

# MONTREAL PROTOCOL

## BUSINESS OPPORTUNITIES



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## The Ozone Layer

### Facts About Ozone:

- Ozone is a form of oxygen made up of three oxygen atoms ( $O_3$ )
- It is colourless and has a very distinct odour
- Ozone can absorb UV radiation
- Approximately 90% of the ozone in the atmosphere is found in the stratosphere

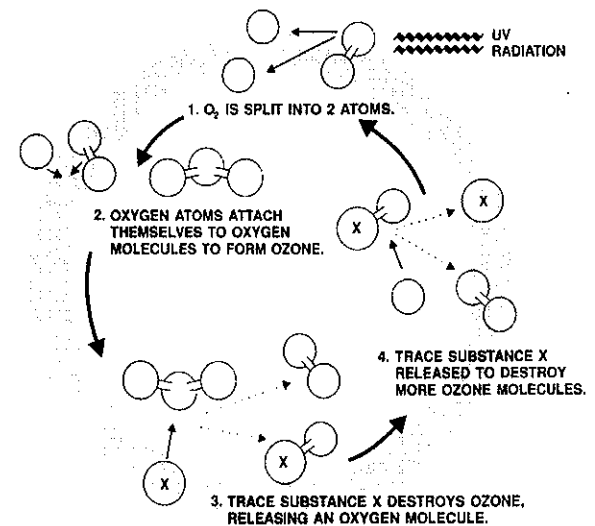
### What is the ozone layer?

High above the earth, a protective veil of gas shields the earth's organisms from the sun's harmful ultraviolet (UV) rays. This thin shield, located between 15 and 35 kilometres above the earth, is known as the ozone layer. It is made up of ozone molecules dispersed thinly throughout the stratosphere.

### "Good" versus "bad" ozone

Ozone is found in two places; "good" ozone, in the stratosphere and "bad" ozone, at ground level. Stratospheric ozone filters ultraviolet rays; while ground ozone, the reaction between sunlight, volatile organic compounds (VOCs) and nitrogen oxides ( $NO_x$ ), creates smog. Unfortunately, levels of stratospheric ozone are decreasing whereas ground ozone levels are on the rise.

### The natural cycle of ozone production and destruction in the stratosphere



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## Ozone depletion

In 1995 Sherwood Rowland and Mario Molina were awarded the Nobel Prize for chemistry for their postulation, in 1974, that chlorinated and brominated compounds used in refrigerants, foams, sprays, fire extinguishers and solvents were depleting the earth's ozone layer. In the decade following Rowland and Molina's hypothesis, support grew, culminating in the discovery of an "ozone hole" over the Antarctic in 1985. This event provided enough evidence to bring the world's attention to this problem. Chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), bromofluorocarbons (halons), carbon tetrachloride, methyl chloroform and methyl bromide have all been identified as ozone-depleting substances (ODS). They are all stable compounds that contain either chlorine or bromine.

## Effects of ozone depletion

Although it is not certain what the full extent of damage may be as a result of ozone degeneration, the effects of ultra-violet radiation are numerous. Depletion of the ozone layer can lead to an increased risk of skin cancer, eye cataracts, immune system disorders as well as decreased vegetation productivity and deterioration of the marine food chain. Scientific analysis has left no doubt that immediate and drastic action is necessary to bring ozone depletion to a halt.

## Ozone depletion and the international community

Growing global concern for the well being of the ozone layer began to emerge in the late 1970s. Several developed countries imposed bans on non-essential uses of CFCs; the United Nations Environment Program (UNEP) set up a Coordinating Committee on the Ozone Layer; and UNEP's governing council adopted the World Plan of Action on the Ozone Layer. Work on establishing an international framework convention for the protection of the ozone layer led to the Vienna Convention. In March 1985, twenty-two countries signed the Vienna Convention for the Protection of the Ozone Layer. This convention created global guidelines for action to protect the ozone layer, but did not establish measures for implementing specific controls on ozone-depleting substances. Canada, the first country to ratify the Vienna Convention in June 1986, was chosen to host the meetings where these measures would be established. The result of these meetings was the adoption of the Montreal Protocol on Substances that Deplete the Ozone Layer.

