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CANADA'S GREEN PLAN

Canada's Green Plan
for a healthy environment

Government of Canada Gouvernement du Canada



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Statement by The Prime Minister

As Canadians, we are the trustees of a unique, beautiful, and productive northern land. From the first native populations, to the European settlers who followed centuries later, Canada's natural environment has shaped the development of our character and spirit.

Today, Canada has blossomed from a country once dependent exclusively on natural resources into one of the world's great industrial nations.

The challenge we now face is to build upon our economic strengths in harmony with our environment, the basis of our health and prosperity. Every Canadian has a role to play in achieving this goal of sustainable development. When everyone contributes, everyone benefits.

The Green Plan expresses the Government's commitment to work with Canadians to manage our resources prudently and to encourage sensitive environmental decision-making.

Canada's Green Plan has implications that go beyond Canada's borders. The tools we develop and the programs we implement will make a contribution to global environmental health in this critical decade of the 1990's.

Canada's Green Plan for a healthy environment was developed in consultation with Canadians from all walks of life. Taking as a starting point the enormous respect that Canadians already have for their environment, the Green Plan will focus our national efforts. It will assist us as a nation in remedying the mistakes of the past while putting in place new steps to safeguard the environment.

Canada's Green Plan represents our commitment to our children and to future generations. The Green Plan will help Canada be a country which is both economically prosperous and environmentaly healthy.

Brian Mulroney
Prime Minister of Canada

Statement by the Minister of the Environment

This past summer I was privileged to travel throughout Canada as Environment Minister, listening to Canadians speak in public meetings about their concerns and their ideas for cleaning up and protecting their environment.

Canada's Green Plan for a healthy environment is the federal government's response to those concerns and ideas. In preparing this environmental action plan, we have worked hard to ensure the priorities expressed so eloquently by Canadians are reflected in the many Green Plan initiatives. In fact, 400 of the 500 recommendations made at the national wrap-up consultation have been incorporated into the Plan.

The resulting Green Plan is the most important environmental action plan ever produced in Canada. It is the source for more than 100 important and well-funded initiatives over the next five years. It is a *comprehensive* plan that deals with our environment as interrelated and whole. In addition to the $1.3 billion the Government of Canada already spends annually on the environment, the Green Plan commits an additional $3 billion in new funds over five years.

The Green Plan provides definite *targets and schedules* which will drive environmental initiatives within federal jurisdiction for years to come. These will also form the basis on which Canadians can judge our overall progress.

Finally, *Canada's Green Plan* is a statement of strengthened partnerships. Canadians have been involved in its development; they will continue to be involved in its implementation.

The Green Plan will help expand the energy, commitment and optimism that individual Canadians are already giving back to their environment. In fact, the overall impact of the Green Plan initiatives will be multiplied many times by the programs, policies and initiatives of our many partners — the provinces and territories, municipalities, industry and unions, environmental organizations, universities and schools and, most importantly, individual Canadians from coast to coast.

Canada's Green Plan is an investment in our planet, our nation and ourselves.

Robert R. de Cotret
Minister of the Environment

Section One- Overview

I. Our Planet, Our Nation, Ourselves

Canada is a country blessed by nature. When the first European settlers arrived, they found an aboriginal population living in harmony in a land of vast potential wealth: enormous open spaces, massive forests, more lakes and rivers than could be counted, the world's longest coastline bordering three oceans, and a climate that varied from the extremes of the Prairies and the North to the near-Mediterranean climate of Victoria and the Gulf Islands of British Columbia.

We have an economy that relies heavily on our environmental resources.

Much of Canada's economic development and material well-being has grown from the application of more and more sophisticated technology by an increasingly educated workforce to this rich base of renewable and non-renewable resources. Our environmental riches support a high standard of living for a relatively small population.

We have taken nature's bounty and used our talents and ingenuity to develop a dynamic and competitive economy. At the same time, we have become a caring society with a range and quality of social services and safety nets that Canadians consider amongst our finest achievements. Our resource wealth has shaped the Canadian economy—and has determined how our relationship with the environment has evolved.

However, while we have an economy that relies heavily on our environmental resources, there is growing evidence that we have not fully been meeting our environmental responsibilities. Pollution in the Great Lakes and the St. Lawrence, smog in our cities, and the contamination of groundwater and soil show how rapidly neglect can erode the most generous environmental legacy.

Nor are Canadians alone in their concern about the environment. On a global scale, the news we see and read each day seems to confirm that our environmental situation is becoming worse—a planet of polluted air, water and land, of over-exploited fishery resources, forests and wildlife.



In the midst of the affluence we have created comes a worrisome concern: is it possible that we who are history's most affluent and technologically sophisticated society will not be able to maintain what we have for ourselves and our children? Have we reached the limit of the earth's ability to accommodate our aspirations?

Or can we build on our experience, harness our increasing environmental knowledge, and put our talents, ingenuity and technology to work to achieve continued economic development while simultaneously improving and protecting the quality of the environment on which we all ultimately depend for survival and prosperity?

These are among the most important questions we will face in the 1990s. But they are not questions we face alone. Increasingly, they are global questions that require both a global and a local response.

Economic growth is essential if we are to enjoy the services to which we have become accustomed.

Sustainable Development and Canada's Green Plan

In 1983, the United Nations General Assembly established the World Commission on Environment and Development. It was asked to study the relationship between economic development and the global environment and to make recommendations about both that would guide countries in the early years of the next century.

Dr. Gro Harlem Brundtland, Minister of the Environment (and now Prime Minister) in the Government of Norway, was appointed Chairperson. All 23 members of the Commission, including two Canadians, served in their individual capacities rather than as representatives of their respective governments.

Meetings were held in all regions of the world, so that members could learn, first-hand, about economic and environmental problems and the steps various governments were taking to deal with them. In addition, the Commission had public meetings in four countries, including Canada, where it heard from all interested groups and individuals.

In 1987, Dr. Brundtland made a final report to the United Nations and her Commission's findings were published under the title *Our Common Future*.

The Brundtland report quickly captured the world's imagination with the concept of sustainable development, an approach that would enable the world to find solutions to poverty, population growth and limited environmental resources. Sustainable development is described, in general, as activity in which the environment is fully incorporated into the economic decision-making process as a forethought, not an afterthought. It holds that resources must be treated on the basis of their future, as well as their present, value. That approach offers genuine hope of economic development without environmental decline.

We Canadians know from our own experience that economic growth is essential if we are to enjoy the services to which we have become accustomed. But the infrastructure needed to provide running water and sewage disposal, health care and schools—which we accept as given in our lives—is simply beyond the capacity of the majority of developing countries.

The Brundtland Commission said that a five-to-ten-fold increase in economic activity would be necessary by the middle of the next

century to meet the legitimate aspirations of the world's population now living in poverty. Yet our diminishing pool of environmental assets will simply not support more of the resource-hungry kind of prosperity that dominates in developed nations.

The promise of sustainable development is that economic development can and must be sustained by the environment. In the words of the Brundtland report, we can achieve "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

The great challenge of the 21st century will be to accommodate the economic hopes of the majority of the world's growing population within the limits imposed by the planet. The challenge *can* be met. But it will require a fundamental change in the way we use the environment in our pursuit of economic growth. Change takes time: centuries-old values and attitudes are not transformed overnight. The task will be made easier as people become aware that, like any natural species, our success depends on our ability to adapt to our environment. The environment will not adapt to us.

Canada's Green Plan offers a framework for change. Only society as a whole can produce the changes we need to meet the economic and environmental challenges of the 1990s and beyond.

A Plan For Life

While Canadians accept the merits of sustainable development, we understand it is a philosophy, not an action plan. Canadians themselves must determine their own actions for harmonizing our environment and our economy. Sustainable development is *what* we want to achieve. *The Green Plan* sets out *how* we are going to achieve it together in the years to come.

The Green Plan is an affirmation by the Government of the faith Canadians have in their ability to meet tough challenges. It offers a framework for change—in the way we operate as governments at home and abroad, and in the way individual decisions are made at every level of Canadian society.

The Green Plan is not the solution to all our environmental problems. There is no simple solution to the problems we face. No single person, group or level of government has all the answers.

The Green Plan recognizes that, while governments have responsibility to provide leadership, only society as a whole can produce the changes we need to meet the economic and environmental challenges of the 1990s and beyond. This is a national challenge requiring the individual and collective efforts of all Canadians. It will require changes in our thinking and our actions.

It is a plan based on assumptions about the world, the economy and the priorities of Canadians. Like any plan, it was developed

knowing that conditions and priorities will change, and new information will alter our assumptions. *The Green Plan* is designed to change too.

The Government of Canada will review *The Green Plan* annually in consultation with Canadians to ensure priorities are being successfully identified and addressed. New and emerging priorities will also be reviewed with Canadians each year so that resources can be best allocated in succeeding years of the plan.

As a result, each year will see enhancement and broadening of Canada's *Green Plan*. It is a living document, a genuine plan for life.

More than good intentions are required to make *The Green Plan* a reality. The Government of Canada has allocated $3 billion in new financial resources to *The Green Plan*. New programs, policies and regulations are being introduced. Other programs that have proven successful are being greatly expanded.

The Greatest Challenge of Our Generation

Canadians have chosen the path of *optimism* and *challenge*, rather than defeatism. *The Green Plan* moves Canada well beyond defining problems. It enables us to begin acting comprehensively to solve them.



The Green Plan is a fundamentally optimistic document. It is rooted in the assertion *we can*:

- Canadians *can* make better individual and collective decisions;
- Canadians *can* clean up the mistakes of the past and ensure they do not reoccur in the future;
- Canadians *can* be ingenious and join a healthy environment with a prosperous economy;
- Canadians *can* show the world what can be achieved by a people wanting to inhabit the world's most environmentally friendly nation.

In fact, Canadians *can* and *will* secure for themselves and future generations a healthy environment and a prosperous economy.

II. A Partnership for Change

Canada's *Green Plan* represents the unique efforts and commitment of men and women in Canada from every sector of society working together, as partners, in national environmental decision-making.

This plan was born out of an extensive, national multi-stakeholder consultation process that began with the March 29, 1990 release of a background paper, *A Framework for Discussion on the Environment*. A National Advisory Committee, appointed by the Minister of the Environment and comprising representatives of government, business, the natural resource industry, the legal, medical and public health professions, environmental groups, native groups, youth and scientists advised the Minister on the *Green Plan* consultation process.

In the first phase of the consultation process, more than 6,000 Canadians attended a total of 41 information sessions held in cities and towns from coast to coast between April 18 and June 12, 1990. These sessions were held to inform as many Canadians as possible of this major government initiative and to explain the contents of the Framework document. They also informed Canadians about how they might make their views on this important initiative known and how they could become involved in the consultation process.

In the second phase, more than 3,500 Canadians attended consultation sessions in 17 major cities between May 24 and June 26, 1990. Participants represented all segments of Canadian society, including individuals, native groups, women's groups, environmental groups, church groups, labour, industry, business and associations, provincial, territorial and local governments, academics, youth, and Members of Parliament. At these sessions, participants discussed the issues presented in the Framework document and made recommendations to the Government on the various options described.

