



PROGRESS IN POLLUTION PREVENTION

5th ANNUAL REPORT
1999 - 2000



Government of
Canada

Gouvernement du
Canada

Canada

Progress in Pollution Prevention 1999-2000: Annual Report of the Pollution Prevention Coordinating Committee

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Message From the Minister of the Environment

It is my pleasure to present the fifth annual report of the Government of Canada's Pollution Prevention Coordinating Committee — *Progress in Pollution Prevention 1999-2000*.

Pollution prevention is a priority for all federal government departments and agencies. This report demonstrates the continuing cooperation among departments to achieve shared objectives and report on the Government's success in promoting pollution prevention within its own operations. The success stories profiled in the report also attest to the commitment that other levels of government, the private sector and the Canadian public bring to pollution prevention strategies.

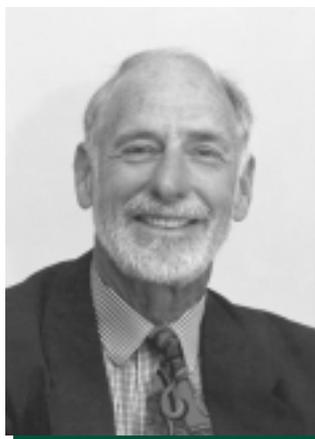
Progress in Pollution Prevention 1999-2000 reports on projects that either began, or reached a major milestone, in the period April 1999 to March 2000. The value of this work has been recognized by the Treasury Board Secretariat, which profiled *Progress in Pollution Prevention* as an excellent example of results-based management in its 2000 report to Parliament, *Managing for Results 2000*.

Canada's research and development investments have resulted in innovative and effective ways of preventing pollution at home and abroad. The National Research Council, Natural Resources Canada, Industry Canada and Environment Canada have provided technical and financial support to commercialize and market Canadian pollution prevention technologies. This domestic agenda is complemented by bilateral projects with other countries funded by the Canadian International Development Agency and other sources.

The collective impact of these actions is considerable: cleaner air and water, improved health, and sustainable ecosystems and habitats - in short, a higher quality of life for all citizens of the world.

I would like to thank everyone who contributed to this report. It takes the combined effort of many concerned Canadians to make pollution prevention an environmental, economic and social reality.

POLLUTION PREVENTION is everyone's concern. We all benefit when businesses, communities and individuals act to promote cleaner air and water for present and future generations.



Honourable David Anderson, P.C. MP
Minister of the Environment





Executive Summary

Canada continues to be strongly committed to pollution prevention as the most effective means of protecting human health and the environment.

Progress in Pollution Prevention 1999-2000 showcases the federal government's achievements in incorporating pollution prevention into its own activities and those of its partners. This is the fifth annual report prepared by the federal Pollution Prevention Coordinating Committee. The report focuses on the progress made against the goals stated in the Federal Pollution Prevention Strategy and Action Plan during the year ending March 31, 2000, and demonstrates the federal government's leadership and commitment to pollution prevention. This year, all federal departments were encouraged to record their prevention efforts, and actions were taken to move the document toward more results-based reporting.

Pollution Prevention—A Federal Strategy for Action sets priorities for action based on working with five target sectors: federal departments and agencies, other orders of government, the private sector, individual Canadians and the international community. By directing efforts toward preventing pollution instead of managing it after it has been created, the federal strategy works toward the ultimate goal of sustainable development.

This Year's Accomplishments

The Government of Canada is advancing pollution prevention by strengthening legislation and regulations, integrating the pollution prevention approach into current programs, designing guidelines and codes of practice for industrial operations, working in partnership with the private sector, other orders of government and communities, supporting non-regulatory initiatives, and participating in developing and implementing international agreements.

Progress within the Federal Government

On March 31, 2000, the federal government enacted a renewed *Canadian Environmental Protection Act, 1999* (CEPA 1999) with pollution prevention as its cornerstone. The Act requires that more substances of concern be assessed faster, establishes strict timelines for controlling toxic substances, and requires the virtual elimination of releases of the most dangerous toxic substances—those that are

persistent and bioaccumulative. The Act gives the Minister of the Environment the authority to require pollution prevention plans for substances declared toxic under CEPA. Regulations passed under CEPA 1999 in 1999-2000 include the Sulphur in Gasoline Regulations and the Federal Halocarbon Regulations.

Federal initiatives, such as the Toxic Substances Management Policy, Greening of Government Operations and the National Pollutant Release Inventory, remain the foundation for the more detailed policy, operational and measurement frameworks needed for successful delivery of preventive environmental care. In greening operations, Agriculture and Agri-Food Canada, Public Works and Government Services Canada, Health Canada and National Defence took measures to reduce water use and realize significant savings. Vehicle fleet management initiatives and investments in alternative fuels by various departments have resulted in improved vehicle performance and reductions in greenhouse gas emissions.

Departments have used pollution prevention to meet or exceed the requirements of environmental regulations and policies. National Defence was awarded the 1999 United States Environmental Protection Agency's Stratospheric Ozone Protection Award for the department's progress in the recovery, reclamation and reuse of halons. Environment Canada's and Transport Canada's use of electric vehicles demonstrated leadership in the adoption of cleaner technologies.

Federal departments are committed to integrating pollution prevention into environmental awareness training of all staff. Some departments have employed social marketing techniques to reduce the barriers to behavioural change. For instance, Transport Canada encouraged sustainable transportation by offering incentives to staff.

Progress with Other Governments

Through the Canada-Wide Accord on Environmental Harmonization, overseen by the Canadian Council of Ministers of the Environment, federal, provincial and territorial governments and agencies work collaboratively



Executive Summary (continued)

to achieve national standards for the prevention and control of toxic substances. The development of Canada-wide standards for six substances (mercury, dioxins and furans, ozone, particulates, petroleum hydrocarbons and benzene) is on track for completion in 2001.

Parks Canada and Environment Canada provided technical expertise in support of more sustainable planning initiatives to local governments including the Town of Banff, City of Surrey and Regional Municipality of Halifax. In addition, Environment Canada continued to lead work on ecosystem initiatives including British Columbia's Georgia Basin and the Great Lakes Basin.

Recent joint efforts of the federal and provincial governments to address climate change will create future opportunities to prevent pollution through initiatives such as retrofitting of buildings and the promotion of alternative transportation methods.

Progress with the Private Sector

Investment in research and development has led to new and innovative ways of preventing pollution at home and abroad. Natural Resources Canada, Industry Canada, Economic Development Canada and Environment Canada provided technical and financial support to commercialize and market Canadian pollution prevention technologies through programs such as the Canadian Lightweight Materials Research Initiative, the Climate Change Action Fund, Technology Partnerships Canada, and the Strategic Regional Initiative. Support was also given through research institutes such as Environment Canada's Environmental Technology Centre, as well as through bilateral projects with other countries funded by the Canadian International Development Agency and other donors. Many of these technologies were promoted through Canadian Environmental Solutions, an Internet-based information tool.

Through partnerships, federal government departments prevented pollution by facilitating private sector development and adoption of best management practices, clean processes

and green technologies. The voluntary participation of industry and government departments in the Accelerated Reduction and Elimination of Toxics (ARET) program has resulted in further progress toward the stated ARET goals, and participants have committed to further reductions in releases to the environment. Other private sector initiatives profiled in this report include waste reduction requirements for construction, renovation and demolition activities led by Public Works and Government Services Canada; prevention and treatment of mine, mill and metallurgical effluents led by Natural Resources Canada; and best environmental practices for golf courses and aquaculture operations led by Environment Canada.

The unique needs of small and medium-sized enterprises were recognized by Economic Development Canada, Natural Resources Canada and Environment Canada through programs that address eco-efficiency, environmental management and technological support.

Progress with the Canadian Public

Vital expertise and information were exchanged with the expansion of pollution prevention networks and Internet products such as the Canadian Pollution Prevention Roundtable and the Canadian Pollution Prevention Information Clearinghouse.

Local community action to address environmental issues received continued support through projects that promoted energy efficiency, water conservation, healthier living and environmentally responsible products and services. Projects were aimed at a variety of public audiences including households, automobile owners, consumers and children.

Progress with the International Community

The federal government represented Canada's environmental interests abroad by participating in the development and implementation of international agreements and technology transfer programs, and through scientific cooperation. The 1999-2000 year marked the signing of

the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone as well as the 25th anniversary of the signing of the Great Lakes Water Quality Agreement.

The Canadian International Development Agency promoted pollution prevention abroad through the implementation of environmental technologies in sectors such as petroleum, textiles and manufacturing. The Government of Canada continued to be an active participant in initiatives aimed at the Asia-Pacific and South American regions including the China-Canada Cooperation Project in Cleaner Production and the Community Pedal Power Project. The Government of Canada was also involved in programs targeting small and medium-sized enterprises, as well as various technology exchange programs aimed at increasing the skill base of environmental protection practitioners.

Moving Forward

Progress in Pollution Prevention 1999-2000 demonstrates that the practice of pollution prevention is expanding across the targeted sectors. This report shows that the techniques and processes used for pollution prevention are evolving to address national and global challenges.

The pollution prevention successes achieved in 1999-2000 position the Government of Canada to support a stronger and healthier environment in the new millennium.

Strengthening the Pollution Prevention Framework

The legislation and policies that support pollution prevention are part of the national commitment to protect human health and the environment.

POLLUTION PREVENTION PRACTICES AND TECHNIQUES

- Conserving natural resources and using them efficiently
- Substituting “clean” and “green” materials and feedstock
- Thinking “green” for purchasing, product design and reformulation, process changes, equipment modifications and production
- Reducing inputs and waste; on-site reuse and recycling
- Training everyone in pollution prevention techniques
- Introducing cleaner operating practices

The federal government defines pollution prevention as: *The use of processes, practices, materials, products, substances or energy that avoid or minimize the creation of pollutants and waste, and reduce overall risk to human health or the environment.* The goal of pollution prevention is the elimination of the causes of pollution rather than the treatment of generated waste. Pollution prevention involves continuous improvement through design, technical, operational and behavioural changes. It encourages transformations that are likely to lead to lower production costs, increased efficiencies and more effective protection of the environment.

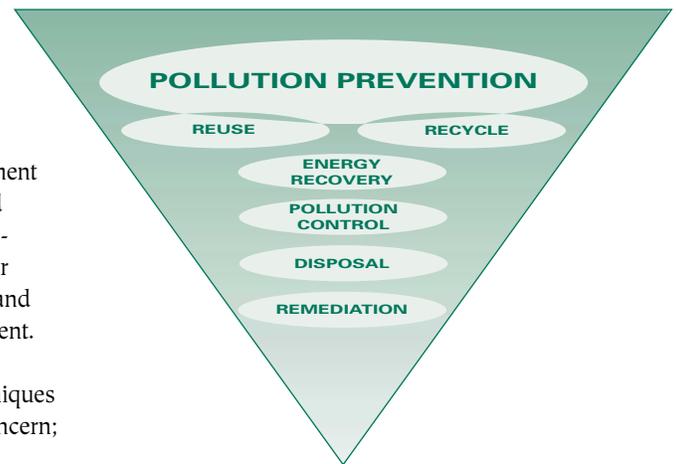
Pollution prevention practices and techniques focus on such areas as substances of concern; efficient use and conservation of natural resources; reuse and recycling on-site; materials and feedstock substitution; operating efficiencies; training; procurement techniques; product design; process changes; product reformulation; equipment modifications; and clean production.

