



Canadian Council of Ministers  
of the Environment    Le Conseil canadien  
des ministres de l'environnement

---

# National Action Plan

*for the Environmental Control of Ozone-Depleting  
Substances (ODS) and their Halocarbon Alternatives*



**May 2001 Update**

*Prepared by the  
Federal Provincial Working Group  
on Ozone-Depleting Substances  
and Halocarbon Alternatives*

**PN 1314**

---

The Canadian Council of Ministers of the Environment (CCME) is the major intergovernmental forum in Canada for discussion and joint action on environmental issues of national, international and global concern. The 14 member governments work as partners in developing nationally consistent environmental standards, practices and legislation.

The CCME Secretariat may be contacted at:

Canadian Council of Ministers of the Environment  
123 Main Street, Suite 360  
Winnipeg, Manitoba, R3C 1A3  
Tel: (204) 948-2090  
Fax: (204) 948-2125

This is an update to the January 1998 National Action Plan.

Comments regarding the content of this National Action Plan should be addressed to:

Chair, Federal-Provincial Working Group on  
Ozone Depleting Substances and Halocarbon Alternatives  
c/o Commercial Chemicals Evaluation Branch  
Environmental Protection Service  
Environment Canada  
Ottawa, Ontario  
K1A 0H3

ISBN: 1-896997-09-0

Ce document est également disponible en français.

## ***Abstract***

---

This report updates the National Action Plan for the Environmental Control of Ozone-Depleting Substances (ODS) and their Halocarbon Alternatives, published in January 1998 by the Canadian Council of Ministers of the Environment (CCME). The January 1998 National Action Plan incorporated many of the recommendations and suggestions that resulted from national consultations held in 1995 and the subsequent report “Strengthening Canada’s Ozone Layer Protection Program.” This update report presents the current status of the tasks that were identified in the 1998 National Action Plan. In addition, it identifies new tasks for the implementation of Canada’s Strategy to Accelerate the Phase-out of CFC and Halon Uses and to Dispose of the Surplus Stocks (Canadian Council of Ministers of the Environment, CCME PN 1316, May 2001).



# ***Table of Contents***

---

ABSTRACT	i
LIST OF FIGURES	v
LIST OF TABLES	v
EXECUTIVE SUMMARY	vii
<b><i>Section 1</i></b>	<b>1</b>
INTRODUCTION	
1.1    Background	2
1.2    Industry Sectors, Uses and Consumption	3
1.2.1 Refrigeration and Air Conditioning Sector	3
1.2.2 Aerosol Sector	4
1.2.3 Foam Blowing Agents Sector	4
1.2.4 Solvents Cleaning Sector	4
1.2.5 Sterilant Gas Sector	4
1.2.6 Metered-Dose Inhalers	5
1.2.7 Laboratory Use Sector	5
1.2.8 Fire Protection Sector	5
1.2.9 Pest Control Sector	5
1.2.10 Consumption and Inventory	6
<b><i>Section 2</i></b>	<b>9</b>
SUMMARY OF THE 1998 NATIONAL ACTION PLAN	
2.1    Objectives	9
2.2    Status of General Tasks	10
2.2.1 Task #1	10
2.2.2 Task #2	11
2.2.3 Task #3	12
2.2.4 Task #4	12
2.2.5 Task #5	13
2.2.6 Task #6	14
2.3    Status of Refrigerant Sector Tasks	14
2.3.1 Task #7	14
2.3.2 Task #8	15

2.3.3	Task #9	15
2.3.4	Task #10	16
2.3.5	Task #11	16
2.4	Status of Solvents Cleaning Sector Tasks	17
2.4.1	Task #12	17
2.5	Status of Fire Protection Sector Tasks	17
2.5.1	Task #13	17
2.5.2	Task #14	18
2.6	Status of Aerosols, Sterilants and Laboratory Use Sector Tasks	18
2.6.1	Task #15 (a)	18
2.6.2	Task #15 (b)	19
2.6.3	Task #15 (c)	19
2.7	Status of Pest Control Sector Tasks	19
2.7.1	Task #16	19
2.8	Status of Foam Blowing Agents Sector Tasks	20
2.8.1	Task #17	20
<b>Section 3</b>		<b>22</b>
1998 NATIONAL ACTION PLAN UPDATE		
3.1	Objectives	22
3.2	Tasks	22
3.3	Task Descriptions	23
3.3.1	Task#1	23
3.3.2	Task#2	23
3.3.3	Task#3	24
3.3.4	Task#4	24
3.3.5	Task#5	24
3.3.6	Task#6	24
3.3.7	Task#7	25
<b>Section 4</b>		<b>27</b>
REPORTING ON PROGRESS		
GLOSSARY		30

## ***List of Figures***

---

1. Canadian ODS Consumption	7
2. Canadian 1998 CFC Inventory	8
3. Canadian 1998 Halon Inventory	8

## ***List of Tables***

---

1. Status of Major National Action Plan Tasks (Jan. 2001)	21
2. Updated National Action Plan Tasks - 2001	28





## ***Executive Summary***

---

As one of the early signatories to the Montreal Protocol on Substances that Deplete the Ozone Layer, Canada has consistently met or exceeded its obligations under the Protocol to protect the ozone layer. An important component of the program to address this issue was the “National Action Plan for Recovery, Recycling and Reclamation of CFCs” (NAP), approved and published by the Canadian Council of Ministers of the Environment (CCME) in 1992. The NAP provided a national framework for a harmonized approach by the federal, provincial and territorial governments to implement an ozone layer protection program primarily focused on CFCs used in refrigeration and air conditioning systems. The 1992 NAP was revised in 1998 to address all ODS and their Halocarbon alternatives. The 1998 NAP has now been updated to reflect the status of previous tasks and to incorporate the additional tasks needed to implement Canada’s Strategy to Accelerate the Phase-out of CFC and Halon Uses and to Dispose of the Surplus Stocks (CCME Report 1316, May 2001).

Significant progress has been achieved to date. Virtually all of the tasks in the 1992 NAP and most of the tasks in the 1998 NAP have been completed. CFCs, methyl chloroform and Halons are no longer produced or imported in Canada. Carbon tetrachloride is only imported for use as feedstock in chemical production. All jurisdictions require recovery and recycling of CFCs and HCFCs in the refrigeration and air conditioning sectors, and prohibit deliberate release to the environment. Measures to implement recovery/recycling and emission controls for HFCs, to require use of refillable containers for all halocarbon refrigerants and to prohibit the recharging of mobile air conditioning systems with CFCs are in place or under consideration in all jurisdictions. Environmental awareness training programs for refrigeration service technicians have been developed and are being delivered. This training is mandatory in all jurisdictions except Quebec. More than 95,000 service technicians in the refrigeration and air conditioning sector have received environmental awareness training. This has contributed to raising public interest and awareness.

In addition, the consumption of ODS in Canada in 1999 has been reduced to approximately 2,000 ODP-weighted kilotonnes (mostly HCFCs and methyl bromide). The 1998 inventory of CFCs and Halons in Canada was just under 26,000 kilotonnes.

The new tasks relating to implementation of the Phase-out Strategy are those that will be undertaken by the federal, provincial and territorial governments. In addition, other components of the Strategy will be carried out by industry or other stakeholders. The tasks have been divided into two groups, following the approach taken in the Strategy. The first group of tasks relates to infrastructure provisions needed to achieve the goals of the Strategy. The second group of tasks are primarily control measures needed to implement the phase-out objectives and approaches specific to industry sectors.