The consultation process culminated with a two-day national wrap-up session in Ottawa in mid-August 1990. At this session, discussion was based on *A Report on the Green Plan Consultations*. This document synthesized some 3,000 pages of comments and suggestions, an analysis of 4,500 question-response forms, and written suggestions from more than 1,000 individual Canadians and organizations. It also included a list of possible policy, program and legislative elements of *The Green Plan*.

The Green Plan also builds on the work of the National Task Force on Environment and Economy. Created in 1986 by the Canadian Council of Resource and Environment Ministers (now the Canadian Council of Ministers of the Environment), it brought together, for the first time in Canada, Environment ministers, business executives, environmentalists and academics to make recommendations on actions needed to move Canada towards sustainable development.



The Government of Canada believes that we can maintain the long-term integrity of our environment while ensuring our economic and social well-being.

Using the Task Force as a model, the National Round Table on the Environment and the Economy was established to provide leadership and form new partnerships among Canadians on issues of environment and economy. Round Tables on the Environment and the Economy have also been formed in every province and territory. Their success is testimony to the multi-sectoral commitment to achieving sustainable development in Canada.

Clearly, only by strengthening existing partnerships (such as those developed and solidified during the *Green Plan* consultation process), and by forming new partnerships, will we truly achieve sustainable development in Canada.

Canadians, Their Governments, and The Green Plan

During the consultations, Canadians spoke of their willingness to change, and their desire to see governments act now. Many thousands of people took time to give the Government their thoughts and ideas. They stated their urgent concerns about our environment and its importance to the health and prosperity of men and women in Canada, both today and in the future. And they are already making changes—in their communities, homes and workplaces—in the way they think about and act towards the environment.

The Government of Canada believes that we can maintain the long-term integrity of our environment while ensuring our economic and social well-being. As a country, we have begun to act and can point to significant progress in dealing with some major problems such as acid rain, lead emissions and ozone depletion.

We must continue and redouble these efforts. But to ensure an environmentally sustainable future for Canada in the 1990s, we must explore new directions. We have to adopt a more systematic approach that will enable us to foresee and prevent environmental problems. We can no longer afford the costly mistakes that come with a policy of "react and cure."

The Government of Canada is setting a national objective:

To Secure for Current and Future Generations a Safe and Healthy Environment, and a Sound and Prosperous Economy.

Priority Objectives for Canadians

To meet this challenge, the Government of Canada has defined specific goals. It is committed to working toward:

- clean air, water and land;
- sustainable use of renewable resources;
- protection of our special spaces and species;
- preserving the integrity of our North;
- global environmental security;
- environmentally responsible decision-making at all levels of society; and
- minimizing the impacts of environmental emergencies.

Clean Air, Water and Land

Canadians are increasingly worried about the quality of the environment in which they live. Much of this concern stems from anxiety about the possible danger to human health posed by pollution. People are concerned about the water they drink, the air they breathe and the food they eat. During the *Green Plan* consultations, cleaning up our air, water and land was cited as an essential environmental imperative for Canada.

The past two decades have seen some improvements in environmental quality—for example, a reduction in the nutrient contamination of the Great Lakes, and a marked decline in concentrations of several major air pollutants. However, we now face new and more complex problems, such as the widespread release of toxic chemicals, smog, overflowing landfill sites and degradation of our water and ocean resources. In addition, there are growing concerns about our ability to prevent and, when necessary, respond to environmental emergencies such as oil and chemical spills.

Much of Canada's prosperity depends on healthy and productive soil, fish stocks and forests.

Sustainable Use of Renewable Resources

Nowhere is the link between a healthy environment and a prosperous economy more evident than in the use of renewable resources. In fact, much of Canada's prosperity depends on healthy and productive soil, fish stocks and forests.

Canadians want to continue to enjoy the benefits of harvesting our rich renewable resources. At the same time, they recognize the need for an environmentally sound approach to resource management and harvesting. Such an approach is essential to ensure the health and productivity of soil, forests and many aquatic ecosystems.

For the benefit of current and future generations, all Canadians must act to help sustain our renewable resources and the ecosystems upon which they depend.

Protection of Spaces and Species

Of vital importance to both the environment and the economy is the preservation of plant and animal species and the spaces or ecosystems of which they are a part. Biodiversity sustains life and produces the environmental wealth upon which our economy depends. As a signatory to the United Nations World Charter for Nature, Canada recognizes the inherent right of all species to exist.

Despite its importance, biodiversity continues to be threatened in Canada and around the world. In Canada alone, some 175 animal and plant species are known to be at risk. Valuable natural spaces, including old-growth forests and wetlands, also continue to disappear. Governments, industry and individual Canadians must make a fresh commitment to protecting our valuable ecological resources. We must act to ensure their long-term health and diversity.

The Government also seeks to preserve sites that show us how nature has shaped Canada's history, how technology has altered the environment, how natural resources have been used and how environmental changes affect heritage resources.

Preserving the Integrity of Our Northland

Some 40 per cent of Canada's land mass is located north of the 60th parallel. This vast northland is surrounded by two thirds of our coastline and offshore waters. In addition, Canada shares the Arctic region with seven other countries.

In recognition of the special nature of this region, and the intimate relationship between aboriginal people and the land and sea, the

Government is committed to preserving the environmental integrity of our Northland.

Global Environmental Security

For the first time in history, human activity has the capacity to alter global ecosystems. World population growth and economic development are placing ever-greater stresses on our planet. Climate warming and ozone depletion are only two of the problems that threaten the global environment.

Canada, particularly, has an important international responsibility, as steward of one of the largest and most diverse environments in the world. With its international partners, it must work to minimize and eventually reverse the effects of global pollution in order to ensure global environmental security.

Environmentally Responsible Decision-Making

In countless day-to-day decisions, individual Canadians shape the economy of our country. Acting alone or within a business, a government or another organization, we determine our consumption of energy and materials and our production of waste. What we decide has an impact on the natural world and, ultimately, on our own health and well-being. We face problems today because our past decisions did not adequately reflect environmental considerations.



A Town with the Blues

Saying goodbye to something can be sad – especially when the discarded item is heading for a disposal site that occupies valuable land, and when precious natural resources are used to manufacture a replacement item. That's why the Delta Recycling Society established its Blue Box program in Delta, British Columbia, in March 1988.

Delta residents were asked to sort paper, metal and glass from their garbage and place it in Blue Boxes for pick-up and recycling. In the first month of operation, 55 per cent of the residents participated and garbage was reduced by 13 per cent. By January 1990, 70 per cent of the homes were using Blue Boxes and 16 per cent of the waste was being recovered – an estimated 300 tonnes per month!

It takes far less energy to recycle things than to replace them. For example, it takes 42 per cent less energy to recycle paper than it does to process raw wood fibre. And Delta Recycling has also given jobs and training to 23 people. Now everyone wants the Blues.

If we are to achieve a safe and healthy environment and a sound and prosperous economy, we must all change the way we make decisions and the way we see our own activities in relation to the environment. Individually and collectively, we must make choices that reflect the true value of our scarce, unique and fragile environmental resources.

We must all change the way we make decisions and the way we see our own activities in relation to the environment.

Environmental Emergencies

The Green Plan provides a framework both for cleaning up our past mistakes and, more importantly, for incorporating environmental considerations as central elements of economic decision-making. While the emphasis of *The Green Plan* is on anticipation and prevention, emergencies will inevitably occur—both man-made and natural. We must be prepared to respond quickly to threats posed by both types of emergencies, and we must minimize damage to life, the natural environment and to property.

Action Plans with Targets and Schedules

Beyond an overall objective and specific goals, we need a way to measure progress. *The Green Plan* includes targets and schedules by which we can gauge our success. The most important of these are set out below.

Clearly, these targets will evolve as our understanding improves and we learn from experience. In some areas, specific quantitative targets are not yet provided. The Government of Canada will work with the provinces, industry and interested groups to establish precise targets and schedules in all areas as quickly as possible.

Goal 1: Clean Air, Water and Land

Targets:

- Assurance that citizens today and tomorrow have the clean air, water and land essential to sustaining human and environmental health.
- Protection and enhancement of the quality of our water resources and promotion of the wise and efficient use of our water.
- Virtual elimination of the discharge of persistent toxic substances into the environment.
- Canada-wide reduction of the concentration of ground-level ozone (smog) to below the threshold of health effects in the most susceptible segments of the population.

- A 50-per-cent reduction in Canada's generation of waste by the year 2000.

Goal 2: Sustainable Use of Renewable Resources

Targets:
- The shifting of forest management from sustained yield to sustainable development.
- Maintenance and enhancement of the natural resources that the agri-food sector uses or affects, and integration of environmental, economic and social factors.
- Long-term sustainability of our fisheries resource.

Goal 3: Protection of Our Special Spaces and Species

Targets:
- The setting aside of 12 per cent of the country as protected space.
- Completion of the national parks system by the year 2000.
- Maintenance and enhancement of the health and diversity of Canada's wildlife and plants.
- Commemoration and protection of our historical heritage.

Goal 4: Preserving the Integrity of our North

Targets:
- Preservation and enhancement of the integrity, health, biodiversity and productivity of Canada's Arctic ecosystems.

Goal 5: Global Environmental Security

Targets:
- Stabilization of carbon dioxide and other greenhouse gas emissions at 1990 levels by the year 2000.
- Phasing-out of CFCs by 1997, and of methyl chloroform and other major ozone-depleting substances by the year 2000.
- A 50-per-cent reduction of sulphur dioxide emissions in eastern Canada by 1994. Capping of acid-rain-related emissions in eastern Canada beyond 1994. Establishment of a national emission cap for the year 2000.

Goal 6: Environmentally Responsible Decision-Making

Targets:

- As a cornerstone of Canada's foreign policy, acceleration of global co-operation, understanding and progress on environmental issues.
- Strengthening of existing environmental partnerships within Canada, while also building new ones.
- Provision of timely, accurate and accessible information to enable Canadians to make environmentally sensitive decisions.
- Development of an environmentally literate society—one in which citizens are equipped with the knowledge, skills and values necessary for action.
- Strengthening of Canada's environmental science and technology with a special emphasis on understanding regional ecosystems.
- Balanced use of strong and effective environmental laws with market-based approaches for environmental protection.
- Assurance that the operations and procedures of the federal government exceed national targets and schedules for sustaining our environment.

Goal 7: Minimizing the Impact of Environmental Emergencies

Target:

- Quick and effective response to threats posed by pollution emergencies due to human activity and naturally occurring environmental emergencies.

III. Principles for Environmental Action

The Government of Canada has adopted the following principles as the basis for its own efforts to secure a safe and healthy environment, and a sound and prosperous economy.

Respect for Nature

We do not own the environment. It is a trust we must protect.

Nature has an intrinsic value that exceeds its worth in the marketplace. It supports a diversity of life on the planet and is essential to our well-being.

