of domestic ODS measures is already built into the Montreal Protocol regime. Under Article 7 of the Montreal Protocol, the Parties are now required to report a wide range of information to the Ozone Secretariat and the Multilateral Fund Secretariat. These data requirements include for example statistical data on each Party's production, imports and exports of each of the controlled substances under the Protocol (for guidance, see the *Handbook on Data Reporting under the Montreal Protocol* in Annex 2: Further Reading).

2.10 A SUMMARY CHECKLIST FOR CHAPTER 2: SETTING THE STAGE

The following is a summary checklist for setting the stage for effective policy-making with respect to the management of ODSs.

- ☑ Survey the patterns of ODS use and production, and set regulatory priorities that will lead to compliance with the Montreal Protocol.
- ☑ Develop and implement a plan for expanding political will to manage ODSs. As an initial step plan major speeches around International Ozone Day and other events.
- ☑ Assess the existing institutional framework and develop a plan for filling all legislative, institutional and resource gaps.
- ☑ Ensure the country programme reflects the need to adopt and implement an adequate policy framework.
- ☑ Identify ways to increase institutional capacity without new financial resources.
- ☑ Create mechanisms for on-going co-ordination with other appropriate agencies.
- ☑ Adopt an information disclosure policy for the public.
- ☑ Develop and implement a public participation plan.
- ☑ Adopt a "conflicts of interest" policy for the NOU.
- ☑ Develop a progress for regular feedback and evaluation.

3. IDENTIFYING CRITERIA FOR EFFECTIVE POLICIES

This chapter answers the general question: what is likely to make a law or policy more effective in achieving its goal? In short, what are the qualities that make good laws or policies? For example, the best laws and policies will be mutually supportive and reinforcing, and promote broader objectives like sound environmental and economic management in a changing world. They will be consistent, understandable, fair, transparent, and administratively efficient. Good laws must 'fit' the institutional capacity and structure of the government agencies responsible for their implementation and enforcement. Laws and policies also should build on the political support of multiple stakeholders, including both the public and industry. Collaborative approaches should be encouraged, but never at the expense of building the necessary enforcement capabilities.

The following then is a brief set of criteria regarding the qualities or characteristics of sound laws and policies. Some refer to the process of law- or policy-making, as processes can sometimes determine the ultimate effectiveness of a regulatory system more than the substantive approaches. The criteria are not meant to be exhaustive and we recommend that NOUs take the time before beginning the development of a new policy to identify the criteria they believe are most important for evaluating potential effectiveness in their own socio-economic and political contexts. These criteria can then be used to evaluate the different policy options described in Chapters 4 and 5.

BOX 3.1: WHAT MAKES A GOOD POLICY? SEVEN CRITERIA FOR EFFECTIVE POLICY-MAKING

- Visionary and aspirational;
- Consistent with other policy goals, including international obligations;
- Accessible, clear and understandable;
- Fair, equitable and balanced;
- Affordable and realistic;
- Comprehensive and flexible; and
- Enforceable and measurable.

3.1 VISIONARY AND ASPIRATIONAL

The best laws and policies not only reflect their socio-economic and cultural contexts, but they also inspire citizens, communities and industry. In short, laws and policies can lead a society, as well as reflect its common values and culture. This should be particularly true with domestic ODS management programmes, because the magnitude of what is at stake with ozone depletion is worthy of inspiration. Law-makers and particularly policy-makers at the level of the NOUs can easily become preoccupied with the technical details of export and import controls, licensing, phase-outs, etc., and lose sight of the overall goal that we are trying to achieve – saving the global environment from one of the most serious threats. Any ODS management programme should borrow some 'Save the Planet' rhetoric and invoke a moral commitment to saving the planet.

The NOU should also stress the significance and importance of the Montreal Protocol regime; national implementation today is the necessary and important next step in a remarkable process of international co-operation to respond to one of the most significant environmental threats the world has ever faced. To the extent that including aspirational and inspirational messages in domestic ozone programmes makes the regulated community feel as if they are part of a broader endeavor, we may significantly increase the commitment and will to comply with the specific policies and proscriptions.

Of course, an emphasis on the aspirational part of the laws or regulations can not be viewed in isolation. Being aspirational or moral in preparing environmental regulations is not sufficient for effective implementation. Indeed, the aspirational aspect of a law can be in conflict with several of the other general principles outlined below – for example, the need to have clear and enforceable norms.

3.2 CONSISTENT AND SYNERGISTIC

Where possible, regulators should look for synergies between policies that implement the Montreal Protocol and other government programmes and objectives. Box 3.2 identifies the common programmes and objectives that overlap ODS management. The key is to find and emphasize policies that are complementary and that reinforce one another, particularly with respect to the signals that the regulatory system is sending to industry. All policies should be co-ordinated to ensure that the incentives for phasing out ODSs and investing in alternative technologies and approaches are clear and consistent.

BOX 3.2: PROGRAMMES AND OBJECTIVES THAT OVERLAP ODS MANAGEMENT

- Economic development;
- Industry policy
- Agricultural policy
- Trade policy;
- Public safety and health (including fire protection);
- Border control;
- Improving administrative effectiveness;
- Military preparedness;
- Waste management;
- Pest control; and
- Energy policy and climate change.

The relationship between ozone protection policies and climate change deserves special mention, because there are explicit linkages between the two issues. Most ODSs are also greenhouse gases that contribute to climate change. Reductions in ODSs under the Montreal Protocol regime thus also promote the goals and objectives of the climate change regime, to which most developing countries are also party. Unfortunately, some common alternatives, in particular in the refrigeration/air-conditioning sector, are also greenhouse gases controlled under the Kyoto Protocol. In those cases, it becomes particularly important to ensure that the emissions of these alternative gasses are also minimized.

In recent years, increased attention has been paid to the relationship between multilateral environmental agreements and the trade rules of the World Trade Organization. In some cases, the threat that certain trade-related environmental measures could be the subject of a WTO challenge have had a 'chilling' effect on environmental regulators. Understanding at least somewhat the relationship between the Montreal Protocol and WTO rules can be helpful in building confidence that measures taken to implement the Montreal Protocol, for example import and export controls, will not be found to conflict with WTO rules. Box 3.3 provides a brief summary of the relationship between the Montreal Protocol and international trade. As suggested by that review, NOUs should not be unduly cautious over potential threats that measures necessary to implement the Montreal Protocol should be found inconsistent with the WTO rules.

BOX 3.3: THE MONTREAL PROTOCOL REGIME AND INTERNATIONAL TRADE

The Montreal Protocol was one of the first multilateral environmental agreements to use trade measures to further its objectives. Parties may trade controlled substances amongst themselves, but such trade is constrained by the phase-out schedules for production and consumption. Otherwise, the Protocol's primary trade restrictions are between Parties and non-Parties. The primary objective of the Protocol's measures restricting trade with non-Parties is to encourage broad participation in the Protocol by preventing non-participating countries from enjoying a competitive advantage during the phase-out of ODSs and by discouraging the construction of ODS production facilities in non-party countries. Article 4 of the Protocol requires Parties to prohibit: (1) imports of controlled substances from non-Parties; (2) exports of controlled substances to non-Parties; and (3) imports of products from non-Parties of listed products that contain controlled substances. (See Annex D of the Protocol). These bans on imports do not apply, however, if the country of origin has submitted data showing it is in full compliance with the Protocol's phase-out provisions and if a Meeting of the Parties determines that it is in compliance.

On their face, the restrictions on trade with non-Parties are quantitative restrictions, prohibited by Article XI of the General Agreement on Trade & Tariff. They also appear to conflict with the most favored nation ("MFN") principle of Article I, because they discriminate between like products of Parties and non-Parties. Nonetheless, most analysts believe that the Montreal Protocol regime's trade restrictions would in the unlikely event of a trade challenge be found to fall within Article XX exceptions to the GATT, which permit restrictive trade measures "necessary to protect human, animal or plant life or health" or "relating to conservation or exhaustion of exhaustible natural resources." The exception described above was included in the Protocol on the advice of the GATT Secretariat, to avoid any objections on this point. Moreover, given the number of countries that are parties to the Montreal Protocol regime, a WTO challenge to reasonable implementing measures is unlikely.

3.3 ACCESSIBLE, CLEAR AND UNDERSTANDABLE

Many ODS laws and regulations are not implementable because drafters have not considered carefully enough what they have written and how the words translate to real life. Legal texts result from compromise and negotiation between government departments, parliamentarians and other stakeholders as any comprehensive legal analysis. Clarity and simplicity are often lost in the process. But if the language is not understandable, the regulatory goals will likely not be fully achieved. To take just one example: the term "ozone depleting substance" is in most regulations defined one way or another (often with reference to all substances as controlled in the Montreal Protocol). Every time the term is used in the legal text the requirements in that particular paragraph will apply to all ODSs as defined in the regulation. But often it is obvious that the specific paragraph applies only to some of the ODSs (e.g. to CFCs but not to HCFCs).

More broadly, translating and adopting model laws from other countries, even where there is a common language may result in confusion or a lack of clarity (for examples of ozone protection policies in various countries, see *Update of Regulations to Control ODS* in Annex 2: Further Reading). Legal drafters should pay special attention to making sure terms and expressions are translated taking into account local usages and idiomatic expressions as well as specific legal terminology.

The key to making sure that ODS laws and policies are clear and understandable is to remember that laws and policies should be written in everyday language, without

pretension, jargon or too many acronyms. Indeed the rules for good legal writing are the same for good writing generally. Box 3.4 provides tips to writing clear laws and policies; the tips were developed for English-speaking lawyers and regulators, but the general rules can be applicable across many languages.

BOX 3.4: TIPS TO WRITING CLEAR LAWS AND POLICIES

- Omit surplus words;
- Use familiar, concrete words;
- Use short sentences;
- Use base verbs and the active voice;
- Arrange your words with care; and
- Be precise and explicit.

This requires that NOUs involved in policy drafting know the issues well enough to be able to understand the implications, not of what they intend to write, but of what they actually have written. Reading the draft slowly over and over again is a good starting point. Introducing a clear structure with good descriptive headings on sections and sub-sections is another.

3.4 FAIR, EQUITABLE, AND BALANCED

Laws and regulations must be fair, equitable and balanced, to foster broad public support. Corporations are most concerned with *relative* burdens of environmental regulations. Regulators should try where possible to avoid making one firm or group of firms less competitive than others. If all competitors face similar regulatory burdens, each is more likely to support or at least accept the new requirements. A company will fight regulations that disadvantage it relative to its competitors. Conversely, companies or industries likely to be advantaged by new regulations will likely be strong supporters. The regulations should treat similarly situated companies and ODS users similarly. The NOUs should be particularly careful not to give an unfair competitive advantage to one group over others (at least without a rationale that is linked to reducing ODSs).

3.5 AFFORDABLE AND REALISTIC

In most countries in the world, except in extreme circumstances governments will not shut companies down for failing to comply with environmental regulations. Therefore, as a result, regulations that are too strict and have too onerous an impact on the regulated industry may look good on paper but will undoubtedly not be enforced over the short-term. Corporations are powerful even in the largest and best-regulated countries. They are significant employers at the local, national and regional levels, and concentrate wealth in ways that allow them to be influential in national political life. Industry is generally both able and willing to adapt to new requirements, provided that they are given enough time to integrate those requirements into their own planning and that the same rules apply to all their competitors. On the other hand, industry has great difficulties with abrupt changes. It is therefore important that the NOU, in dialogue with industry, build up an understanding of how things work in the sectors that they intend to regulate (without necessarily accepting

all that industry tells them at face value). Reliance on the Montreal Protocol regime is helpful in this regard, because the phase-out schedules are clear from a country's acceptance of the various amendments and adjustments. Given that the Montreal Protocol regime sets out the basic goals and schedule for ODS control, discussions with industry can center around *how* to comply with the schedule.

3.6 COMPREHENSIVE AND FLEXIBLE

No one single tool is likely to be successful alone; a well considered combination of tools is generally the key to success. For instance, regulations in combination with economic incentives and well-targeted information are much more effective than each one of these tools individually.

Comprehensive strategies will likely include several of the following components:

- raising public awareness, education and engaging government partners, industry and the public;
- creating incentives to move from ODS-reliant to non-ODS practices;
- actively facilitating ODS phase-out through for example technical assistance, training programmes and co-ordination of Multilateral Fund investment projects; and
- setting and enforcing credible and reliable limitations and sanctions on future availability and use of ODSs to ensure substantial co-operation and compliance.

The net effect must be to send a clear signal that reliance on ODS-technologies will not be a viable long-term business strategy and that the phase-out of ODSs are expected to meet the schedule set forth in the Montreal Protocol regime.

3.7 TIMELY AND SEQUENTIAL

The success of policies and laws depend on appropriate timing of their announcement, the date when they will enter into force, and the steps taken to enforce them. Regulations that otherwise are sound can easily fail if the sequencing has not been well considered. As an example, if training is required as part of a regulatory approach to controlling ODS, then enough time should be provided to organize training courses and to give all relevant enterprises a possibility to get trained before the legal requirement enters into force. Providing early warning – that for example prohibitions on a certain use of ODSs will enter into force in several years – can be a very efficient and cost-effective tool for softening the regulatory impact on industry as they allow affected enterprises and users to adapt over time and in a manner that suits their own business.

Policies also need to be balanced and mutually reinforcing. For example, it does little good to create capacity for recycling of CFCs if there is no price or supply pressures curtailing the availability of new, low-cost virgin CFCs. By way of illustration, many investment projects have installed infrastructure and trained technicians to facilitate the recycling of used CFCs. The long-term value of such projects would be significantly enhanced by controls on the availability and/or price of new, virgin CFCs. This would help provide a supportive economic contexts for recycling to take root as a significant way of reducing the production and release of CFCs. Chapter 4 of this Handbook analyzes the different policy tools that are

available for addressing ODSs to provide a menu of options for designing a comprehensive national plan.

3.8 ENFORCEABLE AND MEASURABLE

The importance of actually implementing and enforcing the regulations, once they are adopted, cannot be emphasized enough. Many countries, including developing countries, have not implemented their ODS regulations effectively or consistently. Failure to achieve effective enforcement and implementation may be due to a host of factors, for example a lack of political will (discussed in Chapter 2) or inefficient or inconsistent monitoring and verification of compliance (discussed in Chapter 6).

The major point to be made here is that one of the key factors leading to a failure of effective enforcement is the lack of clarity in setting standards and the setting of standards that cannot be met. In both cases, the chance for widespread compliance is very low. Regulators should thus be very careful to take the implementation and enforcement considerations into account when designing the policies in the first place. In short, well-designed policies are critical to effective enforcement and implementation.

3.9 SUMMARY CHECKLIST FOR CHAPTER 3: CRITERIA FOR EFFECTIVE POLICIES

The following is a summary checklist, based on the above discussion, of steps necessary for ensuring effective policies.

- ☑ Create a list of criteria for effective ODS policies in your social, cultural and economic context;
- ☑ Evaluate existing and proposed policies against these criteria;
- ☑ Ensure all policies and regulations are clear and understandable by enlisting non-experts to review and edit drafts; and
- ☑ Engage industry early on how best to meet the phase-out schedules of the Montreal Protocol.

4. A TOOLBOX OF POLICY INSTRUMENTS

This Chapter provides a menu of policy options that can be used to develop a multi-faceted and comprehensive approach to managing ODSs. Selecting appropriate policy instruments begins with a clear understanding of the policy objectives and of the underlying driving forces for continual ODS use. What is required is a thorough understanding of national ODS markets, including factors affecting both the supply and demand of ODSs. Identifying clearly the supply chain, for example, will identify a variety of potential targets for government action. Each link in the chain is a potential point for government intervention or action. The same is true with respect to the demand for ODSs and related technologies, including the maintenance and support of such technologies.

The Montreal Protocol sets forth clear schedules for phasing out and eliminating the controlled ODSs. Prohibitions of production and imports will thus frequently form the basic long-term policy framework. During the phase-out period, many different policy approaches can facilitate the transition from ODSs. Examples might include import taxes on ODSs or ODS-reliant technologies, recycling policies, or better management of ODS stockpiles. Consumers' inclinations to purchase or use ODSs can be lowered by such initiatives as public awareness and education campaigns, sales taxes, consumer labeling and prohibitions on the use of banned products, substances and practices (e.g. non-medical aerosols). Promoting "ozone-friendly" alternatives is also an important way of indirectly, though powerfully, influencing market demand for ODSs. The government is also often the largest consumer in the market and can effectively exercise its influence through green procurement policies.

A variety of policy tools and approaches are thus available to governments to influence the production and use of ODSs (see Box 4.1). NOUs must think strategically about which combination of tools are appropriate for best meeting their obligations under the Montreal Protocol, given the particular political, economic and cultural context. They should consider how suites of policy options complement and reinforce each other in addressing both the supply of and demand for ODSs. Furthermore, given the Montreal Protocol's set time limits, NOUs should consider the time available, the time it will take to achieve the necessary reductions if they choose one or another policy option and the combination required to achieve the reductions in time.

BOX 4.1: A MENU OF POLICY INSTRUMENTS

- Phase-out and prohibitions
- Licensing systems
- Import and export restrictions, including quotas
- Technical standards
- Excise and sales taxes
- Recycling and banking of ODSs
- Labeling
- Voluntary measures and standards
- Subsidies or tax reductions for non-ODS products, equipment or technology
- Assisting industrial conversion
- Government procurement policies
- Training programmes
- Public outreach and education campaigns

4.1 PHASE-OUTS AND PROHIBITIONS

When developed countries started controlling ODSs in the late 1970s there was no consensus on which chemicals to include or even on the need to control ODSs at all. Aerosols with CFC propellants became the first target, with a precautionary measure targeting non-essential use. As the international consensus developed further the targets for national regulations became broader.

This gradual development is reflected in the way the regulations have developed and how they are structured in many developed countries. Now it is better to plan for controls on all ODSs in all their applications. This is particularly important with regard to ODSs which can be used as substitutes for other ODSs such as 1,1,1-trichloroethane, carbon tetrachloride, "other CFCs", HCFCs and HBFCs. This does not imply that all ODSs and all applications must be – or can be – controlled equally or immediately, but the legal and administrative structure should be planned for their total elimination. It is also important that such signals reach the ODS users to encourage their investigations into alternatives.

Increased use of ODSs should be prevented as soon as possible to avoid a continued dependency on ODS technology. It is more difficult and costly to eliminate an already established use pattern than to prevent it from being established. Developing countries should take advantage of their more favorable situation, as compared to that of industrialized countries which were deeply dependent on ODS technology when the Montreal Protocol was signed in 1987.

Some countries rely on controls on supply to eliminate an already established use of ODSs by gradually limiting the quantities which can be imported and produced. Other countries concentrate their controls on the end use of ODSs, prohibiting by certain dates the use of ODSs for specified applications. Many countries combine both approaches.