## The Montreal Protocol

On September 16, 1987 the Montreal Protocol on Substances that Deplete the Ozone Layer was signed by twenty-four countries in Montreal, Quebec. It is considered the first effort of global cooperation to protect the environment. The Protocol established measures for controlling the production and consumption of ozone-depleting substances (ODS) that came into effect on January 1, 1989. It required that Parties to the Protocol freeze CFC emissions at 1986 levels and reduce them by 50% by 1998. The Protocol also called for a freeze in halon production at 1986 levels by 1992. An important feature of the Protocol is its treatment of developing countries. It permits these countries a ten year grace period in which to comply with the control measures in order to meet their basic domestic needs.

## The Ozone Issue Leading to the Montreal Protocol

- 1974 Rowland and Molina hypothesize ozone depletion
- 1977 UNEP World Plan of Action on the Ozone Layer
- 1985 Vienna Convention for the Protection of the Ozone Layer
- 1985 Discovery of Antarctic "ozone hole"
- 1986 Canada first country to ratify Vienna Convention
- 1987 Montreal Protocol on Substances that Deplete the Ozone Layer signed by 24 countries

The original agreement has since been amended on two occasions. At the meeting of the Parties to the Protocol in London in 1990, several changes were made: the Interim Multilateral Fund was created to help Article 5 countries<sup>1</sup> meet the control measures of the Protocol; tighter control measures for CFCs and halons were passed; and carbon tetrachloride and methyl chloroform were added to the list of controlled substances. In Copenhagen in 1992, the phase-out deadlines for ozone depleting substances (ODS) were further tightened and methyl bromide, HCFCs and HBFCs were added to the list of substances subject to control. As of December 1996, 161 countries have ratified the Montreal Protocol.

Current Phase-Out Deadlines			
Controlled Substance	% Eliminated	Non-Article 5	Article 5
CFCs	100	Jan. 1, 1996	Jan. 1, 2010
Halons	100	Jan. 1, 1994	Jan. 1, 2010
Carbon Tetrachloride	100	Jan. 1, 1996	Jan. 1, 2010
HCFCs	100	Jan. 1, 2030	Jan. 1, 2040
HBFCs	100	Jan. 1, 1996	Not established
Methyl Bromide	100	Jan. 1, 2010	Freeze in 2002
Methyl Chloroform	100	Jan. 1, 1996	2015

## The Multilateral Fund of the Montreal Protocol

### Creation of the fund

Replacing ozone-depleting substances with new "ozone-friendly" substances involves a number of expenses including research, retrofitting and or development of new technologies and training. In light of these costs, it has been more difficult for developing countries to meet the Protocol deadlines. The original Protocol provided no mechanisms to surmount this problem for developing countries. However, at the Second Meeting of the Parties in London, in 1990, an Interim Multilateral Fund was created to assist developing countries in financing the incremental costs of adherence and in the transfer of non-ODS technologies to developing nations. The Interim Fund was initially set at US \$160 million for 1991-1993 and was later increased to US \$240 million when China and India signed the Protocol. When the Fund became permanent at the Fifth Meeting of the Parties in 1993, a budget of US \$510 million was adopted to cover the 1994-1996 period. Replenished every three years, the level of funding for the 1997-1999 period has been set at US \$540 million (including US \$74 million carried over from 1994-1996).

### Mandate

Successful implementation of the Montreal Protocol depends on global participation. The Multilateral Fund's mandate, therefore, is to help developing countries eliminate substances that are controlled under the Montreal Protocol within the agreed time frame.

### The Multilateral Fund

- Created in 1990 at the Second Meeting of the Parties in London
- Mechanism to assist Article 5 countries meet the Protocol deadlines
- Allocation of Fund managed by the Executive Committee
- Executive Committee composed of seven representatives from Article 5 countries and seven representatives from non-Article 5 countries

<sup>1</sup> An Article 5 country is a developing country whose annual per capita consumption of controlled substances does not exceed 0.3 kg. This consumption is based on complete data submission to the Multilateral Fund Secretariat.

## A global partnership

Although the roles of donor and recipient countries differ under the Multilateral Fund, the responsibilities of its governance are shared equally by developing and developed countries. Developing countries are defined under Article 5 of the Protocol as countries whose annual per capita consumption of ODS is less than 0.3 kilograms. Article 5 countries are those eligible for assistance through the Multilateral Fund. Non-Article 5 (developed) countries, are responsible for financing the Fund based on the United Nations scale of assessment.