## Section 1

---

### Introduction

Substantial progress has been made in Canada to reduce the emissions of ozone-depleting substances (ODS) through strong control measures implemented by federal, provincial and territorial governments, changes in technology, and voluntary actions by industry, such as the use of alternatives to ODS.

In 1992, CCME published a National Action Plan (NAP) for Recovery, Recycling, and Reclamation of Chlorofluorocarbons which identified objectives along with the tasks and schedules to achieve them. In 1994, the National Air Issues Coordinating Committee (NAICC) directed the Federal-Provincial Working Group (FPWG) on Controls Harmonization (now the FPWG on Ozone-Depleting Substances and Halocarbon Alternatives) to undertake public consultations to ascertain appropriate actions to strengthen the Canadian ozone layer protection program. The consultations focused on:

- further reducing ODS emissions;
- destroying unneeded ODS;
- taking a sustainable approach to alternatives;
- implementing additional controls; and
- putting more emphasis on international activities.

The FPWG published the conclusions and recommendations in a report entitled “Strengthening Canada’s Ozone Layer Protection Program.” The recommendations were endorsed by the CCME in May 1995.

A revised NAP was published in January 1998 to incorporate the recommendations of the “Strengthening Canada’s Ozone Layer Protection Program” report, and became the framework for the continued coordination of the respective efforts of the federal, provincial and territorial governments in ODS management and control. The 1998 NAP describes the necessary activities (tasks) to meet the objectives of control, reduction, and elimination of emissions of ODS and certain halocarbon alternatives. It also addresses the ultimate phase-out and disposal of CFCs and Halons in Canada. It was recognized that, to be successful, the program must continue to be implemented in a harmonized manner across all jurisdictions involved.

In the summer of 1998, the FPWG began to examine the feasibility of accelerating the phase-out of CFC and Halon uses, as called for in the 1998 NAP. This work culminated in the CCME report titled “Canada’s Strategy to Accelerate the

Phase-out of CFC and Halon Uses and to Dispose of the Surplus Stocks”<sup>1</sup>. The 1998 NAP is now being updated to reflect the status of these tasks and to incorporate the new tasks needed to implement the Phase-out Strategy.

## **1.1 Background**

The development of the theory of ozone depletion and its subsequent confirmation by scientific study led to the signing of the Vienna Convention on the Ozone Layer in 1985. Signatories agreed to further study and consult on the causes and effects of ozone layer depletion. There is now a large consensus that ozone depletion is caused by atmospheric releases of man-made compounds containing chlorine, which allows for an increase in the amount of ultraviolet (UV) radiation to reach the earth’s surface. There is evidence that human exposure to increased UV radiation will lead to an increased incidence of sunburn, skin cancer, eye cataracts, and the weakening of the immune system and photoaging of the skin and eye. Although human behavior modifications can affect UV radiation exposure, the best way to protect the health of the population is to maintain an adequate stratospheric ozone layer.

Ecosystem health is also adversely affected by increased UV radiation. This begins at the bottom of the food chain where increased UV radiation reduces the plankton population in the ocean and vegetation production on land. Wildlife and domestic animals may also be affected either directly or indirectly.

Canada played a major role in the development of the Montreal Protocol on Substances that Deplete the Ozone Layer, and was one of the first signatories to the Protocol in 1987. The Protocol came into effect in 1989, requiring signatories to reduce consumption (consumption = production + imports - exports) of certain ODS, mainly CFCs. Subsequent amendments to the Protocol have increased the reductions and shortened the time frame in which these consumption reductions are to be achieved.

In June 1989, the Federal-Provincial Working Group (FPWG) on Controls Harmonization (Ozone-depleting Substances) was established to develop a strategy for harmonization of controls on ozone-depleting substances. In November 1990, the FPWG was instructed to develop an action plan to implement recovery, recycling, and reclamation of CFCs across Canada.

This first National Action Plan (NAP) was approved in October 1992 and issued as a CCME document, entitled: "National Action Plan for Recovery, Recycling, and Reclamation of Chlorofluorocarbons (CFCs)". The NAP focused mainly on recovery, recycling, and reclamation of CFCs from refrigeration and air conditioning systems.

---

<sup>1</sup> “Canada’s Strategy to Accelerate the Phase-out of CFC and Halon Uses and to Dispose of the Surplus Stocks”, Prepared by the Federal-Provincial Working Group on Ozone-Depleting Substances and Halocarbon Alternatives, CCME PN 1316, May 2001

A revised NAP was published in January 1998. It addressed all ODS, their associated systems, their halocarbon alternatives, and identified new tasks to be implemented. It incorporated a pollution prevention strategy to reduce emissions and consider a use phase-out of existing CFCs and Halons and options for disposal of surplus quantities. The 1998 NAP also proposed to give consideration to further emission reductions in other industry sectors, such as solvent cleaning, sterilant carrier gases, foam blowing, and aerosol applications. Continued coordination and harmonization by all levels of government is needed to enable the successful implementation of a strengthened Canadian ozone layer protection program.

## **1.2 *Industry Sectors, Uses and Consumption***

CFCs were first introduced in the 1930s as a substitute for more hazardous refrigerants such as sulfur dioxide and ammonia. As a wide range of CFC-based compounds became available, CFC uses spread into other industry sectors, such as aerosols, foam blowing, solvent cleaning, sterilant carrier gas, and laboratory uses. Two other sectors where the use of ODS grew substantially were the fire protection and pest control sectors.

The following provides a brief overview of the uses of ODS by industry sectors in Canada.

### **1.2.1 *Refrigeration and Air Conditioning Sector***

The development in the 1930s of low toxicity, non-flammable heat exchange fluids, such as CFCs, helped accelerate the market for home refrigerators and later, for freezers. A wide range of CFCs permitted development of low temperature freezers, display cases and building air conditioning systems. The environmental impact of CFCs was neither known nor considered at that time. Due to their relative low cost and low toxicity, the previous practice of recovering refrigerants during servicing was abandoned and increasing quantities of these substances began to enter the atmosphere.

Since the signing of the Protocol, the phasing-out of the production and import of CFCs, mandatory recovery and recycling regulations, as well as environmental awareness training for service people, have substantially reduced emissions of refrigerants in Canada.

The use of HCFCs, HFCs and blends has helped provide alternatives on an interim basis. However, the use of these substances, some of which are ODS, and the large inventory of CFCs in existing systems, means that continued effort will be required to control and eliminate ODS emissions.

### **1.2.2 Aerosol Sector**

The aerosol industry grew out of the need for portable, dispersible insecticides during World War II. Following this period, the industry grew at a phenomenal rate until the late 1970s, when the question of ozone depletion became a concern. Canada and the United States were the first countries to take action to limit the types of products that could use CFCs in aerosols.

The use of CFCs in aerosol products has been replaced mainly by mechanical devices, HCFCs, HFCs and hydrocarbons. Other chemicals such as dichloromethane have also been used in specific applications. The only exception is in some medical applications, such as medical inhalers. HCFCs constitute a threat to the ozone layer, although much less than CFCs, and their use is being gradually phased out.

### **1.2.3 Foam Blowing Agents Sector**

In the 1970s, the demand for foam insulation rose dramatically as a result of the oil shortage and the concerns about the carcinogenic properties of asbestos. Foams are also used as packaging materials. The use of CFCs as the blowing agent in foams has been discontinued. Substitute chemicals such as HCFCs, hydrocarbons, dichloromethane, and blends containing these materials are now used. The use of HCFCs in this sector will gradually be phased out over the next 10 years.