When deciding on the approach, the risk of illegal imports should be taken into account. Controls on supply should thus be supplemented with actions targeting end users to avoid creating a market for illegal import. Such markets can develop if the users are unprepared for cuts in supply. Some European countries that have only controlled ODS supply have experienced such problems. Controls on end uses make it necessary to discuss phase out dates and difficulties with representatives of the sectors involved. This in itself helps to alert the users on the need to start investigating alternatives.

New installations should also be controlled to prevent increased dependency on ODS. Increased use of ODSs should be prevented as soon as possible to avoid a continued dependency on ODS technology. Eliminating an already-established use pattern is more difficult and costly than preventing it from being established in the first place.

Countries should also prevent increased use in applications that involve investments in equipment with a long lifetime (both industrial and non-industrial equipment). Many developed countries prohibited installations of new ODS equipment for certain applications on short notice while allowing a longer time to phase out already installed equipment.

Controls on new installations are also an important tool to minimize the dumping of old equipment which is designed for the use of ODS. Large quantities of second-hand ODS equipment now exist in developed countries and, in the absence of controls, are exported to or marketed in developing countries.

As discussed in Chapter 1, the Montreal Protocol regime has established phase-out schedules for the controlled ODSs currently in commercial use. As a result, the basic policy framework at the national level must be motivated by meeting the Protocol's phase-out requirements and ensuring that the country complies with its international obligations. Given the structure of the Montreal Protocol, NOUs should be thinking in terms of identifying complementary policy instruments that can work effectively to both support and propel industry and the market toward reflecting the adjustments that are necessary to meet the Protocol's phase-out schedules. A complete phase-out of a particular ODS will ultimately depend on prohibiting production as well as imports. Moving from current levels of usage to the total phase-out, while meeting the interim scheduled reductions of the Montreal Protocol regime can depend on other policy issues. For example, phase-outs can be implemented over time through quota systems or setting priorities for implementation, including for example: a ban of ODSs in particular sectors or for particular uses first, or a ban of all ODS use or production in new facilities. To a certain extent many of the other policy options identified in this chapter are intended as complementary ways to facilitate the transition to a complete phase-out of ODSs.

BOX 4.2: EXAMPLES OF PROHIBITIONS IN CHINA

China has issued the following bans in recent years:

- *Ban on the New Deployment of Halon Extinguishers in Non-Essential Areas*, issued on 11 Nov. 1994 jointly by the Ministry of Public security and SEPA;
- *Ban on Using CFCs as Propellants in the Aerosol Sector*, issued on 5 July 1997 jointly by 9 ministries;
- *Ban on the Installation Of CFC-Based Mobile Air Conditioning In New Autos*, issued on 2 July 1997 by the former Ministry of Machinery Industry;
- *Ban on the New Construction of Production Facilities Producing or Using ODS*, issued on 16 September 1997 by four ministries; and
- *Ban on the New Installation of Facilities for Production and Consumption of ODS as Processing Agents* on 7 August 1999 issued by four ministries.

4.2 LICENSING SYSTEMS

The granting or withholding of licenses or other authorizations is an important tool for controlling pollutants, including ODSs. Licenses allow governments to apply specific standards for ODS-related activities (discussed below), and can also include other specific conditions, including codes of good practice and/or training requirements, for example. Licenses also facilitate enforcement because they serve as notice to the regulated community of the obligations they face and they provide in one place all of the norms and standards that apply to the facilities. Licenses also may be withdrawn or suspended when the conditions are not fulfilled or according to the needs of the economy or of the overall impact on the environment. When coupled with fees, licenses can also cover some of the government's administrative or regulatory costs (see *ODS Import/Export Licensing System Resource Module* in Annex 2: Further Reading).

The NOU can choose from several options, including:

1. Simple registration or notification of ODS production, use, purchases and/or sales;
2. Blanket licenses that cover all entities engaged in a particular activity;
3. Individual licenses issued through formal application, certification, competitive selection, or auctioning.

In implementing these licensing procedures, the regulator may follow an open-entry policy, permitting anyone to apply, or may impose qualifying conditions, for example financial requirements. Regulatory agencies are increasingly using competitive bidding or auctioning to assign a limited or declining number of licenses. Auctions can be an effective way to ensure that licenses are assigned quickly to the entity that values them most, while recovering the value of the licenses for the public. Auctions promote transparent decision making by providing a clear basis upon which a license applicant can determine why and how it did or did not obtain a license. By contrast, making a comparative review of the qualifications of competing applicants can be time-consuming, resource-intensive, and subjective.

Singapore has used a modified auction process to encourage major industries to phase out

use of ODSs. Chief among these was the *Tender and Quota Allocation System (TQS).* Administered by the country's trade agency, the TQS annually auctioned half the total nation-wide allowable ODS use to the highest bidders, and allocated the remainder to historic users in the proportions of their prior use. This system allowed the private sector to determine who most needed access to ODS supplies, while sending a clear signal about limitations to overall ODS availability. The effective administration of a system like TQS requires reliable controls over supplies. This was also part of the system in Singapore. The government decided each year how much could be imported of a certain chemical. The importers had then to collect Quota Warrants from their customers corresponding to the amount they wanted to import and had to show these Quota Warrants in order to clear the goods through customs.

BOX 4.3: ADVANTAGES AND DISADVANTAGES OF LICENSING SYSTEMS

Advantages	Disadvantages
Licenses present all conditions and standards in one place.	Licenses require effective enforcement and monitoring.
Licenses can facilitate enforcement efforts.	Licenses can provide a potential climate for corruption.
Licenses may be withdrawn or suspended as penalties	Licenses may distort other competitive factors (for example, the most efficient producers may not receive a license that is lotteried or auctioned off).
Licenses, if auctioned or sold, may provide a source of revenues for the regulator.	

Licenses and permits are a general approach that may cover a broad number of uses or applications of ODSs, for example licenses to use methyl bromide, or they may be the instrument for imposing import and export controls, as discussed in the next section. Licenses and permits may also be allowed for some limited special purposes, for example to enable the purchase of ODSs for use in refrigeration servicing workshops.

4.2.1 IMPORT/EXPORT CONTROLS, INCLUDING QUOTA SYSTEMS

An important first step is to establish a reliable system to monitor the import and export of ODSs in bulk (and production when relevant) on a regular basis. Reliable information on annual consumption is the key to evaluate how effective various actions to phase out ODS really are.

The Parties to the Montreal Protocol have through the Montreal Amendment prescribed that all parties should have established an import and export-licensing system for control and monitoring purposes by February 10 2000. However, Article 5 countries may postpone the inclusion of HCFC and HBFC into the licensing system until January 1 2005 and methyl bromide until 2002.

Controls on imports and exports of ODS, typically involve granting licenses to importers, and setting limits on individual or aggregate annual total shipment amounts. These amounts

are then tied to national goals for limiting ODS supply and use over time. Good administration of import/export controls requires good monitoring and clearance procedures, and clear and comprehensible customs codes (preferably harmonized with regional and international standards). NOUs may also need to invoke import/export restrictions to curtail the "dumping" of ODS-dependent equipment on developing countries. Import/export controls should be designed separately for the control of ODSs in bulk (pure or in mixtures) and equipment or products containing ODSs or using ODSs. The latter type of regulations might occasionally also cover products manufactured with ODSs.

India's *Ozone Depleting Substances Law* is a good example of import/export restrictions. It provides, first, that trade in ODSs with non-Parties is strictly forbidden, consistent with Article 4 of the Montreal Protocol. The law further provides that importers and exporters of ODSs from Parties must be licensed, and that such licenses are subject to limitations based on twelve-month goals for specific groups of chemicals and for India's aggregate national consumption, as announced by the Central Government. India's law further restricts the import of CFC compressors through registration procedures. Implementing regulations incorporate this restriction as against automobile and truck air-conditioning units (whether or not incorporated in vehicles), domestic and commercial refrigerators and heat pumps (except where transported by individuals as part of their personal property). License restrictions are tightened each year in accordance with the schedule for ODS phase-out required by the Montreal Protocol.

Information about how to establish and implement an import and export licensing system is described in more detail in *ODS Import/Export Licensing Systems*. The experience of thirteen countries with designing their monitoring and control systems is provided in *Monitoring Imports of ODS: A Guidebook* (see Annex 2: Further Reading).

Quota systems have also been used for the control of ODS production. In China, the production of both CFCs and halons is being controlled through a quota system to enable China to meet its compliance obligations under the Montreal Protocol.

4.2.2 CERTIFICATIONS

One form of licensing that is typically not connected to an underlying emission standard is the use of certification, accreditation or authorization requirements (the terminology differs and can sometime create confusion). Certification is here used to imply that only those who fulfill certain requirements are allowed to conduct certain activities, for example, to require that all garages that repair mobile air conditioners be certified to manage ODS responsibly. In some cases, the need for certification has allowed government regulators to control who is allowed to compete in a certain market and who is not. Certification programmes can provide a ripe climate for corruption, if they are not operated openly. Certifications should be tied either to a training course or an exam that the applicant must pass before being certified. For certification programmes to be useful, training programmes must be adequate, available and open to all. Several training and associated certification programmes are discussed in Section 4.10 on training. Certification requirements can also include a requirement to have the necessary equipment and fulfill other conditions.

Certification schemes are becoming more widely used by developing countries for certifying servicing technicians for CFC-based refrigeration and air conditioning equipment in connection with technician training programmes.

4.3 EXCISE AND SALES TAXES

Economic incentives (lower duties, favorable loans, etc.) and disincentives (higher duties, special fees, taxes or levies, high fees or levies on approved exemptions from certain regulations, non-eligibility for economic privileges, etc.) are used by some countries as one of several tools to phase out ODS use. They can be quite effective as supporting measures and are, in some countries, also used to fund the government units in charge of ozone protection. The use of economic incentives and disincentives can present important challenges, however, including for example how to maintain equity between nationally produced products and imported products. Another challenge is how to avoid creating a market for illegal import of ODSs, as experienced by the United States.

Developing countries may want to consider applying taxes in connection with ODS import and use. In the United States, for example, a central tool for applying downward pressure on ODS consumption has been the *Ozone Depleting Chemicals Tax*, which subjects substances identified by the Montreal Protocol and its ratified amendments for the application of an excise tax. The tax targets manufacturers' or importers' first sale or use of ODSs, certain imported products containing or requiring ODSs and floor stocks. The tax sets a baseline per-unit-weight tax, with automatic annual hikes to smoothly but relentlessly apply incentives to switch to alternatives. The application of the *Ozone-Depleting Substances Tax* to, for example, importers' and manufacturers' first use or sale, helps lower the number and diversity of taxable entities, while providing some assurance that new ODSs introduced into circulation are covered by the cost-increasing taxes.

Many economic instruments, especially taxes, can create significant revenue for the public sector while at the same time sending responsible price signals about the need to adjust to a future without ODSs. The primary goal of an ozone-related tax, however should almost always be creating the right price signals for the long-term phase-out of the respective ODS, and not public revenue generation (in fact, an ODS taxation system may cost more to operate than the revenue that is brought in by it). Another disadvantage of ODS taxation systems is that they can create an incentive for smuggling, because they create an immediate price differential between illegal and legal ODSs in the market place.

4.4 ENFORCEABLE STANDARDS (VOLUNTARY AND MANDATORY)

Standards are the predominant means for direct regulation of environmental quality in most developed countries. Emissions of ODS refrigerants represent an important part of ODS consumption in most countries. As a rule, about one third can be attributed to intentional venting during service and disposal and about two thirds to leakage and other unintentional emissions. Thus ODS consumption can be reduced substantially through recovery and recycling, better maintenance and better design – measures that in the longer term benefit all parties but are difficult to achieve because of the many enterprises and users involved. Standards can come in many different forms (for example, ambient or environmental quality standards, public health standards, emission standards, technological standards, performance standards or product standards). Technology-based standards may be the most common in ODS management. All requirements to convert to new equipment and chemicals, for example, can be considered technical standards. Such standards are considered vital mechanisms for managing the transition from an ODS-reliant to an ODS-free technology. Use standards, for example standards for the application of methyl bromide

or for the testing of halon-based fire fighting equipment, are also common. As with any type of regulation, standards need to be set with the participation and consultation of all interested stakeholders, including competitors, customers and suppliers of new refrigeration, etc. It may even be useful to create or work with an independent, open standards-setting entity, perhaps even one organized by the private sector.

BOX 4.4: EXAMPLES OF ODS-RELATED STANDARDS

- Fire-fighting equipment standards in building codes;
- Standards for the amount of testing of fire-fighting equipment containing halons;
- Standards for the maintenance of refrigerators with CFCs;
- Standards for the recycling and reuse of CFCs;
- Standards for the application of methyl bromide; and
- Product standards for aerosols, refrigeration equipment, or foams.

All standards presuppose the existence of a monitoring agency able to oversee the ODS producer's or user's activities and impose penalties for noncompliance. If the agency has no enforcement powers, the only incentive the polluter has to meet the standard is social conscience and economic or public relations. In that respect, the only difference between codes of good practice (discussed below under voluntary commitments) and standards is the extent to which enforcement of standards is credible. Enforcement and compliance monitoring are discussed in detail in Chapter 6.

BOX 4.5: ADVANTAGES AND DISADVANTAGES OF ENFORCEABLE STANDARDS

Advantages	Disadvantages
Clear and measurable targets for industry to meet	Rigid and relatively inflexible, thus sometimes being more costly for industry to implement
Environmental outcome (e.g., the resulting level of ODS use) is clearly predictable, assuming compliance	Depends on effective compliance monitoring and enforcement
Industry-wide standards protect existing competitive climate (provides no relative advantages to any firms).	Do not provide incentives for developing new technologies
Conceptually simple and familiar	

4.5 RECYCLING AND BANKING

Recycling systems are important policy mechanisms for recovering ODSs that are already in the marketplace and meeting future demand, particularly for essential uses, without increasing production. Indeed, many of the certification, training and other policies discussed in this part are linked to recycling and reuse of ODSs. In conjunction with taxes, or other regulatory pressures on the availability of new CFCs, recycling can help industries

wean themselves off ODS reliance. The primary difficulty with recycling efforts is that it is capital intensive to begin a recycling programme. Substantial resources are necessary to pay for the handling and collection facilities. Technician training may also be needed. A successful recycling initiative will also require complementary policy initiatives to make recycled ODSs commercially viable.

CFC recovery and recycling programmes are critical components of many refrigeration management plans, because they make it possible to reduce the import of virgin CFCs and provide the only legal mechanism to continue to meet demands for CFCs once the phase out schedule is in vigor. Most CFC refrigerant currently in use in domestic, mobile and commercial cooling applications is recoverable and reusable. This is important because the demand from maintaining and servicing currently existing equipment into the future will maintain a substantial market for CFCs for years to come, in particular as production declines and import controls make virgin CFCs increasingly difficult to obtain. Recovery and recycling programmes also reduce the amounts of ODSs released into the atmosphere when obsolete equipment is discarded and replaced.

In 2002, Japan initiated a mandatory programme requiring motorists to pay for the removal of all CFC-based refrigerants from their vehicles before being scrapped. This requirement eliminated CFC leakage from scrapped vehicles.

Recovery and recycling programmes involve technical challenges and require infrastructure investments. A national recovery and recycling programme should:

- create a sustainable infrastructure for recovery and recycling;
- increase awareness and education about the importance of recovering CFCs during maintenance and service operations;
- provide adequate recycled refrigerants to serve the reasonable life of existing ODS-reliant refrigeration and air conditioning equipment; and
- lead to a substantial reduction in overall consumption of ODSs in the refrigeration and air-conditioning sector.

BOX 4.6: CANADA'S NATIONAL ACTION PLAN

Canada's Council of Ministers of the Environment in 1992 adopted a National Action Plan for Recovery, Recycling and Reclamation of Chlorofluorocarbons, prepared by a Federal Provincial Working Group on ODS controls.

The goals of the Plan included:

- Reducing demand for virgin CFCs by managing existing supply;
- Minimizing emissions of CFCs during installation, maintenance, repair and disposal of equipment;
- Establishing a regulatory infrastructure for recovery, recycling, and reclamation of CFCs, and ultimately, long-term destruction of CFCs;
- Establishing the practice of recovering and recycling HCFCs through industry training; and
- Reducing waste and venting of CFCs from containers.

The Plan recognized that success would require:

- Incentives (e.g., economic, regulatory, codes, standards) to encourage recovery, recycling, and reclamation, adequate equipment design, and proper work practices;
- An industry-supported infrastructure to facilitate the recovery, safe transport, reclamation, and recycling of CFCs and HCFCs and ultimately their disposal in an environmentally safe manner;
- A comprehensive plan to train the equipment service community and sensitize the public to the need for recovery, recycling, etc.; and
- A comprehensive plan to involve building owners and managers in developing a strategic plan and policies to reduce and eliminate use and emissions of CFCs.

One form of recycling is banking of ODSs that have been turned into centralized collection stages. This approach is particularly useful where there are substances that need to be withdrawn from the environment but for which there are also remaining "critical uses" for which no effective alternative exists yet. The primary example in this ODS context is halon banking. Because halons are needed for a limited but important number of critical uses (such as fire protecting in commercial aircraft passenger cabins and cockpits), there will continue to be a need for servicing some halon-based equipment past the likely production phase-out dates in the developed and the developing world. Countries must effectively monitor and manage stocks of halons to serve these needs. Much work in both developed and developing countries has centered on creating halon "banks" to store and distribute existing stocks. The advantage of such banks is that regulators can keep close track of sale and use, and at the same time ensure a legal source of halons to serve ongoing critical needs. Meanwhile the halons that have been banked are isolated from the environment until such time as they are used. One issue that needs to be carefully considered is who should own or manage the halon bank (the government or a private enterprise) and, as part of this consideration, who ultimately should pay the cost of destruction when halons are no longer needed (see *Eliminating Dependency on Halons: Self-help Guide for Low-Volume Consuming Countries* in Annex 2: Further Reading).

4.6 LABELING

Labeling requirements are an important policy tool for curbing the demand for environmentally damaging products, including those containing or produced by ODSs. Labeling requirements help to build public awareness through educating the consumer about the impacts of their consumption decisions. Labeling can be mandated by governments as a way to promote the phase out of ODSs. In such cases, products containing or produced with ODSs would have to bear such a label. Governments can also act only as the police for truth-in-labeling. In that case, NOUs could encourage companies voluntarily to put positive labels on their products – for example, stating that a refrigerator "Does not contain CFC refrigerants that deplete the ozone layer", or that an aerosol product is "ozone friendly" or "CFC-free", which is now common throughout the world.

Examples of labels used to promote ozone-friendly products in different countries. Labeling schemes are policies tools available to NOUs to help steer consumers to ozone friendly products and away from CFCs.