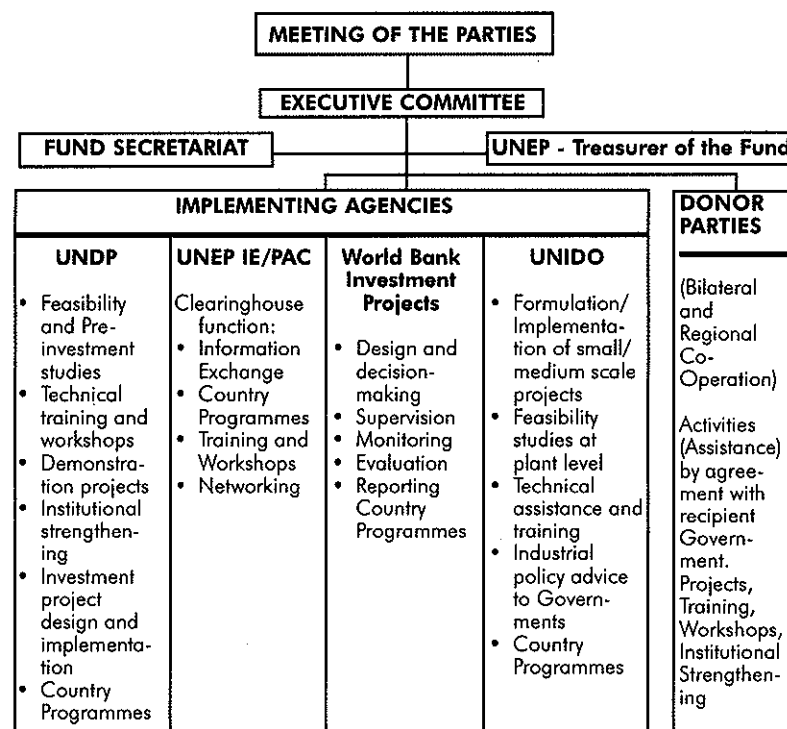
The Executive Committee, established to manage the Fund, is composed of 14 members, seven representatives from Article 5 countries and seven from non-Article 5 countries. The Chair and Vice-Chair of the Executive Committee are selected from the 14 members for a one-year term. The Chair's position alternates between Article 5 and non-Article 5 countries with the Vice-Chair being chosen from the group not holding the Chair's position. Decisions made by the Executive Committee are by consensus and when this is not possible, a two-thirds majority from both groups is required. The Executive Committee meets three to four times a year and performs numerous functions. They include the following: the development and monitoring of operational policies, budgets, guidelines and administrative arrangements; the allocation and disbursement of resources; the establishment of criteria for project eligibility; and the review of performance reports.

The Parties to the Montreal Protocol determine the policies and funding levels of the Multilateral Fund at the annual Meetings of the Parties. The Fund Secretariat, established in Montreal, assists the Executive Committee in administering the Fund by liaising with the Parties and implementing agencies. These agencies, selected by the Executive Committee, are the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), the United Nations Industrial Development Organization (UNIDO) and the World Bank. An Article 5 country interested in obtaining assistance through the Multilateral Fund must apply to one of the above-mentioned agencies. The agency then assesses the particular needs of the country seeking assistance in order to meet the control requirements of the Protocol. Each implementing agency prepares an annual Work Programme for review and approval by the Executive Committee. A Work Programme describes the scope, timing and budget information for planned projects and support activities.

## How the fund works

To initiate a project under the Multilateral Fund, an Article 5 country presents a proposal to either the Fund Secretariat or one of the four implementing agencies. The Fund Secretariat can also identify an implementing agency to help develop a country program or project proposal. Each of the implementing agencies has a main field of activity. The World Bank is the primary agency involved in developing and implementing country programmes and investment projects. It helps countries gather the necessary data on ODS in the country, defines objectives, target and means, develops projects and calculates costs and benefits. The UNDP helps eligible Parties plan, prepare and implement country programmes (where the ODS phase out is less than 1000 tons) and training and demonstration projects. The UNDP cooperates closely with the World Bank and UNEP in project and programme design and implementation. UNEP's main field of assistance is within the area of information and information exchange. Its role as implementing agency is undertaken by the UNEP Industry and Environment Activity Centre (UNEP/IEPAC) in Paris. The United Nations Industrial Development Organization's (UNIDO) field includes assistance with the formulation and implementation of small and medium scale projects, technical assistance and training, and industrial policy advice to Governments.