Respect for nature requires us to accept our responsibility as its stewards. We do not own the environment. It is a trust we must protect for the benefit of current and future generations. The same ingenuity and innovative spirit that we have devoted to improving our standard of living must now be used to help preserve the quality of the environment.

Respect for nature also implies an attitude of prudence. Human actions can wreak serious, irreversible damage on the environment. Yet in deciding on an action, we rarely know all its environmental ramifications. Caution is therefore appropriate: we must be prepared to give nature the benefit of the doubt. We should err on the side of protecting the environment.

The Economy-Environment Relationship

The well-being of Canadians is dependent on the health of both our environment and our economy. A threat to either will imperil the way of life to which we have become accustomed. Nowhere is this linkage more apparent than in the predicament facing many developing countries, caught in a vicious circle of economic ills, environmental degradation and poor human health.

We must meet our environmental goals in ways that promote economic prosperity. For example, to operate at its full potential, Canadian business needs clear rules dealing with the use of environmental resources, and these should be applied fairly and consistently. We must regulate the environmental impact of economic activity, but we must do so effectively and efficiently.

We must also make use of the forces of the marketplace and allow industry as much flexibility as possible in meeting specific environmental goals and targets.



To support the economic and social well-being of Canadians, we must provide for our country's environmental and economic future by investing in science, education and technology. Finally, we must view the environmental challenge as an economic opportunity, not a constraint.

Efficient Use of Resources

For the health of our environment and economy, we must use environmental resources efficiently. All are limited in some way. We must value them at their true worth and use them frugally, so that we live off the interest without depleting the capital.

Whoever causes environmental degradation or resource depletion should bear the full cost.

For example, our water, land and air have a finite capacity to absorb waste safely; we must not overburden them. We should not exploit renewable resources such as farmland, fish stocks and forests more rapidly than they can replenish themselves. And in extracting non-renewable resources such as petroleum and minerals, we should take into account what their depletion will cost us. At all times, we should keep in mind the "four Rs": reduce, re-use, recycle and recover.

To encourage efficient use of resources, we must adopt the rule that the polluter or user pays. Whoever causes environmental degradation or resource depletion should bear the full cost.

Shared Responsibility

No single government or industry, however large, and no individual, however committed, can tackle our environmental problems alone. The responsibility for finding lasting solutions rests with all Canadians.

Environmental stewardship is a responsibility shared by various levels of government. Both the federal and provincial governments have important constitutional powers to promote environmentally sustainable economic development. Ownership of natural resources and jurisdiction over property and civil rights provide the provinces with the authority to regulate much economic activity that might affect the environment. As for the federal government, it is responsible, among other matters, for international relations; transboundary pollution; migratory birds; fisheries; and northern regions. Finally, municipal governments are responsible for some local aspects of environmental management, such as water and sewage treatment, solid-waste disposal and land-use planning.

To meet our shared responsibilities, we must work together here in Canada and with our global neighbours. By co-operating, we will respect each other's roles and make the best use of each other's strengths.

Leadership

Governments are trustees of the environment on behalf of the people. They are responsible for establishing the framework of laws and regulations that control access to the environment. During the *Green Plan* consultations, Canadians called for such leadership, especially from the federal government.

Governments are trustees of the environment on behalf of the people.

The Government of Canada is prepared to show leadership on environmental matters. The Government will continue to define policy on national environmental issues and to advance Canada's environmental interests in the international community. Canada's role on such issues as ozone depletion, acid rain and global warming is indicative of the approach the Government of Canada will take in responding to the call for government leadership.

Informed Decision-Making

To make wise decisions about our use of the environment, we must know and understand the physical world and its ecosystems, and the interrelationships between the natural environment and the economy.

Informed decision-making requires high-quality environmental science, education and information. Scientific and technological research and development provide the basis for our understanding of the problems and our efforts to find workable solutions. Education and information ensure that, in their day-to-day decisions, Canadians understand the environmental and health implications and take responsibility for them.



Read All About It!

Now even bad news can be put to good use. Since 1983, the City of London, Ontario, has been using old newspapers to help dispose of sewage waste.

About 60 tons of newsprint are collected each week, fed into pulpers, and mixed with sewage sludge and polymers. After the mixture has been pressed to extract moisture, the solid waste can be incinerated. The newspapers provide additional fuel in the incinerator, thus saving more than $200,000 a year in natural gas. Moreover, this process replaces a former treatment system that added ferric chloride and lime to the sewage sludge – so fewer chemicals are now entering the environment.

For the City of London, old news is definitely good news!

Also needed is effective public participation to help integrate environmental considerations into decision-making processes within government and industry. Decision-makers recognize that we can no longer rely solely on experts for the solutions to environmental problems. Instead, we need input from a wider cross-section of the population.

Public consultation providing that input is therefore an essential part of the environmental policy-making process. If Canadians are to be called upon to make changes in their behaviour toward the environment, they have a right to be involved in the process that determines what those changes will be. And to keep pace with the growing number and complexity of environmental problems, we must develop new and innovative mechanisms for public participation in policy-making. Examples of such mechanisms are Canada's Round Tables on the Environment and the Economy.

We Must Think, Plan and Act in Terms of Ecosystems

We live in a complex and integrated environment. All creatures, including humans, interact with and depend on each other. They all draw on the materials and energy of the physical environment to obtain food and recycle wastes. They all affect each other's behaviour.

In the past, responses to environmental problems paid very little attention to these important inter-relationships. Today, the increasing number and complexity of environmental issues demand that we adopt a more integrated approach.

IV. The Government-Wide Commitment

As you will read in this document, *The Green Plan* is much more than an action plan for the federal Minister of the Environment and Environment Canada. Indeed, it is a comprehensive plan of action for the entire Government of Canada, supported by more than 40 federal departments and agencies.

The Green Plan is a government-wide initiative, rooted in the knowledge that such a concerted effort is essential if we are to solve our intricate environmental challenges effectively.

Canada's Green Plan is a government-wide initiative.

While the initiatives introduced in *The Green Plan* are new, this government-wide commitment to environmental protection and enhancement is not. The Government of Canada has become markedly more environmentally sensitive.

The Government of Canada has recently introduced the proposed Canadian Environmental Assessment Act. The proposed legislation will entrench in law the federal government's obligation to integrate environmental considerations into its project planning and implementation processes.

Further, as recommended in the report of the World Commission on Environment and Development, the Government now conducts environmental assessments of all proposed program and policy initiatives. Canada is one of only a few nations in the world to conduct such policy assessments.

The initiatives introduced in this document will build on this ongoing commitment to environmental protection and enhancement. In particular, in 1991 the Government of Canada will adopt a comprehensive Code of Environmental Stewardship that will cover all areas of federal operations and activities.

Perhaps one of the biggest strengths of *The Green Plan* is that it contains numerous measures to ensure that these initiatives are fulfilled.

For example, State of the Environment Reports will be published on a regular basis so that Canadians can assess and evaluate Canada's progress.

Environmental indicators, similar to economic and social indicators used daily by Canadians, will also be developed and published. These will provide Canadians with a concise measurement of the state of the environment and the relationship between environmental factors and economic development.

In addition, environmental monitoring systems and programs will be developed. They include, to name just a few, systems and programs



to determine the health of Canadian forests, the effectiveness of acid rain control measures, the state of ozone depletion, and the quality and ecological integrity of water bodies.

These feedback mechanisms will highlight areas where more far-reaching actions are needed to accelerate action on known environmental challenges or to meet new ones as they arise. In addition, consultation on various issues—ranging from climate change to the use of economic incentives and disincentives for achieving environmental objectives—will further enable Canadians to develop and effectively implement appropriate actions.

V. Financing The Green Plan

The Green Plan relies on a wide variety of mechanisms for achieving our environmental objectives. Within the federal government, for example, there are more than 50 statutes with environmental implications. The number triples when provincial and territorial legislation is added. And most of these pieces of legislation are supported by regulations.

While regulations are an important means of pursuing environmental objectives, funding is also required for their development and enforcement, and for the investments in science and technology, partnerships, information, conservation and remedial action that figure prominently in *The Green Plan*.

At present, the federal government devotes more than $1.3 billion annually to its major environmental programs. Much of this funding is allocated to Environment Canada, which has general responsibility for coordinating federal policies and programs directed at preserving and enhancing environmental quality. This mandate is carried out through programs to provide Canadians with environmental information; to ensure the wise management and use of renewable resources; to promote the establishment and adoption of environmental quality and pollution prevention objectives; to ensure that new federal activities are assessed early in the planning stage for any adverse effects on the environment; and to protect and present nationally significant natural and heritage resources.

Federal jurisdiction in environmental matters is not confined solely to Environment Canada: all federal departments and agencies are responsible for the environmental aspects of their activities. And several departments deliver major programs with important environmental objectives. For example:

Agriculture Canada enters into co-operative arrangements with provincial governments and producers to conserve and protect the agricultural resource base. Agreements with the provinces, such as the National Soil Conservation Program, encourage producers to adopt improved soil conservation practices.

Energy, Mines and Resources Canada funds programs that encourage energy efficiency, alternative energy, technology development, geological surveying, mapping, remote sensing, mineral recycling, waste management and environmental assessment.

Fisheries and Oceans Canada administers the *Fisheries Act*, which provides for the conservation and protection of fish and fish habitat. The fish habitat management program is a major regulatory activity to maintain and improve fish habitat, and to protect it from physical or chemical disruption.

- Forestry Canada undertakes research programs to improve and implement more economical and environmentally acceptable methods of controlling forest insects and diseases, to enhance understanding of forest ecosystems, and to improve forest management techniques. The department also enters into co-operative arrangements with the forest industry to support research and development of improved products and environmentally sensitive processes in the forest sector. In addition, it undertakes large-scale forest rehabilitation projects in conjunction with provincial governments.

- Health and Welfare Canada carries out health protection and medical services programs. The health protection program provides for: environmental assessment and monitoring; the promotion of public awareness of the effects of the environment on health; the study of the long-range transport of air pollutants and of pollution of the Great Lakes; and the development of national guidelines on matters such as drinking water quality. The medical services program monitors the health of native people, the travelling public and federal public servants.

- Indian and Northern Affairs Canada undertakes programs to enable Indian and Inuit people to respond to environmental problems affecting their reserve lands, waters or traditional land-use areas, and to conserve and protect the northern environment.

Over the next five years, an additional $3 billion will be provided under *The Green Plan*. Combined with existing programs, the Government of Canada will allocate almost $10 billion for the first five years of the Plan. By the fifth year of *The Green Plan*, annual environmental spending across the federal government will increase by 50 per cent.

This additional funding will be allocated to the eight areas described in Section Two of *The Green Plan* (Table 1).