4.7 VOLUNTARY MEASURES AND STANDARDS

Voluntary measures and standards have become increasingly popular in recent years as industry and others promote them as alternatives to government-enforced regulations or management. The appeal of voluntary measures is that they do not rely on effective governments or official policies. Moreover companies that have agreed in advance to certain standards are, almost always, more likely to implement and comply with the standard. Energy is put into meeting the standard, not into opposing or sidestepping a law or regulation. The downside is that these actions and standards are often weaker than necessary to protect the public health. The potential competition from enterprises that do not comply with a voluntary standard will make it difficult for the industry partners to the agreement to agree on measures that go beyond what they can fulfill without losing economically in relation to those enterprises that will not follow the voluntary standard. This implies also that the number of users in a certain sector and the possibility to reach agreement with all users will greatly affect the possibility to rely on voluntary standards. Many developed countries that started out with voluntary agreements have eventually found it necessary to turn to mandatory requirements (e.g. the European Community and Finland). At least the credible threat of enforceable, binding, non-voluntary standards has proven essential in many countries as a necessary step toward protecting the environment and building respect for the rule of law. The time available to reach results (for example in order to comply with the Montreal Protocol) is also an important element in the choice of policy.

BOX 4.7: ADVANTAGES AND DISADVANTAGES OF VOLUNTARY MEASURES

Advantages	Disadvantages
Voluntary measures are flexible.	Voluntary measures are often insufficient to reach the long-term environmental goal, for example the phase out of ODSs.
Voluntary measures enjoy the support of the regulated community.	Voluntary measures are unenforceable.
Effective government agencies are not necessary for the effective implementation of voluntary measures.	Voluntary measures are often seen as replacements for effective government regulation.
Voluntary measures can build trust between the government and the regulated community as a stepping-stone toward subsequent binding standards.	Industry will back away from voluntary measures if the measures have any significant economic impact, for example if companies are not competitive with those who do not accept the voluntary standards.
Timing for implementing the standards under the Protocol may not be sufficient.	

4.7.1 CODES OF GOOD PRACTICE

Voluntary standards and commitments come in many different shapes and sizes. Codes of good practices, for example, can promote greater industry involvement and 'buy-in' for improving their environmental performance. Such codes are best thought of as a vehicle to educate and enter into a dialogue with industry to move them toward better environmental practices. They can be used as an effective complement interpreting more general legal requirements and can in those cases be considered as a middle-way between voluntary and mandatory regulations. Such Codes of Practice are typically not binding but indicate an acceptable manner of fulfilling the objective set out in the general requirement. With respect to ODS, UNEP has developed *Refrigeration Standards and Codes of Good Practice and Halon Standards and Codes of Good Practice* (Annex 2: Further Reading). Additional codes reflecting national conditions can be proposed and developed by or in dialogue with the target industry. In either event the evaluation of performance against the codes is an important part of ensuring that they are being taken seriously. As the specific standards in various codes of good practice become more widely accepted, industry's opposition to those voluntary standards becoming mandatory will weaken.

4.7.2 VOLUNTARY PLEDGES

Another method of voluntary commitment is to use public pledges to change corporate behavior. Companies might be forced through public opinion to make commitments they otherwise might ignore. As part of the tenth anniversary celebrations of the Montreal Protocol, for example, UNEP DTIE OzonAction Programme invited companies in the developed countries to pledge their support for the efforts of developing countries to meet the 1999 freeze on Annex A, Group I CFCs. The pledge encourages companies not to transfer CFC-using technologies and equipment to developing countries and countries with economies in transition. Developing countries may consider asking multinational companies doing business in their territories to make similar pledges, and publicize good

corporate citizens. Such pledges can have good public relations impacts, but it is often difficult to design effective mechanisms for monitoring implementation of the pledge.

BOX 4.8: THE MONTREAL PROTOCOL TENTH ANNIVERSARY CORPORATE PLEDGE

"Our company has phased out the production and consumption of CFCs to the greatest extent feasible in its global operations. We have encouraged our subsidiaries and joint partnerships to likewise phase out these substances. Our company will not manufacture or sell any new CFC-using equipment or technology in developing countries or countries with economies in transition except CFCs produced under the Montreal Protocol essential use exemption. We will endeavor to promote environmentally-friendly technologies in developing countries to assist them in meeting their commitments under the Montreal Protocol."

4.8 PROMOTING AND SUBSIDIZING ALTERNATIVES

Arguably one of the most important factors leading to the reduction of ODSs in industrialized countries has been the relative availability of substitutes. Where low-cost and user-friendly substitutes have been developed, companies and consumers alike have responded by switching away from ODS-reliant technologies or procedures. The challenge is thus how to stimulate the development of, and enhance the use of, ODS-free alternative technologies and approaches. A variety of ways exists for governments to promote alternative technologies or approaches, including through promoting domestic research and development, through facilitating technology transfers from abroad, or by financing industrial conversions.

4.8.1 PROMOTING RESEARCH

Governments can stimulate significant advances in economic, technical and educational approaches to ozone protection by supporting research (in academia, government or the private sector) into alternative substances, products and practices that can speed up the elimination of ODSs. While large-scale research spending (either from the public sector or from private companies) may be beyond the capabilities of many developing countries and companies, some modest efforts may be able to support research at a scale that can assist developing country businesses. It may, for example, be worth spending limited, targeted amounts of money to research how advances developed elsewhere may best be adapted to local conditions and needs. These approaches might include tax breaks for research and development costs or perhaps running high-profile competitions to stimulate research in universities or industry. In the United States, for example, public utilities and not-for-profit organizations created awards for innovative refrigerator design and manufacture to both improve energy efficiency and move consumers away from reliance on CFCs. Ultimately, twenty-four energy utilities contributed US$30 million towards this goal. The awards were paid to the winner, in proportion to its actual delivery of refrigerators using CFC alternatives. This payment mechanism ensured that the awards were tied directly to meaningful contributions to ODS control.

4.8.2 CONVERSION ASSISTANCE

One form of support for alternatives is to provide direct subsidies and other assistance for the conversion of industrial processes from ODSs to ODS-free technologies. Such subsidies can overcome resistance by industry by reducing their expense and the need for large initial

capital outlays. Such subsidies are particularly suited for targeting large manufacturing facilities or large-scale users. This approach has the further advantage of leading to direct reductions in ODS use at the targeted facilities. Industrial conversions are the focus of many investment projects under the Montreal Protocol Fund, and developing countries may continue to be able to get international assistance for these types of projects. However, reductions of the consumption in individual facilities do not necessarily lead to corresponding reductions in the country's total consumption, not even in the same sector, as the market can be taken over by another enterprise. Moreover, conversion assistance may not be practical for small-scale applications, such as car air-conditioners or refrigerators.

4.9 GOVERNMENT PROCUREMENT

The government, particularly the military or state-owned enterprises but also government agencies in general can be dominant players in some sectors of the ODS market (e.g. with regard to refrigeration and air-conditioning and fire protection equipment). If the government, acting as a consumer, leads the way by changing the specifications for the products it purchases, the government can significantly catalyze the creation of a profitable market for ozone-friendly products and technologies.

4.10 PROVIDING TRAINING OPPORTUNITIES

Closely associated with certification programmes are programmes aimed at training those responsible for handling ODSs in methods and procedures for responsible handling. These training programmes can, but do not need to be, associated with certification programmes. If certification including certain training is required for certain activities, then it will be a market-place advantage to being certified or trained in responsible ODS handling. In the longer term, training courses may then also be able to pay for themselves.

Given the market structure of refrigeration, for example, with many different consumers using CFC-reliant refrigerators and air conditioners, many governments have focussed their effort on educating and training maintenance technicians who repair and maintain these appliances. Technician-training programmes, in some cases coupled with certification programmes, can both educate and improve the performance of these technicians. By schooling them in appropriate use of substitutes as well as the handling, transport and destruction of CFCs, these training techniques can significantly reduce a country's ODS use.

Colombia, for example, has placed substantial emphasis on technician training in its programme to control CFCs in refrigeration and cooling applications. Colombia's national learning service offers a five-semester technical education course including guidance on CFC containment, recycling and alternatives. Colombia also has created a National Programme for Building Capacity of Refrigerator Technicians. This programme, implemented in co-operation with private businesses, offers free 30-hour courses to practicing technicians to help them better manage CFCs. The programme rewards participants by issuing cards certifying completion and publicizing their names and new environment-friendly skills, although no formal certification is required to repair or service refrigerator and air conditioning equipment.

Programmes that aim to train the trainers are often the most cost-effective way for the government to reach a broader range of the regulated community. If trainers are well-

trained, then they can replicate training, creating new opportunities for small businesses that otherwise would be difficult for governments to identify and reach. Ghana's NOU, for example, has developed training programmes for trainers with the hope of reaching a larger number of actual technicians servicing CFC-reliant equipment in the field. The training emphasizes reducing emissions through proper handling, and recycling. A certification programme is under development to clarify and promote good practices.

Some possible priority targets for training programmes relating to ODS management and phase-out, include:

- Customs and trade officials on the requirements and how to recognize ODSs and ODS products;
- Refrigeration maintenance technicians;
- Local environmental inspection and enforcement officials; and
- Technical and vocational training institutions.

4.11 PUBLIC OUTREACH AND EDUCATION

Public attitudes can help (positively encourage) or hinder (delay or obstruct) compliance with the Montreal Protocol. An informed and concerned public that supports environmental protection can pressure industries and regulators to meet environmental goals. However, if public opinion is tilted toward non-environmental concerns, environmental protection faces uphill challenges. Moreover, even where concern for environmental protection may be generally strong, surges in response to local or regional crises often bring about more regulatory advances than consistent, long-term concerns. Public interest for protection of the ozone layer thus may rise and fall somewhat with the size of the ozone hole over Antarctica, for example, but local impacts are typically not so sudden and severe in ways that grab headlines and really galvanize public pressure. Continuous, effective public education must take the place of *ad hoc* reporting of sudden crises.

Aware and educated consumers demanding ODS-free alternatives can substantially reinforce regulatory goals by reducing demand for ODSs. On the other hand, public attitudes can swing against environmental concerns, particularly where environmental protection requires changes in individual lifestyles or purchasing choices, as could be the case with ODSs. If the public continues to demand ODSs and ODS-reliant products, a black market could develop that could undermine the NOU's regulatory effort.

Thus, the power of the public, in influencing both the government and the market, makes public education and outreach a critical strategy for NOUs. If a broad consensus inside and outside government can be built to create and maintain an effective ODS phase-out policy framework, ozone co-ordinators will be well on their way to success. Box 4.9 provides some guidelines on building an effective public outreach campaign. Ozone co-ordinators should actively seek partnerships, including with civil society organizations and industry, in designing and implementing such a campaign (see *Communication Strategy for Global Compliance with the Montreal Protocol* in Annex 2: Further Reading).

BOX 4.9: CHECKLIST FOR BUILDING A PUBLIC OUTREACH CAMPAIGN

- Select targeted group and objective;
- Select and develop the primary message or slogan;
- Select mechanisms and strategies for delivering the message;
- Roll-out the campaign; and
- Evaluate effectiveness of the campaign and make adjustments.

The first step in any outreach effort is to identify and prioritize the most important constituencies. Government leaders, industry groups, small and medium enterprises and the public, for example, each form distinct and valuable targets for outreach efforts. The message should be tailor-made to the target group. Information to the general public might have as its objective to gain understanding and support for efforts in general to reduce the use of ODSs. Information to the small service enterprises, on the other hand, might have as its objective to tell them about upcoming regulations and how a specific training could benefit them. Many outreach mechanisms can work, but the key is to select approaches that are most likely to inform and motivate the group that is the primary target (see *Five Steps for Raising Awareness on Ozone Depletion* Annex 2: Further Reading).

BOX 4.10: MECHANISMS AND TECHNIQUES FOR OUTREACH

- Awards and recognition;
- Conferences and workshops;
- Brochures, publications and videos;
- Labeling;
- International Day for the Preservation of the Ozone Layer ("Ozone Day") celebrations (September 16 is the official UN Commemorative day);
- Poster or essay competitions for children;
- Partnerships with NGOs;
- Advertising and public service announcements;
- Endorsements by national or local celebrities; and
- Press conferences, press releases and media outreach.

Many of these techniques will obviously cost money or require resources, but some will not. In some countries, for example, public service announcements can be run for free. Also, state-owned radio and television stations are often available to run advertising campaigns at reduced costs. Independent journalists, radio, television and print, are also looking for material for stories. An effective regulator can learn to use the press and media to run stories without financial outlays. The skillful use of press releases, conferences and briefings is thus valuable for regulators. Unfortunately, few regulators are trained in press relations, so these skills must be learned on the job. They are learnable, however, and over time regulators will gain more experience. Box 4.11 provides some pointers for NOUs on working with the press.

BOX 4.11: TIPS FOR WORKING WITH THE MEDIA

- Get to know local and national journalists in newspaper, TV and radio, as many stories depend on relationships;
- Set specific goals for any press outreach, including targeting specific media outlets (e.g., specific newspapers or radio markets);
- Create opportunities for educating journalists, through for example press briefings, press releases or general background sessions;
- Send written press advisories several days before any press event and follow-up with phone calls;
- Be sensitive to journalists' deadlines; and
- Prepare and make available general fact sheets and background information to help journalists tell the story (e.g., the background and importance of the Montreal Protocol and the need to control ODSs).

Much of the outreach effort of NOUs may be targeted to specific interest groups or stakeholders who can help in specific ways in meeting the obligations of the Montreal Protocol. For example, several countries have created multiple-stakeholder forums for both obtaining and distributing information regarding the phase-out of specific methyl bromide uses. Benin's cotton farmers, for example, have been experimenting with organic methods to increase soil fertilization and crop protection and reduce dependence on methyl bromide. The effort has involved creating a "consultation board" of stakeholders, including producers, researchers, NGOs, and others involved in growing and preparing cotton for sale.

Similarly, Canada established a Methyl Bromide Working Group to provide a consultative forum where interested stakeholders such as growers, end users, fumigators, pesticide manufacturers, research organizations, and government and non-government organizations can discuss and provide strategic direction on effective implementation of Canada's programme for the control of methyl bromide. The mandate of the group is also to identify priorities for research and registration of alternatives in each end use; discuss, review and make recommendations on the adoption of alternatives, including institutional barriers, if any, to such adoption; and to discuss opportunities for joint researching, demonstration and adoption of new alternative technologies. The Group is co-chaired by Agriculture Canada, Environment Canada, and an industry representative. This informal group acts as a supplement to – not a replacement for – other consultative mechanisms and related advisory bodies.

4.12 ODS POLICIES IN DEVELOPING AND DEVELOPED COUNTRIES

For a collection of various laws and regulations regarding the management of ODSs, see *Update to Regulations to Control Ozone Depleting Substances* (Annex 2: Further Reading). The Guidebook provides an overview of the regulatory instruments used in various developed and developing countries, without evaluating their adequacy or effectiveness. The Guidebook also provides contact information for the local authorities and government officers involved in implementing the various ODS regulations.

5. SECTOR-SPECIFIC CHALLENGES

This chapter approaches the selection of appropriate policy measures from a sector-by-sector perspective. It builds on the general discussion and advice provided in previous sections by providing representative 'model' collections of policies that can be used to address major sectors of ODS use. The sectors highlighted are (1) CFC use in refrigeration and air-conditioning, (2) halon use in fire suppression, and (3) methyl bromide use for agriculture and fumigation.

The information in this chapter should also inform NOUs about how to address ODS use in other sectors, such as aerosols, foams, and solvents, as the policy measures and approaches are in some cases similar. However, the nature of the sector may require NOUs to concentrate on a specific policy issue. For example since ODS alternatives in aerosol and some foam applications are characterized by the use of inflammable materials, national standards for the location of facilities and storage tanks must be elaborated and enforced. Since some alternatives have toxicity concerns, proper handling guidelines and worker safety regulations must be developed. Examples of policies adopted in developed and developing countries in these other sectors are presented in *Update of Regulations to Control ODS* (see Annex 2: Further Reading).

5.1 REFRIGERATION AND AIR CONDITIONING

Refrigeration and air conditioning are the largest uses for chlorofluorocarbons (CFCs) in developing countries. The primary CFCs used in refrigeration and cooling are CFC-11 and CFC-12, with CFC-13, CFC-113, CFC-114 and CFC-115 being used in smaller quantities. Halon 1301 is also occasionally used as a refrigerant and is then called CFC-13B1. Many residential, commercial and industrial refrigerators and freezers utilize CFC-12 as their primary refrigerant. Many automobile air conditioners also use CFC-12. CFC-11's applications include large-scale commercial and industrial air conditioning. CFC-11 is also used to flush refrigeration systems. CFC-114 has some special military applications, and CFC-13 can be found in ultra-low temperature applications. CFC-115 appears in limited quantities and applications.

All the CFCs used as refrigerants are subject to control under Annex A Group I of the Montreal Protocol except for CFC 13, which belongs to Annex B Group I ("Other CFCs") and CFC 131B, which is a halon and belongs to Annex A Group II. Developing countries operating under Article 5 were required to freeze their production and consumption of CFCs under Annex A Group I, at the average of 1995–97 levels by July 1, 1999. Total phase-out is scheduled for January 1, 2010. See Box 5.1 that provides the phase-out schedule for those ODSs that are used as refrigerants.

BOX 5.1: PHASE-OUT SCHEDULE FOR ARTICLE 5 COUNTRIES FOR ODS REFRIGERANTS

Annex A, Group I: Chlorofluorocarbons (CFCs-11, -12, -113, -114, -115)

Year	Freeze	20% Reduction	50% Reduction	85% Reduction	100% Phase out
Base level: Average of 1995-1997 consumption					
1987	1 July 1999	1 July 2003	1 July 2008		
1990			1 January 2005	1 January 2007	1 January 2010

Annex A, Group II: Halons (Halon 1301)

Base level: Average of 1995-1997 consumption					
1987	1 July 2002				
1990			1 January 2005		1January 2010

Annex B, Group I: Other CFCs (CFC 13)

Average of 1998-2000 consumption					
1990		1 July 2003		1 January 2007	1 January 2010

Annex C, Group I: HCFCs

Base level consumption: 2015 consumption; Base level production: average of production and consumption in 2015					
		2016			2040

5.1.1 ALTERNATIVES

Several important alternatives exist to the use of CFCs and other ODSs for refrigeration and air conditioning. Foremost among these are hydrofluorocarbons (HFCs). HFCs contain no bromine or chlorine and so do not directly threaten stratospheric ozone. Several can be used in refrigeration applications, including principally HFC-32, HFC-134a, HFC-125 and HFC-152a. HFC-134a is a reasonably energy-efficient replacement for CFC-12 in air conditioners and water coolers, requiring some retrofitting and proper lubrication. The primary disadvantage to HFCs is that they are powerful greenhouse gases and are thus among the substances to be controlled under the international climate change regime. Strategies to limit emissions, e.g. through recovery and recycling requirements, leak detection and application of good practice in servicing and installations, should therefore also apply to HFC refrigerants.