### **1.2.4 Solvents Cleaning Sector**

CFCs, carbon tetrachloride, methyl chloroform and HCFCs are used as cleaning agents for printed circuit boards, electronic components, electrical assemblies and components, maintenance cleaning, avionics and precision metal parts, and dry cleaning of specialty garments. These applications used to have high rates of emission, since obsolete equipment, poor equipment design, and a lack of training made these solvents difficult to recover. Now, market forces and regulations have phased out the use of CFCs, carbon tetrachloride and methyl chloroform in these applications. There is currently very limited use of HCFCs, HFCs and PFCs in solvent cleaning applications.

### **1.2.5 Sterilant Gas Sector**

Due to the sensitivity of certain medical equipment to heat and the long retention time with steam systems, alternative sterilization systems using ethylene oxide were developed. Ethylene oxide is extremely reactive and toxic, therefore, CFC-12 was added as an inert carrier gas to dilute the ethylene oxide to safe but effective concentrations. Alternative carrier gases have now been introduced. In addition, new systems that do not require a carrier gas are now in use (e.g. plasma sterilization).

### **1.2.6 Metered-Dose Inhalers**

CFCs are used as carriers and solvents in metered dose inhalers, which are small devices used to prevent and relieve asthma and other pulmonary diseases. The medical aerosol industry receives an exemption to the ban on CFC production and import in order to continue the manufacture of metered-dose inhalers (MDIs). This exemption is granted because of the long lead-time required to approve alternative delivery agents. Alternatives for some MDIs have been developed and are now available in Canada. A phase-out strategy for MDIs containing CFCs has been prepared, with a target of 100% phase-out by 2005.

### **1.2.7 Laboratory Use Sector**

A very small volume of ODS is used in laboratories. The use of certain ODS is entrenched in some analytical and research laboratory procedures but alternatives are being considered and used in certain applications. The amount of ODS consumed by this sector is small. Canada has reduced the applications allowed in this sector as per the Montreal Protocol.

### **1.2.8 Fire Protection Sector**

Halons were developed during the Second World War for military applications where the available agents imposed severe weight and space penalties unacceptable for use on board aircraft, armoured fighting vehicles and ships. In addition, occupant safety after a discharge was critical. Since then, halons have been used as a fire extinguishant in sensitive areas where other agents might cause unacceptable damage, and for use in areas where other extinguishing agents could cause suffocation. Halons have been used in both fixed and portable fire extinguishing systems.

Halons are extremely damaging to the ozone layer and, as a result, their consumption was phased-out at the end of 1993. Chemical alternatives exist, but there is no "drop-in" replacement available now or expected to be developed in the near future for many halon uses. Alternative agents generally require a new system or major modifications to the existing system. There are a large number of Halon systems still in service in Canada. In a 1998 study, the Canadian halon inventory was estimated to be approximately 3,000 tonnes.

### **1.2.9 Pest Control Sector**

This sector involves the use of methyl bromide, a fumigant gas, as a pesticide. Methyl bromide is mostly used to control soil pests prior to planting certain crops and to control food pests in the food processing and transportation industries. Canadian methyl bromide consumption is already controlled by Environment Canada's Ozone-Depleting Substances Regulations. Under these regulations,

methyl bromide consumption was frozen at the 1991 level starting in 1995. A 25% reduction came into effect in 1998. Quantities for quarantine and pre-shipment uses are exempted from the phase-out controls.

Industry and Government have been working to develop and approve alternatives. Canada's program reduced methyl bromide consumption by an additional 25% by the end of 2000 and will phase out consumption by the end of 2005, with the continued exemption of quarantine and pre-shipment uses. There may be further exemptions for critical agricultural uses where no technically or economically viable alternatives are available. There is a need for environmental and agricultural authorities to continue working together on this issue.

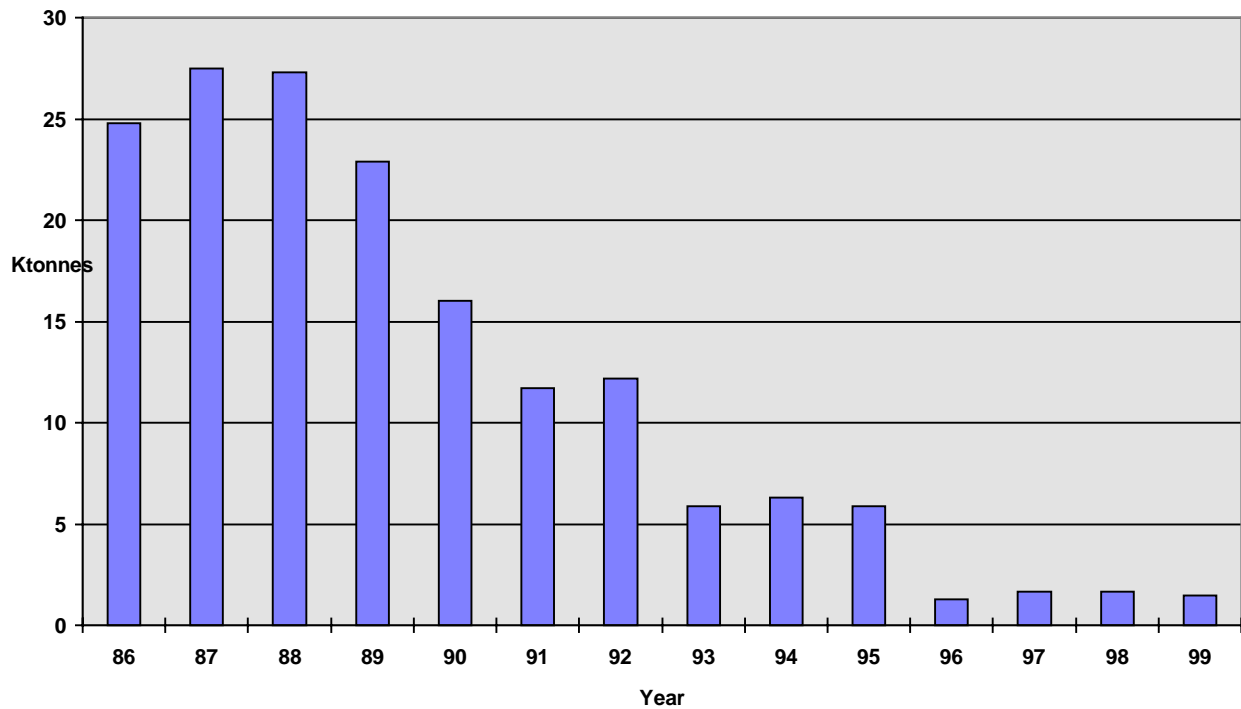
### **1.2.10 Consumption and Inventory**

Canada's historical ODS consumption, starting in 1986, is shown in Figure 1. In a ten-year period, ODS consumption in Canada was reduced by 96%. This was made possible through the harmonized actions of all levels of government working in support of commitments made under the Montreal Protocol. There was active cooperation by industry, trade and technical associations with very little industry disruption or overall economic loss. Future consumption concerns will focus mainly on HCFCs and methyl bromide as the production and import of all other newly produced ODS is now prohibited, except for essential uses.

Although the major part of Canada's consumption of ODS has been eliminated, air conditioning, refrigeration and fire suppression systems still contain large quantities of these chemicals. In 1998, an inventory of CFCs and Halons indicated there were just under 26,000 tonnes in Canada (see Figures 2 and 3).