Pollution prevention:

- minimizes or avoids the creation of pollutants;
- prevents the transfer of pollutants from one medium to another;
- accelerates the reduction and/or elimination of pollutants;
- minimizes health risks;
- promotes the development of source reduction technologies;
- uses energy, materials and resources more efficiently;
- reduces the need for costly enforcement;
- limits future liability with greater certainty;
- recognizes that waste is a cost that can be reduced;
- avoids costly clean-up in the future; and
- promotes a more competitive economy.

Federal Pollution Prevention Strategy
Pollution Prevention—A Federal Strategy for Action is the Government of Canada's policy

THE ENVIRONMENTAL PROTECTION HIERARCHY



framework for advancing pollution prevention as the priority approach to environmental protection. Approved by Cabinet in June 1995, the Strategy elaborates on Government policy and sets priorities for action based on five goals involving partnerships with federal departments and agencies, other orders of government, the private sector, individual Canadians and the international community.

The goals of the Federal Pollution Prevention Strategy include the following:

- Within the Federal Government: institutionalize pollution prevention across all federal government activities;
- With Other Governments: foster a national pollution prevention effort;
- With the Private Sector: achieve a climate in which pollution prevention becomes a major consideration in industrial activities;
- With All Canadians: provide access to the information and tools necessary to implement pollution prevention practices;
- With the International Community: participate in international pollution prevention initiatives.

Section 1: Strengthening the Pollution Prevention Framework (continued)

Federal Pollution Prevention Coordinating Committee

The federal Pollution Prevention Coordinating Committee (P2C2) was established in 1992. It collectively promotes the implementation of *Pollution Prevention—A Federal Strategy for Action* (1995) by encouraging the practice of pollution prevention throughout the federal government and with the federal government's clients. Environment Canada chairs the committee. The current committee membership, listed below, includes representatives from 11 federal departments.

- Environment Canada
- Agriculture and Agri-Food Canada
- Canadian International Development Agency
- Fisheries and Oceans Canada
- Foreign Affairs and International Trade
- Health Canada
- Industry Canada
- National Defence
- Natural Resources Canada
- Public Works and Government Services Canada
- Transport Canada

Progress in Pollution Prevention, the annual report of the P2C2, was first published in 1996. This annual report informs Canadians and government officials of national progress in pollution prevention, highlighting pollution prevention achievements and successes across the country. By relating progress to the five target sectors of the Federal Pollution Prevention Strategy and Action Plan, this progress report provides a framework for monitoring performance and profiling federal environmental successes.

The first three annual reports of the P2C2 were published by Environment Canada. This is the second report to be published as a Government of Canada document in recognition of pollution prevention's continued promotion across federal government departments. Because of its demonstration of intergovernmental collaboration and its example as a framework for monitoring performance and reporting on results achieved, *Progress in Pollution Prevention* has also been featured in the Treasury Board

POLLUTION PREVENTION POLICIES AND REGULATIONS

Environmental Protection Act	1988
Canadian Council of Ministers of the Environment (CCME) Commitment to Pollution Prevention	1993
Environmental Management Policy	1995
CCME Commitment to Sustainable Development Strategies	1995
Industrial Operations Policy	1995
<i>Pollution Prevention—A Federal Strategy for Action</i>	1995
CCME Commitment to Pollution Prevention	1996
Management of Toxic Substances	1998
Environmental Protection Act, 1999	2000

Secretariat's report *Managing for Results 2000* as an excellent example of results-based reporting. Altogether, there are 16 federal department and agency contributors to this report.

Putting the Strategy into Practice

Within Canada, jurisdiction for the environment is shared by the municipalities, provinces, territories and the federal government. The Canadian Council of Ministers of the Environment (CCME) is Canada's premier forum for intergovernmental discussion and action on environmental issues. The CCME comprises environment ministers from the federal, provincial and territorial governments. Its mandate is to improve environmental protection and promote sustainable development in Canada.

In 1993, the CCME contributed to the evolution of pollution prevention in Canada by releasing the *National Commitment to Pollution Prevention*. In May 1996, the CCME again addressed pollution prevention by releasing *A Strategy to Fulfill the CCME Commitment to Pollution Prevention*. This strategy sets out a shared vision, mission and goal statement as well as guiding principles for the implementation of pollution prevention by all provinces, territories and the federal government. As part of the strategy, CCME jurisdictions adopted a common definition of pollution prevention: "The use of processes, practices, materials, products or energy that avoid or minimize the creation of pollutants and wastes, at the source." As stated in the CCME strategy, pollution prevention is a shared responsibility

among governments, individuals and industrial, commercial, institutional and community sectors.

To show its support for pollution prevention, the CCME presents pollution prevention awards annually and maintains a Pollution Prevention Network. The Network serves as a forum for information exchange among its members on an ad hoc basis and provides technical support to the CCME Pollution Prevention Awards Program.

The Government of Canada, with stakeholders in the private sector, environmental non-government organizations, communities, labour and academia, is putting pollution prevention into practice through a mix of regulatory and non-regulatory instruments. This includes modernizing legislation and regulations, managing national programs, developing guidelines and codes of practice for industrial operations, establishing Canada-wide standards for specific substances, supporting voluntary initiatives, ensuring accessibility of tools and information and implementing international agreements.

Progress within the Federal Government

Federal government departments are making pollution prevention a permanent part of their operations through the development and implementation of strategies, programs and projects.

ENVIRONMENT CANADA

administers the pollution prevention provisions of the *Fisheries Act* (sections 34-42), which prohibits the deposit of deleterious substances into water frequented by fish. Under the Act, regulations have been developed for certain industries to limit the deposition of deleterious substances. More recent regulatory initiatives are incorporating site-specific environmental effects monitoring programs to verify that the discharges are not harming the receiving environment. Fish habitat protection measures are addressed by Fisheries and Oceans Canada.

Legislation and Regulations

On March 31, 2000, a renewed and stronger *Canadian Environmental Protection Act, 1999* (CEPA 1999) was proclaimed with pollution prevention as the cornerstone. The renewed Act gives the Minister of the Environment the authority to require pollution prevention planning for substances declared toxic under CEPA. Other provisions include:

- implementing a "fast track" approach to evaluating and controlling toxic substances;
- ensuring the most harmful substances are phased out, or not released into the environment in any measurable quantity;
- improving enforcement of regulations;
- improving "whistle-blower" protection to encourage more Canadians to report CEPA violations; and
- allowing for more effective cooperation and partnership with other governments and Aboriginal peoples.

Since environmental challenges, expectations, and legal and scientific knowledge are constantly evolving, the Act will be reviewed by a parliamentary committee every five years. For more information, visit: www.ec.gc.ca/CEPARRegistry.

In June 1999, the Government approved new regulations under the *Canadian Environmental Protection Act, 1999* that set a limit of 30 parts per million (ppm) of sulphur in gasoline by January 1, 2005. This limit represents a 90% reduction from the current gasoline sulphur content. These new regulations will be phased in to help the refining industry adjust to the new requirements while achieving the health and environmental benefits of lower sulphur gasoline. As part of the first phase, sulphur levels in gasoline produced or imported into Canada must meet an average of 150 ppm in 2002.

Issued in July 1999, the new Federal Halocarbon Regulations are aimed at minimizing the release

In June 1999, the federal Government approved regulations to reduce the sulphur content in gasoline by 90% by 2005.



Photo: R.J. Durand

of ozone-depleting substances from refrigeration, air conditioning, solvent cleaning and fire protection systems in federal facilities. Several departments including Environment Canada and National Defence have held workshops to educate personnel on the requirements of these regulations.

Toxic Substances/Clean Air

Strengthened under the new *Canadian Environmental Protection Act* (CEPA), the National Pollutant Release Inventory (NPRI) provides Canadians with access to pollutant release information for facilities located in their communities. Starting in 1999, companies are required to report to the NPRI on an additional 73 pollutants, including 20 toxic substances. The addition of these 20 toxic substances increased the total number of substances on the NPRI that have been declared toxic under CEPA from 16 to 36.

Environment Canada prepared a report on the use of heavy fuel oil by federal departments in Atlantic Canada. Combustion of heavy fuel oil produces greater emissions of particulate matter, sulphur dioxide, nitrogen oxides and carbon dioxide than alternatives such as light oil, natural gas and district heating. This report is the first step in promoting options for replacing heavy fuel oil with alternatives.

Section 2: Progress within the Federal Government (continued)

TOXIC SUBSTANCES MANAGEMENT

The Toxic Substances Management Policy outlines a risk management approach based on two key objectives: virtual elimination from the environment of substances that are persistent, bioaccumulative, and primarily the result of human activity (Track 1); and life-cycle management of other toxic substances of concern to prevent or minimize their release into the environment (Track 2). Environment Canada applies a pollution prevention approach and the precautionary principle to the management of both Track 1 and Track 2 substances. Environment Canada is also implementing action plans to virtually eliminate the most toxic substances (e.g. dioxins, furans, hexachlorobenzene, PCBs, POPs). Action has already been taken to limit or ban the production, use, import and release of these substances.

Environment Canada, Health Canada, other federal departments and provincial governments share responsibility for managing substances declared toxic under the *Canadian Environmental Protection Act* (CEPA) and, as such, are key partners in the development of prevention and control options for them. The Strategic Management Process was used to develop management options for the 25 substances listed as toxic under CEPA (Priority Substance List 1). Fourteen multi-stakeholder "issue tables," seven sector-based and seven substance-based, were established and chaired by Environment Canada. Each issue table developed recommendations for the most feasible way to address the problems associated with toxic substances. Management measures are being developed following recommendations from 10 issues tables, and work is proceeding to complete the tasks of the other four tables.