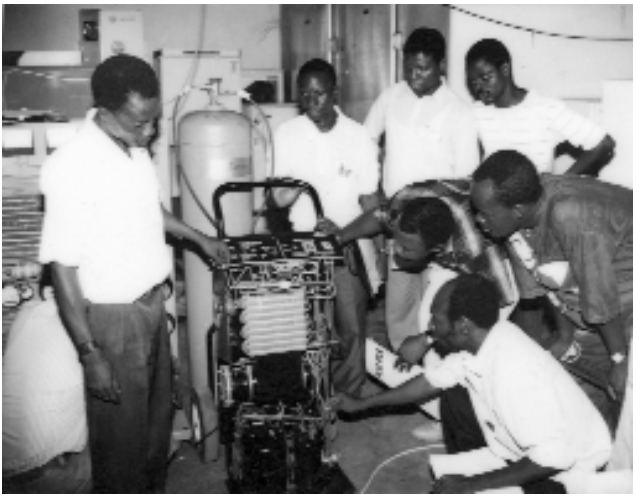
The rapid phase-out of CFCs in refrigeration and cooling applications in developed countries has also relied on hydrochlorofluorocarbons (HCFCs) as a substitute. The primary refrigerants among HCFCs are: HCFC-22 and HCFC-123. These chemicals behave similarly to CFCs in refrigeration applications, and require only moderate conversion investments for refrigerators and coolers. HCFCs are destroyed more quickly in the atmosphere, and so have

lower ozone depleting potential. Nonetheless, HCFCs do contribute to stratospheric ozone loss and are subject to control under Annex C, Group I of the Montreal Protocol. As currently agreed, developing countries operating under Article 5(1) must freeze their production and use of HCFCs in 2015, and completely eliminate their consumption by 2040, but this schedule is under constant discussion and could be accelerated. HCFC conversion can thus provide only a short-term fix to CFC dependence in these sectors, but ultimately alternatives to it will be required as well. Developing countries may choose to move directly to the use of other chemicals in refrigeration and cooling, rather than relying on intermediary compounds that will also have to be phased out in a few decades.

Several hydrocarbons can also act as refrigerant substitutes, notably propane and butane. Hydrocarbon refrigeration requires different compressors and greater attention to fire safety at every stage in equipment life cycles. Hydrocarbons are attractive, because they do not deplete the stratospheric ozone layer, nor contribute substantially to climate change.

5.1.2 REFRIGERANT MANAGEMENT PLANS

Because the refrigerant sector is such a critical category of ODS use and because it can be so complex, the cornerstone of any effective phase-out of ODS use in this sector will require the development of a comprehensive management plan. Such refrigerant management plans (RMPs) should be developed through open and transparent procedures with the full participation of the public and the regulated community. The primary objective of an RMP should be to develop and plan a national strategy to manage the use and phase-out of virgin CFC refrigerants for servicing refrigeration and air-conditioning equipment. Box 5.2 provides an outline of the steps for formulating an RMP; the process is adopted from *Guidelines for the Development of Refrigerant Management Plans* (see Annex 2: Further Reading).



Refrigerant recovery and recycling demonstration in Ghana. Training and certification of servicing technicians are a key to ensuring a successful RMP.

BOX 5.2: STEPS FOR FORMULATING AN RMP

Step 1) Establish a Coordinating Team

Step 2) Undertake country-specific review and analysis of:
- a) Refrigeration and air-conditioning sector and sub-sector
- b) Consumption of CFC and HCFC refrigerants and their availability, sources of supply and distribution channels
- c) Production of refrigeration and air-conditioning equipment
- d) Servicing and maintenance workshops

Step 3) Characterize the relative importance of sub-sectors on the basis of:
- a) Level of consumption of ODS refrigerants
- b) Economic importance
- c) Trade orientation.

Step 4) Assess the available and feasible options, including:
- a) Technical options such as good practices, recovery and recycling and conversion, retrofitting, replacements, etc.
- b) Policy options such as voluntary programmes/agreements, legislation and regulations, and economic instruments.

Step 5) Evaluate the alternative options for:
- a) Cost-effectiveness
- b) Feasibility and timing
- c) Maximum impact

Step 6) Formulate a Refrigerant Management Policy (which should include all or most of the following elements, in accordance with country-specific needs):
- a) Training programme for refrigeration technicians
- b) Recovery and Recycling system
- c) Training program for customs officials
- d) Improved system for collection and monitoring and controlling consumption of ODS refrigerants.

While an RMP should reflect the specific economic, institutional and policy contexts of a country, certain common elements are shared by all RMPs (see Box 5.3).

BOX 5.3: REPRESENTATIVE ELEMENTS OF AN RMP

- Assessment of use of ODS and ODS-using refrigeration and air-conditioning equipment;
- Assessment of potential impact of and need for increased public awareness and established policy instruments to meet the obligations of the Montreal Protocol;
- Basic refrigerant management policy, including objectives, national strategy, activities and time-table;
- Specific plan for improving operations and maintenance practices;
- Specific plan for establishing and enforcing refrigerant containment practices (usually a code of good practices, certification scheme, etc.);
- Specific plan for implementing refrigerant recovery, recycling and reclamation;
- Specific plan for establishing and enforcing related policy for equipment procurement;
- Specific plan for establishing supporting legislation/regulation and awareness raising campaigns; and
- A plan for monitoring and reporting.

The RMP should take into account all sub-sectors, including the consumption by small servicing enterprises in the informal sector, servicing of mobile air-conditioning systems, etc. The Multilateral Fund may provide funding for some part of the necessary activities, but a clear explanation for how the intended actions will ensure compliance with the Protocol reduction and phase-out requirements and a commitment to reach at least the 85% reduction by 1 January 2007 without further funding requests – if necessary through import restrictions – is required. The cost and means of financing all necessary actions must be identified, including national financing (Executive Committee Decision 31/48). Note also that the intended system should have long term sustainability (not just consist of one-time ad hoc activities).

5.1.3 REPRESENTATIVE POLICY APPROACHES

Given the phase-out schedules agreed to under the Montreal Protocol regime for the major ODSs currently in use in the refrigeration and air conditioning sector and given the complex nature of this sector, a variety of policy measures need to be implemented together. The following set of policies could provide a useful illustration of a coordinated approach.

5.1.3.1 Ban new production or manufacturing facility for CFCs or HCFCs.

Given the eventual ban of these substances under the Montreal Protocol, any major capital investments aimed at expanding production of refrigerants or air conditioning substances should be for the production of substances that do not deplete the ozone layer.

5.1.3.2 Import and Export Controls.

Controls on imports and exports of CFCs and HCFCs are among the major policy tools for achieving the phase-out of CFCs according to the schedule in the Montreal Protocol regime. Typically these controls will be implemented through licensing arrangements that set gradually decreasing limits on individual or aggregate annual shipments. Effective administration of these controls requires good monitoring and clearance procedures, clear and comprehensible customs codes (harmonized, where possible, with regional and international standards). See also Section 4.2.1.

5.1.3.3 Enforceable Standards

A wide range of standards can be set as a way to push industry toward control of CFCs in refrigeration and air conditioning. These standards could apply to new refrigerators and installations (for example that they can no longer contain CFCs) or set standards for how CFCs from mobile air-conditioning sources should be handled. The standards may be imposed through licensing arrangements and may also form the basis for the training and certifications, discussed below. See also Section 4.4.

5.1.3.4 Recovery and Recycling Programmes

Recovery and recycling programmes are important initiatives in most Refrigerant Management Plans, because recycling can provide additional CFCs and other ODSs for use in maintaining and servicing existing equipment. When mixed with clear limits on the production or import of new CFCs, recycling can be an important part of the overall compliance strategy. See also section 4.5.

5.1.3.5 Technician Training and Certification

Training and certification programmes, particularly for refrigeration maintenance technicians are important efforts to improve the handling of ODSs currently in use. Such a programme may be necessary for extensive recycling programmes to be used, to reduce leakage and other unintentional emissions and to facilitate the enhanced use of substitutes. Training customs and trade officials to recognize ODS refrigerants and equipment relying on CFC refrigerants may also be advisable.

These different policy approaches should form a core part of most countries' management plans for meeting the phase-out schedules under the Montreal Protocol. Mauritius, for example, developed a national CFC-12 recovery and recycling programme, combined with a demonstration of retrofit technology in commercial refrigeration. It includes a one-day training-of-the trainer's seminar and three one-day training seminars by the trainers. It also includes a demonstration activity to provide technical know-how for retrofitting a CFC-based cold store to non-CFC refrigerants, based on recommendations from the existing compressor manufacturer and the refrigerant manufacturers. The retrofitted unit was to serve as a demonstration model for the rest of the industry in Mauritius. Based on the experience gained and the success of this demonstration unit, the Mauritius Agricultural Marketing Board will finance the retrofit of the rest of the commercial refrigeration equipment in the country.

Canada's National Action Plan (see Box 4.6), provides a good example on how to establish a Refrigerant Management Plan.

A more detailed description of action taken in various developed and developing countries can be found in *Update of Regulations to Control Ozone Depleting Substances and Government Strategies to Phase-out Ozone-Depleting Refrigerants – Four Case Studies From the Nordic Countries* (Annex 2: Further Reading).

5.2 METHYL BROMIDE

Methyl bromide is an effective and easy-to-use pesticide fumigant used worldwide for soil preparation and the preservation of commodities including grains, timber, wood items, flowers and fruit, as well as some limited applications in storage areas, including buildings, vehicles and other structures.

Historically, many countries that import agricultural products and commodities have had legal requirements that require exporting countries to fumigate with methyl bromide before those commodities would be allowed into the importing countries. This practice has encouraged methyl bromide consumption in the past.

The most common use of methyl bromide is for soil fumigation before planting crops. This use accounts for approximately 70% of total global methyl bromide use. The two primary soil fumigation techniques are manual application and mechanized injection. Manual application involves vaporizing or discharging methyl bromide into soil covered by plastic sheets. Mechanized injection involves injecting methyl bromide directly into the soil, with or without plastic sheeting. Methyl bromide also finds substantial use in the fumigation of storage and transport facilities. Fumigation of commodities and structures uses methyl bromide released directly from containers, sometimes assisted in its vaporization by a heat exchanger. Total amounts of methyl bromide used in these applications depend on industrial standards, contractual and legislative requirements, the amount of commodity to be treated and the area of storage facilities to be treated. Careful monitoring of the application process and proper sealing of the storage space during fumigation can help ensure that only required doses are applied, but a widespread tendency to over-use of methyl bromide has been noted.

BOX 5.4: CHILE'S METHYL BROMIDE USE

The Chilean agricultural sector accounts for about 70% of national methyl bromide use, primarily for sterilizing soils in the production of tomatoes (open-field and seed beds), peppers (open-field and seedbeds), tobacco (seedbeds), cut flowers (nursery greenhouses) and fruits (seedbeds in nursery greenhouses). Post-harvest applications, mainly for pre-shipment and quarantine purposes, including fruit and wood fumigation, account for an additional 22% of nationwide methyl bromide use. These quarantine and pre-shipment uses are critical for exports of fruit to the U.S., Europe, and other Latin American markets.

Methyl bromide is also a potent ozone depleter. Developing countries that have ratified the Montreal Protocol's Copenhagen and Montreal amendments should have frozen their consumption of methyl bromide at 1995-1998 average base levels by 2002, and should achieve 20% reductions from the base level by 2005. Total phase-out is to be achieved by 2015, except for critical uses and pre-shipment and quarantine uses aimed at preventing the transport and spreading of pests through international trade in fruits, vegetables, and flowers.

BOX 5.5: PHASE-OUT SCHEDULE FOR METHYL BROMIDE IN ARTICLE 5 COUNTRIES

Annex E: Methyl bromide

Year	Freeze	20% Reduction	100% Phase-Out
1995	1 January 2002		
1997		1 January 2005	1 January 2015

5.2.1 ALTERNATIVES

Although methyl bromide has a great number of uses and no one chemical can replace it in all of its applications, feasible alternatives exist for more than 90% of methyl bromide's applications. These include both chemical and non-chemical alternatives, either singly or combined into an integrated pest management (IPM) approach. For storage facilities and mills, the application of specific enhanced sanitation techniques are increasingly replacing the need for methyl bromide fumigation. However, some alternatives (especially other chemical pesticides) may not be acceptable to regulatory authorities, markets or end users. Where methyl bromide use continues, emissions can be reduced through improved containment, better-sealed enclosures and less permeable sheeting to cover the fumigation surfaces. Recovery and recycling equipment is currently being developed (e.g. in Australia) to further minimize emissions and ultimately reduce demand for new production of methyl bromide.

A variety of crop management techniques, developed both in traditional and modern farming, have also proved effective at limiting the impacts of a variety of crop pests, without the use of methyl bromide. Crop rotation, biological controls (e.g. trichoderma), physical methods (like the application of heated steam), chemical alternatives, and contact pesticides can all make important contributions, without the health and environmental problems associated with methyl bromide. Thus, significant headway is being made in finding acceptable alternatives to the use of methyl bromide. UNEP estimates that alternatives are available for all but 2,500 tons of the annual global use of about 72,000 tons.

5.2.2 REPRESENTATIVE POLICY APPROACHES

Methyl bromide presents special challenges in connection with developing countries under the Montreal Protocol. First, its wide range of applications calls for a wide variety of substitute substances and practices. The chemical's economic importance and use across a broad and diffuse range of businesses presents substantial compliance challenges, and ultimately its use has implications for food security. Agricultural exports, which must be pest-free, are important parts of the economy for many developing countries. Additional challenges for methyl bromide phase-out include importing countries' requirements for quarantine and pre-shipment treatment, economic consequences to methyl bromide producers, and the need for substantial co-ordination among government agencies.

5.2.2.1 Prohibit New Production or Manufacture of Methyl Bromide

Allowing new investments in methyl bromide production would run counter to country obligations under the Montreal Protocol regime to phase out all production by 2015. Moreover, the transition away from methyl bromide (and other ODSs) is more difficult for companies or others who have become reliant on the substance.

5.2.2.2 Import and Export Controls on Methyl Bromide

The supply of methyl bromide in developing countries is predominantly from imports. Imports of methyl bromide should have been frozen by 1 January 2002, to be gradually reduced and ultimately prohibited in 2016, although some exempted uses may still be permitted. Customs regulations aimed at controlling methyl bromide must monitor two different aspects – total imports and purpose of importation (because several uses are exempted from the prohibition). Total import may best be handled through a licensing system, whereby total allowable imports are distributed by license among approved importers. Customs checks may be supplemented by reporting requirements for these importers, to allow crosschecking data and monitoring the behavior of licensees. Licensees that underreport methyl bromide imports can lose their licenses temporarily or permanently, or have their quotas adjusted accordingly.

5.2.2.3 Agricultural Extension Programmes

Agricultural extension programmes can be critical partners for informing and educating the farming community of the need to phase out methyl bromide and of alternatives to use of methyl bromide. Agricultural extension programmes often have the trust of the agricultural community and can implement and sustain the broader methyl bromide policies. It is important for NOUs to help ensure that agricultural extension programmes have continuous access to the latest developments in methyl bromide alternatives, and that they in turn outreach the alternatives to the farmers. NOUs may consider establishing national networks of methyl bromide alternative experts, agricultural extension workers and relevant NGOs to support the diffusion of this critical knowledge. The CAP Methyl Bromide Officers can help with this process (see UNEP DTIE OzonAction Programme in Annex 1: Useful Contacts).

5.2.2.4 Handling and Application Standards

Setting and publicizing standards for handling and applying the pesticide can be very helpful. Governments should work with international organizations, and domestic industry groups, to develop appropriate codes of practice. Combined with labeling of methyl bromide canisters and fumigation equipment, such standards can do much to improve efficiency and reduce emissions from methyl bromide fumigation applications.

5.2.2.5 Certification of Fumigators and Other Users

Often implemented in conjunction with the setting of process standards, the certification of fumigators and other applicators of methyl bromide can greatly reduce the impact on public health and the environment. For example, Zambia's plan emphasizes annual licensing and certification of fumigators. The government of Zambia's Ministry of Agriculture, Food and Fisheries asks fumigators to notify inspectors from the Plant Protection Agency regarding treatments of unloaded perishables. Supplementing these requirements are training and a fumigators' code of conduct. Regulatory authority flows from the Zambian Plant Pests and Disease Act. Similarly South Africa requires fumigators to be registered technicians, and that they use adequate barriers (VIFs or `virtually impermeable film') to contain the fumigant.

5.2.2.6 Public Health Training

Given the potential toxic health effects to workers from its misuse, education and training regarding the environmental and health effects of methyl bromide is particularly important.

In this regard, the ministries of public health and/or of labor may be strong allies with NOUs, in order to protect worker safety. These programmes should be targeted at specific user groups and specific applications, and thus specific alternatives to methyl bromide. For example, the government of Zambia designed a programme with the Zambia Exporters and Growers Association (ZEGA) to promote the use of phosphine, a chemical substitute for non-time-sensitive applications of methyl bromide.

5.2.3 PRACTICAL POINTERS

Customs officials need training to identify and record methyl bromide imports/exports. A particular challenge is determining whether methyl bromide is being imported for controlled or exempt (i.e. pre-shipment and quarantine) uses. Pre-shipment applications are defined by the Meeting of the Parties to the Montreal Protocol as those non-quarantine applications applied within 21 days prior to export to meet the official requirements of the importing country or existing official requirements of the exporting country. Official requirements are those that are performed by, or authorized by, a national plant, animal, environmental, health or stored product authority (Meeting of the Parties Decision XI/12). Importers' reporting requirements may include pre-reports on planned shipments that are for one purpose or another. Tracking the uses of such shipments, to the extent possible, is essential to ensure that the pre-shipment and quarantine exemptions do not provide a loophole that makes effective import control impossible.

Good communication with merchants and importers will also be vital to effectively monitoring the differently controlled uses of methyl bromide. Regulators may want to survey current uses of methyl bromide in controlled and exempt applications to determine the approximate volumes used in each. This will provide baseline data against which to evaluate later claims by importers and users. Just because the Montreal Protocol does not require controls on pre-shipment and quarantine uses, countries may determine that the effective control of methyl bromide imports requires careful monitoring and perhaps licenses for these uses as well. In any event, the Protocol does require reporting on imports of exempted goods, and it would be difficult to monitor such imports if import licenses were not required. Developed countries generally require import licenses also for imports of goods that are exempted under the Protocol regime, such as e.g. methyl bromide intended for quarantine and pre-shipment applications. It should also be taken into account that the quarantine and pre-shipment exemptions might be further restricted or abolished in the future.

Given the inherent difficulty in determining and monitoring the purpose of imported methyl bromide, NOUs may want to adopt other approaches. Several countries, for example, have prohibited the import and use of the small "two-pound" containers of methyl bromide, because they are particularly hard to track, both at the border and in their distribution and use.