## Structure of the Fund



## Contacts and Addresses

### The Fund Secretariat

Chief Officer  
Multilateral Fund Secretariat  
1800 McGill College Ave.,  
27th Floor  
Montreal, Quebec, Canada  
H3A 3J6  
Tel: (514) 282-1122  
Fax: (514) 282-0068

### The World Bank

Operations Coordinator  
Global Environment Fund  
The World Bank  
1883 H Street, Northwest  
Room S-15041  
Washington, D.C., USA  
20433  
Tel: (202) 477-1234  
Fax: (202) 477-6391

### United Nations Development Program (UNDP)

Montreal Protocol Task Manager  
Environment and Natural  
Resources Group  
United Nations Development  
Programme  
Room DC1-2056  
New York, New York, USA  
10017  
Tel: (212) 906-5004/5005  
Fax: (212) 906-5365

### United Nations Environment Program (UNEP)

The Director  
Industry and Environment Activity  
Center  
United Nations Environment  
Program  
39-43 Quai Andre Citroen  
75739 Paris CEDEX 15, France  
Tel: 33 (1) 4058 8858  
Fax: 33 (1) 4058 8874

### United Nations Industrial Development Organization (UNIDO)

The Director  
Industrial Operations Technology  
Division  
United Nations Industrial  
Development Organization  
Vienna International Center  
P.O. Box 300  
A-1400 Vienna, Austria  
Tel: (431) 21131-3742  
Fax: (431) 230-9615

### Technology Transfer Office Environment Canada

351 St. Joseph Blvd., 18th Floor  
Hull, Quebec, Canada  
K1A 0H3  
Tel: (819) 953-5669  
Fax: (819) 953-7253

## Canadian Projects Under the Multilateral Fund

Under the rules of the Multilateral Fund, developed countries may reserve 20% of their contribution to the Fund for bilateral projects with Article 5 countries who have completed a country programme. Bilateral projects must work towards attaining specific objectives set out in the country programme. The cost effectiveness of a potential project (calculated as the amount of ODS phased out in a project divided by the total value of the project) must also be demonstrated for it to be approved. All bilateral projects are carried out according to the conditions of the Protocol and require approval by the Executive Committee.

Funding Bilateral Projects			
All funds in US dollars	1997	1998	1999
Maximum funding for bilateral projects (20%)	\$1,140,147	\$1,140,147	\$1,140,147

### How a bilateral project is initiated

An Article 5 country initiates a bilateral project by stating its interest in writing to the non-Article 5 country with whom they wish to undertake a project. The non-Article 5 country must then ensure that it can provide the technology or expertise necessary to realize the project. Once this has been established, the two countries work together to develop a project proposal for submission to the Executive Committee for approval.

## Expertise and technology funded under the Multilateral Fund

The following list indicates the types of expertise and technologies that can be funded under a bilateral project of the Multilateral Fund:

### Refrigeration:

- recovery and recycling demonstration projects and training programs in the mobile, residential and commercial/industrial sector
- equipment/refrigerant manufacturing, including ammonia-based systems
- research, development and testing of alternative refrigerants

### Aerosols:

- conversion from CFC to hydrocarbon aerosol manufacturing
- technical assistance and training

### Solvents:

- conversion to alternative solvent technologies (e.g., aqueous) and recovery systems
- conversion to no-clean technologies

### Halons:

- training workshops and demonstration projects re: recycle/recovery
- fire protection design
- halon bank management
- identification of essential uses

### Institutional Strengthening:

- workshops on alternative technologies and substances
- Ozone Layer Protection Program (regulations, enforcement, data collection)

### Methyl Bromide:

- alternative substances, technologies or processes to space and soil fumigation

## Canada's bilateral experience

Canada can be proud of its role in the effort to save the ozone layer, having played a leading role in negotiating the Protocol and being among the first to ratify the accord. Through its bilateral projects, it has also been successful in providing developing countries with the technology and expertise they need to comply with the Protocol.

Since the creation of the Multilateral Fund, Canada has participated in bilateral projects with several Article 5 countries: Brazil, Chile, China, India and Venezuela. Environment Canada, as lead agency, is responsible for negotiating, approving and implementing these bilateral projects. These projects are considered highly desirable as they:

- promote Canadian expertise in alternative processes, substances and technologies;
- assist Article 5 countries in meeting their phase-out schedules and consequently their commitments to the Protocol;
- meet Environment Canada's environmental objective of eliminating ODS;
- provide international leadership visibility for Canada in resolving the problem of ozone-layer depletion;
- encourage joint-venturing by the private sector; and
- complement Canada's foreign policy objectives.