TARGETED SECTORS

Dry Cleaning** (tetrachloroethylene)

Solvent Degreasing** (tetrachloroethylene; trichloroethylene)

Wood Preservation* (polycyclic aromatic hydrocarbons; hexavalent chromium compounds; creosote-contaminated sites; dioxins and furans)

Steel Manufacturing** (inorganic arsenic compounds; inorganic cadmium compounds; oxidic, sulphidic and soluble inorganic nickel compounds; benzene; inorganic fluorides; polycyclic aromatic hydrocarbons; polychlorinated dibenzodioxins; polychlorinated dibenzofurans; dichloromethane; tetrachloroethylene; 1,1,1 trichloroethane; polychlorinated biphenyls; hexavalent chromium compounds; lead; mercury)

Base Metal Smelting** (inorganic arsenic compounds; inorganic cadmium compounds; oxidic, sulphidic and soluble inorganic nickel compounds; polychlorinated dibenzodioxins; polychlorinated dibenzofurans; lead; mercury)

Metal Finishing** (hexavalent chromium compounds)

Coal-Fired Power Generation** (inorganic arsenic compounds; inorganic cadmium compounds; oxidic, sulphidic and soluble inorganic nickel compounds; hexavalent chromium compounds; mercury)

TARGETED SUBSTANCES

Benzidine/3,3'-Dichlorobenzidine**

Dichloromethane**

Refractory Ceramic Fibres**

Ethylhexyl Phthalate**

Short Chain Chlorinated Paraffins

Hexachlorobenzene**

Dichloroethane

* Recommendations made in 1999-2000

** Recommendations made before 1999-2000

Sustainable Development and Environmental Management Systems

The *Auditor General Act* requires each federal department to table a sustainable development strategy in Parliament that outlines its goals for integrating sustainable development into its policies, programs and operations. Environment Canada has coordinated and led federal efforts through the Interdepartmental Network on Sustainable Development Strategies. Consistent with the approach of continual improvement, federal departments are required to update their strategies every three years, with the first update due by December 2000. Federal departments concentrated their efforts over 1999-2000 on updating their existing strategies based on first-round implementation, including a greater emphasis on interdepartmental cooperation on shared issues.

An environmental management system (EMS) provides a systematic framework to help an organization manage its environmental obligations and document, evaluate and communicate its environmental performance. Co-chaired by Environment Canada and Natural Resources Canada, the Federal Committee on Environmental Management Systems promotes the effective implementation of departmental environmental management systems. At the departmental level, Health Canada designed an EMS specific to hospitals and provided training support to staff. Transport Canada piloted an ISO 14001 EMS at an aircraft hangar facility and managed to mitigate environmental impacts in a number of areas, including reducing the hazardous waste generated in five varsol parts washers by replacing the varsol with an aqua-based solution. Under its EMS, the Department of Foreign Affairs and International Trade adopted environmental targets and performance measures for 11 priority areas.

Section 2: Progress within the Federal Government (continued)

TOXIC SUBSTANCES RESEARCH INITIATIVE (TSRI)

The TSRI was established jointly by Environment Canada and Health Canada to support research on toxic substances, in order to provide a sound scientific basis for policy decisions, management of pollutants and protection of the environment and human health. For more information, visit: www.hc-sc.gc.ca/ehp/ehd/tsri.

Waste Reduction

To minimize the amount of waste produced, Environment Canada's Quebec Region used electronic slides for presentations and an electronic briefcase. For example, in 1999-2000, the St. Lawrence Vision 2000 Coordination Office used only 60 conventional slides for presentations instead of the 270 that would normally have been used. To reduce the number of paper documents at meetings of Environment Canada's Management Board and the different departmental roundtables, an electronic briefcase was used. The use of electronic briefcases has saved nearly 7,000 pieces of paper a year.

INTERDEPARTMENTAL ARRANGEMENTS ON POLLUTION PREVENTION AND ENVIRONMENTAL MANAGEMENT

Federal departments and agencies often share interests, mandates and responsibilities when it comes to sustainable development. Participating in interdepartmental groups is essential for developing common tools, joint activities and sharing information.

Interdepartmental mechanisms used to promote coordination include:

- Deputy Ministers' Sustainable Development Coordinating Committee;
- Interdepartmental Network on Sustainable Development Strategy;
- Federal Committee on Environmental Management Systems; and
- Pollution Prevention Coordinating Committee.

Canadian Forces Base Petawawa reduced the amount of solid waste sent to landfill by reusing the entire output of sludge from the Town of Petawawa sewage treatment plant for revegetation and erosion control projects. This activity resulted in the reuse of approximately 1.8 million gallons per day of sewage flow from the plant, of which 70% is generated by the base and private married quarters.

In an effort to reduce its hazardous waste, Canadian Forces Base Petawawa purchased and installed an aqueous paint gun cleaner. The aqueous cleaner has eliminated the use

of organic solvent to remove paints. Examples of other pollution prevention activities on the base include the reuse of vehicle antifreeze and the reuse of chipped waste wood for ground maintenance and dry landfill cover.

On a similar note, all demolition projects conducted at Canadian Forces Base Trenton were assessed by staff for potential recycling and reuse. Improved waste management practices resulted in a 5%-20% diversion rate of material from landfill.

Energy Efficiency/Water Conservation

The Federal Buildings Initiative (FBI), led by Natural Resources Canada, is designed to facilitate comprehensive energy and water efficiency upgrades and building retrofits for federally owned facilities. The FBI has helped reduce greenhouse gas emissions by approximately 7% in the 1990-1998 period. FBI projects or related energy conservation measures have been instituted in 171 Public Works and Government Services Canada (PWGSC) facilities, representing 60% of the total inventory in terms of floor area. Cumulatively, energy use within Crown-owned PWGSC facilities has been reduced by approximately 20% compared to 1990 reference levels. Water conservation measures, including FBI projects, had been implemented in 147 Crown-owned PWGSC facilities by the end of March 2000, up from 128 facilities in March 1999.

National Defence has reduced its water use by 65% since 1989-1990. The reductions were achieved through retrofitting and renovation of existing facilities and the design of new facilities. Similarly, departmental energy use has declined 25% since 1989-1990 due to the adoption of energy conservation best practices and the use of energy performance contracts.

Health Canada was proactive in introducing alternative energy sources at its facilities. A ground source heat pump installed at the Tyendinaga Health Centre is expected to save \$1,000 per year in electricity. Also, the planning phase for the installation of a geothermal system was initiated at the Gane Yohs Health Centre. The system is expected to save \$10,000 annually in energy costs plus another \$10,000 per year in maintenance costs. The Earth Energy

Section 2: Progress within the Federal Government (continued)

GREENING GOVERNMENT OPERATIONS

The Greening Government Operations provides guidance to federal departments and agencies on preparing and implementing green strategies. In the October 1999 Speech from the Throne, the Government reiterated its commitment to

WASTE MANAGEMENT

Greening Government Operations provided guidance on developing and updated annually waste management plans developed and implemented waste management plans, composting where feasible and recycling. Waste collected centrally, stored and disposed

WATER/ENERGY CONSERVATION

Greening Government Operations developed and implemented energy conservation equipment and devices specified energy conservation (e.g. water-efficient fixtures, energy-efficient lighting and water heating)

VEHICLE FLEET MANAGEMENT

Greening Government Operations provided and alternative fuels used vehicle fleet management and reduce emissions. Greening Government Operations for departmental use reduced vehicle fleet management and regular maintenance performed. Greening Government Operations and oils recycled

PROCUREMENT

Greening Government Operations provided in service and supply contracts. Greening Government Operations minimized (e.g. cleaning products, office supplies and paints)

TRAINING AND AWARENESS

Greening Government Operations provided and informed of opportunities to reduce energy, reduce waste and make green purchasing decisions. Greening Government Operations raised to optimize pollution prevention

REMEDIAL ACTIONS

Greening Government Operations provided and nations identified and alternatives. Greening Government Operations phased out and PCBs not in use. Greening Government Operations meet the new guidelines and checked

greening its operations. Shown below are examples of pollution prevention and other environmental protection actions taken in 1999-2000 to "green" federal departments and agencies.

ACTIONS TAKEN

Health Canada implemented the zero waste program in nine buildings in the national capital area. Solid waste audits were conducted at various Transport Canada offices, and Public Works and Government Services Canada continued to assist its tenants in reducing waste.

ACTIONS TAKEN

Agriculture and Agri-Food Canada's Lethbridge (Alberta) Research Centre upgraded its irrigation system. Phase three of the project resulted in use reduction of over 100 million litres of water throughout the phase and is expected to lead to use reductions of 100 million litres of water per year. The department also undertook energy reduction measures at its research facilities in Newfoundland and Nova Scotia and water conservation measures at its Research Centre in Ottawa.

ACTIONS TAKEN

Indian and Northern Affairs Canada reduced its fleet by eight vehicles and achieved a 3% reduction in carbon dioxide emissions. Similarly, Citizenship and Immigration Canada explored some fleet optimization options by studying regional transportation alternatives.

ACTIONS TAKEN

The procurement staff at one of Health Canada's laboratories in Winnipeg began to acquire and utilize rejuvenated toner cartridges for printers and fax machines.

ACTIONS TAKEN

Presentations on the CEPA 1999 pollution prevention planning provisions were given to Environment Canada staff across the country. The Department of Foreign Affairs and International Trade delivered similar training on pollution prevention.

ACTIONS TAKEN

At year end, 72% of Public Works and Government Services Canada (PWGSC) facilities were reported free of PCBs. PWGSC also managed to stay well within its target of maintaining losses of refrigerant to a maximum of 4% per annum, with a loss of just 1% per annum.

Society of Canada, Natural Resources Canada and First Nation Technical Services were involved in helping Health Canada implement these initiatives.

In Environment Canada's Dartmouth office, all of the windows on the south and west sides of the building were replaced with more energy-efficient tinted

glass. The project is expected to lessen heating and air conditioning needs and reduce energy consumption by 18%.

Section 2: Progress within the Federal Government (continued)

RECOGNITION FOR HALON REDUCTION

National Defence has taken a proactive approach in the management of halons used in building fire extinguishing systems. As a result, the department was awarded the 1999 United States Environmental Protection Agency's Stratospheric Ozone Protection Award for its progress in the recovery, reclamation and reuse of halons.

WHAT IS GREEN PROCUREMENT?

Green procurement involves purchasing products and services that minimize environmental impacts. As the largest single buyer and property manager in Canada, the Government of Canada plays a leadership role in advancing green procurement.

As an example of green procurement, Natural Resources Canada has committed to purchasing 10,000 megawatt hours of green power in Alberta for a 10-year period beginning in January 1998. In 1998 and 1999, a reduction of 18,000 tonnes of greenhouse gas emissions was realized.

Operations/Facility Management

National Defence, as part of its Environmental Assessment process, routinely identifies the potential impacts of its activities and projects on the environment during the planning stages. The identification of the environmental impacts allows for the appropriate selection of pollution prevention techniques and/or the mitigation of these impacts prior to project implementation.

To prevent spills of hazardous materials, National Defence has upgraded its web-based spill reporting tool, SpillNet. This tool allows the department to monitor trends and to identify and eliminate the circumstances contributing to spills.

Bioindicators were used by Environment Canada's Quebec Region to identify sources of air pollutants. Bioindicators have an advantage over conventional devices in that they absorb air pollution over a long period of time. This means that only 30 samples had to be analyzed, as opposed to 364 conventional samples. As a result, the analysis required the use of smaller quantities of chemicals and materials, as well as less energy from reduced travel.

Fisheries and Oceans Canada approved a department-wide Environmental Policy and Environmental Management Framework for its operations. The department completed baseline studies for 13 environmental aspects on 117 Coast Guard vessels. This information provided the basis for establishing fleet-wide objectives and targets for the department's environmental management system. It also provided the baseline from which annual environmental performance can be measured.