5.3 FIRE SUPPRESSION (HALONS)

Halons are a class of chemicals used to suppress fires, particularly in buildings, factories, ships and airplanes. Halons disrupt fire both by depriving fuel of oxygen and interrupting a fire's chemical reactions. The most commonly used halons are halon-1211 (portable fire extinguishers), and halon-1301 (automatic systems). Halons are the most potent of all ODSs covered by the Montreal Protocol. Bromine released by halons destroys stratospheric ozone 50 times as efficiently as chlorine released by CFCs. Complicated reactions involving both

bromine and chlorine destroy ozone faster than would be the case for the two atoms separately. Halons' ozone depleting potential lasts 65 years in the atmosphere. And like methyl bromide, halons' primary applications virtually guarantee their widespread release into the atmosphere.

Developing countries that have ratified the Montreal Protocol are obliged to freeze halon production and consumption by 2002, achieve 50% reductions by 2005 and complete phase-out by 2010. Production of halons in developed countries ended by 1994 except for production for exports to developing countries. Major production facilities in developing countries (e.g. in China) are also being phased out, with assistance from the Multilateral Fund. Significant stockpiles remain to be used and stored in existing fire-extinguishing equipment worldwide.

BOX 5.6: PHASE-OUT SCHEDULE FOR HALONS IN ARTICLE 5 COUNTRIES

Annex A, Group II: Halons

Year	Freeze	50% Reduction	100% Phase-Out
1987	1 January 2002		
1990		1 January 2005	1 January 2010

5.3.1 ALTERNATIVES

Halon production worldwide is about to end and this will inevitably reduce the use of halons in most countries. Continued investments in halons and halon-based fire-fighting equipment will be ill advised, because they will not be supportable in the near future, and require short- to medium-term replacement in any case by non-halon alternatives.

As a first option, better fire protection strategies through, for example, use of flame retardant building materials, more careful planning of where to place high-risk equipment or activities, early warning and improved response time should be considered. When a fire protection agent is needed, return to water-based fire suppression systems may be appropriate in many cases. Water is non-toxic, relatively cheap, and produces no significant environmental harms. However, water clearly can harm electronics. Carbon dioxide systems may serve better in unpopulated areas where electronic systems or equipment are present. Foam flooding, dry powder, fine solid particulates, and aerosols all have been shown to be effective in many applications (see the *Technical Notes 1-3* produced by the UNEP Halon Technical Options Committee in Annex 2: Further Reading).

5.3.2 REPRESENTATIVE POLICY APPROACHES

Technical and policy challenges include responsible storage and distribution of existing stocks, improving fire containment and avoidance, retrofitting existing halon systems with non-ODS alternatives, developing alternative means of fire suppression, and de-commissioning and destroying existing halons and halon-based equipment. UNEP has developed an extensive and useful discussion of technical and policy approaches to controlling halons (see *Eliminating Dependency on Halons: Self-Help Guide for Low Consuming Countries* in Annex 2: Further Reading). Box 5.7 describes the elements for a halon management programme.

BOX 5.7: ELEMENTS FOR A HALON MANAGEMENT PROGRAMME

- Meet with members of the fire protection community and assess the uses of halons in your country and estimate the level of installed capacity;
- Build awareness of the problem of ozone depletion and the need to eliminate imports of newly-produced halons;
- Commit to phase out the use of halons for all but critical uses;
- Establish a national panel to identify and review critical uses;
- Reduce unnecessary emissions and uses of halons;
- Educate users and fire equipment companies to allow for a safe transition to alternative fire protection methods;
- Formulate standards for fire-fighting equipment;
- Develop a halon bank management programme to eliminate the need for newly manufactured halons; and
- End imports of newly-produced halons.

The halon stakeholder community includes public fire protection authorities, insurers, large-scale commercial and military users, fire equipment suppliers, and groups involved in writing standards and testing equipment. Convening representatives of these various stakeholders can help develop and implement an effective Halon Management Plan. Canada's Halon Roundtable, for example, is a voluntary forum with representatives from all major sectors of fire prevention and protection in Canada. Members include distributors, installers, and manufacturers of fire protection equipment, as well as certification agencies, legislators, environmental interest groups and users. The Halons Roundtable met on several occasions during 1992 and 1993 to develop a system for management of halon inventories in Canada. Achievements included the development of requirements for servicing companies and the reconditioning of equipment, and the establishment of a clearinghouse to track the movement of recycled halons in Canada.

The regulation of halons has followed similar patterns to those of other ODSs, with heavy reliance on import and export controls and on restrictions on their domestic use and production. Because halons have several very critical uses, many countries have adopted halon 'banks' as well. The following discussion outlines several common policy options for regulating halons.

5.3.2.1 Control Imports and Exports

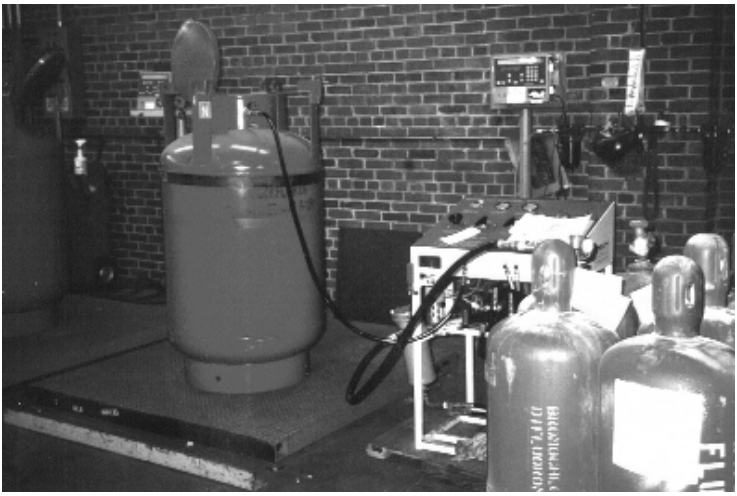
Given that production of halons worldwide is diminishing, countries can effectively cut off supply of halons by strict control over exports and imports. Thus, many countries have instituted outright prohibitions on imports of newly-produced halons. Singapore is one example. In addition to prohibiting halon-1301 in new fire protection systems, Singapore has prohibited the import of halon 1211, halon 1301 and halon 2402 and the import of fire extinguishers filled with halon 1211.

5.3.2.2 Require the Recovery, Recycling and Storage of Halons in Halon Banks

Because so many installed fire-suppression systems rely on halons, including ones for essential uses, halon markets will exist past the phase-out of production. Some developed countries have created physical halon "banks" to store and distribute existing stocks to meet long-term needs. The advantage of such banks is that regulators can keep close track of the sale and use, and at the same time ensure a legal source of halons to serve ongoing critical needs. One disadvantage is that someone has to carry the cost of destruction, when the banked halon is no longer needed. This has to be taken into account when structuring the bank, deciding who should be the owner of the banked halon, and determining how destruction is going to be financed.

BOX 5.8: HALON BANKING SUPPORT THROUGH THE ON-LINE HALON TRADER

A company that is seeking to trade or obtain recycled or decommissioned halons should first contact national halon banks inside and outside of its region. The next step should be to register with the On-line Halon Trader (www.halontrader.org), UNEP's "business to business" web portal that provides a virtual marketplace for banked halon by matching demand with supply. This site is designed for owners, managers and/or operators of fire protection systems, fire control services, companies and other organizations that use halons in applications for which there are no technically feasible alternatives ("critical uses"). Through this free service, users that need halon for critical applications ("halon seekers") are able to post listings of specific demand in a virtual "marketplace". Companies or halon banks that can meet this demand with recovered, reclaimed or recycled halon ("halon providers") can respond or post their own listings about halons available for exchange. UNEP provides the platform for this exchange and does not in any manner become party to the transaction between those who seek halons and those who provide halons.



A halon recovery unit in action transferring halon 1211 into a recovery cylinder. Recovery and banking of decommissioned or surplus halon is a key component of a halon management strategy.

The quantities of halons currently present in existing containers, portable fire extinguishers and mobile units are far greater than the quantities produced every year. This existing stock of halons becomes slowly available for recycling and reuse as installations are closed down or alternative fire protection measures are introduced. The halon bank is therefore a valuable asset that should be managed at the national level. Bank management consists of keeping track of halon quantities at each stage: initial filling, installation, recovery, recycling and recharging.

Halon banks take different forms in different countries. Most are not physical 'banks' with warehouses and storage tanks, but are inventories with a list of halon users who no longer require their extinguishing agents and of users who still require halons but do not have (or will not have in the future) sufficient stock. Halon bank management provides a method of matching the two. Some of the halon banks purchase halons, reclaim and resell them. Others keep a detailed inventory of stocks available at owners' premises and only a small amount is recycled and ready for reuse. This activity resembles an information clearinghouse. Such banks trade information on the availability of halons and leave the process of sale and purchase to the individuals concerned. Some halon banks require membership to participate in the trade. The key element of all halon banks, however, is that they become the sole available supply of halons, as import controls and other policy measures come into effect.

5.3.2.3 Restrict Halon Use to Narrowly Identified 'Critical Uses'

Critical uses should be identified or reviewed by a panel of independent technical experts after a comprehensive review of reasonably available alternatives and the importance of the use. Critical uses should be reviewed periodically to determine if new alternatives or other processes have been developed.

5.3.2.4 Ban or Control the Use of Halons for Testing or Training

Restricting the testing of halons will reduce unnecessary releases of halons to the atmosphere. This approach may require outreach and training efforts of those in the fire control industry, for example, to get them to reduce their testing of halon fire control systems.

5.3.2.5 Set Disposal and Use Standards

Given that halons will continue to exist in fire equipment and that some critical uses may require halons into the future, close management of halon stocks is required. This can be supported through specific and technical regulations requiring all practical measures to prevent unnecessary releases of the halons to the atmosphere. In addition, standards should be set to require appropriate disposal of any unwanted halons to either another qualified user or to a destruction facility. These standards could be set through a certification process, coupled with technical training. The certification would ensure:

- the implementation of a high standard of service, maintenance and training aimed at reducing accidental discharges or leakages of halons;
- undertaking a fire-risk assessment programme to minimize the likelihood of fires; which in turn would reduce the likelihood of halon discharges; and
- an environmentally safe method of disposal of the halons.

5.4 TERMINAL PHASE-OUT MANAGEMENT PLANS (TPMPS)

Some LVCs, especially small island countries, have the political will to move faster than the Montreal Protocol requirements and phase out their ODS use earlier than the dates stipulated in their Country Programmes. Such countries are prepared to take early action to achieve total ODS phase-out by eliminating their remaining consumption through the TPMP approach.

The TPMP is a multi-sector approach that uses a combination of technical and policy initiatives to address all remaining ODS-using sectors. It employs performance-based disbursements for the specific projects that will be identified within the plan as necessary to achieve zero consumption. The TPMP complements projects already approved and addresses ODS consumption that is not covered under existing CPs, RMPs and/or other projects. It builds on data already gathered in those projects and collects any missing data related to the remaining consumption. The TPMP also identifies a concrete strategy/action plan for complete phase-out.

After the preparation and approval of a TPMP, a country is not expected to return to the Multilateral Fund for any additional assistance as this project covers the remaining terminal (i.e. remaining) ODS consumption.

The steps in a TPMP are:

- Review the remaining consumption areas in the sectors of halon, aerosol, solvents and foams based on completed and on-going projects;
- Discuss and review consumption and steps for cooperation for phase-out with:
  - Industry sector, associations, government ministries, financial institutions (to explore revolving fund, loans, etc.);
  - Regional trade bodies and entities;
  - Countries in the region;
  - Countries supplying ODSs and ODS-containing products;
- Develop the plan with a timetable;
- Share the plan with stakeholders and get comments;
- Revise and finalize plan; and
- Submit the plan to the Executive Committee for comments and approval.

TPMPs are only appropriate for LVCs that also have consumption in sectors other than refrigeration and air conditioning and have made substantive progress in policy-setting under their RMPs.

6. COMPLIANCE MONITORING AND ENFORCEMENT

Almost every policy option discussed in Chapters 4 and 5 of this Handbook regarding the control of ODSs requires effective compliance monitoring and at least the credible threat of meaningful enforcement. Indeed, the ultimate effectiveness of any regulatory standard depends on broad voluntary compliance backed up by enforcement in the event of non-compliance. The threat of a strong, consistent enforcement programme will persuade the regulated community to comply consistently with prescribed standards.

The lack of meaningful enforcement of regulations undermines the government's credibility and makes the private sector adopt an attitude of "wait-and-see". At the same time, it provides a basis for corruption, which further reinforces the weakness of the regulatory tool. Enforcement may never be one hundred percent effective – but total effectiveness also may not be necessary. What is necessary is that a consistent and credible threat, and thus a clear signal, be sent to regulated communities that the government is taking compliance with the ODS management programme seriously. In this way, a culture of compliance can develop where most industry complies, confident that any non-compliers or 'free riders' will be pursued effectively through enforcement.

Viewing non-compliance only as intentional and punishable, however, may be misguided. Because enforcement is often seen as too adversarial, emphasis should also be placed on non-enforcement incentives for gaining compliance, including providing financial assistance and technical support. This requires taking an integrated, active approach that aims to identify and address the underlying sources of non-compliance co-operatively and in good faith. This integrated approach requires that regulators and affected groups should continuously or periodically re-evaluate their regulatory approach to suit the economic and political realities. Industry itself often asks for regulations and enforcement – it is important for them that everybody has to play according to the same rules. What should not change is the overall targets for ODS freeze and phase-out toward which regulations aim. These targets constitute binding international obligations and have been determined to be vital to the success of the Montreal Protocol and health of the stratospheric ozone layer.

BOX 6.1: OBJECTIVES FOR A COMPLIANCE AND ENFORCEMENT PROGRAMME

- Identify and correct conditions causing non-compliance;
- Deter non-compliance and persuade others to comply;
- Punish violators; and
- Create a culture of compliance with norms of expected behaviour.

A comprehensive approach to enforcement and compliance requires systematic and strategic planning. First, the regulated community must be clearly identified and data must be accumulated that can set the baseline for compliance monitoring and enforcement actions, if necessary. Second, applicable legislation must be clear and well publicized so that the regulated community is put on notice regarding compliance standards. Part of this effort should be to assess and identify the underlying causes of non-compliance, including whether such non-compliance is intentional, inadvertent or due to a lack of capacity. A systematic and effective compliance monitoring mechanism is critical both for assessing the causes of non-compliance and for triggering actions in specific cases to facilitate implementation or begin enforcement proceedings.

This implies that the law enforcement agency should receive the human and financial resources needed for the task, including the employment of basic detection material and risk assessment techniques. Customs, enforcement and judicial authorities must all be informed and trained with respect to the requirements.

Once substantial non-compliance is identified, the next phase is to select the appropriate government response. The comprehensive approach outlined here builds on a spectrum of regulatory responses, so that government can choose either more co-operative or confrontational approaches, as circumstances require. The focus should be on encouraging and persuading industry to comply continuously, rather than relying solely on dramatic, expensive and piecemeal punishments (although the credible threat of such sanction-based approaches forms an important part of an overall compliance strategy). Governments can decide whether to adopt facilitative approaches or more adversarial enforcement approaches, depending in part on the reasons believed to be leading to the non-compliance. The goal is to select approaches most likely to gain the highest levels of compliance over time.

BOX 6.2: STEPS FOR A COMPREHENSIVE COMPLIANCE AND ENFORCEMENT PROGRAMME

Step 1) Issue and publicize clear laws and regulations;

Step 2) Gather and assess information regarding the regulated community;

Step 3) Data collection, management and reporting;

Step 4) Establish an effective and comprehensive system of compliance monitoring;

Step 5) Identify and assess the underlying causes of non-compliance;

Step 6) Develop an implementation and enforcement plan, in light of causes of non-compliance and available resources;

Step 7) Select the appropriate facilitative or enforcement response and apply them in specific cases; and

Step 8) Evaluate current approaches and select future priorities.

6.1 ENSURE CLEAR AND REALISTIC LAWS AND REGULATIONS

Effective compliance monitoring and enforcement begins with effective, clear and realistic laws and regulations that are well known to the regulated community. The standards may be in either regulations or in permit or license conditions, but what is crucial is that the regulated community needs to know what is expected of them and by when. In this regard, the NOU could publish a national country handbook of all ODS-related rules and standards. Making these handbooks widely available will increase the likelihood that ODS users know about applicable standards. Also of particular importance is that the regulator realistically consider when the requirements should enter into force. There is, for instance, no point in requiring that all enterprises should have approved training and certification to conduct certain activities, before the necessary training and approval framework is in place.

In the ODS context, standards may take many forms, but in most cases the basis for these standards will be some permitting or licensing system in place either for the production, use, import or export of ODSs. ODS-related permits and licenses need to include appropriate information and need to be designed in a way that enhances country compliance with the Montreal Protocol regime. Box 6.3 provides some elements for issuing Enforceable Permits or Licenses. Import and export information, for example, is essential to calculating a country's ODS consumption, and ultimately for monitoring the effectiveness of control measures. In addition, each Party to the Montreal Protocol is required to submit to the Protocol's Secretariat an annual report on its ODS imports and exports.

BOX 6.3: SAMPLE CHECKLIST FOR DEVELOPING ENFORCEABLE PERMITS

General

- Is the length of time that the permit will be valid clearly stated? Is a date specified to indicate when an application for a new permit should be filed?
- Does the permit explicitly require modification if ownership of the facility or the contact information changes, or if the facility changes its ODS-related activities?
- Do the permit conditions conflict with conditions in any other permits that the facility has?
- Does the permit specify that it can be automatically revoked if the applicant deliberately submits false, misleading, or incomplete information during the application process?
- Does the permit state whether the owner or operator will be liable for noncompliance?

Requirements

- Are requirements with respect to ODS import, export, production or use clear and sufficient to ensure that the facility or user contributes to the ultimate compliance with the Montreal Protocol regime?
- Does the permit specify that the government can modify the permit if the underlying time schedules or other requirements change, including specifically changes in the Montreal Protocol regime accepted by the country?

Monitoring, Record Keeping, Reporting and Inspection

- Does the permit clearly state what and how often the facility or user is required to monitor? Do these requirements support the country's compliance with the reporting obligations of the Montreal Protocol?
- Does the permit make falsifying self-reporting data a separate enforceable violation?
- Does the permit clearly state what data, and in what format, the facility is required to record, report and maintain it?
- Will these data show whether or not a facility is in compliance with the ODS regulations? Will these data provide sufficient evidence to document a violation?
- Are the reporting requirements frequent enough to allow timely response to a violation? Is the facility required to retain information long enough for enforcement purposes?
- Does the permit make falsifying data or failing to maintain or report records a separate enforceable violation?
- Does the permit specify to whom the information is to be reported? Is the facility required to make records available upon request?
- Does the permit enable inspectors to gather data needed to determine compliance? Do these procedures cover entering a regulated facility, inspecting documents, and collecting samples?