Many opportunities exist for Canadian companies as Canada continues, through its bilateral projects, to match its environmental technology and expertise with the needs of developing countries. More than US \$3 million is available for Canadian bilateral projects for the 1997-1999 period. Canadian companies who have developed alternative technologies or technologies that reduce the use of ODS, and who are interested in participating in technology and information transfer in the scope of a bilateral project should contact the Technology Transfer Office at Environment Canada at:

Technology Transfer Office  
Environment Canada  
351 St. Joseph Blvd., 18th Floor  
Hull, Quebec, Canada  
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Tel: (819) 953-5669  
Fax: (819) 953-7253

*The following information sheets summarize Canadian bilateral projects undertaken to date.*

## REFRIGERATION TRAINING WORKSHOP

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Phase I  
September 8-10, 1993 - São Paulo

**COUNTRY:** Brazil

**DESCRIPTION:** A training workshop was held to provide technical and policy assistance to Brazilian industry and government in the reduction of ODS, utilizing Canadian experience, technology and expertise. The focus of this workshop was on the refrigeration and air conditioning sector. The workshop consisted of plenary information sessions; technology presentations by Canadian companies by sub-sector; and plant visits.

**APPROVED FUNDING:** US \$172,500

**TIME FRAME:** 1 year; 1993-94

**CANADIAN ORGANIZATIONS:** Environment Canada; Heating, Refrigeration and Air Conditioning Institute (HRAI)

**BRAZILIAN ORGANIZATIONS:** Associação Brasileira de Refrigeração, Ar Condicionado, Ventilação e Aquecimento (ABRAVA); Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA); Companhia de Tecnologia de Saneamento Ambiental (CETESB); Serviço Nacional de Aprendizagem Industrial (SENAI); Financiadora de Estudos e Projetos (FINEP)

**CANADIAN COMPANIES:** Managing Environmental Change; P & F Technologies Ltd.; Refrigerant Reclaim of Canada Inc.; Halozone Recycling Inc.; Environment Air Ltd.; Belco Controls; Malnar Industries Ltd.; Icemaster Industries

**STATUS:** Completed.

**RESULTS:** The workshop was considered to be successful and was received positively by both Brazilian and Canadian participants. This workshop was intended as a first step in a planned long term programme for cooperation and was designed to lead to the identification of possible follow up activities between Brazil and Canada.

## REFRIGERATION TRAINING WORKSHOP

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Phase II  
September 26-30, 1994 - Toronto, Montreal, Ottawa

**COUNTRY:** Brazil

**DESCRIPTION:** As a follow-up to Phase I of the Refrigeration Training Workshop held in September 1993 in São Paulo, a delegation of industry, government, institutional and educational representatives from Brazil came to Canada to meet with counterparts from Environment Canada, the Heating, Refrigeration and Air Conditioning Institute (HRAI) and the environmental industry. The focus of the workshop was ODS reduction/control (specifically refrigerant conservation) and covered areas such as regulatory and policy infrastructure, the Environment Canada/HRAI technician training program, recovery and recycle equipment procurement, and pricing and distribution mechanisms for recycled refrigerants. Activities included on-site visits to Canadian companies, a training session at HRAI's facilities and meetings with Canadian government representatives.

**APPROVED FUNDING:** US \$58,390

**TIME FRAME:** 1 year; 1994-95

**CANADIAN ORGANIZATIONS:** Environment Canada; Heating, Refrigeration and Air Conditioning Institute (HRAI)

**BRAZILIAN ORGANIZATIONS:** Associação Brasileira de Refrigeração, Ar Condicionado, Ventilação e Aquecimento (ABRAVA); Serviço Nacional de Aprendizagem Industrial (SENAI); Financiadora de Estudos e Projetos (FINEP); Associação Brasileira da Indústria Elétrica e Eletrônica (ABINEE)

**CANADIAN COMPANIES:** P&F Technologies Ltd.; Thermco International; Halozone Recycling Inc.; Environment Air Ltd.; Belco Controls

**STATUS:** Completed

**RESULTS:** Workshops such as this one continue to establish, develop and reinforce business-to-business and goodwill links between Canada and Brazil, working toward enhancing current working relationships and thus further depletion/elimination of CFCs. This project was also the beginning of the establishment of a training program with SENAI using the Canadian (HRAI) program as a model. As a result, Brazilian refrigeration technicians are now trained with the same standards as their Canadian counterparts.