Environment Canada chairs a committee that advocates pollution prevention, economic incentives and enforcement as means to upgrade shipbuilding and repair facilities in Atlantic Canada. As a result of legal action in some shipyards, there has been an increased interest in adopting pollution prevention options at all shipyards in Atlantic Canada. On a related front, the technical authority for coatings applied to Canadian Forces ships now specifies coatings that emit less volatile organic compounds.

Environment Canada, in partnership with Correctional Services Canada, designated Warkworth Institution in Campbellford, Ontario, a pollution prevention demonstration site. The objective of this initiative is to show that the principles of pollution prevention can be successfully integrated into the Institution's daily activities. Six projects have been implemented and are being monitored. The results of these projects will be shared with other corrections facilities.



The Department of National Defence has a web-based spill reporting tool that monitors trends to identify and eliminate the causes of spills.

Vehicle Fleet Management

The Natural Resources Canada Fleet Management Program achieved a 38% reduction in total fleet from April 1995. The fleet size was reduced by 268 vehicles from a total of 700 vehicles. The number of vehicles capable of running on alternative fuel has reached 89.

Transport Canada helped reduce harmful gas emissions by purchasing 22 alternative fuel vehicles for the departmental fleet. This purchase brings the percentage of alternative fuel vehicles in that fleet to more than 10%, double the previous year's level. Agriculture and Agri-Food Canada, Health Canada and the Meteorological Service of Canada made similar purchases in 1999-2000.

Environment Canada's Quebec Region encouraged employees to use its electric vehicle for short trips under 60 kilometres in the course of their duties. The vehicle has travelled more than 3,800 kilometres. Its use in urban situations helped to reduce air pollutant emissions.

Section 2: Progress within the Federal Government (continued)

Training and Awareness

National Defence's Maritime Forces Atlantic Environmental Training Program provided training to Unit Environmental Officers in specialty topics and General Environmental Awareness Training lectures. Similarly, training was delivered to ground crew operators at Canadian Forces Base Trenton on best management practices for the more efficient use of glycol during aircraft de-icing activities. The training resulted in a 30% reduction in the amount of de-icing agent used. To promote other pollution prevention projects at Canadian Forces Base Trenton, a pollution prevention video was produced by Environment Canada in partnership with National Defence.

Environment Canada's Pacific and Yukon Region undertook an effort to increase the extent to which its environmental protection programs encourage pollution prevention solutions, as opposed to traditional pollution control and waste management. The effort included information sessions and meetings with individual program staff. Staff members who attended the information sessions were surveyed both before and after to gauge their ability to identify examples of pollution prevention and non-pollution prevention solutions. Comparison of the before and after survey results showed an improvement in average scores from 51% to 65%.

Parks Canada developed an Integrated Pest Management Directive that provides guidance on the management and minimization of pesticide use at facilities or on lands owned, administered, licensed or leased by Parks Canada. Parks Canada aims to completely eliminate the use of pesticides for cosmetic purposes at all of its facilities.

In its continuing efforts to assist the Atlantic Canada Opportunities Agency, Environment Canada provided technical support to the Agency's sustainable development training program. More than 100 staff members were trained across the region. Environment Canada also helped in the preparation of a guide book that

Through a variety of programs and initiatives, the federal government encourages its employees to use active transportation rather than traditional means for commuting.

encourages the inclusion of environmental planning and the adoption of eco-efficient practices in business plans submitted by applicants seeking financial support from the Agency.

Behaviour Change

As part of the Green Commute Program, Transport Canada installed shower facilities and bicycle racks at its headquarters in Ottawa. With these facilities in place, Transport Canada employees were encouraged to use active transportation, such as biking or walking, as a means to travel to work. The next two phases of the program will focus efforts on increasing the use of carpooling, public transit and telecommuting.

Transport Canada, Environment Canada, Health Canada and other federal departments participated in the First National Commuter Challenge. The event encourages employees to choose alternative means of travelling to work for one week. Federal government employees participated in "green commuting" practices, using public transit, car pools, cycling, in-line skating, walking to work or telecommuting. The project's long-term goal is to increase the number of green commuters by reducing negative attitudes and barriers against green commuting.

To decrease automobile use, all divisions of the Environment Canada Quebec Region's Corporate Affairs Branch were encouraged to use public transit. Before purchasing bus or train tickets, many employees checked to see if any other branches had staff travelling to the same place so they could share transportation.



Photo: R.J. Durand

Progress with Other Governments

All levels of government in Canada are working in close cooperation to ensure that the implementation of environmental protection is an ongoing priority.

National Partners

Under the mandate of the Canadian Council of Ministers of the Environment (CCME), federal, provincial and territorial government agencies are developing Canada-wide standards for substances including mercury, dioxins and furans, ozone and particulates, petroleum hydrocarbons and benzene. Pollution prevention is a guiding principle for implementation of Canada-wide standards. The standards include numeric targets and timelines for their achievement. Each jurisdiction is responsible for preparing action plans to meet each standard. Canada-wide standards for fine particulate matter, ground-level ozone, benzene (phase 1), and mercury from incineration and metal smelting were presented in November 1999 to the Ministers. Between fall 1999 and spring 2000, Ministers sought appropriate authority to formally sign these agreements.

Provincial, Territorial and Municipal Partners

At the launch of the west coast Georgia Basin Initiative in 1998, the federal and provincial environment ministries set action plan goals aimed at achieving clean air and clean water and conserving and protecting species and habitat. In January 2000, Environment Canada and the United States Environmental Protection Agency signed a Joint Statement of Cooperation on the Georgia Basin and Puget Sound Ecosystem. Issues of joint concern included air quality, point and non-point discharges to surface water and reduction of toxic chemicals. Currently the Georgia Basin partners are working cooperatively to develop indicators that will help measure progress toward sustainability in the region.

Parks Canada actively supported the Town of Banff's Community Energy Management Plan. The plan provided information about the consumption of energy and helped decision makers select programs and policies more likely to reduce energy consumption and expenditures. Implementation of the plan will lead to a 7% reduction in household energy expenditures and a reduction in per capita carbon dioxide

emissions of 20% below 1998 levels by 2010. Parks Canada, the Federation of Canadian Municipalities and Natural Resources Canada provided the funding for this project.

Environment Canada is participating in a pilot project with the City of Surrey, British Columbia, to minimize pollution created by residential developments. Environment Canada and many federal and provincial participants are part of the project's advisory committee. Phase 1, the development of a neighbourhood concept plan, has been completed. The proposed design will reduce pollution through energy- and resource-efficient street construction and by requiring transit and commercial services to be within a five- to six-minute walk. The project can be tracked via the Internet at: www.sustainable-communities.agsci.ubc.ca/projects/Headwaters.html.

The Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA) coordinates federal and provincial action in response to Canada's commitments under the Canada-United States Great Lakes Water Quality Agreement. Under COA, the Great Lakes 2000 Program made significant environmental improvements in the Great Lakes basin ecosystem through a cooperative effort of seven federal and four provincial ministries. Overall, a 71% reduction in the use, generation or release of Tier I substances (benzo(a)pyrene, hexachlorobenzene, alkyl-lead, mercury, octachlorostyrene, dioxins and furans) was achieved. Canada and Ontario remain committed to the rehabilitation, protection and conservation of the Great Lakes basin ecosystem and will continue to work cooperatively with basin stakeholders.

Though the Transportation Halifax (TRAX) program, alternative commuting methods in the Halifax Regional Municipality were implemented and promoted. The goal of the program is the reduction of greenhouse gas emissions from single-occupancy vehicles. The project's trip reduction program worked with three organizations, including Environment Canada.

Section 2: Progress with Other Governments (continued)

The TRAX website (www.trax.ns.ca) includes a sign-up form for carpooling opportunities.

As part of the ongoing national review of wastewater discharges, a coastal community sewage workshop was hosted by the Bluenose Atlantic Coastal Action Program, with support from Environment Canada, in October 1999. Over 150 participants, including city managers, interest groups from 17 communities in Atlantic Canada and officials from federal and provincial government departments, met in Lunenburg, Nova Scotia. Lunenburg is a United Nations (UNESCO) world heritage site but has no sewage treatment. Discussions focused on how to better manage sewage wastes through measures such as at-source control and economic incentives.

Addressing Climate Change

Under the direction of the National Climate Change Secretariat, Canada continued its effort to address the commitments made under the Kyoto

Protocol on Climate Change. By March 2000, 17 options reports were completed, profiling the efforts of 16 issues tables. These reports and their recommendations will be taken into account when formulating the national strategy on climate change. The strategy will be based on five priority areas: enhancing awareness and understanding; promoting technology development and innovation; investing in knowledge/building the foundation; governments leading by example; and encouraging action by all Canadians across all sectors of the economy.



The CCME annually awards companies and organizations who are leaders and innovators in incorporating pollution prevention into their activities.

Municipalities are key partners in efforts to reduce greenhouse gas emissions and to improve air and water quality. The Government of Canada is providing municipalities with \$125 million toward these efforts from 1999 to 2003 through two funds. The Green Municipal Enabling Fund is a five-year fund that will provide grants to cost-share energy audits and feasibility studies on projects designed to reduce greenhouse gas emissions and improve air and water quality, as well as to encourage the sustainable use of renewable and non-renewable resources. The Green Municipal Investment Fund will provide loans to enable recipients to carry out direct energy efficiency measures such as retrofitting buildings and public transit systems.

1999 CCME POLLUTION PREVENTION AWARDS

The Council of Ministers of the Environment (CCME) gives national awards to companies and organizations showing innovation or leadership in pollution prevention. The 1999 CCME Pollution Prevention Awards were presented to:

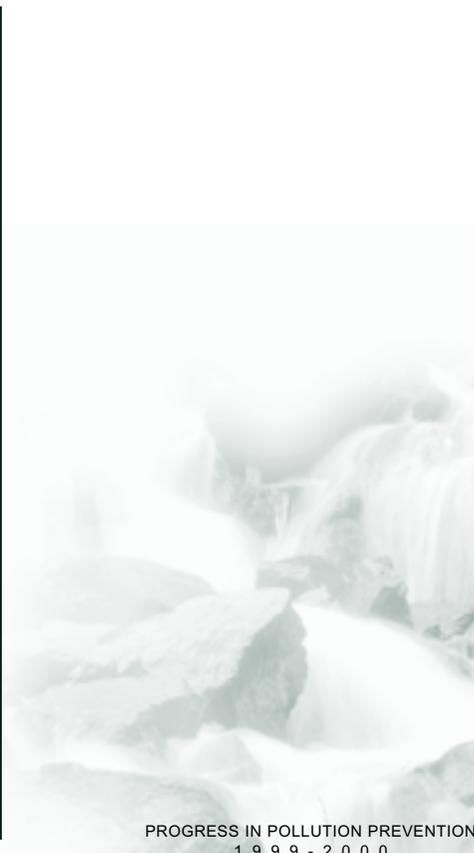
1. Ingersoll Rand Inc. of Vancouver, British Columbia, for commercializing a new high-pressure diesel injection (HPDI) technology that allows the use of cleaner natural gas engines. HPDI reduces greenhouse gases, soot and smog-producing pollutants from existing diesel engines.