Adapted from the US Environmental Protection Agency Enforcement Handbook, Table 3-7.

6.2 GATHER AND ASSESS INFORMATION REGARDING THE REGULATED COMMUNITY

Data collected from, and submitted by, a variety of sources, including reporting by industry, local and regional governments, customs officials and NGOs are critical for designing a compliance and enforcement programme. The NOU needs to think strategically in advance about the specific categories of information that will be necessary to develop and support a successful compliance and enforcement programme.

BOX 6.4: BASIC INFORMATION REQUIREMENTS FOR DESIGNING A COMPLIANCE AND ENFORCEMENT PROGRAMME

- Identifying information of the facility and contact name;
- Address or location;
- Description, including type and size of business or operation;
- Existing licenses or permits; and
- Types, quantities and uses of ODSs imported, produced, used or present at the site annually.

What is important is that the reports from various sources be integrated into a comprehensive and easily cross-checked database. Co-ordination and co-operation among and between the government, the public and regulated community will result in a more complete and useful database. Once the data is compiled and integrated, it can provide meaningful support for effective enforcement.

Many developing countries in implementing the Montreal Protocol regime already recognise the need for adequate data collection and management. Brazil, for example, received Multilateral Fund support to create a countrywide database of regulated firms. Data was supplied by relevant government agencies at the national and state levels, as well as NGOs in some states. Reaching out to NGOs to supplement available information is an important potential strategy for leveraging the data collection resources of the NOU. Regulators are of course always free to determine which information should be acted upon, but submissions from NGOs may alert the government to possible non-compliance.

BOX 6.5: METHODS FOR GAINING BASIC INFORMATION

- Inventories or surveys of the regulated community;
- Site visit or inspections;
- Permit or license applications;
- Registration with the NOU;
- Existing records in the environmental or other agencies (e.g., customs);
- Industry and trade association publications (e.g. sales reports);
- Civil society reports and investigations; and
- Information received from other countries or international organizations.

6.3 COLLECT, REPORT AND MONITOR DATA

Under the Montreal Protocol, developing countries have specific reporting requirements to both the Ozone Secretariat and the Multilateral Fund Secretariat. The data are used by the Parties to determine the country's compliance with the Montreal Protocol regime. The reporting requirements are also meant to assist the international community in monitoring each country's effectiveness in implementing and complying with the Protocol regime. Most countries have already taken steps at the national level to meet their international data collecting and reporting requirements. All Parties, including developing country Parties, have to submit annually data on production, imports and exports of ODSs in accordance with Article 7 of the Montreal Protocol. Developing country Parties receiving assistance from the Fund must also report annually on production, imports, exports and consumption (use) by sector. *The Handbook on Data Reporting under the Montreal Protocol and the Handbook on Methyl Bromide Reporting under the Montreal Protocol* provides detailed information on the data reporting obligations and procedures of the Protocol (see Annex 2: Further Reading).

Data collecting is also independently important to national efforts to design an effective ODS control programme. Indeed, it is the primary means by which countries can gain any certainty that their efforts and resources are properly targeted and ultimately effective. Monitoring and reporting are also relatively inexpensive when compared to implementing substantive environmental standards, so they can help to standardize the relationship between regulators and regulated. Long-term compliance requires that regulators and the regulated establish a relationship that includes accountability for data collection and reporting. Failures in this area may also reflect deeper issues of concern for implementing substantive regulatory goals.

BOX 6.6: OBJECTIVES FOR DATA COLLECTION

- Meet international obligations under the Montreal Protocol;
- Begin a dialogue between the regulators and the regulated community;
- Build a credible database of ODS use and users;
- Provide information for the design of policy measures;
- Monitor compliance through self-reporting;
- Identify compliance challenges and prioritize enforcement actions; and
- Evaluate the effectiveness of existing policy measures.

Data can be generated from a variety of sources, including government monitoring and self-reporting by industry, local and regional government, customs officials, etc. Self-reporting is probably the most important way in which governments receive ODS information as well as other environmental information. Ensuring the objectivity and validity of self-reported data is critical to ensuring the integrity of the entire regulatory system. Thus, in many systems failure to report or knowingly reporting false data often carries the strongest fines and penalties, including criminal fines and sanctions.

Also important is that the government has the resources and mandate to verify incoming data and integrate it into a comprehensive and easily cross-checked database. If the data

gathering and database are well designed, regulators can get meaningful answers to specific questions, which can assist them in evaluating and improving ongoing policy initiatives.

6.4 MONITOR COMPLIANCE

The importance of adequate compliance monitoring cannot be under-estimated. Compliance monitoring helps government agencies to:

- Detect and correct violations;
- Ensure the adequacy of self-reported data;
- Gather evidence to support enforcement actions; and
- Evaluate programme progress by establishing compliance status.

Compliance monitoring is not easy, particularly in the ODS context where many different enterprises or individuals are involved. Where regulators target a small number of large, easily identifiable economic actors, compliance monitoring may be relatively straightforward. On the other hand, the smaller, more numerous and widely-dispersed the regulated community, the greater the challenge.

Institutions entrusted with monitoring functions vary considerably from country to country. Some developing countries have centralized monitoring mechanisms in government agencies or institutes. Others use existing decentralised networks – including public and private entities – typically co-ordinated and funded by public entities. Because governments often lack the human and financial resources to undertake comprehensive on-site monitoring, a combination of self-reporting and government inspection requirements may be more appropriate for environmental monitoring in general, and ODS monitoring in particular. NOUs should also look for ways to supplement compliance monitoring resources by seeking out and responding to civil society complaints or reports.

BOX 6.7: MECHANISMS TO MONITOR COMPLIANCE

- Self-reporting;
- On-site monitoring and inspections;
- Annual technical audits;
- Customs data;
- Import/export licensing data;
- Permitting data;
- Citizen complaints or reports;
- Establishing monitoring committees; and
- Participate in regional/international co-operation and information exchange.

Compliance monitoring requires an integrated and comprehensive approach, using all of these approaches. Gathering information on compliance should be one of the highest priorities of the NOUs. How the information is used may vary; it may not always, or even

frequently, lead to formal enforcement actions. Accurately represented and current compliance information, however, will empower the NOU to take necessary steps to improve compliance.

BOX 6.8: COMPLIANCE MONITORING IN INDIA

India requires every regulated entity to monitor and report on its respective activities with regard to ODSs. As a result, India's monitoring and reporting requirements cover a wide range of activities such as ODS production and sale, imports and exports, and destruction. Further, each record is to be made available for inspection at any "reasonable time" on request by an officer of the relevant authority. In practice, however, India has especially focused its compliance monitoring efforts on both wholesalers of ODSs and on those companies that receive support from the Multilateral Fund. The government's Ozone Cell established a monitoring mechanism that includes an advisory, multi-stakeholder Monitoring and Evaluation Sub Committee. This committee is comprised of representatives from the Multilateral Fund's implementing agencies, relevant Indian Ministries and industry representatives. The committee contributed significantly to the development of detailed formats for the evaluation of investment and non-investment projects in India financed by the Multilateral Fund. These projects are regularly (3–4 times per year) subjected to on-site inspection covering both project completion reports and the destruction of ODSs. As of July 2001 on-site visits of already-completed projects were being organized regularly, so as to ensure that companies had not reverted back to using ODSs and that the new technology had been installed. India's ozone monitoring mechanism, especially pertaining to the projects funded by the Montreal Fund, represents a good example of public-private sector partnership on environmental management.

6.4.1 SELF-REPORTING

Self-reporting is the bedrock of any compliance or enforcement system. No government agency, even in developed countries, has sufficient resources to monitor compliance of all the regulated community. This is usually the case with ODS, where a large number of users are involved. Governments must rely on regulated communities to report valid information. Government resources should then be targeted to 'spot-check' the completeness and veracity of data provided in industry-generated reports. Critical to making such a system work is the credible threat of serious enforcement actions, particularly if false or misleading reports are submitted. Indeed, in many circumstances misrepresenting data to the government on environmental reports should lead to the most serious enforcement actions, including even criminal sanctions.

National reports are also required by the Montreal Protocol, so many countries already have reporting requirements written into their national laws. The United States, for example, requires that manufacturers of ODSs keep daily records and submit quarterly reports to the US Environmental Protection Agency (USEPA). In addition, importers of ODSs must also inform the USEPA of the quantity of ODSs imported by them as well as the country of origin. The latter is particularly important because imports from countries that are not Parties to the Protocol are prohibited under the Protocol's terms. In the European Union, each producer, importer and exporter of controlled substances is obliged to report to the European Commission annually (with copies sent to the competent authorities of the relevant EU Member State). The reports' content includes, for example:

- The producer's total annual production of each controlled substance and quantities recycled, reclaimed or destroyed with reference to the preceding 12 months;

- The importer's total annual released quantities of controlled substances in the EU, or total annual imports of controlled substances; and
- The exporter's total annual exports of controlled substances from the EU, including re-exported substances.

6.4.2 MONITOR THROUGH REPORTS FROM IMPORTERS AND EXPORTERS

Many countries have chosen to monitor ODS consumption through customs and trade statistics, as import and export data provide a measurement of a country's total consumption of ODSs (if the country does not produce ODS). Traditionally, customs statistics have not provided the reliable data on ODS import and export. The reasoning for this is described in the *Handbook on Data Reporting and Resource Module on ODS Import/Export Licensing Systems* (see Annex 2: Further Reading) A licensing system should require all importers and exporters to report directly to the competent authority on their ODS imports and exports. Identifying importers and exporters also provides an initial channel for identifying end users.

6.4.3 CONDUCT ON-SITE MONITORING AND INSPECTIONS

At least part of any compliance-monitoring programme should be ensuring the authority and resources for on-site inspections. Such inspections are critical for creating a culture of compliance and giving regulated communities confidence that governments are paying attention and are committed. Even the credible threat of such inspections can help to provide incentives for compliance.

BOX 6.9: GOALS OF ON-SITE INSPECTIONS

- Identifying specific environmental problems, for example the improper use, storage or disposal of ODS, and making the facility operator aware of such problems;
- Developing a relationship between the enforcement officials and the ODS users or producers;
- Gathering information to determine a facility's compliance status and evidence for enforcement;
- Ensuring the quality of self-reported data;
- Demonstrating the government's commitment to compliance by creating a credible presence; and
- Checking on whether facilities that have been ordered to change their behaviour have done so.

In most cases, NOUs will not have the resources to inspect every importer, producer and/or user of ODS. To overcome this limitation, local and regional authorities should be engaged to the extent possible. The government authorities will need to prioritize inspection activities to meet specific objectives. For example, inspections might be targeted where they are likely to have the largest impact on reducing ODSs. Facilities or users that have a strong compliance history may not need as frequent inspections; on the other hand, those who have frequently been out of compliance will probably warrant a higher priority on the inspection list and more frequent scrutiny. NOUs can also husband scarce resources by 'tiering' inspections. Beginning first with document reviews or spot-checks of self-reported data that are less intensive than full inspections allows the inspectors to screen the regulated community at a lower cost. Every inspection also need

not address every aspect of compliance; having a presence at many different facilities may do more to demonstrate government commitment to enforcement and compliance, than will a few more thorough inspections.

BOX 6.10: REPRESENTATIVE CHECKLIST FOR INSPECTIONS

- Does the facility have a current permit, license, authorization, registration or certification?
- Have they installed any required equipment?
- Is the equipment being operated correctly?
- Have personnel been properly trained or certified?
- Are records of self-reported data properly prepared and maintained?
- Are ODSs and ODS-using equipment properly labelled?
- Are there any signs of wilful violations of ODS standards or rules?

Governments will also need to provide technical support, training and resources to inspectors. Inspectors will be the front lines of any compliance strategy for ODSs and will need to be well-informed on how to identify and distinguish the various ODSs, as well as the approved uses and standards applicable for each.

NOUs may also want to co-ordinate with the inspectors for other environmental or public health agencies. To the extent possible, agencies may want to consolidate the inspection function or at least share information regarding regulated facilities. In some countries (e.g. in Australia and Sweden), industry associations actually assist the government with inspections. An increasing number of countries, including some developing countries, are moving their environmental monitoring and compliance programmes towards multi-faceted monitoring and reporting. In such cases, on-site inspections should also move in the direction of each site being subject to multi-faceted inspections, where appropriate, instead of separate visits (and separate inspectors). Such a comprehensive approach would arguably provide the administration with a more wide-ranging picture of a given site's environmental performance, presumably at lower cost – one inspection/one trip rather than several inspectors, trips and paperwork during the year.

6.4.4 ENGAGE CIVIL SOCIETY IN COMPLIANCE MONITORING

Government regulators can expand the amount of resources enlisted in the effort to monitor or regulate ODSs by orienting their policies toward the public, including environmental NGOs. Thus, NOUs can increase the effectiveness and reach of compliance monitoring efforts by enlisting the help of concerned citizens. 'Hotlines' for citizens to call with information about violations of ODS laws or policies are one possible informal way to involve members of the public. Some policies, such as consumer labeling requirements, can facilitate citizen oversight.

6.5 CONTROL ILLEGAL TRADE IN OZONE DEPLETING SUBSTANCES

Illegal trade in all categories of ODSs, but specifically for CFCs in developing countries is a main concern that the NOU should consider when developing a compliance and

enforcement programme. Excessive market demands provide breeding conditions for organized crime, smuggling and corruption that flourish where financial and human resources render effective law enforcement impossible. Controlling illegal trade is a difficult task requiring investments in customs resources, including training and equipment, and the availability of intelligence, including monitoring of price movements and trade patterns (see *Training Manual for Customs Officers and OzonAction Newsletter Special Supplement on Illegal Trade* in Annex 2: Further Reading). Co-operation between enforcement authorities in exporting, importing and transit countries is also critical for combatting illegal trade. Most customs administrations are part of one of the World Customs Organisation (WCO) legal instruments, which facilitates the international exchange of information and intelligence on customs offences. Multi-agency approaches, both nationally and internationally (e.g. task forces) can also improve sharing intelligence and experience.

BOX 6.11: MAJOR METHODS OF ILLEGAL TRADE

- Mislabelling of containers;
- Concealment of material;
- Disguise: e.g. deliberate contamination to make the material appear as recycled; and
- Diversion of material, either imported or in transit, from legal destinations (e.g. for essential uses/re-export) to the domestic market, with false documentation.

Seized boat and containers from a thwarted attempt to smuggle CFC-12 into Miami, Florida, United States. Illegal trade of ODS threatens the ozone protection successes already achieved and must be fought with targeted policies and enforcement.

One of the best strategies for an effective fight against environmental crime is to stop their illegal movement at the national border before entering or leaving the country. The role of customs is crucial to this. Most customs administrations are part of one of the WCO legal instruments, which creates a legal or administrative basis for international exchange of information and intelligence on customs offences.

BOX 6.12: MEASURES TO INCREASE CUSTOMS CAPACITY TO DETECT ILLEGAL TRADE

- List the most commonly traded ODS under separate HS codes (Harmonised System), including the development of specific customs codes for ODS mixtures;
- Develop a licensing system for import, exports and transit of ODS (and ODS containing equipment) and apply it rigorously; and
- Customs services should be furnished with sufficient authority for intelligence, investigation, and detection equipment and supported through relevant training programmes.

Effective enforcement is crucial to the prevention of illegal trade. Intelligence led policing is a proactive approach using intelligence and analysis of the crime area to identify high-risk shipments / companies and criminals / criminal organizations for targeted investigation. Targeting through risk assessment techniques enables the enforcement agency to assess the probability that goods being processed through customs control have not been legally entered or declared. It helps customs to identify potential or suspected persons, vehicles or goods in advance for further examination.

BOX 6.13: MEASURES AT THE NATIONAL LEVEL TO ENCOURAGE ENFORCEMENT

The following measures can be taken at the national level to encourage enforcement:

- Establish registers of traders in ODS to facilitate work of enforcement agencies;
- Develop national statistics to assess the size of illegal cases and the seriousness of offences;
- Organise close collaboration between enforcement agencies including customs services, NOU, environment / trade inspectorates, police and judiciary;
- Provide training for all enforcement agencies officers (including prosecutors / judges), e.g. at National Police Academies;
- Appoint special investigative agents and/or station environment officials at a countries main entry points who can work together with customs officials;
- Provide for real-time data on imports and combine it with automatic alerts from customs agents when goods cross the border;
- Employ risk assessment techniques; and
- Establish regional and international networks of environment and enforcement officials.

6.6 IDENTIFY AND ASSESS THE UNDERLYING CAUSES OF NON-COMPLIANCE

As discussed previously, in many developing countries, environmental laws and regulations are often not implemented well. This can be due to a host of factors such as lack of political

will, unclear regulatory standards, bribery, inefficient monitoring and verification of compliance, or a lack of sufficient institutional capacity for enforcement. Even in countries with considerable enforcement and implementation challenges, NOUs should emphasize this part of the national ODS management programme.

Because potential enforcement responses can vary considerably, the NOUs need to identify the major causes of non-compliance in each sector or portion of the market for each ODS. The goal of the enforcement system is not primarily to punish, except as punishment deters future non-compliance in the regulated community. Where the underlying causes of non-compliance are unrealistic requirements (e.g. with regard to the time of entering in force, as mentioned in section 6.1) or a lack of capacity rather than a lack of will, no amount of punishment is going to improve compliance short of shutting down the activity. It is best to work with the regulated community to overcome the specific obstacles to compliance.

BOX 6.14: POSSIBLE CAUSES OF NON-COMPLIANCE

- Lack of technical capacity or financial resources to comply with the standards;
- Technological impossibility of compliance;
- Unrealistic legal requirements (e.g. regarding date of entering into force);
- Lack of knowledge regarding the applicable standards or norms;
- Accidental noncompliance;
- Deliberate and intentional noncompliance.

6.7 DEVELOP AN IMPLEMENTATION AND ENFORCEMENT PLAN

No government has sufficient resources to undertake all of the implementation and enforcement actions that could plausibly improve compliance in their regulated community. Some choices will need to be made, and priorities set, to ensure the 'biggest bang' for the available enforcement resources. Such priority setting should be completed through a strategic enforcement plan designed to answer questions such as:

- How should limited resources be apportioned between enforcement of non-compliance and measures aimed at facilitating compliance?
- Which facilities should be inspected and how frequently? and
- Which violations should be responded to and how?

When setting priorities, policymakers may have to balance several important objectives. For example, often 20% or less of the regulated community causes 80% or more of the pollution. By targeting the largest users, producers and polluters, governments can achieve the most reduction in pollution with the least resources. For this reason, some developed and many developing countries in regulating ODSs have initially targeted the largest ODS producers or importers. Such an approach is really only effective when the regulated community consists of a small, easily identifiable number of actors, which may not be the case for many ODS sectors. Thus, NOUs focussing on the larger ODS producers or consumers should not neglect efforts to phase-out the ODS consumption in sectors that are dominated by small-scale users and where more time is needed.