## OZONE DEPLETING SOLVENTS WORKSHOP

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May 23-24, 1994 - São Paulo

**COUNTRY:** Brazil

**DESCRIPTION:** The focus of the workshop was to help Brazilian industry in understanding best technologies and practices for ODS phaseout, by providing industry representatives with appropriate information to make informed decisions about alternative technologies and substances (alternatives to metal cleaning; semi-aqueous and aqueous alternatives; no-clean alternatives; aircraft maintenance). Workshop activities included demonstrations of ODS-free technologies being used at International Cooperative for Environmental Leadership (ICEL) members' manufacturing facilities in Brazil, and visits by participants to existing facilities where new technologies are already in place.

**APPROVED FUNDING:** US \$50,000

**TIME FRAME:** 1 year; 1994-95

**CANADIAN ORGANIZATIONS:** Environment Canada; Heating, Refrigeration and Air Conditioning Institute (HRAI); International Cooperative for Environmental Leadership (ICEL)

**BRAZILIAN ORGANIZATIONS:** Ministry of Industry, Commerce and Tourism; *Companhia de Tecnologia de Saneamento Ambiental* (CETESB); Ministry of External Relations and Foreign Affairs; *Financiadora de Estudos e Projetos* (FINEP)

**CANADIAN COMPANIES:** Northern Telecom (Nortel)

**STATUS:** Completed

**RESULTS:** The workshop resulted in an increased awareness of the problems of ozone depletion and ODS use, and provided the Brazilians with the information necessary to develop phaseout project proposals to submit to the Multilateral Fund.

## HALON RECYCLING AND BANK MANAGEMENT

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**COUNTRY:** Brazil

**DESCRIPTION:** This project supports the efforts of Brazil to eliminate the need to import halons. The phases of the project will be as follows: establishing an advisory group; establishing a halon bank clearinghouse; providing recycling and reclamation equipment and laboratory analysis equipment; offering an engineering training program and a technology transfer workshop; and providing follow-up technology transfer and monitoring. The project also works toward modifying technical standards and regulations in Brazil to discourage the use of halon fire extinguishants and to encourage the use of non-ODS fire protection alternatives.

**APPROVED FUNDING:** US \$499,360

**TIME FRAME:** 2 years; 1996-98

**CANADIAN ORGANIZATIONS:** Environment Canada; Canadian Commercial Corporation

**BRAZILIAN ORGANIZATIONS:** *Companhia de Tecnologia de Saneamento Ambiental* (CETESB); Ministry of External Relations; Ministry of Industry, Commerce and Tourism

**CANADIAN COMPANIES:** Taylor/Wagner Inc.; Control Fire Systems

**STATUS:** Ongoing

**RESULTS:** The project will eliminate the need to continue the importation of newly produced halons to support critical fire protection applications while maintaining the investment represented by existing halon fire equipment. It will also result in the development of a program that will suit the unique needs of Brazil in protecting the ozone layer while continuing to meet important fire protection objectives.

## **BROMOSORB TECHNOLOGY IN COMMODITY FUMIGATION**

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**COUNTRY:** Chile

**DESCRIPTION:** This project involves a technology transfer of a methyl bromide recapture and recycling machine to Chile. The Bromosorb technology is designed to work in conjunction with fumigation chambers for the recapture of methyl bromide used in commodity fumigation. In Chile, the first Bromosorb unit has been installed to a fumigation chamber used to treat fruit destined for export. This project is the first of its kind in a developing country as developing countries do not currently recycle, recover or reclaim methyl bromide.

**APPROVED FUNDING:** US \$317,000

**TIME FRAME:** 2 years; 1994-96

**CANADIAN ORGANIZATIONS:** Environment Canada; Canadian Commercial Corporation

**CHILEAN ORGANIZATIONS:** *Comision Nacional del Medio Ambiente (CONAMA); Asociación de Exportadores de Chile; Fundación para el Desarrollo Frutícola; Servicio Agrícola y Ganadero (SAG)*

**CANADIAN COMPANIES:** Halozone Technologies Inc.; Knowzone Solutions Inc.

**STATUS:** Completed

**RESULTS:** Final testing and commissioning of the equipment took place in early December 1996. Testing revealed that methyl bromide was recovered at an average rate of 84.4% after ten minutes and 86.9% after twenty minutes. This rate, slightly lower than expected, was likely due to the discovery of a gas leak in the plant. Further testing will likely be carried out in 1998.

## **NO-CLEAN TECHNOLOGY PROGRAMME**

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November 17-19, 1994 - Beijing

**COUNTRY:** China

**DESCRIPTION:** The focus of the workshop was to provide engineers and manufacturing specialists in the electronics industry with information about the no-clean technology developed by Nortel in electronic cleaning applications. The programme included: a technical workshop, technology assistance to suppliers and a demonstration programme.