2. Sherwin Williams Inc. of St. Thomas, Ontario, for introducing new painting products that are free of volatile organic compounds (VOCs), a major air pollutant.

3. Rensselaer Printing BBW Graphics of Owen Sound, Ontario, for its pollution prevention program. Its energy recovery system has cut electrical usage by 31%. The company has also reduced VOCs and eliminated nitrogen oxides and sulphates from its printing production by more than 72% during the last three years.

4. Rechargeable Battery Association and the Rechargeable Battery Recycling Corporation for their efforts to eliminate the use of mercury in the production of batteries and to launch a successful battery recycling campaign. These efforts have reduced the amount of mercury entering the Canadian solid waste stream from four tonnes in 1991 to virtually zero.

To learn more about the CCME and these awards, visit the CCME website at:



Progress with the Private Sector

Through partnerships with private sector corporations and associations, federal government departments are harnessing the forces of competition, innovation and entrepreneurship to prevent pollution.

HELPFUL ENVIRONMENTAL BUSINESS INFORMATION

Visit the Canadian Business Environmental Performance Office (BEPO), the one-stop information and services centre for small and medium-sized Canadian businesses that wish to improve their environmental performance, at: virtualoffice.ic.gc.ca/bepo. This site was developed jointly by Industry Canada and Environment Canada to improve the environmental performance of small and medium-sized businesses.

Industrial Pollution Prevention

The Accelerated Reduction and Elimination of Toxics (ARET) program is a multi-stakeholder pollution prevention and abatement initiative involving industry, health and professional organizations, as well as governments across Canada. Through voluntary actions, ARET seeks the virtual elimination of 30 persistent, bioaccumulative and toxic substances as well as significant reductions in emissions of another 87 toxic substances. In the ARET report, *Environmental Leaders 3*, 169 companies reported decreases of 67% (26,360 tonnes) from baseline data by 1998. In total, 43% of the 169 companies reported achieving their year 2000 targets.

Environment Canada, the Ministère de l'environnement du Québec and other partners continued their efforts on Phase III of the St. Lawrence Action Plan, Vision 2000. Activities under Phase III will promote sound environmental management practices through voluntary action and the implementation of pollution prevention initiatives designed to reduce releases of 18 toxic substances. The industrial and urban component of the plan targets 60 plants in three industrial sectors: chemicals, metallurgy and metal processing. Currently in the beginning stages of Phase III, three plants representing the three target sectors have agreed to conduct pilot projects to test and perfect the program's approach. Studies, reports and fact sheets on the plan and its results are available on the program's Internet site at: www.slv2000.qc.ec.gc.ca.

The Canadian Industry Program for Energy Conservation (CIPEC) defines sector-specific energy efficiency targets. Natural Resources Canada worked with CIPEC's 23 voluntary sector task forces to determine the potential for energy efficiency improvements, establish a means of reporting and tracking progress, and create action plans for reaching targets. Once the CIPEC task forces have drafted targets and action plans, the Industrial Energy Innovators Initiative will provide a means for turning

sector commitments into company actions. As of October 1999, 249 industrial companies were recruited as Industrial Energy Innovators.

Sector-Specific Initiatives

Agriculture and Food

With the help of three local fish processing plants and the Atlantic Coastal Action Program/Humber Arm Environmental Association in Corner Brook, Newfoundland, Environment Canada developed and distributed a pollution prevention guide to local fish plants. The guide outlined methods for the reduction of waste, water and energy, as well as alternative uses for fish wastes. It also included success stories relating how various fish processors took measures to minimize their environmental impact.

Environment Canada's Atlantic Region developed pollution prevention guidelines for the environmental assessment of aquaculture operations. The guidelines outlined best management practices and principles of pollution prevention in the design, construction, operation and maintenance of aquaculture facilities. Final guidelines will be distributed nationally to Environment Canada and other federal departments as well as industry project proponents.

The Ontario Sustainable Aquaculture Working Group includes members from Environment Canada, the provincial government, fish farmers, Ontario aquaculture association representatives and scientists from the University of Guelph Aquaculture Centre. The major tasks of the working group are to test and develop verifiable approaches to maintain acceptable water quality and fish habitat in the vicinity of aquaculture operations and to make recommendations for an environmentally sustainable aquaculture industry in Ontario. Efforts to date have focused on water-cage aquaculture operations, including the development of a low polluting feed for farmed rainbow trout and the testing of fish waste collection systems.

Section 2: Progress with the Private Sector (continued)

With Environment Canada's project direction and technical advice, the Livestock Manure Pollution Prevention Project provided solutions and advice to Ontario farmers on the issue of environmentally responsible manure management. Through the efforts of a government-industry working group, a brochure was published explaining the benefits of streamside buffers. The group produced a spills contingency plan decal that outlines an emergency action plan for farmers in case they have a manure spill. The working group also finalized a position paper on how to address the problems surrounding high-trajectory liquid manure irrigation guns. Irrigation guns have been implicated in 40% of the manure spills that have occurred in Ontario in the past 12 years.



Environment Canada and Ontario farmers are working together to reduce the occurrence of manure spills through environmentally-responsible manure management programs.

Automotive

The Canadian Automotive Manufacturing Pollution Prevention Project is a partnership between member companies (Ford, General Motors and DaimlerChrysler) and Environment Canada and the Ontario Ministry of Environment. The project's goal is to produce a verifiable reduction of persistent toxic substances as well as other environmental contaminants of concern used, generated or released by the participating member companies of the Canadian Vehicle Manufacturers Association. Six progress reports have been released detailing the progress made by the 28 participating facilities, with 114 case studies. As of 1999-2000, 6,759 tonnes of listed toxics and over 332,000 tonnes of other substances of concern have been reduced or eliminated since the project began. Three supplier workshops were held to promote pollution prevention amongst the automotive suppliers.

The Alliance of Manufacturers and Exporters Canada—Manitoba Division Pollution Prevention Partnership Project assists the auto body and auto repair sector to reduce its use of toxic substances and lower the level of volatile organic compounds released. The Alliance, Environment Canada and Manitoba Conservation work together to support this project. The *Ontario Autobody Profitability Manual/Workbook* was revised to reflect the Manitoba sector and was used by the 85 member firms that attended the Manitoba Autobody Profitability Workshop and Tradeshow.

Chemical

The main elements of a Memorandum of Understanding (MOU) were negotiated between the Canadian Chemical Producers' Association (CCPA), the provinces of Ontario and Alberta and the federal departments of Environment, Industry and Health. The objective of the new MOU is the prevention and reduction of the release of chemical substances under CCPA's Responsible Care® program. It is projected that over the term of the MOU (until 2002), approximately 58% reductions in volatile organic compound emissions from a 1992 baseline and 25% from a 1997 baseline will have been achieved through pollution prevention nationally.

Construction

Natural Resources Canada and Environment Canada, in partnership with the Greater Vancouver Regional District, Industry Canada and others, promoted the use of EcoSmart concrete in major Vancouver construction projects. With EcoSmart concrete, at least 40% of the Portland cement traditionally used is replaced with flyash. Flyash is a byproduct of coal-burning power plants and is usually destined for landfill. In addition to providing a use for the flyash, replacing one tonne of cement with one tonne of flyash reduces industrial carbon dioxide emissions by approximately one tonne. By March 31, 2000, Public Works and Government Services Canada had incorporated waste reduction requirements for construction, renovation and demolition activities into its project delivery standards.

Over 1999-2000, waste reduction measures were implemented in at least four projects. The department, in partnership with the Canadian Construction Association, also developed and disseminated construction industry best practices for solid waste management.

The National Energy Board, Transport Canada, Environment Canada, Fisheries and Oceans Canada, and provincial environmental agencies cooperated to develop and implement stricter design and construction specifications for pipelines, highways and other activities that may potentially disturb naturally occurring acid-generating materials. Maritimes and Northeast Pipeline built over 1,400 kilometres of natural gas pipeline in New Brunswick and Nova Scotia that met the stricter design and construction guidelines. This approach avoided the generation of acid leachate and the associated release of metals in toxic concentration from native soils. It is expected that the specifications will be employed for distribution systems as well.

EnerGuide for Houses, developed by Natural Resources Canada, is a service that provides consumers with independent advice on how a home uses energy and where it is being wasted. As of October 1999, a total of 7,700 houses were evaluated in Canada. Implementing the recommended upgrades in a house generates average energy savings of 23%, while the average reduction in carbon dioxide emissions is 4.3 tonnes per house per year. This program was made more visible by the marketing efforts of key partners in the renovation industry and others such as financial institutions. For instance, the Yukon Housing Corporation is currently using the program to qualify homes for "green mortgages," which feature an interest rate below prime.



Section 2: Progress with the Private Sector (continued)

ENVIRONMENTAL SOLUTIONS

To view the pollution prevention capabilities of Canada's best technology and service firms, visit Canadian Environmental Solutions (CES) at: strategis.ic.gc.ca/CES. Developed by Industry Canada, CES addresses environmental problems related to water, air, soil, energy, and research and development. It is a direct link to solutions and to Canadian companies that can supply them. CES works because it is exhaustive—it describes 2,000 environmental problems and solutions, along with more than 850 solution-providing companies!

Dry Cleaning

Environment Canada funded the development of infrastructure to deliver an environmental training package to dry cleaners in British Columbia. A mandatory, industry-driven training and certification program was recommended, to provide high levels of compliance with consistent standards while delivering built-in benefits for dry cleaners. Infrastructure development will continue in 2000-2001. This work is part of a larger effort on the part of Environment Canada to reduce dry cleaning perchloroethylene consumption from 5,500 tonnes (1994 estimate) to 1,600 tonnes annually.

Environment Canada's Wet Clean Demonstration Project utilizes Japanese technology to reduce the use of detergents in wet cleaning. Traditional wet cleaning serves as a replacement for dry cleaning, which uses toxic perchloroethylene. Yet traditional wet cleaning produces a different type of pollution problem—detergents are sources of phenols and biological oxygen demand. The goal of this project is to reduce detergent use by 40% in the on-site demonstration at Our Cleaners in Barrie, Ontario. This project will show reductions in water and energy use while increasing the volume of clothing cleaned.

Health Care

Operation Green: An Instrument for Change was a joint project undertaken by the Atlantic Coastal Action Program (Cape Breton), Environment Canada and the Cape Breton Regional Hospital. The project included a number of initiatives aimed at reducing the impact of the hospital's operations. Results include a 10% reduction in energy use, a 15% reduction in liquid wastes and a 6% reduction in air emissions.

Marinas/Harbours

Fisheries and Oceans Canada addresses the environmental impacts of operations at harbours where fishing is practised. During 1999-2000, the department established and implemented environmental management plans for 347 of 559 small craft harbours—an 18% increase over the previous fiscal year. It is the department's goal to have plans in place for all small craft harbours by 2002.



Fisheries and Oceans Canada is working to establish environmental management plans for all small craft harbours by 2002.