Table 1: GREEN PLAN RESOURCES
(over five years)

I.	Life's Three Essentials: Clean Air, Water and Land	$850 million
II.	Sustaining Our Renewable Resources	$350 million
III.	Our Special Spaces and Species	$175 million
IV.	Canada's Unique Stewardship: The Arctic	$100 million
V.	Global Environmental Security	$575 million
VI.	Environmentally Responsible Decision-Making	$500 million
VII.	Starting in our Own House	$275 million
VIII.	Emergency Preparedness	$175 million
	Total	$3 billion

The Green Plan is a practical plan of action, and will respond to changing circumstances. Each year, the Government of Canada will examine and adjust these allocations to ensure existing priorities are being met and to respond to new and emerging priorities.

Section Two-
The Green Plan

Canada's *Green Plan* initiatives are highlighted by the following symbols:


Science and technology:


Public awareness, information and monitoring:


Government programs and services:


Legislation, regulation and enforcement:


International action:


Partnerships:


Federal government operations.

I. Life's Three Essentials — Clean Air, Water and Land

A. Our Health and the Environment are Inseparable

Canada's Goal is to Ensure that Citizens Today and Tomorrow Have the Clean Air, Water and Land Essential to Sustaining Human Health and the Environment.

Introduction

Human health, the environment and the economy are inextricably linked. We humans arrive on Earth as individual beings, each with our own traits imprinted into our unique genetic structure. From the moment we enter the world, however, we exist not simply as individuals, but also as highly active parts of an ecosystem that is itself alive and finite. The health of that environment determines the health and safety not only of ourselves, but of our children, and of theirs, and of theirs to follow.

While our economic activities have contributed greatly to the development of society and the expansion of our populations, it is those same economic activities that are overloading much of the world's environment. Deforestation, pollution and extinction of wildlife species are but a few of the well-known consequences of human activity. In turn, as the environment becomes less healthy, the health of individuals and the economy can be adversely affected.

Take, as one example, the effects on human health of sulphur dioxide pollution. This major cause of acid rain has also been linked closely to increased hospital emergency visits. People with asthma or other respiratory problems are particularly susceptible to atmospheric pollutants.

However, the impact of the environment on human health involves more than physical well-being. The spiritual, psychological, social and emotional health of individuals is affected by the health of the environment as well. This applies to both our natural environment and our day-to-day surroundings — homes, workplaces, neighbourhoods and communities. Forest wastelands, polluted lakes and unbreathable air have a profound effect on the human psyche.



Human health is an important consideration in every environmental issue, from toxic substances and ozone depletion to waste management and the treatment of our renewable resources. To ensure long-term good health, Canadians need clean air, water and land.

In 1991, the Minister of National Health and Welfare will release the Health and Environment Action Plan.

Action to alleviate environmental pollution, and ultimately improve health, has already begun. For example, multi-level government action led to the acid rain abatement program that is reducing the concentration of sulphur dioxide in urban air across Canada. Further, when scientific evidence indicated that leaded gasoline emissions could be affecting the neurological development of certain children, the Government banned lead-based gasoline additives in Canada, effective December 1, 1990.

The Health and Environment Action Plan

In 1991, the Minister of National Health and Welfare will release the Health and Environment Action Plan. This plan will contain the detailed measures necessary to identify and address certain human health problems associated with environmental pollution. It will include both national and international initiatives, with a view to facilitating individual and community action. In particular, it will focus on those groups of Canadians most at risk to environmental stresses.

The Health and Environment Action Plan will include the following specific elements:

Drinking Water Safety



In partnership with the provinces, the Government will enact a new Drinking Water Safety Act to help reduce illness attributed to hazardous drinking water (see Chapter I-B for details).

Effects of Air on Health



This program will investigate the effects of airborne contaminants and climate change on human health. It will focus on assessing the health hazards posed by acid rain, air toxics, ground-level ozone and indoor air contaminants.

Waste Management and Health



To address the health and environmental aspects of our waste management strategies, the Government will assess and monitor the health effects of waste management, and develop guidelines and materials to increase public understanding of the issues.

Native people and Environmental Contaminants

Native people are particularly at risk from environmental hazards due to traditional lifestyle patterns and food sources.

Of concern are native populations in the Great Lakes basin. The Government will undertake a comprehensive study in co-operation with native people. It will assess the health risks that contaminants pose for native people living in the Great Lakes basin, and will develop mechanisms to protect their health.

A program will also be initiated to focus on the way in which environmental contaminants affect pregnancy and child development. The program will concentrate on native women and children living in communities that have already experienced contamination problems.

Native people are particularly at risk from environmental hazards due to traditional lifestyle patterns and food sources.

Northern and Arctic Health and Environment

There is increasing evidence that pollution in the Arctic is presenting a health risk to northern residents, particularly those who rely mainly on country foods. To provide better advice on the way in which to deal with these risks, the program will focus on the health risks posed by foods for northern residents.

Registry of Health Effects in "Hot Spots"

Over the next five years, the Government will improve its ability to gather, analyze and organize health and environment information.

Working with the provinces and Statistics Canada, the Government will develop a registry of health effects and correlate contamination "hot spots" with the incidence of cancer and other major diseases.

Radiation

The Government will assess and monitor the effects of radiation on human health.

Health and Environment Information and Awareness

Individuals and communities in Canada have made it clear that they are concerned about the effects of the environment on their health and, in turn, how their own actions might make the environment unhealthy for others. There is growing conviction in the health constituency that concrete action, supported by authoritative information, and environmental responsibility must begin at the community level, and that within the community, new partnerships must be formed to ensure healthy environments for people.

Thus the Government will establish a number of programs designed to encourage and support individual and community action on health and the environment. These will include:

- A national health and environment information and awareness program designed to provide individuals and communities with accurate and timely information and the skills to make reasonable individual and collective choices on a range of health and environment issues in *The Green Plan*;
- A clearinghouse on health and environment information, which will provide individuals and communities with information on a broad range of issues affecting the health of women and men. The Government will contribute support to enable them to take action on locally relevant issues; to develop networks; and to foster the development of new partnerships; and
- A fitness and environment program that will promote healthful physical activity in a healthy natural environment.

The Health and Environment Action Plan will complement other *Green Plan* initiatives, particularly measures to control toxic substances (Chapter I-C), solve urban smog problems (Chapter I-D) and protect and enhance water quality (Chapter I-B).

B. Continuing Action to Protect and Restore Our Water

Canada's Goal is to Protect and Enhance the Quality of Our Water Resources and Promote the Wise and Efficient Use of Our Water.

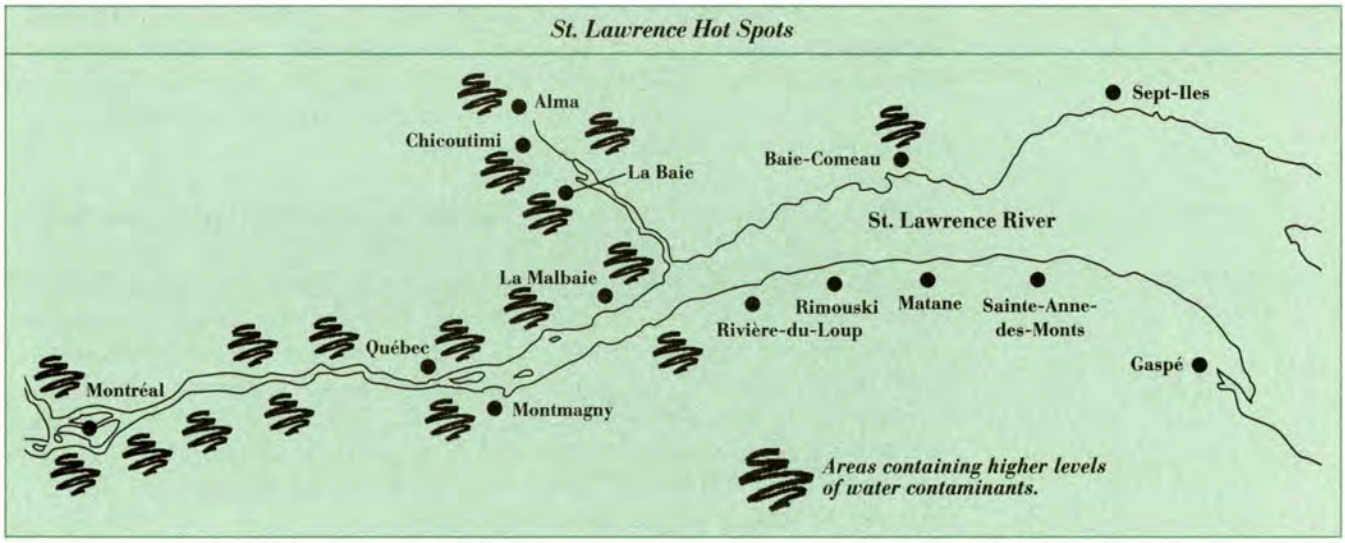
Introduction

Water is the essential element of all life. Animal life first developed in water before emerging onto the land. Millions of years later, our own human bodies are still 83 per cent water. The health of our water resources defines the health of the millions of species of plant and animal life in Canada and throughout the world. Water is also basic to the economies of the world. It is used for transportation and power generation, for waste disposal, recreation, agriculture, and fisheries, and is essential both in manufacturing and in the service sector.

Few nations have been shaped by water as much as Canada. Native exploration and settlement followed the course of the waterways. European settlers used the rivers as their transportation arteries throughout the continent and established our major urban centres on these water routes. Our early industries and commerce were launched on Canada's waterways.



And few nations have as much responsibility as Canada to protect global water resources. Canada is the trustee of nine per cent of the



world's renewable supply of freshwater. The Great Lakes is the largest freshwater system in the world, acting as a reservoir for 20 per cent of the globe's stored freshwater. Canada is also steward to the world's longest coastline, involving three oceans.

The Government is developing action plans to deal with 17 priority "hot spots" in the Great Lakes and the St. Lawrence River.

Canadians recognize that, when it comes to protecting the quality of our water and managing competing demands, the responsibility belongs to everyone.

Efforts to Date are Working

Co-operative actions have been under way since the 1970s to reduce pollution in the Great Lakes. The $8 billion committed to date by national, provincial and state governments in Canada and the United States have brought excessive-nutrient-level problems under control. Lake Erie has been brought back to life. Reductions of up to 75 per cent have occurred in the levels of some persistent toxic chemicals in the herring gull, a fish-eating bird. The Great Lakes Water Quality Agreement, signed by Canada and the United States in 1978, was strengthened in 1987 and is proving to be an effective tool to co-ordinate action on both sides of the border.

The Great Lakes and St. Lawrence River action plans, both co-operative federal-provincial programs, support pollution clean-up efforts and preserve water quality. The Governments of Canada, Quebec and Ontario have already committed hundreds of millions of dollars.

The Government is developing remedial action plans, in concert with the Ontario government and a number of public advisory committees, to deal with 17 priority "hot spots" in the Great Lakes and the St. Lawrence River, including the Toronto waterfront and Hamilton harbour. Quebec City, Montreal, Trois-Rivières and the Lachine Canal have been established as clean-up priorities in the St. Lawrence. The federal government is working with the province and industry to implement the St. Lawrence Action Plan.