**APPROVED FUNDING:** US \$51,100

**TIME FRAME:** 1 year; 1994-95

**CANADIAN ORGANIZATIONS:** Environment Canada; International Cooperative for Environmental Leadership (ICEL)

**CHINESE ORGANIZATIONS:** National Environmental Protection Agency (NEPA); Ministry of Electronic Industries (MEI); Association of China Cleaning Engineering Technical Cooperation (ACCETC)

**CANADIAN COMPANIES:** Northern Telecom (Nortel)

**STATUS:** Completed

**RESULTS:** The workshop was well received and participants felt that it was a well-organized and extremely useful endeavour. Technical information was exchanged; methods and technologies for phasing out ozone depleting substances were discussed; and, foundations for exchanging further information on eliminating ODSs were established. A number of Chinese companies expressed interest in acquiring money from the Multilateral Fund to finance ODS phaseout projects.

## OZONE TECHNICAL TRANSFER WORKSHOP

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October 3-8, 1993 - Chengdu

**COUNTRY:** China

**DESCRIPTION:** The workshop was held to assist companies and organizations in China's Sichuan and surrounding provinces in meeting environmental protection norms related to China's obligations as a signatory to the Montreal Protocol. The primary objective of the workshop was to link Canadian expertise to the needs of Chinese companies. Activities included a plenary information session; technology presentations by Canadian companies, by sub-sector; and plant visits.

**APPROVED FUNDING:** US \$172,500

**TIME FRAME:** 1 year; 1993-94

**CANADIAN ORGANIZATIONS:** Environment Canada; Industry Canada; External Affairs and International Trade; National Research Council

**CHINESE ORGANIZATIONS:** National Environment Protection Agency (NEPA); Sichuan Environmental Protection Agency (SEPA); Sichuan Commission for Science and Technology; Sichuan Commission for Construction; Office of External Affairs of Sichuan Province; Sichuan International Science and Technology Corporation

**CANADIAN COMPANIES:** Woodbridge & Associates; Advanced Monobloc (C.C.L.); Belco Controls, Cancoil Thermal Corporation; Enspeco Inc.; Halozone Recycling Inc.; Heating, Refrigeration and Air Conditioning Institute; Leber/Rubes Inc.; P&F Technologies; Securiplex Technologies Inc.; Taylor/Wagner Inc.; Thermco International

**STATUS:** Completed

**RESULTS:** Outcomes of this successful workshop included defining the ozone-related problems in the region as well as the range of options currently available for resolving them. The exchange of information in sub-groups resulted in identifying project areas for possible future cooperation.

## OZONE DEPLETING SUBSTANCES REDUCTION WORKSHOPS

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February 15-16, 1996 - Delhi

February 19-20, 1996 - Madras

February 22-23, 1996 - Mumbai

**COUNTRY:** India

**DESCRIPTION:** Environment Canada, in collaboration with the Confederation of Indian Industry (CII), hosted three ozone-depleting substances reduction workshops targeting small and medium size enterprises. The goal of the workshops was to raise awareness on: emerging technologies, project identification, and project preparation training. This was done in the following manner. Participants reviewed the principles of incremental costs and the role of implementing agencies such as UNDP, the World Bank, UNIDO, and UNEP. They also examined the "how to's" of preparing and submitting project reports in a prescribed format. Finally Canadian companies demonstrated how proven alternative technologies could reduce or eliminate India's use of ozone depleting substances, and at the same time, provide economic benefits.

**APPROVED FUNDING:** US \$109,780

**TIME FRAME:** 1 year 1995-1996

**CANADIAN ORGANIZATIONS:** Environment Canada; Canadian Commercial Corporation

**INDIAN ORGANIZATIONS:** Confederation of Indian Industry (CII); Ministry of Environment and Forests (MOEF)

**CANADIAN COMPANIES:** Cancoil Thermal Corporation; Halozone Technologies; Dow Chemical of Canada Inc.; ZER-O-LOC Enterprises

**STATUS:** Completed

**RESULTS:** Deemed successful by both speakers and participants, the workshops raised the level of awareness of the problem of ODS in India. It is also anticipated that concrete technology transfer projects will be developed as a result of this initiative.

## HALON RECYCLING AND BANK MANAGEMENT

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Phase I and II

**COUNTRY:** Venezuela

**DESCRIPTION:** This project supported the efforts of Venezuela to eliminate the need to import halons. The first phase of the project included the establishment of an advisory group and the development of a halon management program. The second phase of the project provided recycling and reclamation equipment and laboratory analysis equipment, as well as four two-day workshops for equipment users.