Metal Finishing

Ontario's Metal Finishing Industry Pollution Prevention Project is a partnership between the metal finishing industry, their associations, and the federal and provincial governments. The project promotes the development and implementation of site-specific pollution prevention plans by member companies of the Canadian Association of Metal Finishers and the American Electroplaters and Surface Finishers Society. The Sixth Progress Report from the task force was released in September 1999 and reported on the progress of substance use and waste reductions. Twenty-six metal finishing companies participated in the project with a total of 32 documented case studies, four more than last fiscal year. The project has reduced or eliminated almost 2.58 million kilograms of pollutants and over 75 million litres per year of water use, for a total savings of over \$750,000 per year. Ninety-four employees from 35 organizations have completed training in pollution prevention planning.

Through the Alliance of Manufacturers and Exporters Canada—Manitoba Division Pollution Prevention Partnership Project, a series of pilot projects and training courses were implemented within Manitoba's metal finishing sector. Environment Canada is a member of the Metal Finishing working group (co-chaired by Bristol Aerospace and Standard Aero). During 1999-2000, three pollution prevention audits were undertaken and six chemical management training courses were delivered at member facilities. This project will assist Manitoba metal finishers in reducing their use of toxic substances and other substances of concern and in improving their overall environmental performance.



Section 2: Progress with the Private Sector (continued)

Mining

Natural Resources Canada worked with industry through the Mine Environment Neutral Drainage 2000 Program (MEND 2000). The program was aimed at developing technology for the prevention or control of acidic drainage within a three-year timeframe ending in 2000. Closure technology was developed to prevent acidic drainage through the use of layered combinations of natural soils and organic materials that act as dry covers on mine tailings. For more information, visit: mend2000.nrcan.gc.ca.

of the new *Canadian Environmental Protection Act*, the Government of Canada now has the authority to regulate emissions from off-road engines. The MOU is a voluntary agreement between Environment Canada, recreational marine engine manufacturers and the CMMA to fast-track the introduction of cleaner engines into Canada. The agreement covers outboard engines and personal watercraft engines. Engine manufacturers have voluntarily committed to supply these cleaner engines in Canada starting with the 2001 model year.

environmental management initiatives at 28 golf courses throughout Ontario. The goal is to reduce the use of chemicals and improve the overall environmental quality at golf courses. In addition, Environment Canada developed guidelines outlining best management practices and principles of pollution prevention in the design, construction, operation and maintenance of golf courses.

Transportation

Through a funding agreement, Environment Canada contributed to the identification of pollution prevention priorities for Air Canada's Technical Centre at Dorval International Airport in Montreal, Quebec. Priority projects were identified and will be implemented next fiscal year. The projects include the cleaning and degreasing of aircraft parts, and development of computer software to help Air Canada in its management of hazardous waste.

In 1999-2000, Environment Canada and the Ottawa-Carleton Regional Transit Commission entered into a partnership to implement a number of pollution prevention projects aimed at eliminating or reducing the use of products containing hazardous chemicals in one of their maintenance garages. After a review of existing operational activities and in consultation with OC Transpo, six projects were identified and selected for implementation. Projects include the replacement of organic degreasing solvents with water-based degreasing fluids and substitution of a methyl ethyl ketone (MEK)-based paint gun cleaner with a non-MEK cleaner.

Photo: Lowe-Martin Company Inc.



With the help of federal government agencies, the printing industry is undertaking regional initiatives to develop sector-wide environmental management programs based on pollution prevention.

The Tailings and Waste Rock Program provided technical knowledge and expertise to the Canadian mining industry in managing solid mine waste. Natural Resources Canada provided expertise on long-term management options for mine waste through the development of contaminant prevention techniques and disposal technologies. An example of a contaminant prevention technique is the use of water covers for storage and disposal of mine tailings. Water covers prevent acid generation and subsequent metal mobilization from the tailings.

Recreational, Utility and Off-Road Engines

January 2000 marked the signing of a Memorandum of Understanding (MOU) between Environment Canada and the Canadian Marine Manufacturers Association (CMMA). With the passing

Printing and Graphics

The printing industry across Canada, in partnership with government agencies including Environment Canada's regional offices, is developing sector-wide environmental management programs based on pollution prevention principles. Activities across Canada include the Atlantic Green Printers Project, CleanPrint Ontario, B.C. Printing Project, Manitoba Green Printing Project and an initiative of the Association des arts graphiques du Québec. Some regions have undertaken workshops, while others have drafted environmental management systems guides on best practices. The programs assisted printers in reducing or eliminating wastes at source through voluntary actions resulting in environmental compliance, improved operations, less waste and financial savings. In Ontario, companies participating in the project have reduced their emissions of toxic substances and other environmental contaminants of concern by 661 tonnes. For more information, visit: www.cleanprint.org.

Tourism

The Golf Course Eco-Efficiency Project is a partnership between GreenLinks Eco-Efficiency Services, Burnside Golf Services and Environment Canada to promote pollution prevention and other

Section 2: Progress with the Private Sector (continued)

ECO-EFFICIENCY

involves the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life cycle, to a level at least in line with the earth's estimated carrying capacity. (World Business Council for Sustainable Development)

Training and Awareness

The Nova Scotia Department of Natural Resources, Nova Scotia Power, the Illuminating Engineering Society of North America (Bluenose Section) and Environment Canada combined resources to promote the use of energy-efficient light bulbs in commercial enterprises. Contractors and likely clients were invited to 10 workshops that highlighted the benefits of these bulbs. As a result of the workshops, at least 20 commercial enterprises have made modifications and are very pleased with the economic and lighting results. Ten lighting contractors participated in the workshops and now routinely advocate energy-efficient lighting changes to all clients. A total of 10,000 brochures were mailed out to businesses and contractors.

Each year in the Atlantic Region, approximately 2,500 reports of environmental emergencies are received by a spill reporting network of Environment Canada, which now contains over 10,000 entries. The provincial environment departments, Fisheries and Oceans Canada and the Canadian Coast Guard play significant roles in this work. Information is analyzed to identify spill trends or problem areas and is frequently used by industry when undertaking environmental audits. This year a report will be published that summarizes years of data and should enable targeted prevention programs to be developed. Environment Canada's Environmental Emergencies Section frequently organizes, provides or participates in training and information sessions for various audiences relating to preventing spills.

Small and Medium-Sized Businesses

Environment Canada and the Miramichi River Environmental Assessment Committee co-hosted an EnviroClub™ awareness session for businesses in Miramichi, New Brunswick. The EnviroClub™ concept builds on a successful Quebec pilot project that targets small and medium-sized businesses. Presentations focused on how the program could enable firms to enhance business competitiveness, profitability and environmental performance by adopting pollution prevention approaches. As a result of the workshop, 20 businesses have expressed an interest in participating in EnviroClub™. The Committee has also worked with several small and medium-sized businesses to develop environmental management plans. The plans help incorporate pollution prevention, treatment and recycling into overall business practices.

RENEWABLE ENERGY DEPLOYMENT INITIATIVE

Renewable Energy Deployment Initiative (REDI) is a six-year, \$24-million program created in 1998 to stimulate the use of renewable energy systems for hot water heating and cooling. REDI is the evolution of the renewable energy industry into a competitive supplier of environmental impact energy to be used in the medium and long term. REDI is delivered by the Renewable and Alternative Energy Division (REED) of Environment Canada and is a part of the Department's broad Renewable and Alternative Energy Program. REDI supports four systems: solar water heating systems, solar air heating systems, geothermal heat pumps (earth energy) and high-efficiency, low-emission combustion systems. REDI promotes these systems through financial incentives to industry and government, technical strategies and assessments, and infrastructure development. For more information about REDI, visit: <http://www.ec.gc.ca/er/er/eed>.

Encouraged by the success of the initial EnviroClub™ pilot project in Quebec, Environment Canada, in partnership with Economic Development Canada, has initiated recruitment for two more projects in the province. The goal is to have 24 small and medium-sized businesses from the manufacturing sector participate in workshops and initiate pollution prevention projects in their facilities.

During 1999, Natural Resources Canada collaborated with Alcan Aluminium Limited on a pilot project to introduce eco-efficiency concepts into small and medium-sized enterprises that supply goods and services to large natural resource sector companies in the Saguenay region of Quebec. By adopting eco-efficiency concepts in their business processes, companies benefit from reduced energy and materials consumption as well as decreased waste production.

The Eco-efficiency Centre in Burnside (Halifax, Nova Scotia) is a non-profit centre supported by a team of public and private partners and sponsored by federal, provincial and municipal governments, as well as private industry and educational institutions. In June 1999, the Centre launched the Eco-Business Program to



PROGRESS IN POLLUTION PREVENTION
1999 - 2000

Section 2: Progress with the Private Sector (continued)

encourage small to medium-sized businesses to commit to making eco-efficient improvements in their operations. The program is aimed at raising awareness on the benefits of making the right environmental choices. The registered businesses are challenged to reduce the environmental impact of their company while increasing profitability. The Centre provides information and some technical assistance and helps companies set and meet targets in the areas of energy efficiency, water conservation, reduction of solid waste and reduction of environmental risk. Fifteen companies joined in June 1999, and by January 2000, that number had grown to 45. Environment Canada staff participate on the Steering Committee of this initiative.

Research and Development

Technology Partnerships Canada (TPC) is a technology investment fund operated by Industry Canada. In 1999-2000, TPC invested \$98 million in eight environmental technology projects, which will leverage approximately \$296 million more from other sources. Examples of funded projects include: developing a hybrid electric bus that operates on diesel and electricity; developing advanced industrial gas turbine technologies that produce cleaner, more efficient power; and developing closed-system technologies that decrease the loss of raw materials, increase mill efficiency and productivity, and reduce or eliminate the production of pollutants. For more information, visit: tpc.ic.gc.ca.

Economic Development Canada, with technical support from Environment Canada, approved eight projects designed to test and market environmental technologies, for an estimated investment of \$8.2 million. The projects were delivered under the Innovation, Development of Entrepreneurship and Export Program and the Strategic Regional Initiative.

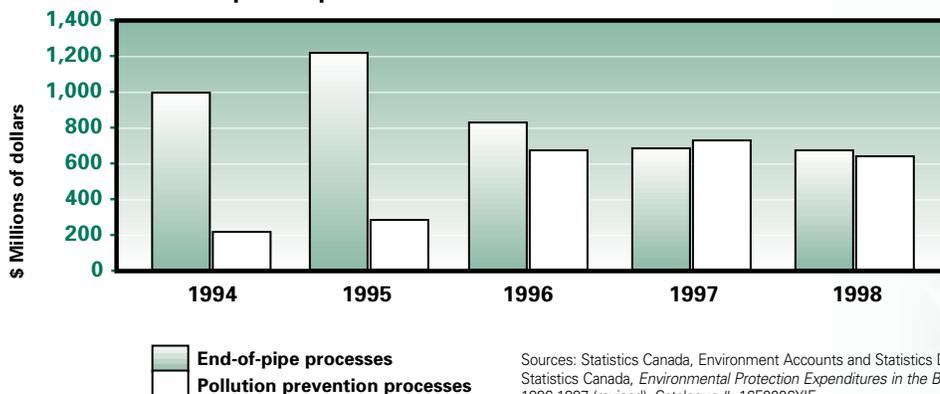
Natural Resources Canada (NRCan) coordinated the Canadian Lightweight Materials Research Initiative, a government and industry partnership aimed at developing materials and manufacturing processes for fuel-efficient vehicles. The program's technical focus is weight reduction in ground transportation—for every 10% reduction in vehicle weight there is a 6% to 8% improvement in fuel efficiency. With decreased fuel consumption comes less urban smog, cleaner air and reduced emissions of carbon dioxide. The program began in April 1999 with an initial set of 11 projects. In addition to NRCan, the National Research Council and five universities perform the research, supplemented by the work of private sector research and development centres.