The Government of Canada has participated in the environmental audit of the Port Industrial Lands in the City of Toronto now being co-ordinated by the Royal Commission on the Future of the Toronto Waterfront. The Government of Canada sees this multi-governmental partnership as a model of the way in which it can work with other levels of government to achieve common objectives through the application of an ecosystem approach. Canada's participation in Phase II of this audit may serve to demonstrate how federal lands and jurisdiction can be used in partnership with other levels of government to deal with the problems of our urban waterfronts.

Because of their important constitutional responsibility for water, the provinces are active in protecting Canada's waters. Ontario's Municipal-Industrial Strategy for Abatement (MISA) Program, for example, will reduce water pollution from industrial and municipal discharges by ensuring the application of the best available technology.

Municipalities regularly collect and analyze drinking water to ensure that it meets the Canadian Water Quality Guidelines established by Health and Welfare Canada. These guidelines describe conditions that affect drinking water quality and specify the maximum levels of particular substances in drinking water supplies.

Areas of Concern in the Great Lakes Basin



1. *Peninsula Harbour*
2. *Jackfish Bay*
3. *Nipigon Bay*
4. *Thunder Bay*
5. *St. Louis River*
6. *Torch Lake*
7. *Deer Lake*
8. *Manistique River*
9. *Menominee River*
10. *Fox River and Southern Green Bay*
11. *Sheboygan*
12. *Milwaukee Estuary*
13. *Waukegan Harbour*
14. *Grand Calumet River and Indiana Harbour Ship Canal*
15. *Kalamazoo River*
16. *Muskegon Lake*
17. *White Lake, Montague*
18. *Saginaw River System and Saginaw Bay*
19. *Collingwood Harbour*
20. *Penetang Bay to Sturgeon Bay*
21. *Spanish River*
22. *St. Marys River*
23. *St. Clair River*
24. *Clinton River*
25. *Detroit River*
26. *Rouge River*
27. *Raisin River*
28. *Maumee River*
29. *Wheatley*
30. *Black River*
31. *Cuyahoga River*
32. *Ashtabula River*
33. *Buffalo River*
34. *Niagara River*
35. *Hamilton Harbour*
36. *Toronto*
37. *Eighteen Mi. Cr.*
38. *Port Hope*
39. *Rochester*
40. *Oswego River*
41. *Bay of Quinte*
42. *St. Lawrence River*

The 1987 Federal Water Policy sets out a national strategy for managing Canada's water resources.

The 1987 Federal Water Policy sets out a national strategy for managing Canada's water resources. Its goals are to protect and enhance the quality of our water resources and to promote the wise and efficient use of our water.

Recent federal legislative and regulatory actions will also provide for enhanced protection of Canada's waterways. The proposed Canadian Environmental Assessment Act will ensure that federal projects, including those that affect water resources, are subjected to environmental impact assessments. Regulations proposed under the *Canadian Environmental Protection Act* will virtually eliminate the release of dioxins and furans from pulp and paper mills. Proposed regulations under the *Fisheries Act* will set new limits on other pulp and paper industry effluents.

Even with all that is being done, there is growing evidence that we are straining the capacity of nature to supply safe and adequate supplies and to maintain healthy and productive water ecosystems. Beach and fisheries closures, drought conditions and contaminated fish are symptoms of an over-stressed environment. More recently, we have recognized that airborne toxic pollutants contribute to water pollution.

Reaffirming the strategy and goals of the Federal Water Policy, *The Green Plan* sets out the Government's contribution to further national co-operative efforts to protect and enhance Canada's water resources. *The Green Plan* contains detailed programs to:

- secure safe and dependable supplies of drinking water;
- clean up past mistakes;
- promote pollution prevention;
- encourage wise water use; and
- improve water science and technology.

Recognizing the growing pressures on the world's ocean waters, *The Green Plan* also sets out actions to enhance the protection of Canada's coastal and marine waters.

These actions will complement and support other *Green Plan* initiatives, particularly the Environment and Health Action Plan (see Chapter I-A), the programs on toxic substances (Chapter I-C) and actions to protect fish and fish habitat (Chapter II-C), and measures to reduce the risk of ocean spills and enhance Canada's ocean spill response capability (Chapter VIII-A).

Drinking Water Supplies Must Be Safe and Secure

Drinking Water Safety Act

Public confidence in the safety of drinking water is being shaken by the rising number of potentially harmful substances being detected in water supplies. During the *Green Plan* consultation process, Canadians expressed concern that the Canadian Water Quality Guidelines were inadequate. They requested action to further protect and enhance the quality of water supplies. Therefore:

In 1991, the federal government will introduce a Drinking Water Safety Act.



In 1991, the federal government will introduce a Drinking Water Safety Act.

This Act will give the Minister of National Health and Welfare the power to develop regulations within federal jurisdiction establishing drinking water quality objectives that would be mandatory.

The Act will provide for the development of quality criteria for materials used in contact with water, chemicals used in water treatment and point-of-use water treatment devices. As well, the Act will promote research on the health effects of drinking water.

Action on Groundwater

One quarter of all Canadians—one million people in the Maritime provinces alone—rely on groundwater as the source of their domestic water supplies. Groundwater is important not only for human consumption, but also for livestock watering, aquaculture and mining. However, in many parts of Canada, our groundwater resources are polluted by pesticides, leaking underground tanks and contamination from landfill waste disposal.



The federal government will publish a series of guidelines and codes of practice to help local authorities deal with groundwater problems.

Indian Health and Water

One of the most important environmental issues for many Indian communities is the provision of safe water and sewage services. These services are required to reduce the possibility of water-borne communicable diseases.



To this end, the Government will significantly accelerate the provision of water and sewer systems to Indian reserves in order to address health and safety problems. Virtually all the projects will be administered and implemented by Indian communities.

We Must Clean Up Our Past Mistakes

The Fraser River is home to the largest salmon run in the world.

The key to safe, clean water is to prevent pollution before it occurs. However, we must all accept responsibility for restoring areas that have been damaged by past activities. Building on the experience gained from existing clean-up efforts in the Great Lakes and the St. Lawrence, the Government is targeting the Fraser River and the Atlantic coastal area for remedial action.

Targeting the Fraser River Basin

The Fraser River is home to the largest salmon run in the world, hosts the largest population of wintering waterfowl of any river in Canada, and is an important resting point for millions of migratory birds. However, the social and economic activities of the 2.0 million people who live around the Fraser River Basin have affected the river's ability to support the fish and wildlife that depend upon it.

Co-operative mechanisms such as the Fraser River Estuary Management Program have made progress on pollution prevention in recent years. Despite this progress, many parts of the river basin are in need of urgent clean-up action. For example, high levels of heavy metals have been found in non-migratory fish in the lower Fraser River, close to waste treatment plants and industrial sites.

The Government of Canada will work, together with the Government of British Columbia, communities and industry, to develop a Fraser River Basin Action Plan. This plan will build on the work of the Fraser River Estuary Management Program, establishing targets and schedules for remedial action plans. Clean-up of Burrard Inlet will be a priority.



Beginning in 1991, in co-operation with local and provincial governments and industry, a sustainable development management plan will be prepared for the Fraser River and Burrard Inlet.



Monitoring, compliance and enforcement measures will be increased.



By 1992, a mechanism will be established to co-ordinate the various components of the program, work with communities and industries along the Fraser, and provide the public with the information it needs to support these efforts.



The Minister of Fisheries and Oceans will announce plans to double the fish population in the river. This objective will be achieved through stock rebuilding, protection of the habitat base, and the removal of migratory barriers, to create new habitat capacity.

Targeting the Atlantic Harbours and Coasts

The coastal waters of the Atlantic maintain abundant stocks of fish and wildlife and play an important role in the economic and social prosperity of the region. A number of Atlantic Canada harbours and coastal areas have been seriously degraded by pollution from municipal sewage, industrial waste disposal and transportation spills.



The federal government will support efforts to restore Atlantic "hot spots" over the next five years . In developing and implementing remedial action plans, the Government will work with the provinces, local governments, industry and other stakeholders to establish targets and schedules for the control of pollution sources.

A number of Atlantic Canada harbours and coastal areas have been seriously degraded by pollution from municipal sewage, industrial waste disposal and transportation spills.

Pollution Prevention in Our Inland Waters

Canada has in place major programs designed to restore the quality of the Great Lakes and the St. Lawrence River. While these are working to clean up the legacy of past pollution, we also need a preventative approach to ensure that mistakes are not repeated.



To that end, Canada will work with the United States to develop a bilateral action plan for comprehensive pollution prevention in the Great Lakes and St. Lawrence River basin.

To be effective, the plan will require co-operative efforts among industries, communities and governments in both Canada and the United States. The federal government will commit funding for technology demonstration and community education projects to support this plan.



At the same time, Canada will establish a Great Lakes Pollution Prevention Centre by 1992 to act as a focal point for research and information activities. The Centre, a catalyst for action on pollution prevention and an information clearinghouse, will be linked directly to other research centres such as the Canada Centre for Inland Waters, McMaster University and the St. Lawrence Centre.

Development along the Athabasca River Basin in Alberta has recently caused some concern in terms of long-term and cumulative environmental impacts. Together with provincial and territorial governments, the federal government will:



Participate in a three-year environmental impact study on the cumulative effects of existing and proposed developments in the region, in fulfilment of the recent recommendations of the Alberta-Pacific Environmental Impact Assessment Review Board.

There is also concern about water quality in the Red River and Assiniboine River, particularly near Winnipeg, Manitoba. The cumulative effects on water quality of the many industrial, agricultural and municipal activities that take place in these river basins is poorly understood. Better information is needed to determine priority areas for preventative and remedial action.

The key to conserving water is paying a fair price for the water we use.

The Government is proposing a joint study with the provinces of Manitoba and Saskatchewan on water use, sources and effects of pollutants, soil conservation and wildlife habitat in the Red River and Assiniboine River basins.

We Must Make Wiser Use of Our Water

Despite Canada's seeming abundance of freshwater resources, our freshwater supplies are not inexhaustible. Some regions are already beginning to stretch the physical capacity of rivers, lakes and underground water systems to meet ever-increasing demands for water. In some areas of relative abundance, water supplies are being threatened by pollution.