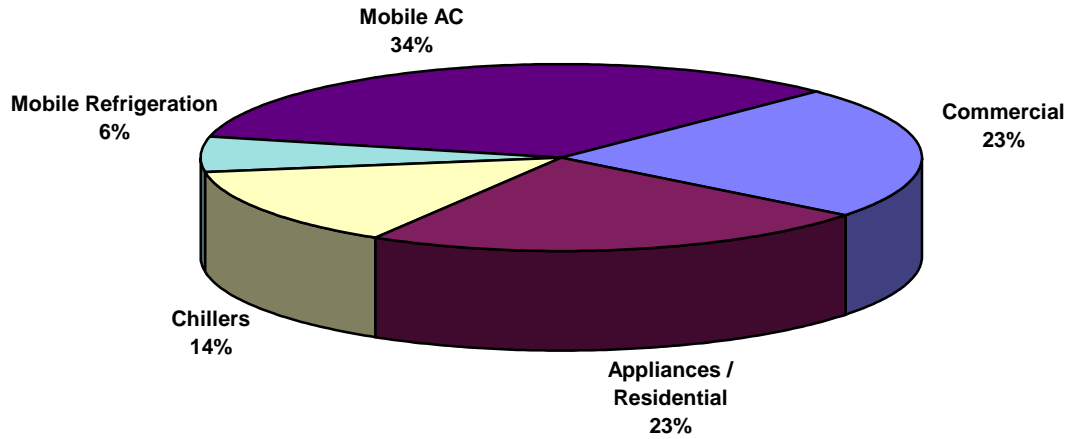
**Figure 1: Canadian ODS Consumption  
(kilotonnes)**



**\*All quantities are ODP weighted i.e. the quantity of each ozone-depleting substance was multiplied by its ozone depletion potential before quantities were added.**

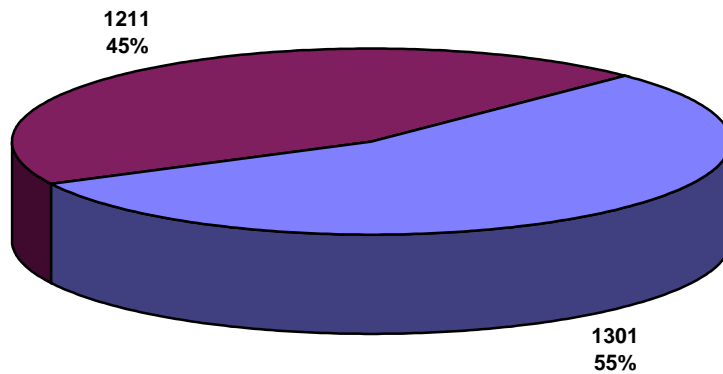
**\*\*ODS consumption includes the following substances: CFCs, HCFCs, Halons, methyl chloroform, methyl bromide and carbon tetrachloride.**

**Figure 2: Canadian 1998 CFC Inventory**



Total: 22,863 tonnes\*

**Figure 3: Canadian 1998 Halon Inventory**



Total: 3,130 tonnes\*

\* Unlike in Figure 1, these are not ODP weighted tonnes.

## Section 2

---

### Summary of the 1998 National Action Plan

The 1998 NAP was appropriately titled "National Action Plan for the Environmental Control of Ozone-Depleting Substances and their Halocarbon Alternatives." The experience gained in the original NAP implementation has permitted similar principles and strategies to be applied to other industry sectors in this revised NAP.

The inclusion of halocarbon alternatives, such as HFCs, in the NAP was a direct result of the "strengthening of the program" consultations. HFCs were not in general commercial use at the time of the first publication of the NAP. They are now being used to replace CFCs and some HCFCs in refrigeration and other sectors. Although HFCs are not ozone-depleting, many of them have a high global warming potential. HFC emissions can be significantly reduced without any industry disruption by using pollution prevention measures such as recovery, recycling and reclamation (R/R/R), and other measures already in place for ODS. Using a preventive and sustainable approach for the alternatives will ensure that one environmental concern is not exchanged for another. In addition, this creates consistency when dealing with ODS and their alternatives in the refrigeration and air conditioning sector.

#### 2.1 Objectives

The specific objectives of the 1998 NAP were:

1. To improve the environmental management of all ODS and halocarbon alternatives and to reduce their emissions from all industry sectors by:
  - minimizing emissions during the installation, operation, maintenance, repair, disposal, and decommissioning of systems and equipment;
  - requiring the practice of recovering and recycling to the maximum extent feasible in all industry use sectors;
  - identifying, where feasible, appropriate dates for the phase-out of specific uses of CFCs and Halons or, as an alternative, mandate total containment;
  - developing a strategy for the disposal of surplus CFCs and Halons;
  - implementing environmental awareness training; and
  - supporting the use of non-ODS alternatives.

2. To provide consistency for industry and to minimize the impact on other environmental issues.

The tasks previously set out in the 1992 NAP were reviewed and updated, and additional tasks were added as per the recommendations of the Strengthening Program. The tasks were grouped together in accordance with the industry sector to which they apply. These groups are as follows:

- General;
- Refrigerants;
- Solvents;
- Fire Protection (Halon);
- Aerosols, Sterilants, Laboratory Uses;
- Pest Control (Methyl Bromide); and
- Blowing Agents.

A detailed description and status of each task is given in the following section. A summary of the status of major tasks is provided in Table 1.

## **2.2 Status of General Tasks**

### **2.2.1 Task#1**

*Prohibit Release and Mandate Recovery of CFCs, HCFCs, HFCs, and All Their Isomers and Blends from Closed Systems and Limit Dispersive Uses.*

The task, which originates from the 1992 NAP, was expanded to include HFCs, establish release prohibition requirements and include all industry sectors. The release prohibition applies to systems and uses where it is technically and economically feasible to reduce and eliminate emissions. There are certain uses for which, by their nature, it is impossible to reduce emissions using containment measures (e.g. aerosols, close-cell foams). It is also essential that such dispersive uses be limited where feasible.

#### Status:

Regulations to accomplish this part of Task #1 for HFCs have been passed by Environment Canada (applying to the federal house), Alberta, British Columbia, Newfoundland, Ontario, Prince Edward Island, and the Yukon.

*Mandate Leak Testing and Repair Prior to Top Up of Systems.*

This task covers both the refrigeration and air-conditioning and fire protection sectors. Leaks from systems, including chiller purge systems, originally accounted for about 25% of the total emissions of ODS. Despite the implementation of the original NAP, leaks still account for a high percentage of the total amount of ODS emissions. This is due, in large part, to the reduction of the other sources of ODS emissions. Systems that have lost ODS must be leak tested and repaired prior to recharging. This will provide significant benefit to the ozone protection program and reduce operating costs for owners.

Status:

All governments except Quebec, the Northwest Territories and Nunavut have mandated leak testing and repair of refrigeration and air conditioning systems before top up of systems can be done. The Northwest Territories and Nunavut have guidelines in place to address this task.

*Evaluate Options for Action on PFCs and Other Halocarbon Alternatives.*

Perfluorocarbons (PFCs) are not ODS but do have a significant global warming potential (GWP). Other halocarbon alternatives, such as chlorocarbons, and hydrochlorocarbons, may have other undesirable environmental impacts, such as contributing to acid rain or smog. Use of these compounds thus requires a careful assessment so that effective management options can be developed and evaluated.

Status:

Environment Canada is carrying out this evaluation. It is an on-going initiative.