The Microwave-Assisted Processes (MAP™) are a family of clean processing technologies that were developed and patented by Environment Canada's Environmental Technology Advancement Directorate. The MAP™ technologies are characterized by significant reductions in energy consumption, waste generation and

toxic releases. Recent developments have focused on edible oils and solvent-free chemical synthesis with zero-toxic release. As of March 2000, Environment Canada had negotiated 10 licences with private sector companies for the commercialization of various applications of these patented processes.

Statistics Canada, through a Survey of Environmental Protection Expenditures, collects data on the expenditures made by primary and manufacturing industries, electric power and gas distribution facilities as well as pipeline transportation facilities. Since 1995, the second survey year, businesses have steadily reduced their investment in end-of-pipe technologies, while 1998 represented the first year investment in pollution prevention declined. In 1998, business investment spending on environmental protection decreased slightly from the previous year while remaining above \$1.7 billion.

Capital Expenditures on Pollution Prevention and Control



Sources: Statistics Canada, Environment Accounts and Statistics Division, Statistics Canada, *Environmental Protection Expenditures in the Business Sector, 1996-1997* (revised), Catalogue #: 16F0006XIE.

Progress with the Canadian Public

Canadians are becoming more proactive in addressing environmental challenges through community-based initiatives and reliable information tools and networks.

ECOLOGO™ PRODUCTS AND SERVICES

TerraChoice Environmental Services Inc., on behalf of Environment Canada, manages and delivers the Environmental Choice Program (ECP), an eco-labelling program that helps individuals, corporations and governments make informed purchasing decisions to reduce their environmental impacts. Over 2,800 brand name products now bear ECP's EcoLogo™, products such as appliances, cleaners, electronics and paints. For more information, visit: www.environmentalchoice.com.

Citizen-Driven Activities

Through its Millennium Eco-Communities Initiative, Environment Canada encouraged groups across Canada to identify themselves as Millennium Eco-Communities (MECs) committed to local environmental improvement. To become a MEC, a group of concerned people from a geographic community, or a community of interests, comes together to set goals and create an action plan for clean air, clean water, nature and climate change. The MEC can register its goals and action plan on the MEC website. For more information, visit: www.ec.gc.ca/eco.

Public Awareness Campaigns

"Home Green Ups" is a two-year pilot project undertaken by the Newfoundland and Labrador Conservation Corps. Youth-led EcoTeams conduct home audits and, in follow-up discussions, show residents how to better manage energy, water and waste, promote active transportation (such as cycling and walking) and encourage pesticide-free yard care. Environment Canada and Human Resources Development Canada, along with provincial governments and industry, are partners in this project. To date, 1,000 homes were assessed, with a target of 3,000 by June 2001. A database is in development for tracking energy and water consumption changes, energy retrofits installed and changes in waste management and lawn care practices.

On a similar note, Clean Nova Scotia launched the "Home Tune Up" program with a goal of carrying out 2,000 household environmental assessments in the Halifax Regional Municipality. Assessors provide written recommendations to households on ways to reduce energy use, water use and wastewater creation, manage solid waste, and practise chemical-free lawn and garden care. Environment Canada is a partner in the project. By March 2000, over 300 assessments had been done. Early indications show many homeowners are implementing the assessors' recommendations and have realized measurable savings on utility bills.

THE AUTOSMART PROGRAM

Since the vehicles Canadians drive account for 30% of the total carbon emissions in Canada, Natural Resources Canada has developed the Autosmart program to provide Canadian drivers with helpful tips on buying, driving and maintaining their vehicles in order to reduce fuel consumption. The Autosmart website offers interactive resources such as a fuel consumption calculator, the most fuel-efficient vehicles and information on the EnerGuide program. For more information, visit: www.autosmartcan.gc.ca

Active and Safe Routes to School is a national program focused on improved air quality and climate change management; increased physical activity among children; increased pedestrian safety around schools; and an enhanced sense of community. Over 1,500 schools have officially registered in the program. In 1999, more than 500 schools participated in National Walk a Child to School Day. This event demonstrated the relationships between lifestyle choices and issues of air quality, climate change and personal health, safety and security. The Active and Safe Routes to School program and National Walk a Child to School Day are supported by Go for Green, Health Canada, the Government of Canada Climate Change Action Fund, and health and municipal organizations. More information is available at: www.goforgreen.ca.

The Action by Canadians (ABC) program addresses climate change by teaching Canadians how they can reduce greenhouse gas emissions. Workshops were delivered in the workplace, giving participants practical ways to reduce emissions at home, on the road and in their communities. The program invited participants to make written pledges and measure their results over time. Participants in early demonstrations of the workshops pledged to cut carbon dioxide emissions by an average of two tonnes per year each. The federal government provided funding from the

Section 2: Progress with the Canadian Public (continued)

Climate Change Action Fund, and 14 of the Energy Council's member companies across Canada have also contributed funding.

"Operation Burn Clean" encourages Canadian consumers to use wood stoves and fireplaces that are certified as clean-burning to improve air quality, safety and wood-burning efficiency. Certification is the responsibility of the Canadian Standards Association or the United States Environmental Protection Agency. Stoves and fireplaces using advanced technology produce a more stable fire and cut overall pollution by up to 90% compared with older models. They also use 33% less wood than conventional models, saving consumers money. Fuel savings could repay an investment in this new technology in as little as two to three years. The program is funded by Natural Resources Canada and Environment Canada, with support from various industry partners. For more information, visit: www.woodheat.org/links/burnclean/burnclean.htm.

"Earth Tones" is a television series focusing on environmental science taking place at Environment Canada, Agriculture and Agri-Food Canada, Fisheries and Oceans Canada, Health Canada and Natural Resources Canada. The series of "Millennium Moments" profiled the past work and scientific breakthroughs of government scientists that continue to benefit Canadians. Topics include integrated pest management, wildlife and habitat protection and resource issues.

Health Canada produced an informative video on the environmental risks associated with groundwater contamination and how to ensure the current supply remains clean. The video, entitled "www.groundwater.com," was produced together with 20 private and public sector partners, including Environment Canada. Copies of the video, which has been aired on community television, were distributed to all municipalities and First Nations in British Columbia.



Health Canada encourages an active lifestyle that will not only help the environment but also the physical health of children through such programs as Active and Safe Routes to School and National Walk a Child to School Day.

Access to Information

The Canadian Pollution Prevention Information Clearinghouse (CPPIC) is an Internet tool that links Canadians to the information they need to practise or support pollution prevention. A variety of pollution prevention documents such as technical reports, fact sheets, tip sheets, guides, legislation, regulations, training materials and success stories are made accessible through CPPIC. New sections for 1999-2000 included P2 for Youth, Frequently Asked Questions, and a Glossary. Environment Canada is responsible for development, maintenance and promotion. Visit CPPIC at: www.ec.gc.ca/cppic.

The third Canadian Pollution Prevention Roundtable, "Innovators in Pollution Prevention," was held in Vancouver in 1999. Over 125 participants representing business, consultants, universities, governments and non-government organizations discussed pollution prevention issues and celebrated Canadian achievements. The event included a pollution prevention planning workshop using proven business examples and a tour of pollution prevention efforts at Tilbury Cement. Environment

Canada provided partial funding support, and the Canadian Centre for Pollution Prevention, a non-profit organization, coordinated the event. For more information, visit: www.c2p2online.com.

Photo: Health Canada photo website. Family: Disk 39, Health Canada, 2001
© Minister of Public Works and Government Services Canada, 2001

Progress with the International Community

International agreements, scientific cooperation and technology transfer are ways in which Canada works with the international community to lead and support the promotion of pollution prevention.

International Agreements and Technology Transfer

As part of the Climate Change Action Fund, Technology Early Action Measures (TEAM) provided financial support for international demonstrations of climate change technologies. Industry Canada and Technology Partnerships Canada, through their involvement in TEAM, sponsored one climate change project in 1999-2000.

The year 1999 marked the 25th anniversary of the Great Lakes Water Quality Agreement between Canada and the United States. Those 25 years marked the restoration and enhancement of the water quality in the Great Lakes system. Environmental successes included reductions in the discharge of nutrients, persistent toxic substances and other contaminants; declining levels of persistent toxic substances in the tissues of fish and wildlife (PCBs, DDT and mercury have declined in fish and wildlife by as much as 90%); enhancements in water quality; and improvements in ecosystem health as measured in the populations of sentinel species such as the bald eagle, osprey and lake trout.

In an effort to meet one of the key goals of the Great Lakes Water Quality Agreement, Canada and the United States worked on purging the Great Lakes of persistent toxic substances. The Binational Toxics Strategy (BNS) set reduction targets for specific substances over the 1997 to 2006 timeframe. Seven workgroups, formed to identify ways to virtually eliminate these substances, have completed the information gathering stage of the strategy and are now concentrating on identifying cost-effective options to achieve reductions. Workgroup activities and results include:

- a report for PCDD (Dioxins) and PCDF (Furans) Reduction Options;
- draft reports on Benzo(a)pyrene (B(a)P) Reduction Options, Hexachlorobenzene (HCB) Reduction Options, and Alkyl-Lead Sources, Regulations and Options; and



Canada and the United States have been working together to ensure the health of the Great Lakes and their surrounding communities through initiatives under the Great Lakes Water Quality Agreement.

- reported PCB reduction, as of April 2000—approximately 70% of high-level PCB wastes have been destroyed, up from approximately 40% in spring 1998 when work in support of the BNS began.

Progress toward achieving the goals of the strategy can be followed at: www.epa.gov/glnpo/bns.

In December 1999, Canada signed the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (AEGLO) with 23 European countries and the United States. Provisions for setting goals to reduce transboundary emissions of air pollutants (i.e. sulphur dioxide, nitrogen oxides and volatile organic compounds) that contribute to acid rain and ground-level ozone are found under the AEGLO Protocol.

Under the direction of the Canadian International Development Agency, Natural Resources Canada and project consultants began work with the Russian Association of Energy Efficiency Demonstration Zones. This project, initiated in January 2000, will help participating Russian oblasts develop municipal capacity to implement energy efficiency policies and programs. In addition,



Section 2: Progress with the International Community (continued)

THE CANADIAN INTERNATIONAL DEVELOPMENT AGENCY

The Canadian International Development Agency continues to work diligently to reduce global pollution prevention internationally. Described below are some of the pollution prevention projects and the progress made in 1999-2000. These projects were implemented in conjunction with the private sector and a number of government departments.