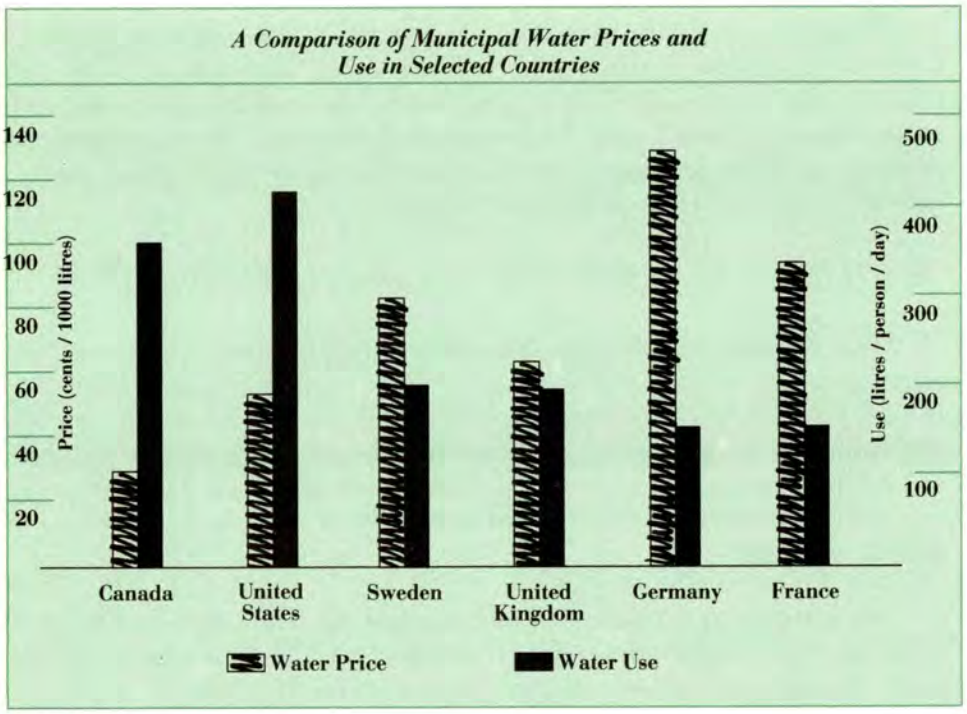


Regional supply problems are aggravated by an increasing demand, spurred on by some of the lowest water prices in the world. Coping with these pressures on water supplies has meant that local governments must invest in expensive treatment facilities or transport water from greater and greater distances.

Today, the cost of replacing existing Canadian water works and wastewater systems is estimated at over $100 billion. Because the cost of water is so low, water sales revenues cannot meet new infrastructure costs or even cover needed maintenance. The result has been a serious deterioration in many water systems and supplies.

There is much that can be done to conserve water and ease pressure on water supplies. At home, we can use low-consumption shower heads and more water-efficient toilets. Industry has access to more water-efficient production processes. An increasing number of companies are recycling their water.

The key to conserving water, however, is paying a fair price for the water we use. If we pay more, we will use less and we will be able to raise the funds needed to build and maintain our water supply and treatment systems. While water pricing and water infrastructure are the responsibility of local governments, the Government of Canada believes that co-operative efforts are needed to promote wiser water use throughout Canada.





The Government of Canada will sponsor a national conference in co-operation with the provinces, communities and the private sector to promote wiser water use through improved demand management, realistic pricing and the development and application of water conservation technologies.

The Green Plan also encourages water conservation through other initiatives described elsewhere, including an expanded Environmental Partners Fund (Chapter VI-A) and the new Canadian Environmental Citizenship Program (Chapter VI-C).

Domestic Water Use



A. toilet flushing.....40%
B. dishes and laundry...20%
C. drinking and cooking.....5%
D. showers and baths....35%

We Will Improve Water Science

Over the past 20 years, there has been an enormous increase in our understanding of water resources, particularly the origin, fate and effects of toxic chemicals. Our ability to detect water contaminants has also improved dramatically. Not long ago, we could measure only in parts per million; now we are able to detect concentrations in parts per trillion.

The Green Plan will increase the federal government's own expenditures in water-related science and technology, in co-operation with the provinces and industry (as set out in Chapter VI-D).

There have also been major advances in water pollution control technology. Environment Canada's Wastewater Technology Centre has been an important contributor. The federal government will take steps to see that the Centre works even more closely with its major partners, industry and the provinces, and that it will ensure more rapid commercialization of the technology it develops.

We Will Be More Effective Stewards of Coastal Waters

Our oceans provide incredibly rich natural habitats, resources and environments that sustain many uses. They contribute more than $8 billion to the national economy and provide Canadians with more than one million jobs. However, while we may be stewards of the coastline, the oceans proper are seen as a global "common" area. Until recently, the world's oceans have been exploitable by all nations but the responsibility of none.

As a result, our marine ecosystems are showing the same signs of stress as many other parts of the environment. Though natural factors, such as shoreline erosion, are playing a part in the damage, human activities are largely to blame for the accelerating deterioration. Marine pollution arises primarily from two types of source: point and diffuse. Point sources are direct discharges into water from industrial and sewage facilities. Diffuse sources are less noticeable, but equally harmful. They include pesticide/fertilizer runoff from agricultural activities as well as pollutants carried long distances by wind and water before finally being absorbed by our coastal and inland waters.

The Government of Canada has accepted its responsibility as steward of its share of this global "commons" and as partner in international efforts to combat threats to marine environmental quality.

The London Dumping Convention was created in the mid-1970s to ensure that the marine environment is protected from the damaging effects of the dumping of wastes at sea. Canada is a leading member of the contracting parties to this international agreement and recently supported a resolution to ban the ocean disposal of industrial wastes by the end of 1995. The international controls contained in the London Dumping Convention are implemented in Canada through the *Canadian Environmental Protection Act*.

The London Dumping Convention, however, does not cover land-based pollution sources, which constitute some 80 per cent of marine pollution. Canada is leading international efforts to control these sources. In 1985, Canada played an important part in developing the Montreal Guidelines for the Protection of the Marine Environment Against Land-Based Sources of Pollution. These guidelines were

developed under the auspices of the United Nations Environment Programme. Most recently, international leaders at the July 1990 Houston Economic Summit adopted a Canadian-sponsored initiative to develop a comprehensive international strategy to deal with land-based sources of pollution. Canada will also convene an international panel of experts in May 1991 to develop the framework for a global protocol to protect the marine environment from all sources of pollution.

The Government will put in place, effective immediately, a five-year Ocean Dumping Action Plan.

Canadian controls on ocean dumping also apply to the disposal of dredged materials. Dredging activities to keep marine shipping channels and harbours safe for navigation generate approximately five million cubic metres of material annually. Much of this dredged material is uncontaminated, but some requires special disposal methods.

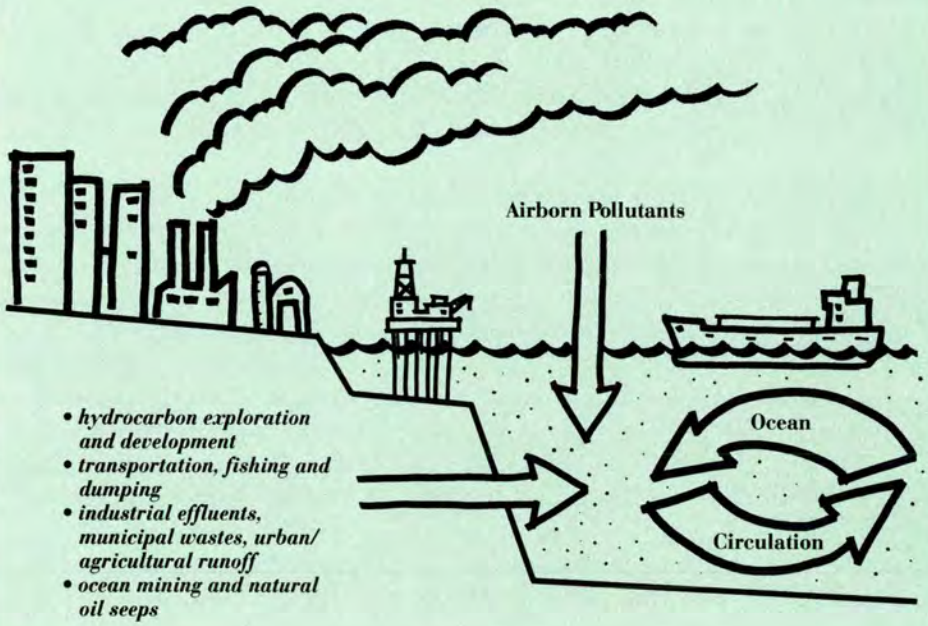
Plastic debris is a significant new maritime pollution problem. Abandoned fish netting, plastic packing bands, synthetic ropes and a wide variety of other non-biodegradable plastic litter are contributing to a problem that is killing fish, marine mammals and sea birds in increasing numbers. This plastic debris comes from a variety of sources, domestic and international, including municipal waste, commercial and recreational fishing activities and commercial shippers.

In order to ensure the ongoing protection of Canada's coastal waters, the Government will put in place, effective immediately, a five-year Ocean Dumping Action Plan. The major elements of this plan will include:

- Improved regulations under the *Canadian Environmental Protection Act* to prohibit the ocean disposal of industrial wastes and to better control the ocean disposal of dredged materials;
- Augmented surveillance activities to ensure compliance with the new regulations in the ocean zones under Canada's protection;
- A national research and information program, developed in co-operation with local and provincial governments and aimed at reducing the discharge of plastics and other persistent debris into the marine environment. Technological, recycling and other measures developed through the program will be implemented at the local, provincial and national levels by 1995.

Canada already has many laws and regulations aimed at protecting our offshore and marine environments. These measures deal with such activities as shipping, offshore development, ocean dumping and the fishery. However, our commitment to the effective management and protection of Canada's ocean resources requires a stronger legislative base.

Some Sources and Pathways of Ocean Contamination



Therefore, by the end of 1991, a discussion paper on a Canada Oceans Act will be released by the Minister of Fisheries and Oceans for public discussion. The proposed Act will, among other things, provide a legal basis for:

- the protection of the marine environment consistent with international law; and
- designation of marine protected areas.

C. Keeping Toxics Out of Our Environment

Canada's Goal is the Virtual Elimination of Discharges of Persistent Toxic Substances into the Environment.

Introduction

The quality of life in Canada depends greatly upon the beneficial use of chemicals. There are over 20,000 chemical substances in use in Canada today, and 100 to 200 new chemicals are added to the list every year. Because chemicals are so beneficial, they now touch every aspect of our daily lives, from the synthetic fabrics we wear, to the preservatives in the food we eat and the refrigerators used to store much of that food.

The improper production, transportation, storage and disposal of chemicals, however, can also pose threats to the environment and to our health. Canadians are concerned about toxic chemicals in the air we breathe, the water we drink and the land that supplies our food. Chemical spills, such as those experienced in the Mississauga, Ontario, train derailment and the St-Basile-le-Grand, Quebec, PCB warehouse fire, have brought the dangers posed by toxic chemicals very close to home for thousands of Canadians.

Throughout the *Green Plan* consultations, Canadians strongly supported the need to increase controls over toxic chemicals. In addition, they want those toxic chemicals already present in the environment removed and toxic dump sites cleaned up and restored.

Actions to Date are Having a Positive Effect

Governments, industry, labour and the public have been taking direct action to reduce and control toxic chemicals. For example, the Workplace Hazardous Materials Information System (WHMIS) was a co-operative effort to protect workers from toxic substances. The *Transportation of Dangerous Goods Act*, developed and implemented co-operatively between the federal and provincial governments, is designed to protect the environment and Canadians from the dangers posed by spills of toxic and hazardous substances while in transit.