## **2.2.2 Task #2**

*Update the ODS and HFC Inventory to 1996.*

The original 1992 inventory study was very useful in defining the initial needs and determining progress regarding the major use of the main ODS, such as CFCs, HCFCs, and Halons. The original inventory provided the necessary data for the development of suitable programs to reduce emissions and uses. The updated inventory includes HFCs as well as all ODS. It also provides information that has been used as a base for the development of programs. It is also a clear measure of actual progress in reducing use in the various sectors over the past three years.

Status:

The inventory update was completed to 1998.

### **2.2.3 Task #3**

*Prepare a New Information Package for Public and Industry Prior to the 9th Meeting of Parties to the Protocol (Montreal, September, 1997).*

The September 1997 meeting of the parties to the Protocol recognized the 10th anniversary of the signing of the original document in 1987, in Montreal. The meeting provided an opportunity to present a summary of Canadian progress, programs, and our future direction.

Concurrently, there was an important need to provide an updated information package for both Canadian industry and the general public. Information packages have been a key factor in obtaining industry cooperation and suggestions. Important concerns such as HCFC control and phase-out, use of HFCs, possible phase-out of uses in some sectors, and so on, required an updated information package. In addition, the new issues and the future direction required an information package for the general public, to keep them up-to-date. The information package was to cover all industry sectors.

Status:

Completed.

### **2.2.4 Task #4**

*Plan for the Disposal of CFCs and Halons.*

*(a) Discussion Paper on Disposal of Surplus CFCs and Halons*

The availability of alternatives for CFCs and for many HCFCs, coupled with the possibility of future use phase-out in some industry sectors, may lead to a surplus of CFCs. A similar situation could also occur with Halons. Therefore, an assessment of this potential problem was required and included the following elements:

- identification of quantities in use in each sector;
- estimates and projections of future surpluses;
- identification of possible disposal scenarios, such as “natural” phase-out, conversion to other environmentally acceptable compounds, and destruction;
- evaluation of possible advantages and disadvantages of the various scenarios;
- options for future actions; and
- discussion of responsibilities for disposal.

Status:

Completed. (“Options for the Management of Surplus Ozone-Depleting Substances in Canada”, Shapiro and Associates, June 1998)

*(b) Development of a Strategic Plan for Disposal of Surplus CFCs and Halons (if necessary)*

The strategic plan would include the following major components:

- a clearly defined objective;
- specified dates for achieving important milestones;
- an action plan defining specific actions and responsibilities; and
- a plan to monitor progress.

Status:

Completed. ("Canada's Strategy to Accelerate the Phase-out of CFC and Halon Uses and to Dispose of the Surplus Stocks", CCME PN 1316, prepared by the Federal-Provincial Working Group on Ozone-Depleting Substances and Halocarbon Alternatives, May 2001)

## **2.2.5 Task #5**

*Form Expert Panels(s) on ODS Alternatives.*

For sectors for which a need is identified, expert panel(s) will be established to review ODS alternatives, identify the most promising ones and provide recommendations on how to foster the development or introduction of these products and technologies. The panel will seek input from stakeholders in Canada regarding suggestions for possible replacements. Environmental concerns as well occupational health and safety issues will be included in the mandate of the panel.

Status:

An expert panel on refrigerants was established and their final reports have been received. Three reports are available – "Stratospheric Ozone: Analysis of Alternative Technology Options in the Residential Sector"; "Stratospheric Ozone: Analysis of Alternative Technology Options in the Industrial and Transportation Sectors"; and "Stratospheric Ozone: Analysis of Alternative Technology Options in the Commercial and Automotive Sectors".

Consideration of alternatives in other sectors is being carried out by other working groups, for example the Methyl Bromide Working Group and the Multistakeholder Working Group for ODS and Alternatives.

## **2.2.6 Task #6**

*Implement Additional Controls on HCFCs.*

Further controls on HCFCs were to be developed to restrict products made with HCFCs where alternatives exist. These controls would also restrict HCFCs to applications currently being met by ODS with higher ODP and control the import of certain equipment containing HCFCs. Dispersive uses of HCFCs will be phased out by 2010.

Status:

Completed. The additional controls were implemented by Environment Canada through amendments to the CEPA Ozone-Depleting Substances Regulations (1998).

## **2.3 Status of Refrigerant Sector Tasks**

### **2.3.1 Task #7**

*Training Program*

*(a) Continue Environmental Awareness Training Program.*

The Environmental Awareness Training Program has been a major asset in informing, motivating, and guiding the service industry in reducing ODS emissions. There remains several thousand service technicians across Canada to be trained. In addition, new people entering the various trades require this training.

Status:

The mandatory training program has been implemented in all provinces and territories except Quebec and Nunavut. Over 95,000 service technicians have received the training since the program was started in 1992.

*(b) Update the Training Program to Reflect Revised Code of Practice.*

The Code of Practice is the main component of the training course. Recently the Code of Practice was revised and updated to reflect the many new developments related to ODS. The training program will be updated to ensure that the latest information, methods, and technologies are provided to the service industry.

Status:

The update of the HRAI training program is complete. The update of the RSES program is underway and is expected to be completed in 2001.



*(c) Assess Results and Progress of the Training Program.*

Concurrent with updating the training program, it was necessary to assess the effectiveness of the program. This assessment should provide the information needed to determine the future direction, content of, and control over the training program.

Status:

Completed. ("Environmental Awareness Training Evaluation," final report, JS Environmental Services, assisted by Bob Anderson, June 1997)

**2.3.2 Task #8**

*Complete a Review of Recovery and Recycling (R/R) Equipment Standards.*

Since the concept of recovery and recycling was introduced, most sectors of the refrigeration and air-conditioning industry are using R/R equipment. The industry's trade and technical associations have established equipment standards to ensure that the R/R needs are met.

There are now several sets of standards. It is therefore essential to examine each one to ascertain whether environmental concerns are adequately addressed. Recommendations for possible future actions may be made following completion of this review.

Status:

Completed. ("Review of Recovery and Recycling Equipment Performance Standards for Use in the Refrigeration and Air Conditioning Industry for the Recovery and Recycling of ODS", final report, JS Environmental Services, February 1997)

**2.3.3 Task #9**

*Mandate Use of Refillable Containers.*

Refillable containers are less prone to leakage and they also eliminate emissions caused by disposal of throwaway and recyclable containers. Their use is now mandatory in several provinces. This requirement should be mandated by all jurisdictions in Canada.

Status:

This has been mandated through regulations by Environment Canada (federal house), Alberta, British Columbia, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward Island, and the Yukon Territory.

### **2.3.4 Task #10**

*Prohibit Recharging Mobile Air Conditioning Systems with CFCs, as Recommended in the Code of Practice.*

Mobile air conditioning is one of the largest sources of CFC emissions in the refrigeration and air conditioning sector. Most vehicles manufactured after 1993 do not use CFCs. Conversion kits and/or alternative refrigerant blends are available for older models. The new Code of Practice recommends that recharging of mobile air conditioners with CFCs be prohibited as of January 1, 2000. This should be mandatory in all jurisdictions in Canada.

Status:

This has been prohibited by Environment Canada (federal house), Alberta, British Columbia, New Brunswick, Prince Edward Island, and the Yukon Territory.

### **2.3.5 Task #11**

*Assess Feasibility of Use Phase-out of CFCs in Refrigeration and Air Conditioning Systems.*

The current inventory of CFCs exists mostly within the refrigeration and air conditioning sector. Normal replacement of equipment was expected to reduce the amount in use by another 30% by the year 2000. The need to further reduce ODS emissions in order to better protect the ozone layer suggested that phase-out dates for CFC uses must be considered. The feasibility of a use phase-out and appropriate dates should be assessed, with due concern given to socio-economic factors and to the possibility of cost effective containment of CFCs.