As the implementation challenge moves towards small and medium scale enterprises and individual users, as is the case with the refrigeration servicing sector and solvent and methyl bromide applications, monitoring compliance with ODS regulations becomes more difficult. Even where small firms do not willfully violate laws and regulations, they may be less well informed and aware of the requirements and impact of their obligations. They may also not have sufficient financial resources to make their operations ODS-free. As a result, regulators may need to promote SMEs' compliance through outreach and awareness raising initiatives – including training workshops on ODS alternatives, collection, recycling and/or destruction. Training and capacity-building initiatives in developing countries are often supported by the Multilateral Fund's non-investment project activities or through financing of specific incremental costs on the use of ODSs by SMEs (for manufacturing an intermediate good). Many developing countries like Brazil, Mexico, and India have promoted compliance through facilitative approaches rather than emphasizing a compliance strategy based on enforcement.

Other objectives of an enforcement programme may lead the government to prioritize other parts of the regulated community – particularly where the enforcement challenge involves hundreds of relatively small ODS users. Among the different objectives for enforcement are:

- Meeting the required reductions under the Protocol, which will require addressing all ODS users, including the widespread small-scale users;
- Protecting and restoring environmental quality and public health;
- Preserving the integrity of the substantive programme, for example by ensuring that data-gathering and reporting are effectively implemented;
- Preserving the integrity of the enforcement programme, by for example maintaining at least some enforcement presence in all of the different sectors; and
- Leveraging programme resources by focusing on activities that attract the largest press or media attention.

6.8 SELECT THE IMPLEMENTATION OR ENFORCEMENT APPROACH

After all of the compliance monitoring and the enforcement programme planning has been completed, there still remains the task of actually responding to individual cases of non-compliance – i.e. the enforcement response. The first step is to recognize that a broad range of tools and response measures are available to facilitate, persuade or ultimately coerce a violator into compliance. The best response measure could depend on a number of different factors, including the gravity of the violation, the frequency of violation, the complexity for the violator to achieve compliance, or the willfulness of the violator in ignoring the ODS regulations. Response measures may also vary according to the different goals of the enforcement activity (see Box 6.15).

BOX 6.15: PURPOSES OF ENFORCEMENT RESPONSE MECHANISMS

- Return violators to compliance;
- Impose a sanction;
- Remove the economic incentive of noncompliance;
- Gather additional information through testing, monitoring or reporting obligations;
- Raise awareness of the ODS regulations and publicize the governments response to non-compliance;
- Offset environmental or public health damages or pay for environmental restoration; and
- Correct internal company management problems.

Enforcement responses may be either informal or formal. Informal responses can be nothing more than, for example, a telephone call, a warning letter or an official notice of violation. These informal mechanisms are inexpensive for the NOU to use and can often be effective in informing the person or facility that they are out of compliance. In many instances, at least where more formal enforcement is a credible threat, such informal steps will result in the requisite behavioral change.

Where informal mechanisms do not work, government officials may need to move toward more formal enforcement measures. Two general approaches can be taken to the enforcement of environmental laws. The first approach emphasizes facilitative mechanisms developed in co-operation with the regulated actors. The second approach uses formal prosecutions and penalties to punish and deter non-compliance. This second approach requires clear obligations and formal rules of investigation and prosecution to be fair and workable.

6.8.1 FACILITATIVE (NON-SANCTIONING) APPROACHES

Many developing countries (e.g. Mexico, Philippines, Brazil, etc.) have been increasingly taking a facilitative approach to non-compliance. Such alternatives may include requirements to undergo training or take other measures to cure a defect in the facility's operations. In some cases, the government may provide technical support or advice giving facility managers access to expertise necessary to achieve compliance.

BOX 6.16: EXAMPLES OF FACILITATIVE RESPONSES TO NON-COMPLIANCE

- Financial support
- Technical assistance and support to come into compliance; and
- Awareness-raising initiatives, including training of regulated parties.

6.8.2 CIVIL SANCTIONS FOR NON-COMPLIANCE

Notwithstanding the flexible and innovative approaches to compliance mentioned above, more traditional enforcement tools may still be needed to prevent, deter and punish non-compliance with ODS regulations. In order to ensure a level playing field between regulated industries, the threat of significant sanctions guarantees that free riding is not acceptable

and that authorities are indeed serious about implementing the ODS plan and regulations. Non-compliance consequences should of course reflect each country's prevailing circumstances in terms of overall political will towards enforcement and administrative and judicial capacity. Non-compliance consequences may include, inter alia:

- Revoking a facility's authorization to operate;
- Imposing administrative or civil fines;
- Imposing non-monetary penalties;
- Withholding financial assistance or revoking the company's eligibility for government contracts; and/or
- Requiring new operating conditions or closing down certain processes that use ODSs.

6.8.2.1 Revoking Authorization to Operate

One of the most serious and controversial enforcement actions is revoking the permit, license or other authorization to operate a particular facility. Such revocations are rare in most environmental circumstances, because the negative impact on local employment or other considerations leads to compromises (often involving long-term compliance schedules tailored to the individual needs of the facility). Given the Montreal Protocol regime's emphasis on phasing out ODSs and ODS-reliant technologies under tight time frames, some closures of operating facilities may be unavoidable. Indeed, this may be the only action that will send sufficiently strong and credible signals to the rest of the regulated community. Where substantial numbers of closures are expected, the government should also consider employment re-training programmes or programmes aimed at finding other jobs for the employees.

6.8.2.2 Imposing Civil Fines

Civil fines are the most common form of sanction. Fines should be set sufficiently high to provide a disincentive to companies to continue to ignore the ODS regulations. For this reason, fines could be continuous, for example making every day an additional fine. In that way, companies cannot just pay the fine and continue to operate in violation of the ODS laws.

BOX 6.17: FACTORS FOR CALCULATING FINES

- Volume and impact of ODS release or violation;
- History of non-compliance of facility or user;
- Importance of maintaining the integrity of the enforcement regime or for creating a 'culture of compliance';
- Economic benefit gained from non-compliance;
- Ability to pay the penalty or fine;
- Whether the violation was intentional;
- Likelihood of repeat violations;
- Degree of co-operation by the facility personnel; and
- Strength of the case for prosecution.

In the United States, for example, the Environmental Protection Agency (USEPA) has the legal authority to take enforcement action to seek civil penalties of US$25,000 per day per violation. Annually, a company could be exposed to over US$9,000,000 in fines, which might be considered too much for relatively minor violations. On the other hand, US$25,000 for many larger companies may not be enough to persuade changes in behavior necessary to bring the company into compliance. The USEPA resolved the dilemma by declaring that each kilogram above the allowed limits would be considered a separate violation. In this way, USEPA directly related the penalty to the amount of ODSs and provided strong incentives to protect the environment.

6.8.3 CRIMINAL ENFORCEMENT

Criminal enforcement of environmental laws is also an important tool. Criminal sanctions are typically more severe than civil ones, and may involve actual prison time for willful violators, including executives of corporations found to be gross non-compliers. Criminal sanctions should be used sparingly and only when no other mechanisms will work to achieve the overall enforcement goals. Because of the stakes involved for individuals and corporations, officials at the highest possible levels of government should provide leadership in making clear that criminal enforcement of environmental laws will be pursued seriously and should be willing to stand behind the specific application of criminal sanctions. In many countries, criminal sanctions are used primarily where there has been intentional endangerment of public health or the environment, when a company is openly and publicly violating the law, or when the company is caught lying systematically in their self-reporting. This latter application of criminal enforcement may be the most important, because the integrity of the entire compliance regime for ODS regulation is typically dependent on the adequacy of self-reporting information given to the government. Criminal sanctions may be the most effective for ensuring broad adherence to the reporting requirements.

Criminal sanctions should also be available for addressing those who knowingly participate in the illegal (“black market”) trade in ODSs in violation of the phase-out schedules. Black-market purchase and sale and import and export are serious threats to the integrity of ODS regulatory systems, as these measures ultimately form the core of most policy approaches to complying with the Montreal Protocol.

Strict criminal enforcement of any regulations, including reporting rules, is not without its disadvantages. Enforcement is expensive and potentially corrosive to constructive, co-operative and voluntary relationships between government and regulated communities. Civil proceedings may be more likely to induce settlement and ultimately compliance, because the stakes are lower for executives (no prospect of jail sentences). Information that might otherwise come from industry may be withheld because of fears that it would facilitate criminal investigations and sanctions. Companies may even be less likely to conduct internal audits into their own practices, because of a fear they may uncover information that will spark a criminal investigation.

6.9 OBTAIN SUPPORT FOR THE COMPLIANCE AND ENFORCEMENT PROGRAMME

Funding can be a problem for all government regulatory activities in developing countries, but the situation can be the worst for enforcement activities. The political will to actually enforce laws and regulations is often particularly weak, as industry and others may

constantly push for non-adversarial approaches. Moreover, reducing the budget is a low-profile way of undermining effective enforcement operations. Box 6.18 describes a variety of funding options for enforcement programmes. In addition to general revenues, many countries earmark revenues created through the collection of fines or fees (for example to cover the costs of permitting, inspections or modifications).

BOX 6.18: SOURCES OF FUNDING FOR AN ENFORCEMENT PROGRAMME

- General revenues;
- Pollution taxes or fees;
- Inspection charges or fees;
- Permit, license or registration fees;
- Monetary penalties or fines; and
- International assistance.

In addition to financial support, NOUs may want to seek outside technical assistance and support. The International Network for Environmental Compliance and Enforcement (INECE) is one such place for support. This global network organizes periodic meetings of enforcement officials and provides other technical advice and support (see Annex 1: Useful Contacts).

6.10 EVALUATE THE COMPLIANCE AND ENFORCEMENT PROGRAMME

NOUs should plan to evaluate their compliance and enforcement programmes periodically. This can help enforcement officials internally to maintain consistency over enforcement activities and to inform the public that the government is taking enforcement seriously (assuming that they have been active). The primary goal of evaluating the compliance and enforcement programme will be to provide feedback and identify remedial measures to ensure that the country complies with the Montreal Protocol's ODS phase-out obligations.

BOX 6.19: OBJECTIVES FOR EVALUATING COMPLIANCE AND ENFORCEMENT PROGRAMMES

- Evaluate programme strategies for their effectiveness in reducing ODS use;
- Monitor programme personnel performance;
- Ensure consistency and balance in implementation of the ODS regulations;
- Increase deterrence impact by raising awareness of enforcement activities to the regulated community; and
- Provide accountability to the public (or in some cases the Parliament) regarding the implementation of ODS laws.

7. A REVIEW: SIX STEPS FOR DEVELOPING A NATIONAL ODS POLICY FRAMEWORK AND IMPLEMENTATION PLAN

In this chapter, we identify six major steps that provide a comprehensive roadmap for developing and implementing an ODS management programme. The major steps are identified below in Box 7.1. Many of them have been discussed or implied in previous chapters.

BOX 7.1: MAJOR STEPS IN THE ODS POLICYMAKING PROCESS

Step 1) Survey ODS production and use patterns

Step 2) Design the policy framework

Step 3) Obtain the necessary support and resources

Step 4) Launch the regulatory programme

Step 5) Monitor compliance and enforcement

Step 6) Develop an effective feedback loop

7.1 STEP ONE: SURVEY ODS PRODUCTION AND USE PATTERNS

One of the first practical steps that must be taken by the NOUs is to survey the ODS production and use pattern. The ultimate goal of the ODS policy framework is set by the Montreal Protocol regime's schedule for phase-out of ODS consumption (taking into account the country's ratification of the various amendments). As described further in Section 2.1, NOUs will need to have a clear picture on how the ODS consumption is distributed, what reductions are need in each sub-sector to meet the Protocol's requirements and an approximate idea on the time needed to achieve these reductions to target and allocate its limited resources in an effective way.

7.2 STEP TWO: DESIGN THE POLICY FRAMEWORK

With basic information about the production and use of ODSs in the country and having the benefit of participatory dialogue with the public and the regulated community, the NOU will be ready to develop the ozone protection policy framework. The NOU will likely select more than one policy option from the menu of policies discussed in Chapter 4. The policy mix must be reinforcing, and reflect current policy approaches and practices, with the long-term goal of sending consistent signals to ODS producers and users that ODSs will be phased out according to the Montreal Protocol schedule. The entire ODS management programme,

from the design to the enforcement, must leave no room for mixed signals that the government is serious about meeting the Montreal Protocol timeframes.

As described in Section 2.5, the NOU should take a multi-stakeholder approach to developing the policy framework for managing ozone protection. Strategically thinking about who, how and when to target different stakeholders is critical to the ultimate success of the ODS management plan. Government leaders, industry groups, and the public form distinct and valuable targets for such efforts. Many mechanisms can work here – workshops, training, awards recognizing environmental responsibility, advertising, consumer labeling, etc. Each mechanism serves a different purpose and should be used at different stages in the regulatory process. The NOU should thus develop an explicit plan for public outreach that will strategically and effectively involve the public and the regulated community at each stage in the development and implementation of the programme.

The programme should be circulated in draft, allowing sufficient time for comment from both the regulated community and the general public. The NOU should also build in time to review the comments and to respond substantively to any suggestions or recommendations, even those that are not accepted. Stakeholders that take the time to make comments on draft programme or policies deserve the respect of a considered response. This process will also help to legitimize the programme and will add to the political buy-in that stakeholders feel toward the programme.

7.3 STEP THREE: OBTAIN THE NECESSARY SUPPORT AND RESOURCES

Once a draft policy framework and implementation plan has been developed, the NOU needs to evaluate early and honestly the resource needs for the effective implementation of the selected policies. At this stage, the NOU should be able to identify sufficient resources or at least have a plan of where they will be able to get those resources in the future (for example, from national budgets or from international sources).

As discussed in Section 2.2 of the Handbook, the NOU will need to review and assess existing institutions and policies with some responsibility or relationship to ODS management. The most effective ODS management programme will fit within the unique circumstances of each country's governmental and legal framework – while still achieving the requirements of the Montreal Protocol regime. To the extent that ODS management can be accomplished without introducing wholly new approaches, institutions or policies, the NOUs will be more likely to have broad support for their programme. The NOUs should also seek proactively to strengthen the political will and public support for the implementation of the ODS policies and compliance with the Montreal Protocol regime (as discussed in Sections 2.1 and 2.4).

7.4 STEP FOUR: LAUNCH THE REGULATORY PROGRAMME

Once the programme is developed on paper, it needs to be implemented. This implementation is a long-term process that involves compliance monitoring and enforcement. How the programme is launched in the beginning, however, can be critical to its success.

First, the actual announcement of the launch of the programme should be part of the effort to send the signal that the government is serious about phasing out ODSs. Proactive use of

the media and other outreach strategies as discussed in Section 2.4 are potentially important for giving the programme momentum from the beginning.

Second, after the initial launch, the NOU should begin a proactive effort to inform the public and particularly the regulated community about the new standards that will be required. This education process is critical and should target the specific producers or users who will be expected to comply with the management programme. The NOU should build in some time in the implementation schedule to reflect how long it will take to 'get the word' out about new requirements. Ignoring this initial phase of dialogue can lead to increased problems with compliance and enforcement later in the year.

Third, the programme should be phased in with the aim of reducing the short-term dislocation costs on industry. Industry should be given sufficient time to make the technical and personnel changes that will be required for the types of changes required by the programme. The programme's implementation schedule should take into account the needs to retrain or relocate personnel, the need to make capital investments in new technologies, and changes in production processes.

7.5 STEP FIVE: MONITOR COMPLIANCE AND ENFORCEMENT

As discussed in Chapter 6, the NOU must develop and implement a compliance monitoring and enforcement plan. This plan is critical for ensuring that ODS users and producers are taking the ODS management programme seriously. Although the ideal situation is 100% compliance so that enforcement is not necessary, this is almost never the case at least in the absence of a credible threat of enforcement. Moreover, bringing successful enforcement actions against all non-compliers would also be ideal, but is probably unobtainable. What is obtainable is creating the perception that a credible threat of enforcement for non-compliance exists and making it difficult for the ODS producers or users to predict whether they will be the target of enforcement actions or not. It is the credible threat of enforcement that provides the broadest deterrence, rather than the actual enforcement actions themselves.

7.6 STEP SIX: DEVELOP AN EFFECTIVE FEEDBACK LOOP

Periodically, perhaps annually or biannually, the entire ODS management programme's effectiveness should be reviewed and evaluated. In this way, the NOU can determine what is working and what is not working in moving the country toward ODS phase-out in accordance with the Montreal Protocol regime. Ideally, someone outside the NOU should undertake the assessment to gain an independent perspective. The assessment should reflect the views of different stakeholders and should make specific recommendations for the future direction of the management programme. This assessment should then feed back into the development of a revised management programme.

7.7 OBTAIN SPECIFIC ADVICE

Effective national policy frameworks are particularly critical during the compliance period of the Montreal Protocol. Without effective policy setting and enforcement, investments in technologies, skills and systems to phase out ODS may be jeopardised. Direct, practical advice is needed for NOUs and policy drafters to understand the key lessons learned by their counterparts in developing and developed countries. UNEP's OzonAction Programme has

put into place a number of mechanisms to share policy-related experiences with the long-term objective of helping developing countries achieve sustained compliance. There are resources available to NOUs to help them meet these challenges.