Over the past 13 years, government action and regulations across Canada have resulted in an 85-per-cent reduction in the levels of lead contained in the air that urban Canadians breathe. The banning of all lead additives in motor gasoline in 1990 will further contribute to this reduction.

National clean-up programs are also in progress.

A national plan to destroy stocks of PCBs held by the federal government is well under way, with regulations enacted in 1989 governing the operation of PCB treatment centres within federal jurisdiction. Since 1989, 40 per cent of the federal government's stock of PCBs has been safely destroyed.

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The clean-up of the Sydney Tar Ponds chemical dump site, one of the largest clean-ups of its kind in North America, is proceeding. The Canadian Council of Ministers of the Environment has undertaken a $250-million cost-shared program to clean up other contaminated sites. This program will enable immediate action to be taken where the responsible party cannot be found or is unwilling to carry out a clean-up program. In the latter case, cost recovery will be pursued through court action.

Co-operative clean-up of the Great Lakes and St. Lawrence River has begun. Action under the St. Lawrence Action Plan has already resulted in a significant reduction in liquid toxic waste discharges by the 50 chief polluters along the St. Lawrence River. The target is 90-per-cent reduction by 1993.

We Must Aim for the Virtual Elimination of Persistent Toxic Substances

Over the past 20 years, scientists have learned much about the detrimental effects of toxic chemicals. We know that barely detectable amounts of some chemicals have the ability to remain and build up in the tissue of the animals we rely on for food. These "persistent" toxic substances accumulate to a point where they represent a danger to our health.

The Great Lakes and St. Lawrence River basin is one of the most intensively studied areas in the world with respect to toxic chemicals. Over 350 persistent toxic chemical compounds have been found in the Great Lakes alone. The process of regulating these substances has begun on such chemicals as mercury, mirex and polychlorinated biphenyls (PCBs). But our scientific understanding of the environment and health effects of many of these substances is not sufficient to establish appropriate discharge and ambient concentration levels for each substance, let alone for the complex mixtures that are now found in the environment.

Faced with this situation in the Great Lakes, the governments of Canada and the United States concluded that the only prudent course was to set a long-term goal to virtually eliminate discharges of persistent toxic chemicals. This objective was established in the Great Lakes

Water Quality Agreement that was signed by the two governments in 1978 and amended in 1987.

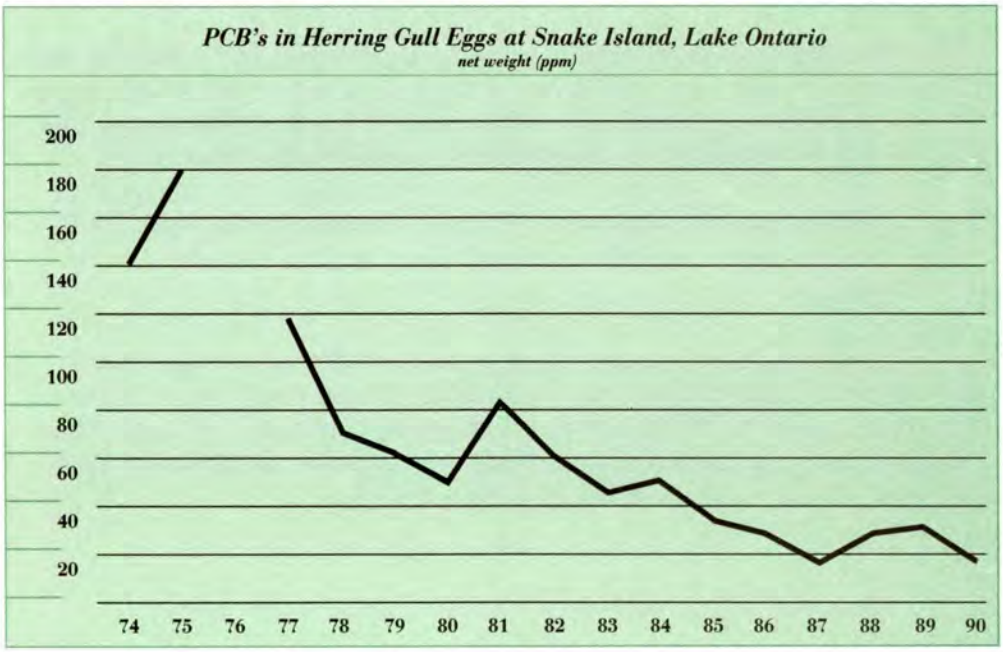
The Government of Canada has concluded that this should be a national goal.

The virtual elimination of persistent toxic substances, however, is a long-term goal that will require ongoing co-operative efforts at all levels of government and by industry. *The Green Plan* will further these efforts by:

- regulating the discharge of individual chemicals where the toxicological evidence already exists;
- accelerating toxicology research; and
- promoting full life-cycle management of chemicals to reduce discharges beyond regulated amounts.

The Government is also acting to ensure the sound management and strict control of biotechnology products and byproducts.

The Green Plan contains additional measures to support our national goal on toxic substances, including the Environment and Health Action Plan (Chapter I-A), the Arctic Environmental Strategy (Chapter IV-A), water pollution prevention (Chapter I-B) and the control of urban smog (Chapter I-D).



A National Regulatory Action Plan

To guide the efforts of all Canadians in eliminating the threat of toxic substances, a comprehensive and scientifically based legislative framework is required. The *Canadian Environmental Protection Act* (CEPA), passed by Parliament in 1988, provides for "life-cycle" management of toxic substances — an objective supported and endorsed by Canada's chemical industry. CEPA sets out procedures for the identification and assessment of toxic substances and provides for the establishment of regulations controlling their import, manufacture, transportation, storage, use, sale, discharge into the environment and disposal. Regulations are developed in consultation with industry and the public, and are based on an evaluation of alternative control options. (For details of the regulatory process, see Chapter VI-E.) CEPA complements other federal statutes such as the *Pest Control Products Act*, the *Fisheries Act* and the *Transportation of Dangerous Goods Act*, and provides the basis for federal-provincial co-operation in environmental protection.

To exercise effective control over toxic substances, we must first identify and assess them to determine their degree of toxicity and the level of the hazard they pose. Based on advice from an independent panel of experts, the Government developed a Priority Substances List containing 44 substances identified as potentially hazardous and in need of assessment. By 1994, the assessment of all 44 substances will be completed and the Government will report on the necessary regulatory action under the *Canadian Environmental Protection Act*.

- A multi-stakeholder panel will be established to review the Priority Substances List and recommend whether other substances should be included on it. This revised Priority Substances List will be published in 1994 and on a continuing basis every three years thereafter. The goal is to complete the assessment of 100 priority substances of most concern by the year 2000, and to enact regulations for all those substances found to be toxic.

Canada also participates in international efforts to control and assess commercially important and widely traded chemical substances. Currently, some 1,500 high-volume substances account for more than 90 per cent of the international trade in chemicals. Canada is responsible for the assessment of 30 of these substances.

By 1994, the Government will have completed assessments of 6 chemicals under this program and will have exchanged assessments with other countries on 150 chemicals. Through this combined effort, the goal is to have initiated data collection on all 1,500 high-volume substances by the year 2000. This action will also contribute significantly to our domestic assessment activities and regulatory program.

Over the next five years, the Government will introduce regulations or other controls for all substances that are declared to be toxic, including commercial chemicals and effluents, wastes and emissions from major industrial sectors.

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The proposed federal regulations for the control of emissions of dioxins and furans from pulp and paper mills, and amendments to the *Fisheries Act* regulations setting new limits on other pulp and paper industry effluents, will be issued in 1991 and will be in full force by 1994.

By 1994, control option reports will be released for major sources, including smelters, petroleum refineries, chemical production facilities and power generation stations.

By 1994, control option reports will be released for toxic Priority Substances in emissions from metal finishing and textiles industries, metal mines and mills and chemical production and steel plants.

On a five-year cycle, the Government will review and update regulations and other control mechanisms on toxic substances to ensure they are effective and afford the appropriate protection to human health and the environment.

As part of this regulatory program, the Government will develop scientific procedures and environmental measurements to link sources of toxic substances with their ultimate impact on the environment. This is essential to predict and demonstrate the effectiveness of alternative control strategies. A comprehensive monitoring and reporting program will provide the necessary feedback so that all Canadians can evaluate our progress towards the goal of virtual elimination of the discharge of persistent toxic substances into the environment.

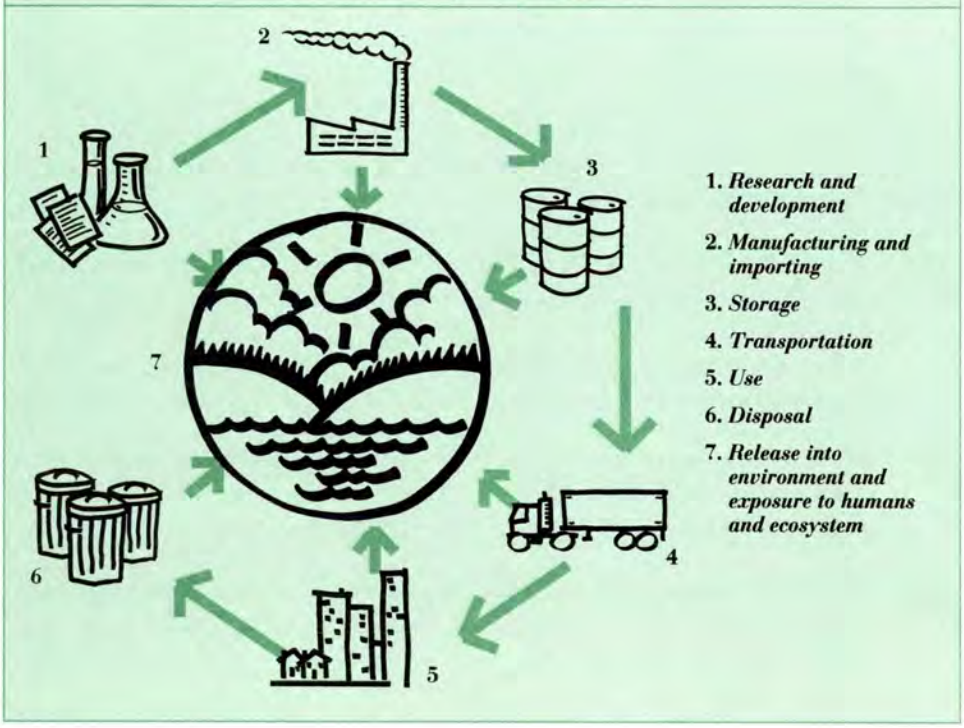
Promoting Life-Cycle Management of Toxic Substances

The Government of Canada is committed to ensuring that toxic substances are controlled at those points in their life cycle where the environment and health of Canadians are at risk: that is, from their production, through their transportation and to their ultimate disposal. All Canadians, however, must accept responsibility for managing the

use of chemicals on a life-cycle basis. Government regulation alone cannot achieve our national goal.