Status:

Completed. The results are reflected in "Canada's Strategy to Accelerate the Phase-out of CFC and Halon Uses and to Dispose of the Surplus Stocks", CCME PN 1316, prepared by the Federal-Provincial Working Group on Ozone-Depleting Substances and Halocarbon Alternatives, May 2001.

## **2.4 Status of Solvents Cleaning Sector Tasks**

### **2.4.1 Task #12**

*Assess Feasibility of Eliminating Halocarbon Emissions During Metal and Electronic Cleaning.*

Most ODS use has been eliminated in this sector because of higher costs or unavailability created by the production phase-out of ODS. These two factors have forced equipment owners to seek alternatives. In the electronics cleaning sector, there is still some hand cleaning and tabletop equipment cleaning that could be replaced by more environmentally efficient methods and equipment.

A study should be performed to assess this situation and to ascertain to what extent environmental improvements can be made. In most cases, it is suspected that the user would realize cost savings.

Status:

A study is being carried out by Environment Canada. It is expected to be completed in 2001.

## **2.5 Status of Fire Protection Sector Tasks**

### **2.5.1 Task #13**

*Implement Halon Code of Practice and Identify Regulatory Requirements.*

The Halon industry sector is highly specialized, and the use of Halons, in certain applications, reduces risks to humans. With the phase-out of consumption, there is a need to ensure that surplus Halons are of acceptable quality and available for use in the remaining systems that still require them. It is equally important that emissions due to poor operation or maintenance be avoided. The new Halon Code of Practice addresses these issues.

This Code of Practice should be implemented in a harmonized manner across the country. It might be necessary to implement some of the proposed measures, such as banning non-critical uses for which alternatives are adequate, through regulations.

Status:

The majority of jurisdictions have implemented the Code of Practice or have regulatory provisions reflecting it.

## **2.5.2 Task #14**

*Assess Feasibility of Use Phase-out of Halons in Fire Extinguishing Systems.*

The critical factor in assessing the feasibility of such a phase-out is the availability of alternatives. It may be necessary to assess the various use areas separately, identify critical needs and establish an adequate time frame for conversion from Halon use.

The use of Halons in some portable systems may be amenable to phase-out in the short term. The time frames would have to be carefully examined, as would the collection and disposal of surplus Halons. The feasibility of a use phase-out and appropriate dates should be assessed, with due concern given to socio-economic factors and to the availability of cost effective alternatives to Halons.

### Status:

Completed. The results are reflected in "Canada's Strategy to Accelerate the Phase-out of CFC and Halon Uses and to Dispose of the Surplus Stocks", CCME PN 1316, prepared by the Federal-Provincial Working Group on Ozone-Depleting Substances and Halocarbon Alternatives, May 2001.

## **2.6 Status of Aerosols, Sterilants and Laboratory Use Sector Tasks**

### **2.6.1 Task #15 (a)**

*Assess the Use of HCFCs and HFCs in the Aerosol and Sterilant Industry.*

With the elimination of CFCs from aerosol use in the 1980's, the industry switched to alternative compounds such as hydrocarbons, HCFCs, and HFCs. HCFCs are ODS and HFCs have high global warming potential. Since aerosols are by nature, totally dispersive, it is important to know the extent of their current use and their environmental impact. Other possible alternatives that could replace them should be identified.

In this sector, HCFCs and HFCs are in use or being considered for use. The use of these substances should be assessed in terms of critical need, possible alternatives, and the potential for the uses of recovery and recycling technology.

### Status:

On-going. Environment Canada has issued many surveys on HCFC and HFC uses since 1998. The current ODS Regulations limit the use of HCFCs in aerosols. The current use of HFCs in aerosols and sterilants is small.

## **2.6.2 Task #15 (b)**

*Monitor CFC and HCFC Use in Laboratory Analysis.*

Use of certain ODS in laboratory analysis results from their low toxicity, non-flammability, and high evaporation rates. Tests using these substances became recognized by various standards organizations. These tests are considered essential use applications until testing alternatives are identified and proven. These efforts must be monitored to ensure there is progress toward eliminating this use.

Status:

On-going. ODS-based applications are being reduced as per the Montreal Protocol.

## **2.6.3 Task #15 (c)**

*Develop Transition Strategy for Metered-Dose Inhalers (MDIs).*

Environment Canada, in cooperation with Health Canada and appropriate stakeholders, will develop a transition strategy to non-CFC based MDIs. This strategy may contain the following elements: public consultations, public awareness and promotion campaigns, removal from the market of CFC-based MDIs and approval of non-CFC products on a priority basis.

Status:

Completed (“Canadian Initial Transition Strategy for the Phase-out of CFC Use in Metered Dose Inhalers”, Environment Canada, June 1998).

## **2.7 Status of Pest Control Sector Tasks**

### **2.7.1 Task #16**

*Promote Prevention of Methyl Bromide Emissions and the Use of Alternatives.*

Methyl bromide is a fumigant gas that is used as a pesticide in the treatment of soil pests prior to the planting of certain crops, in food processing facilities and in the storage and transportation of agricultural products. Introduction of new pest control techniques and new pesticides as well as dissemination of information on techniques that do not use methyl bromide will reduce the Canadian methyl bromide consumption. The use of an integrated pest management approach and the introduction of recovery and recycling technology in some applications will also help to achieve lower emissions. Close cooperation with users, applicators, Agriculture and Agri-Food Canada, and the Pest Management Regulatory Agency should continue, to encourage the introduction of alternatives.

Status:

On-going. Use of methyl bromide has been reduced significantly in the farm sector. The reduction schedule is being met.

## **2.8 Status of Foam Blowing Agents Sector Tasks**

### **2.8.1 Task #17**

*Assess Feasibility of Recovery of Halocarbon Blowing Agents During Foam Manufacture.*

Considerable emission of blowing agent takes place during certain foam manufacturing process. During the manufacture of open cell foams, virtually all the actual blowing agent is lost, while for closed cell foams, the emission rate is low. The feasibility of recovery should be assessed to determine if manufacturing systems could lend themselves to economically feasible changes. Environmental benefits and the cost/benefit ratio of such measures should also be evaluated.

Status:

On-going. A study has been initiated and is expected to be completed in 2001.

**Table 1: STATUS OF MAJOR NATIONAL ACTION PLAN TASKS - Feb. 2001**

Jurisdiction	<u>Task #1</u> Recovery/ Recycling & Emission Controls for HFCs	<u>Task #9</u> Mandating Refillable Containers for all Halocarbon Refrigerants	<u>Task #10</u> Prohibiting the Recharging of Mobile Air Conditioning Systems with CFCs
Newfoundland	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>	<b>Under consideration only</b>
Prince Edward Island	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>
Nova Scotia	<b>Under consideration only</b>	<b>Regulations promulgated</b>	<b>Under consideration only</b>
New Brunswick	<b>Under consideration only</b>	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>
Quebec	<b>Under consideration only</b>	<b>Under consideration only</b>	<b>Under consideration only</b>
Ontario	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>	<b>Under consideration only</b>
Manitoba	<b>Under consideration only</b>	<b>Under consideration only</b>	<b>Under consideration only</b>
Saskatchewan	<b>Under consideration only</b>	<b>Under consideration only</b>	<b>Under consideration only</b>
Alberta	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>
British Columbia	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>
Yukon	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>
Northwest Territories	<b>Will be included in guideline</b>	<b>Will be included in guideline</b>	<b>Will be included in guideline</b>
Nunavut	<b>Will be included in guideline</b>	<b>Will be included in guideline</b>	<b>Will be included in guideline</b>
Federal House	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>	<b>Regulations promulgated</b>

## **Section 3**

---

### **1998 National Action Plan Update**

This section identifies the additional tasks that are required to implement the CCME report “**Canada’s Strategy to Accelerate the Phase-Out of CFC and Halon Uses and to Dispose of the Surplus Stocks**”.