**APPROVED FUNDING:** US \$304,500 (Phase I)  
US \$352,220 (Phase II)

**TIME FRAME:** 4 years; 1994-97

**CANADIAN ORGANIZATIONS:** Environment Canada; Canadian Commercial Corporation

**VENEZUELAN ORGANIZATIONS:** *Fondo Venezolano de Reconversion Industrial y Tecnologica (FONDOIN)*

**CANADIAN COMPANIES:** Taylor/Wagner Inc.; Control Fire Systems

**STATUS:** Phase I completed. Phase II ongoing.

**RESULTS:** Venezuela is now meeting the same phase out schedule for halons as the developed countries. The project has succeeded in eliminating Venezuela's need to import newly produced halons to support critical fire protection applications while maintaining the investment represented by existing halon fire equipment. It has also resulted in the development of a program that will suit the unique needs of Venezuela in protecting the ozone layer while continuing to meet important fire protection objectives.

Projects approved in 1997 Projects approved in 1997 Projects approved in 1997

## METHYL BROMIDE REPLACEMENT DEMONSTRATION PROGRAM

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**COUNTRY:** China

**DESCRIPTION:** This program is intended to help support the People's Republic of China (PRC) phase out its use of methyl bromide (MeBr) in commodity and soil fumigation and replace it with new, alternative integrated pest management (IPM) systems, which include the use of a diatomaceous earth product registered under the name Protect-It™. The program will consist of collaborative field trials to demonstrate the effectiveness and performance of Protect-It™ and will conclude with the delivery of a workshop on integrated pest management techniques for key PRC stakeholders.

**APPROVED FUNDING:** US \$145,000

**TIME FRAME:** 1 year; 1997-March 1998

**CANADIAN ORGANIZATIONS:** Environment Canada; Canadian Commercial Corporation

**CHINESE ORGANIZATIONS:** National Environment Protection Agency (NEPA)

**CANADIAN COMPANIES:** Hedley Technologies Inc.

**STATUS:** Ongoing

**RESULTS:** The collaborative field trials component of this program will assist project officials and their Chinese counterparts in identifying what grain storage management practices would complement the use of alternatives, such as Protect-It™, to MeBr use in stored grains. The workshop component will assist in identifying any existing or remaining hurdles that may delay or impede the effective implementation of an alternative to MeBr in the PRC.

## **IMPLEMENTATION OF A CENTRALIZED RECLAMATION PLANT FOR RECOVERED REFRIGERANTS IN THE COMMERCIAL REFRIGERATION AND AIR-CONDITIONING SECTOR**

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**COUNTRY:** Venezuela

**DESCRIPTION:** This project forms part of a larger project under the UNDP program for the "Implementation of a Programme for the Recovery and Reclamation of Refrigerants". The Canada-Venezuela component will help support Venezuela's efforts to reduce its emissions of ozone-depleting substances (ODS) by providing a domestic refrigerant reclamation operation and outlet for recovered refrigerants. The establishment of a reclamation centre will include the following: provision for the supply of refrigerant reclamation equipment for CFCs, HCFCs and HFC refrigerants; provision for the supply of analytical laboratory equipment for the testing and recertification of reprocessed material to the virgin standard of purity (ARI-700-95 or ISO equivalent); full operational training of local equipment operators; laboratory equipment training and operator testing with the option of certification; and full technical assistance for 18 months.

**APPROVED FUNDING:** US \$495,285

**TIME FRAME:** 1½ years; 1997- end 1998

**CANADIAN ORGANIZATIONS:** Environment Canada; Canadian Commercial Corporation

**VENEZUELAN ORGANIZATIONS:** *Fondo Venezolano de Reconversión Industrial y Tecnológica* (FONDOIN)

**CANADIAN COMPANIES:** Protocol Resource Management Inc.

**STATUS:** Ongoing

**RESULTS:** The project will result in a comprehensive program for the recycling and reclamation of refrigerants in the refrigeration sector. The equipment to be provided will be capable of returning all but mixed refrigerants back to the virgin purity standard of ARI-700-95, and/or equivalent ISO standard. In addition, the laboratory facilities that will be established as part of this project will be capable of certifying the quality of the refurbished refrigerants to an international standard suitable for resale and use in all countries. All told, this project will help eliminate the need for Venezuela to produce ODS used in the refrigeration sector.