Latin America (Central America)

The Services Association of Alberta is working with the Latin American Petroleum Producers Association (ARPEL) to enhance the ability of state-owned oil and gas companies to develop and implement environmental protection and pollution prevention programs and guidelines. During the 1999-2000 fiscal year, a number of activities were completed, including: five regional workshops, 11 simulation workshops, and two direct technical assistance activities were completed.

Asia-Pacific Economic Cooperation Project in Cleaner Production (Asia)

This project, begun in 1996, assists China in implementing cleaner production projects. At Puyang Chemical General Works, cleaner production solutions generated savings of approximately \$1 million a year from such activities as the reduction of 100 tonnes per year of ammonia, 550 tonnes per year of sulphur and 100 tonnes per year of hydrogen in equivalent ammonia, and the reduction of 100 tonnes per year in water consumption. At the Anhui Paper Mill, implementation of cleaner production solutions generated savings of around \$700,000 a year and included such activities as chemical oxygen demand reduction, soda recovery and reduced energy consumption. For more information, visit: www.chinacp.com.

The Centre de la Communauté Québécoise pour une Gestion Écologique des Déchets (Centre for the Quebec Community for an Ecological Management of Waste) Environmental Training and Pilot Project is to increase the awareness of environmental considerations of new pollution prevention measures and to implement and evaluate these measures at a number of textile companies in Tunisia. In 1999-2000, 20 people attended a workshop delivered in Quebec on pollution prevention in the textile industry.

it will introduce Canadian energy and environmental technologies and capabilities to the Russian market. The expected result is a reduction in greenhouse gas emissions through more efficient use of energy resources.

North, Central and South America

In Guatemala, the Canadian International Development Agency funded the Community Pedal Power Project. The project's goal is to develop sustainable and self-sufficient small-scale food production and processing techniques in rural communities. Local partners worked with rural indigenous Mayan (Cakchiquel, Quiche, Mam) campesino communities to assess their needs and to provide bicycles that serve as pedal-powered devices (bicimáquinas). There are two types of devices: pedal-powered pumps, hooked up to draw water easily and quickly from

wells, and pedal-powered mills to grind coffee, corn and other grains. In 1999-2000, 74 pedal-powered machines were built and provided to local community groups, and 45 micro-projects including loans were in progress.

In Havana, Cuba, Bicicletas Cruzando Fronteras (Bicycles Crossing Borders) created self-sustaining bicycle cooperative shops, operated primarily by women, to distribute bicycles to the needy and to rent and repair bicycles. The project is funded by the Canadian International Development Agency through Hermandad Multiuse de Bicicletas (Office of the Historian, Old Havana). This project will contribute both to carbon dioxide emission reductions and to the program of making Old Havana a car-free city. At present, only 10% of the people in Old Havana have bicycles. The goal of this

project is for two state-of-the-art bicycle repair shops to employ approximately 30 people and be capable of servicing about 3,200 bicycles annually.

Asia and Africa

The China-Canada Jiangsu SME (Small and Medium-sized Enterprises) Applied Management and Environment Project provided assistance in management and in environmental and business planning capacity to townships and village enterprises (TVEs) in Jiangsu Province in China. This \$12-million project, sponsored by the Jiangsu provincial government and the Canadian International Development Agency, involves various agencies of the provincial government. The project promoted TVEs' awareness of waste minimization, cleaner production and more environmentally sound technology alternatives through demonstration and pilot projects and through training programs. For more information, visit: ffit.org/smeep.

The Asia-Pacific Economic Cooperation Industrial, Science and Technology Group is focused on industrial voluntary action initiatives and market-driven business opportunities associated with the environment. As a Canadian participant in the workgroup, the National Research Council is providing technical leadership and project management in the field of cleaner production processes to establish collaborative research and demonstration projects. The Department of Foreign Affairs and International Trade provides advice on policy issues. In 1999, a Cleaner Production by Design workshop took place in Chinese Taipei. Pilot projects were identified for research on solar energy in Thailand and Indonesia, and the development of Internet networks for best practices.

Section 2: Progress with the International Community (continued)

THE KYOTO PROTOCOL

Continued negotiations on climate change under the Kyoto Protocol with the objective of concluding a legal instrument on commitments. To this end, Canada participated in the 5th Conference of the Parties to the Protocol in Germany in November 1999, and the Department of International Affairs and International Trade provided assistance to Canadian business in the Clean Development and Mechanism implementation mechanisms under the Protocol. Canada's reduction target is 6% below 1990 levels within the 2008 to 2012 timeframe.

In the wake of unprecedented urban growth in Asia, the Canadian International Development Agency, through the Canadian Universities Consortium, has collaborated with the Asian Institute of Technology (AIT) in the design and development of a graduate field of study in Urban Environmental Management at AIT. The purpose of this partnership is to develop the

environmental management skills of practitioners, academics and researchers through initiatives such as demonstration projects. Examples of such projects include the implementation and demonstration of cleaner production techniques for hotels in Thailand and the integration of urban environmental management in Yala City, Thailand.

The Vietnam-Canada Environment Project is an institutional strengthening project, funded by the Canadian International Development Agency, that targets environmental management agencies in Vietnam. A pollution prevention guide was developed to enable the National Environment Agency and the Department of Science, Technology and Environment to standardize the manner in which pollution prevention programs are carried out. The approach was piloted at five plants: a textile company, leather company, brewery, confectionery, and aluminum frame production factory.



Annual meeting of the Pollution Prevention Coordinating Committee in Toronto, April 2000.



Moving Forward

As the largest single enterprise in the country, the federal government can make a significant difference in Canada's prospects for sustainable development.

Sustainable development is not a destination that can be achieved with a one-time effort. It is a systematic process requiring planning, action, learning and improvement. Work in the five targeted sectors of the federal Pollution Prevention Strategy is building momentum and is achieving positive results. A preventive approach based on continual improvement will help turn sustainable development from talk into action. With a heightened focus on demonstrating results, new and continuing initiatives will promote the use of processes, practices, materials, products and energy that avoid or minimize the creation of pollutants and waste.

The results of this report, *Progress in Pollution Prevention 1999-2000*, demonstrate the Government of Canada's commitment to "institutionalize pollution prevention across all federal government activities," as stated in *Pollution Prevention—A Federal Strategy for Action*. This report also demonstrates that the right incentives will not only protect and improve our environment, but will also help Canada gain a competitive advantage in the industries of the future.

Environment Canada will use the new tools in the *Canadian Environmental Protection Act, 1999* (CEPA 1999) to ensure strong protection for the environment and human health. The Act underscores the importance placed by the Government of Canada on the prevention of harm to human health and the environment and its commitment to sustainable development.

Environment Canada will also continue to work with other federal departments in the development and implementation of science-based pollution prevention strategies. To foster this relationship and recognize achievements, all federal departments are encouraged to record their pollution prevention efforts during the year for inclusion in upcoming annual progress reports.

Having developed consensus and commitment to a coordinated approach, federal departments will continue to "green" operations. Many departments have shown leadership in setting best practices as well as specific performance measures. Identifying gaps in environmental baseline data and performance measures will continue to be a priority.

The Government of Canada will continue to strengthen the country's science and knowledge base in order to better understand the impacts of toxic substances and substances of concern on human health and the environment. A focus will be on the health of the most vulnerable populations: children and Aboriginal people. A sound foundation of scientific knowledge will support the prevention or reduction of threats to the environment and health of Canadians.

Work will move forward with the provinces and territories to set Canada-wide standards, using a scientific foundation and a risk-based approach, for priority substances including mercury, dioxin and furans, ozone, particulates and benzene. Some jurisdictions have also chosen to consult further with industry, municipal, environmental, health and Aboriginal groups on the development and implementation of these standards.

Access to vital knowledge, tools and funding will remain essential to recognize and encourage the abilities of individuals and communities to adopt and promote pollution prevention.

The pollution prevention successes achieved in 1999-2000 leave the Government of Canada well positioned to deliver a stronger and healthier environment in the new millennium.

The Pollution Prevention Coordinating Committee encourages all Canadians to become active in the advancement of pollution prevention. Federal departments can facilitate and coordinate partnerships with businesses, environmental groups, scientists, Aboriginal communities, other governments and individual citizens. By continuing to work together toward the goal of preventing pollution at the source, Canadians will protect the environment and human health and secure a sustainable economy for generations to come.

**To view *Pollution Prevention—A Federal Strategy for Action*, visit:
www.ec.gc.ca/pollution/strategy**

Appendix I

Pollution Prevention Coordinating Committee Membership List

ENVIRONMENT CANADA

National Office of Pollution Prevention

James Riordan (Chairperson)
John de Gonzague (Vice Chairperson)
Kathi De (Coordinator)

Environmental Technology Advancement Directorate

Patricia Mitchell / Adrian Steenkamer

Regions

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Atlantic Region
Thanh Thao Pham
Quebec Region
Brad Cumming / Ron Nobes
Ontario Region
David Noseworthy
Prairie & Northern Region
Snehal Lakhani / Andrew Green
Pacific & Yukon Region

Interdepartmental Network on Sustainable Development Strategies (INSDS)

Craig Ferguson / Stefania Trombetti

NATURAL RESOURCES CANADA

Richard Arseneault / Chris Callaghan

Federal Committee on Environmental Management Services

Richard Arseneault

INDUSTRY CANADA

Environmental Affairs Branch

Giorgio Grappolini

NATIONAL DEFENCE

Directorate Environmental Protection

Holmer Berthiaume / Sean Baptiste

CANADIAN INTERNATIONAL DEVELOPMENT AGENCY

Environment Division

Tina Bailey

FISHERIES AND OCEANS CANADA

Real Property Management Directorate

Susan Martin

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

Environmental Services

Monique Thériault

TRANSPORT CANADA

Environmental Affairs

Alec Simpson / Saleem Sattar

DEPARTMENT OF FOREIGN AFFAIRS AND INTERNATIONAL TRADE

Environmental Services

Jaye Shuttleworth

AGRICULTURE AND AGRI-FOOD CANADA

Corporate Services Branch-Asset Management and Capital Planning Directorate-Engineering Services

Pierre Laplante

HEALTH CANADA

Environmental Management Systems Division

John Horricks / Karen Prince

Members can be reached through the
Government of Canada Employees Directory
at: <http://canada.gc.ca/search/direct500/>.

Appendix II

Federal Department and Agency Contributors

Environment Canada
Agriculture and Agri-Food Canada
Canadian International Development Agency
Citizenship and Immigration Canada
Economic Development Canada
Fisheries and Oceans Canada
Foreign Affairs and International Trade
Health Canada
Indian and Northern Affairs Canada
Industry Canada
National Defence
Natural Resources Canada
Parks Canada
Public Works and Government Services Canada
Statistics Canada
Transport Canada



*On the Internet view this report at:
www.ec.gc.ca/p2progress*

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This report was prepared by the Canadian Centre for Pollution Prevention Inc. based on project submissions and recommendations from various departments of the Government of Canada. Every effort has been made by the departments involved to ensure the information accurately reflects the projects and initiatives reported.

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