The Phase-out Strategy has two separate components. The first component consists of initiatives that will provide the infrastructure needed to encourage an orderly transition to alternative substances and alternative technology. The infrastructure will also help to ensure safe disposal of the surplus stocks of CFCs and Halons. The second component consists of phase-out objectives and approaches specific to individual industry sectors.

The tasks presented here are those that will be undertaken by the federal, provincial and territorial governments. There are other components of the Phase-out Strategy that will be implemented by industry or other stakeholders.

#### **3.1 Objectives**

The main objective of this update is to ensure that the federal, provincial and territorial governments take the steps necessary to achieve an orderly and affordable phase-out of CFC and Halon uses in Canada, as set out in the CCME Phase-out Strategy.

#### **3.2 Tasks**

The new tasks have been grouped according to the approach taken in the CCME Strategy document. The groupings are:

- i) General (Infrastructure) Tasks:
  - Extended Producer Responsibility (EPR);
  - Market Force Instruments;
  - Disposal of Surplus Stocks; and
  - Control Measures.
  
- ii) Sector Specific Tasks:
  - Mobile Air Conditioning;
  - Mobile Refrigeration;
  - Household Appliances;
  - Commercial Refrigeration and Air Conditioning;
  - Chillers; and
  - Halons.



Detailed descriptions of the tasks are presented in section 3.3.

### **3.3 Task Descriptions**

#### **3.3.1 Task No. 1**

*(a) Encourage and support industry to develop Extended Producer Responsibility (EPR) programs and participate in their development as appropriate.*

Industry must lead the development of EPR programs, but Governments can and should actively participate in their development. The Heating, Refrigeration and Air Conditioning Institute (HRAI), through Refrigerant Management Canada, is leading the development of a plan for the collection and disposal of surplus refrigerants in the stationary refrigeration and air conditioning and chillers sectors. The FPWG will participate as appropriate. The FPWG will also encourage other sectors (e.g. mobile air conditioning and refrigeration and Halons) to participate in the HRAI initiative or develop their own EPR programs.

*(b) Develop and implement control measures needed to support the EPR programs and to ensure that a level playing field exists in all jurisdictions.*

While industry is taking the lead in the development and implementation of the EPR programs for CFCs, some control measures (e.g. seller take-back requirements) will be needed to support the programs. Each jurisdiction will implement a regulatory backdrop for EPR. Environment Canada will also develop regulations to allow exports of surplus CFCs and Halons for disposal or critical use applications only. The FPWG will work with the industry to ensure that the most appropriate measures are developed and that the measures taken by jurisdictions ensure a level playing field.

#### **3.3.2 Task No. 2**

*Develop awareness programs to inform stakeholders of the Phase-out Strategy objectives and time lines.*

It is important that stakeholders be informed of the Phase-out Strategy to allow them the opportunity to plan such phase-out. The FPWG has requested that the Multistakeholder Working Group for ODS and Alternatives initiate a comprehensive awareness and education program for the CFC Phase-out. A similar program will be developed for halons with the Halon Round Table. The federal, provincial and territorial jurisdictions will pursue efforts related to the awareness and training of technical personnel.

### **3.3.3 Task No. 3**

*Consult with other government departments and with stakeholders on economic incentives that would be appropriate to achieve the objectives of the Strategy, and how to implement these incentives.*

The ultimate objective of this task is to have appropriate market force instruments implemented in Canada. Environment Canada is studying potential instruments that could encourage the phase-out of uses and disposal of CFCs and Halons in Canada. The FPWG will undertake consultations with other government departments, both federal and provincial, and with stakeholders, on the findings and recommendations of the Environment Canada study.

### **3.3.4 Task No. 4**

*Encourage manufacturers and distributors of alternatives to provide incentives or take other actions to accelerate the transition to alternatives.*

The Phase-out Strategy recognizes the important role manufacturers and distributors of alternative products and technology can play in accelerating the phase-out of CFC and Halon uses. To achieve this task, the FPWG will approach these companies or their representative associations.

### **3.3.5 Task No. 5**

*Monitor the rates of equipment retrofits and replacements, and the reasons for them.*

The FPWG will periodically monitor the rates of equipment retrofits and replacements. This information will be a valuable indicator of how the market place is responding to the Strategy.

### **3.3.6 Task No. 6**

*Ensure that control measures developed to implement the Phase-out Strategy form a clear and comprehensive regulatory backdrop that is consistent among jurisdictions.*

The FPWG will take a lead role by developing model requirements for implementing the phase-out objectives of the Strategy. Governments will then be able to use these model requirements as the basis for action in their own jurisdictions.

### 3.3.7 Task No. 7

*Implement sector specific measures as per the Phase-out Strategy:*

*(a) Prohibit refilling in the mobile refrigeration sector with CFCs, effective 2003.*

The CEPA Code of Practice contains guidelines for recovering CFCs from equipment in this sector. Companies are actively converting from CFCs to alternatives. It is important and timely, then, that action is taken to ensure that surplus CFCs are not used to refill mobile refrigeration equipment. Governments will prohibit the use of CFCs for refilling equipment in this sector effective 2003, as indicated in the Phase-out Strategy.

*(b) Prohibit conversion of household appliances to use CFCs (i.e. R-12) if there is evidence that such conversion is occurring or likely to occur.*

This is largely a “precautionary” step to ensure that a market for this activity does not develop in Canada. The FPWG will assess whether each jurisdiction should contain such a prohibition or if a policy statement is sufficient.

*(c) Monitor/report on the success of recovery programs directed to household appliances, and consider ways to enhance implementation of the programs.*

Programs to recover CFCs from discarded household appliances exist in most jurisdictions in Canada. However, during the preparation of the Phase-out Strategy, some stakeholders expressed concerns about the effectiveness of these programs. This task will help to ensure that existing programs are changed, if appropriate, to increase their effectiveness.

*(d) Implement a staged refill ban for commercial refrigeration and air conditioning equipment, effective by year:*

- *Small commercial units (<5HP) by 2004;*
- *Medium units (5-30HP) by 2005; and*
- *Large industrial units (>30HP) by 2006.*

This staged approach will allow for an orderly and affordable phase-out of CFCs from this sector.

*(e) Require conversion or replacement of CFC-containing chillers at next overhaul, effective 2005.*

As a result of input received during development of the Strategy, this was determined to be the most effective and least costly approach to accelerating the phase-out of CFCs from chillers. The regulations restricting CFC emissions from chillers will remain in place until the phase-out is complete.

*(f) Beginning in 2003, limit releases of CFCs from low pressure chiller purges to less than 0.1 kg/kg of air.*

This sector is a major repository of CFCs. These limits will ensure that the most stringent emission control equipment is used until the chillers are converted to alternatives.

*(g) Prohibit refilling of portable Halon-containing fire extinguishers, except for critical uses, by 2003.*

Several provinces and the federal government have, or are developing, regulations to accomplish this task. The remaining jurisdictions will develop control measures to implement the prohibition.