7.7.1 POLICY AND ENFORCEMENT OFFICERS (PEOS)

As part of the Compliance Assistance Programme, the PEOs in UNEP's Regional Offices are available to provide direct assistance to help Article 5 countries meet their specific policy-setting challenges. The PEOs are available to provide expert advice, answer questions and provide information to support NOUs and other government stakeholders involved in policy formulation, implementation or enforcement. NOUs wishing to access these services should contact the PEO in their region (see Annex 1: Useful Contacts)

7.7.2 REGIONAL NETWORK CO-ORDINATORS (RNCS) AND REGIONAL NETWORKS

RNCs are another resource available through the Compliance Assistance Programme to help NOUs with policy development and many other issues. The RNCs can provide direct assistance to NOUs and they can also mobilize additional support through the Regional Networks of ODS Officers if required. For example, if a country has a specific policy challenge that is proving difficult to resolve, the issue could be discussed or addressed through a special session at a Network meeting. Special "help groups" could be formed in the margins of Network meetings with other NOUs from the region and/or Implementing Agencies, bilateral agencies or external experts to help the country address its problem. NOUs wishing to access these services should contact the RNC in their region (see Annex 1: Useful Contacts)

7.7.3 POLICY MENTORS

RNCs and PEOs can also help identify and secure individualized "expert-to-expert" policy assistance through the voluntary "Policy Mentor Programme". Through this mechanism, a developed or developing country "mentor" will be partnered with a counterpart in an Article 5 country (e.g. a government legal expert) who needs specific advice and information to support their country's policy- setting under the Protocol. The Mentor would make him/herself available on a regular basis to answer questions posed by the Article 5 counterpart, provide advice and insights and to share his/her experiences with effective policy-setting. Additional support could be provided as negotiated between the Mentor and the Article 5 counterpart. The Policy Mentor Programme operates on a voluntary, unpaid basis. NOUs wishing to access the policy mentor service should contact the RNC or PEO in their region (see Annex 1: Useful Contacts)

7.7.4 SOUTH-SOUTH COOPERATION BETWEEN NOUS

Peers are often the best sources of assistance and advice. If one NOU encounters difficulty in addressing specific policy challenges, another NOU in the region that is in a more advanced state in the implementation of the Montreal Protocol may be in an excellent position to lend a helping hand. The NOUs in the same region are likely to have similar conditions in their cultures, economies and languages. Through Multilateral Fund resources, UNEP is able to facilitate such visits between NOUs to undertake targeted problem-solving missions. NOUs wishing to access this service should contact the RNC in their region (see Annex 1: Useful Contacts)

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ANNEX 2: FURTHER READING

Publications available from UNEP

The following publications are available from the OzonAction Programme web site (www.uneptie.org/ozonaction) or from UNEP's distribution agent:

SMI (Distribution Services) Limited
P.O. Box 119
Stevenage, Hertfordshire, England, SG1 4TP
United Kingdom
Tel: +44 1438-748111
Fax: +44 1438-748844
Email:anthony@smibooks.com
www.earthprint.com

A. General

The Montreal Protocol Control Schedule and its Evolution

This short paper provides a concise overview of the phase out schedule under the treaty. It identifies the date and meeting when each Amendment and/or Adjustment was agreed, and the date when each came into force. The paper provides the reader with an evolution table for each group of the controlled substances that are indicated in the Annexes of the Montreal Protocol. (Updated periodically).

www.uneptie.org/ozonaction/library/policy/main.html

B. Policy Compilations

Update of Regulations to Control ODS

This reference document is designed for use by ODS officers and legal officers in Article 5 countries responsible for structuring and drafting of regulations to control and eliminate the use of ODS. It provides a brief overview of the structure and strategies in existing ODS regulations in 58 developing and developed countries, encompassing all governmental directives of a legally-binding nature. Also contains information about governmental guidelines, voluntary agreements and co-operation with industry. (2000, UNEP with the Stockholm Environment Institute).

www.uneptie.org/ozonaction/library/policy/main.html

C. Data Reporting

Handbook on Data Reporting under the Montreal Protocol

This handbook responds to the Meeting of the Parties Decision IX/28, which requested the UNEP to prepare a handbook to assist all Parties with fulfilling their data reporting obligations under the Montreal Protocol. It helps ozone officers understand and follow the correct data reporting procedures, including those related to Article 7 and Multilateral Fund requirements. Although specifically written for National Ozone Units in Article 5 countries,

the handbook will also be useful for Article 7 data reporting by non-Article 5 countries. (1999).

www.uneptie.org/ozonaction/library/datareporting

Handbook on Methyl Bromide Reporting under the Montreal Protocol

This handbook is designed to further assist countries to provide quality data reporting on methyl bromide consumption and production, as required under Article 7 of the Montreal Protocol, as differentiation between quarantine and pre-shipment (QPS) and non-QPS uses, poses a particular challenge to Parties. UNEP DTIE OzonAction Programme has developed a handbook, which provides key methyl bromide data reporting information and guidance, in a simple and user-friendly way. Financing came from the Multilateral Fund for the Implementation of the Montreal Protocol, with input from the Ozone Secretariat, the Multilateral Fund Secretariat, national ozone officers and methyl bromide experts from the public and private sectors in developed and developing countries.

www.uneptie.org/ozonaction/library/datareporting/main.html

D. Licensing Systems and Import Controls

Monitoring Imports of ODS: A Guidebook

A guidebook that helps government environment officers and customs officials in developing countries decide how to design their own systems to monitor and control importation of ODS by learning from the actual experience of their peers on the South East Asia and Pacific region. It describes the monitoring systems in Australia, Brunei Darussalam, Fiji, Indonesia, Lao P.D.R., Malaysia, Myanmar, New Zealand, the Philippines, Singapore, Sweden, Thailand and Vietnam. It includes Monitoring based on customs statistics; Import permits systems and their role in monitoring imports; Customs role in ensuring compliance with import restrictions; Structure of the Harmonized System; Problems related to mixed chemicals. (With Stockholm Environment Institute, 1996)

www.uneptie.org/ozonaction/library/policy/main.html

ODS Import/Export Licensing Systems Resource Module: Phasing out ODS in Developing Countries

A guidebook that provides practical help and step by step guidance for the design and implementation of ODS import/export licensing systems. It is primarily written for government officers in charge of designing and implementing strategies to phase out the ODS and for their colleagues in authorities in charge of import and export controls in general. The main emphasis is on import controls. (November 1998).

www.uneptie.org/ozonaction/library/training/main.html

E. Information, Education and Communication

Five Steps for Raising Awareness on Ozone Depletion

The Handbook will help ODS Officers to plan focussed efforts, aimed at the public and industry, to raise awareness on ozone-depletion issues. A five-step planning cycle is presented, each illustrated by examples of awareness-raising activities on ozone-depletion

issues from developing countries. The Handbook may be used by national ozone units, non-governmental organizations, industry associations and companies, who wish to initiate awareness-raising activities on ozone depletion. (1996).

www.uneptie.org/ozonaction/library/awareness/main.html

Communication Strategy for Global Compliance with the Montreal Protocol

A communication strategy prepared by UNEP for the Executive Committee of the Multilateral Fund to support compliance of developing countries in the phase-out of ODS under the Montreal Protocol through wider involvement of civil society in developing countries. Prepared by the Television Trust for the Environment (TVE) with the assistance of communication experts from UNESCO, UNICEF and numerous countries, this strategy helps promote the country-driven approach to awareness raising as highlighted in the Strategic Planning process initiated by the Executive Committee. The strategy presents key messages to be delivered, identifies target groups, provides suggestions for how to effectively deliver messages, and presents detailed case studies of information, education and communication experiences in developing countries. (2003).

www.uneptie.org/ozonaction/library/awareness/main.html

F. Refrigeration and Air Conditioning

Guidebook for Implementation of Codes of Good Practice: Phasing out ODS in Developing Countries -Refrigeration Sector

A guidebook designed to help governments and industry to design and establish appropriate codes of good practice for the refrigeration servicing sector. Such codes of good practice are an important part of the regulatory framework to support all other phaseout efforts within the Refrigerant Management Plan (RMPs). Includes background information about the Montreal Protocol and the role of codes of good practice, RMPs, the roles of different groups of individuals and organizations in reducing CFC use, steps that should be taken in designing and implementing codes of good practice to reduce CFC use, details of codes of good practice (including general servicing practices to be followed or to be eliminated), sources of further information, templates for recording forms and labels, examples of company policy statements and voluntary industry agreements. (1998).

www.uneptie.org/ozonaction/library/training/main.html

Guidelines for Development of Refrigerant Management Plans

RMPs are comprehensive phase-out plans and strategies for the refrigeration and air-conditioning sectors that are prepared and implemented at the national level. RMPs are particularly well-suited for Low-Volume ODS-consuming countries (LVCs). These guidelines were approved by the 23rd Executive Committee and amended by the 31st Executive Committee meeting. (2000).

www.uneptie.org/ozonaction/library/policy/main.html

Government Strategies to Phase out Ozone-Depleting Refrigerants: Four Case Studies from the Nordic Countries

Shares the experience of government and industry in four Nordic countries (Denmark, Finland, Norway, Sweden) to phase out ODS. These case studies provide examples of how these four countries have approached refrigerant management through a combination of voluntary and regulatory measures. Each case study provides background about the country's refrigeration sector, a description of the government's strategies and regulations, an overview of how industry and government have co-operated on this issue, key features of the national strategy, and a summary of the country's experience with management of ozone depleting refrigerants. (1997, UNEP with the Stockholm Environment Institute).

www.uneptie.org/ozonaction/library/policy/main.html

Recovery and Recycling Systems Guidelines: Phasing out ODS in Developing Countries: Refrigeration Sector

The objective of these Guidelines is to help developing country governments and industry design and establish recovery and recycling systems for CFC refrigerants and to operate them efficiently. The establishment of such systems represents a cost-effective step in reducing the consumption of virgin CFC refrigerants without major capital investment and in allowing existing CFC-based equipment to run until the end of its economic life by using recycled CFC refrigerants. (1999).

www.uneptie.org/ozonaction/library/training/main.html

G. Halons

Eliminating Dependency on Halons: Self-help Guide for Low-Volume Consuming Countries

A guidebook to assist countries that consume small volumes of halons with the phase-out of unnecessary halon uses and the management of existing halon stocks to meet critical uses. The guidebook follows a seven step process that includes raising awareness, setting policies, ending unnecessary halon uses, managing a halon bank and ending halon imports. Annexes include key technical guidance from the UNEP Halons Technical Option Committee, sample brochures that can be adapted to a local situation, overhead presentations for workshops and much more.

www.uneptie.org/ozonaction/library/tech/main.html

Standards and Codes of Practice to Eliminate Dependency on Halons: Handbook of Good Practices in the Halon Sector

A handbook that explains the importance of standards and codes of practice in the phase out process and provides guidance on how to use those instruments to support the safe and timely transition to alternatives. The handbook is designed for NOU, governments and fire protection communities responsible for planning and implementing the Montreal Protocol halon provisions. It identifies the types of standards and codes of practice that are relevant to the Protocol and provides step-by-step guidance on how to establish new, or revise existing, standards and codes of practice to promote the halon phase out. (May 2001, UNEP with the Fire Protection Research Foundation).

www.uneptie.org/ozonaction/library/policy/main.html

H. Methyl Bromide

Methyl Bromide Phase-Out Strategies: A Global Compilation of Laws and Regulations
Provides an overview of the various policy options that can be taken to replace methyl bromide and outlines existing policies on methyl bromide in over 90 countries. The compilation can be used by NOUs, Agriculture Ministries and Pesticide Control Authorities to assist in the development of national action plans for methyl bromide phase out. (September 1999).

www.uneptie.org/ozonaction/library/policy/main.html

I. Customs and Illegal Trade

Training Manual for Customs Officers
This manual provides guidance to NOU, implementing agencies and customs trainers on how to organize and conduct multi-phased customs training programmes. It includes generic agendas, concept notes, evaluation questionnaires, as well as all relevant training materials and overheads. It focuses on the identification of ODS and ODS-containing mixtures, products containing and equipment based on ODS as well as the different smuggling schemes and should be used in conjunction with the country specific "Country Handbook on ODS Legislation and Import / Export Licensing System". (2001).

www.uneptie.org/ozonaction/library/training/main.html

OzonAction Special Supplement 6 – Illegal Trade in ODS
A special issue of the newsletter explaining the causes and magnitude of illegal trade in ODS, methods of illegal trade, and measures being taken by customs agencies, governments, industry and NGOs to combat this problem.

www.uneptie.org/ozonaction/library/oan/main.html

Publications available from other sources

A. Ozone Secretariat (www.unep.org/ozone)

- Handbook for the International Treaties for the Protection of the Ozone Layer
- Reports of the Meetings of the Parties of the Vienna Convention and Montreal Protocol
- Article 7 Data Reporting Forms and Instructions
- Status of Ratification
- ODS Consumption and Production Data

B. Multilateral Fund Secretariat (www.unmfs.org)

- Policies, Procedures, Guidelines and Criteria of the Multilateral Fund
- Reports of the Multilateral Fund Executive Committee

C. Technology and Economic Assessment Panel (www.teap.org)

- Reports of the TEAP and Technical Options Committees (TOCs)
- Technical Notes of the Halon TOC

D. United Nations Conference on Environment and Development – 14 June 1992 (www.unep.org/unep/rio.htm)

- Rio Declaration

E. Protecting the Ozone Layer: The United Nations History (www.earthscan.co.uk)

- *A comprehensive history of the Montreal Protocol written by Dr. Stephen Andersen and K.Madhava Sarma, including discussions of the evolution of the treaty and national implementation and compliance responses.*

ANNEX 3: GLOSSARY

CEIT	Country with Economy in Transition
CFC	Chlorofluorocarbon
CIEL	Center for International Environmental Law
CP	Country Programme
DTIE	UNEP's Division of Technology, Industry and Economics
HBFC	Hydrobromofluorocarbon
HCFC	Hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
INECE	International Network for Environmental Compliance and Enforcement
LVC	Low-volume consuming country
MAC	Mobile air conditioning
NGO	Non-governmental organization
NOU	National Ozone Unit
ODP	Ozone Depletion Potential
ODS	Ozone depleting substance
ODSONET	ODS Officers Network
RMP	Refrigerant Management Plan
SME	Small and medium-sized enterprise
TEAP	UNEP Technology and Economic Assessment Panel
TOC	UNEP Technical Options Committee
TPMP	Total Phase Out Management Plan
UNEP	United Nations Environment Programme
WCO	World Customs Organisation

ANNEX 4: 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. Over 180 governments have joined this multilateral environmental agreement and are taking actions to phase out ozone depleting substances (ODS), which include CFCs, halons, methyl bromide, carbon tetrachloride, methyl chloroform, and HCFCs.

The Parties to this agreement established a Multilateral Fund that provides developing countries with the technical and financial assistance needed to comply with the Protocol. UNEP, UNDP, UNIDO and the World Bank are the Fund's Implementing Agencies.

The objective of UNEP's OzonAction Programme is to assist developing countries and Countries with Economies in Transition to achieve compliance with the control measures of the Montreal Protocol. Since 1991, the Programme has met this goal by strengthening National Ozone Units (NOUS) and facilitating regional and international responses to the ozone depletion challenge by providing the following need-based services:

- Information Clearinghouse, which provides need-based information services that help decision-makers take informed decisions on policies and technologies required to phase out ODS. The clearinghouse has provided over 100 publications and other information aids, including guidelines, videos, CD-ROMs, public awareness materials, a newsletter, sector-specific publications, and a web site.

- National and Regional Training, which builds the capacity of policy-makers, customs officers and local industry to implement national ODS phase-out activities. UNEP promotes the involvement of local experts from industry and academia in training workshops and brings together local stakeholders with experts from the global ozone protection community. To date, OzonAction has conducted 70 training programmes for customs officers and 62 for refrigeration technicians.

- Regional Networking of ODS Officers, which provides a regular forum for those officers to exchange experiences, develop skills, and share ideas with counterparts from both developing and developed countries. Networking helps ensure that NOUs have the information, skills and contacts required to successfully manage their national ODS phase-out strategies. UNEP currently operates 8 regional/sub-regional Networks involving 115 developing and 9 developed countries.

- Refrigerant Management Plans, which provide countries with integrated, cost-effective strategies for ODS phase out in the refrigeration and air conditioning sectors. RMPs assist developing with overcoming the numerous obstacles to phase out ODS in the critical refrigeration sector. UNEP currently provides specific expertise, information and guidance to support the development of RMPs in 67 countries.

- Country Programmes and Institutional Strengthening, which support the development and implementation of national ODS phase-out strategies, especially for low-volume ODS-consuming countries. The Programme has assisted about 100 countries to develop their CPs and 96 countries to implement their IS projects.

In 2002, UNEP restructured OzonAction to better respond to the evolving needs of developing countries during the compliance period. Its overall vision and work strategy was reoriented into the Compliance Assistance Programme (CAP). A major feature of the CAP strategy is to move away from a disparate project management approach towards integrated and direct implementation of the programme using a team of professionals with appropriate skills and expertise. UNEP has now regionalised the delivery of the programme and services by placing its Regional Offices at the forefront to assist the countries in the region.

Primarily funded by the Multilateral Fund, the OzonAction Programme also receives support from the Global Environment Facility, the Government of Sweden, the Government of Finland, and other bilateral sources.

For more information

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About the UNEP Division of Technology, Industry and Economics

The mission of the UNEP Division of Technology, Industry and Economics is to help decision-makers in government, local authorities, and industry develop and adopt policies and practices that:

- are cleaner and safer;
- make efficient use of natural resources;
- ensure adequate management of chemicals;
- incorporate environmental costs;
- reduce pollution and risks for humans and the environment.

The UNEP Division of Technology, Industry and Economics (UNEP DTIE), with the Division Office in Paris, is composed of one centre and five branches:

- The International Environmental Technology Centre (Osaka), which promotes the adoption and use of environmentally sound technologies with a focus on the environmental management of cities and freshwater basins, in developing countries and countries in transition.
- Production and Consumption (Paris), which fosters the development of cleaner and safer production and consumption patterns that lead to increased efficiency in the use of natural resources and reductions in pollution.
- Chemicals (Geneva), which promotes sustainable development by catalysing global actions and building national capacities for the sound management of chemicals and the improvement of chemical safety world-wide, with a priority on Persistent Organic Pollutants (POPs) and Prior Informed Consent (PIC, jointly with FAO).
- Energy and OzonAction (Paris), which supports the phase-out of ozone depleting substances in developing countries and countries with economies in transition, and promotes good management practices and use of energy, with a focus on atmospheric impacts. The UNEP/RISØ Collaborating Centre on Energy and Environment supports the work of the Branch.
- Economics and Trade (Geneva), which promotes the use and application of assessment and incentive tools for environmental policy and helps improve the understanding of linkages between trade and environment and the role of financial institutions in promoting sustainable development.
- Co-ordination of Regional Activities Branch (Paris), which coordinates regional delivery of UNEP DTIE's activities and ensures co-ordination of DTIE's activities funded by the Global Environment Facility (GEF).

UNEP DTIE activities focus on raising awareness, improving the transfer of information, building capacity, fostering technology co-operation, partnerships and transfer, improving understanding of environmental impacts of trade issues, promoting integration of environmental considerations into economic policies, and catalysing global chemical safety.

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Environmentally sound technologies are part of the solution to today's environmental challenges, but they are not the total answer. Technologies must be backed by effective national policies if they are to succeed.

Under the Montreal Protocol on Substances that Deplete the Ozone Layer, experience has shown that a strong national policy framework is a critical requirement for the sustained, permanent reduction and phase-out of ozone depleting substances (ODSs). Effective policies are particularly critical during the Protocol's compliance period when developing countries must freeze and eventually phase out their consumption and production of ODSs. If effective policies are not in place and enforced, then investments in technologies, skills and systems to phase out ODS may be jeopardised.

Implementation of the Montreal Protocol regime has been challenging for all Parties, but particularly for smaller and less economically developed countries and those that use low volumes of the controlled substances. This Handbook helps guide decision-makers and other relevant stakeholders in developing countries to design implement and enforce effective policies at the national level to enable them to meet their obligations under the Montreal Protocol.

This publication was developed by the UNEP DTIE OzonAction Programme as part of UNEP's Work Programme under the Multilateral Fund for the Implementation of the Montreal Protocol. It is part of a series of policy documents designed to help developing countries meet their compliance commitments under the Montreal Protocol.

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