*(h) For fixed Halon-containing fire protection systems, provide for one refill between 2005 and 2010. One refill would be allowed on the condition that the system is replaced by an alternative within a year of the refill. Prohibit refills of fixed Halon-containing fire protection systems, effective 2010. Critical uses would be exempt from these requirements.*

This approach will allow for a cost-effective phase-out of fixed systems and ensure continued protection of facilities protected by Halon systems.

## **Section 4**

---

### **Reporting on Progress**

The FPWG will report regularly to the National Air Issues Steering Committee (NAICC-A) on the progress being made in implementing the NAP. Table 2 sets out the tasks and target dates that will form the basis for the reports to the NAICC-A. The first three tasks are the remaining 1998 NAP tasks that are not yet fully implemented. The last seven tasks are those described in Section 3, to implement the Phase-out Strategy.

In order to ensure consistent implementation of the Strategy, the FPWG will prepare an Implementation Report on the status of tasks. The report will be submitted to the CCME on a regular basis.

**Table 2**

**UPDATED NATIONAL ACTION PLAN TASKS - 2001**

<b>NO.</b>	<b>TITLE</b>	<b>SCHEDULE</b>	<b>RESPONSIBILITY</b>	<b>PRIORITY.</b>
1998 NAP				
98-1	Implement recovery/recycling and emission control measures for HFCs.	As soon as possible	Nova Scotia, New Brunswick, Quebec, Manitoba, Saskatchewan, Northwest Territories, Nunavut	1
98-2	Mandate use of refillable containers for all halocarbon refrigerants.	As soon as possible	Quebec, Manitoba, Saskatchewan, Northwest Territories, Nunavut	1
98-3	Prohibit the recharging of mobile air conditioning systems with CFCs.	As soon as possible	Newfoundland, Nova Scotia, Quebec, Ontario, Manitoba, Saskatchewan, Northwest Territories, Nunavut	1
Updated NAP:				
01-1	(a) Encourage industry to develop EPR programs and participate in their development as appropriate.	On-going	Environment Canada, Provinces/Territories	1
	(b) Develop and implement control measures needed to support the EPR programs and to ensure that a level playing field exists in all jurisdictions.	As soon as possible	Environment Canada, Provinces/Territories	1
01-2	Develop awareness programs to inform stakeholders of the Phase-out Strategy objectives and time lines.	2001	Environment Canada, Provinces/Territories	1

01-3	Consult with other government departments and with stakeholders on economic incentives that would be appropriate to achieve the objectives of the Strategy, and how to implement these incentives.	2002	Environment Canada, Provinces/Territories	2
01-4	Encourage manufacturers and distributors of alternatives to provide incentives or take other actions to accelerate the transition to alternatives.	2002	Environment Canada, Provinces/Territories	2
01-5	Monitor the rates of equipment retrofits and replacements.	On-going	Environment Canada, Provinces/Territories	2
01-6	Ensure that control measures developed to implement the Phase-out Strategy form a clear and comprehensive backdrop that is consistent among jurisdictions.	On-going	Environment Canada, Provinces/Territories	1
01-7	Implement the sector specific control measures and other activities identified in the Phase-out Strategy.	As prescribed in Section 3.3 tasks	Environment Canada, Provinces/Territories	1

**Priority Legend:**    1 = must be done  
                              2 = highly desirable

## ***Glossary***

---

**CCME** - Canadian Council of Ministers of the Environment. Each province and territory, and the federal government are represented at the meetings by the respective Minister of the Environment.

**Chlorofluorocarbon (CFC)** - A very stable compound containing chlorine, fluorine, and carbon atoms. Chlorofluorocarbons decompose in the stratosphere and release chlorine, which destroys ozone.

**Consumption** – Consumption equals production plus imports minus exports.

**Disposable Container** - A container designed to be used only once for transportation or storage of CFCs or HCFCs; designed in accordance with Transport Canada specification 39 (DOT 39 if made in the USA).

**Disposal** - The method used to eliminate a substance that will no longer be used for the original purpose for which it was made. The method may include transformation, destruction, or disposal as a hazardous waste if mixed with other substances.

**EPR** - Extended Producer Responsibility.

**Federal House** - All the entities that are only under federal jurisdiction.

**FPWG** - Federal Provincial Working Group on Ozone-Depleting Substances and Halocarbon Alternatives. The group is responsible for coordinating the development of controls across all jurisdictions for ozone-depleting substances and their alternatives. This group reports to the National Air Issues Coordinating Committee.

**GWP** - Global Warming Potential. A relative measure of the warming effect that the emission of a gas might have on the surface troposphere. Usually a factor relative to CO<sub>2</sub>.

**Halon** - A compound containing bromine, chlorine, fluorine, and carbon in its structure. Halons have high ODP.

**Halocarbon** - A carbon-based compound that may contain hydrogen, fluorine, chlorine, bromine or iodine in its structure.

**HRAI** - Heating, Refrigerating and Air Conditioning Institute.

**Hydrochlorofluorocarbon (HCFC)** - A chemical compound that contains hydrogen, chlorine, fluorine, and carbon atoms. Hydrochlorofluorocarbons have a lower



ozone depletion potential than CFCs. They are considered acceptable substitutes for CFCs for a transitional period. HCFC production and importation will be phased out by 2030.

**Hydrofluorocarbon (HFC)** - A chemical compound that contains only hydrogen, fluorine, and carbon. Since no chlorine is present, these compounds have no ozone depletion potential and are good replacements for CFCs, although they have a global warming potential.

**Methyl Bromide (MBr)** - A chemical compound containing bromine, hydrogen and carbon. It is a pesticide used as a fumigant.

**Montreal Protocol** - An international agreement titled "The Montreal Protocol on Substances that Deplete the Ozone Layer." The Protocol sets the reduction and phase-out dates for the consumption of ozone-depleting substances. It was developed under the auspices of the United Nations Environmental Programme (UNEP) to provide a coordinated response to the global problem of ozone depletion. More than 160 countries have signed the Protocol.

**Ozone-Depleting Substance (ODS)** - A chemical compound that is sufficiently stable to reach the stratosphere and capable of reacting with stratospheric ozone, either directly or through release of a chemical element that reacts after the compound decomposes.

**Ozone Depletion Potential (ODP)** - The rated effect of a compound on the ozone layer compared to CFC-11, which is assigned the value of 1.0. Official ODP values are assigned in the Montreal Protocol.

**Perfluorocarbon (PFC)** - A chemical compound that contains only fluorine and carbon. PFCs are not ODS. They do however have a high global warming potential. They may be a substitute for CFCs and HCFCs if lower GWP compounds are not available.

**Recovery** - Collection of ODS, such as CFCs or HCFCs, from equipment during servicing or before disposal (as opposed to venting to the atmosphere).

**Recycling** - Reuse of recovered ODS by charging back into the equipment after servicing. The ODS goes through some cleanup procedures before return, e.g., filtering, drying. This is usually done at the job site, but may be done off-site, depending on the volume.

**Reclamation** - Recovered refrigerants are shipped off-site to a central processing facility and cleaned by filtering, drying, distillation, and chemical treatment to meet or exceed industry accepted reuse standards. Results are verified by laboratory analysis.

**Refillable Container** - A container that meets the requirements of Transport Canada and is approved for multiple use.

**R/R/R** - Recovery, Recycling, and Reclamation.  
**RSES** - Refrigeration Service Engineers Society.