The Responsible Care program of the Canadian Chemical Producers Association is a good example.

The Life Cycle of Toxic Substances



Industry has taken an important initiative. The Responsible Care program of the Canadian Chemical Producers Association is a good example. It establishes codes of conduct that commit chemical companies to managing toxic chemicals and preventing their release into the environment. Some Canadian companies have demonstrated international leadership by committing themselves to the goal of virtual elimination of toxic discharges from their manufacturing operations. The *Canadian Environmental Protection Act* encourages non-regulatory measures as means of managing toxic chemicals, including environmental codes of practice and guidelines.

Individuals also have an important part to play. Most Canadian households contain a wide range of toxic chemicals, including cleaners, solvents and pesticides, which often find their way into the environment through carelessness. These chemicals should be stored safely and disposed of at local toxic waste collection depots. As consumers, individuals can also purchase products that are less damaging to the environment and pose fewer risks to human health.

The Green Plan contains new and expanded programs that will help Canadians contribute to eliminating the threat of toxic substances in Canada. See, for example, the Canadian Environmental Citizenship Program (Chapter VI-C) and the Environmental Choice Program (Chapter VI-A).



Waste Not, Want Not

It makes no sense to throwing out something you need – especially when it will cost money to replace it. When Ontario's Ashland Chemicals found it had been doing that for years, the company decided to change its ways.

In producing chemicals and resins for the paint, foundry and fiberglass-reinforced plastics industries, Ashland had been generating wastes that it was paying to have hauled away. But the company discovered that, if it sorted those materials into separate containers, many of them could be put back into use. In fact, Ashland found that almost 100 per cent of the waste discarded from some areas was re-usable. As a result, the waste thrown out in one location of the factory dropped from 31,000 pounds in 1980 to none in 1983 – for a saving in that area of some $31,000!

By being more conscious of what it discards, Ashland Chemicals is saving money and less garbage is going into landfill sites. Reducing waste is paying off for everyone.

Improving Our Understanding of Toxic Substances and Their Health Risks

Despite considerable advances in our knowledge of toxic substances over the past 20 years, important information and scientific gaps remain.

- To develop a better understanding of the nature and quantity of toxic substances being released in Canada, the Government will develop a national data base for hazardous pollutants being released from industrial and transportation sources. The reporting requirements for industry will be established by 1992, with the first reports scheduled for public release no later than 1994.

- A new national data base will be developed by 1996 to identify the risks presented to fisheries, the contaminant levels and states of fish health, and the status of fish stocks in major sport and subsistence fisheries across Canada.

Processes for assessing the health and environmental risks posed by toxic substances must be improved in Canada. To do this requires integration of the efforts of governments, industry and the academic community. To that end:

In 1992, the federal government will establish a National Toxicology Network at universities. It will work with universities and other partners to establish toxicology research centres across Canada so that resources and information can be shared.



When the "losh" fish make their annual run down the Mackenzie River in the Northwest Territories, the Dene are there to catch their favourite delicacy. They eat the fish's raw liver. Three years ago, the Dene noticed that the colour of the fish livers had changed. Health and Welfare Canada discovered that the livers contained toxaphene, a chemical sprayed on cotton fields in the southern United States. The dumping of toxaphene was banned in the 1970s, after the chemical was labelled a health hazard. Nevertheless, toxaphene residues had travelled on air and water currents to the Mackenzie River to become concentrated in the food chain.

New Biotechnology Standards

The accelerating commercialization of the products of biotechnology has the potential to provide tremendous economic and social benefits to all Canadians. However, as with other industries, with the benefits come potentially significant risks to human health and the environment. The challenge for all of us is to take a proactive stance in order to minimize the potential environmental impact of this growing industry, and avoid the costly clean-up that has been required for toxic substances.

To achieve this goal:

The federal government will put in place, within five years, a national regulatory regime to address the environmental risks of the biotechnology industry.

The new regulations will include publishing national standards and codes of practice to prevent problems arising from the accidental or deliberate release into the environment of genetically engineered organisms and to ensure the proper treatment and disposal of biogenetic wastes.

By 1992, regulations will be developed and released under the *Canadian Environmental Protection Act* requiring notification of new products of biotechnology prior to their release or introduction to the market on a commercial basis.

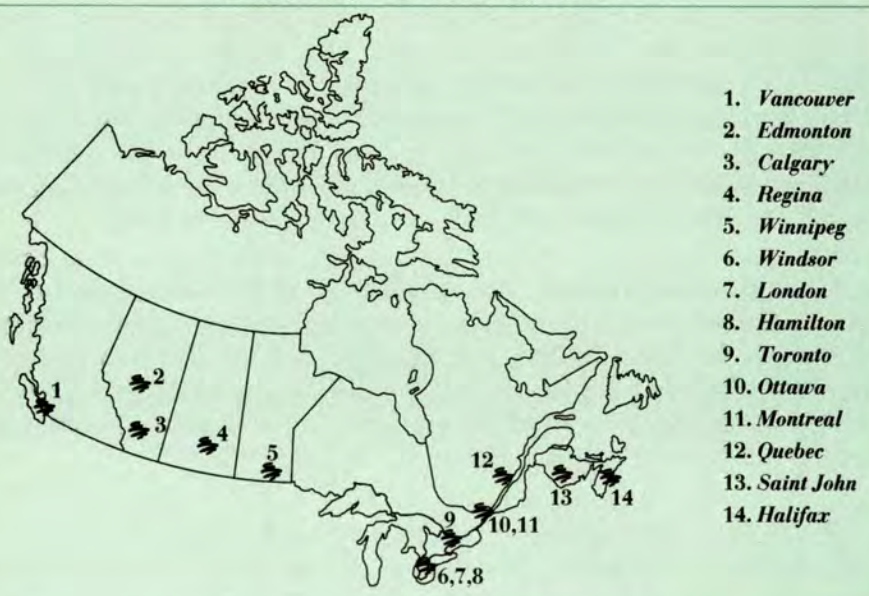
D. Smog is a Visible Threat

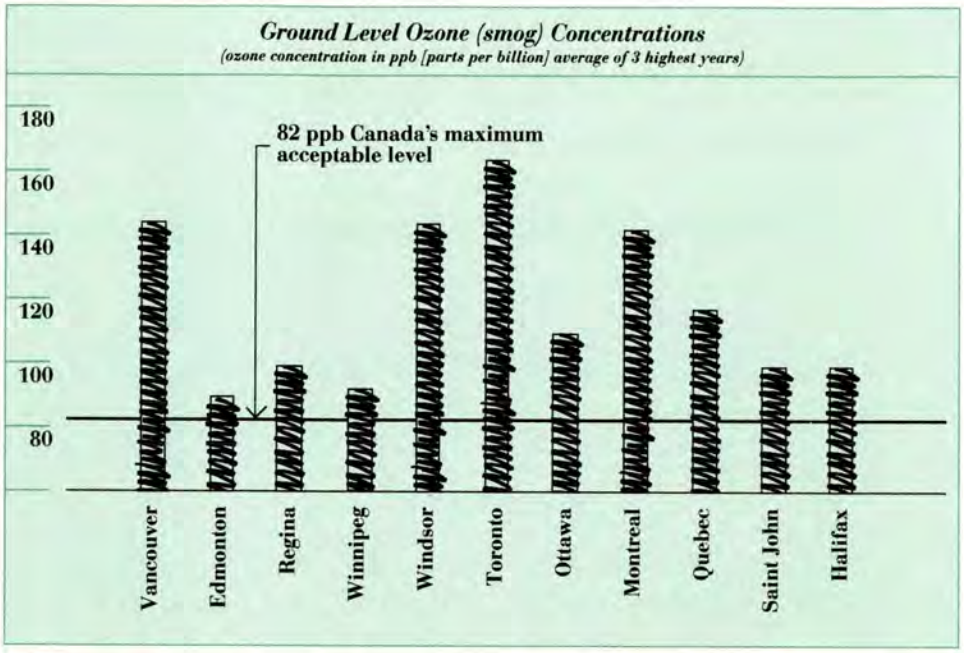
Canada's Goal is Nation-wide Reduction of the Concentration of Ground-Level Ozone (the Main Component of Smog). We will Reduce Ozone Concentration to Levels below the Threshold at which the Most Susceptible Segments of our Population Experience Health Effects from Smog.

Introduction

In the summer months, more than one half of all Canadians are exposed to concentrations of ground-level ozone, or smog, known to have adverse effects on health. In fact, measured concentrations are sometimes more than double what is considered safe air quality, with conditions particularly severe in the Lower Fraser Valley in British Columbia, the Windsor-Quebec City corridor and the Saint John, New Brunswick, area. Elevated ozone levels damage agricultural crops and are also suspected to be one of the factors contributing to forest decline in some areas of eastern Canada.

Areas of Smog Concentration in Canada





Ground-level ozone is produced by the reaction between nitrogen oxides (NO_x) and volatile organic compounds (VOCs). NO_x is formed by burning fossil fuels. VOCs are formed mainly from the evaporation of liquid fuels, solvents and organic chemicals. Since the nature of the reaction is related to the temperature and amount of sunlight, ozone problems are particularly prevalent on hot summer days.

Maximum acceptable concentrations for ground-level ozone have been established at 160 micrograms per cubic metre (82 parts per billion). Any concentrations above this level are linked to adverse health effects, particularly in the people most susceptible, such as those with decreased lung functioning, asthma or bronchial disorders. In 1988, people in several major Canadian cities were advised on certain days to stay indoors and limit outdoor physical activity.

During the last decade, governments at all levels have introduced many measures to limit the emission of pollutants into the atmosphere and improve local air quality. For example, federal and provincial initiatives have been put in place to reduce sulphur dioxide emissions, resulting in a 50-per-cent reduction in sulphur dioxide concentrations in urban air across Canada between 1978 and 1987.

While these measures have solved most of Canada's local air quality problems, ground-level ozone problems persist and have now become the most serious air quality problem remaining in many areas of the country. As a result, we must initiate clean-up actions to reduce emissions in areas where smog problems exist and introduce preventive action to ensure smog problems do not develop in other parts of the

country. Also, Canada must negotiate specific emission reduction commitments with the United States to ensure that the transboundary aspects of the problem are dealt with.

Controlling and Reducing Emissions

In October 1988, the Canadian Council of Ministers of the Environment agreed to develop a comprehensive 10-year, federal-provincial management plan to control NO_x and VOC emissions. The plan, which is being finalized, is based on the results of extensive multi-stakeholder consultations among all affected groups.

Building on the successful approach used in solving the acid rain problem, the management plan will incorporate interim NO_x and VOC emission-reduction targets and schedules for problem areas. It will also require that emissions from all new sources be minimized. As with the acid rain problem, co-operative implementation of the plan will be managed through federal-provincial agreements specifying the obligations of each party. Progress reports will be issued on a regular basis.

The plan will reduce NO_x and VOC emissions in problem areas by up to 40 per cent by 2000. To minimize costs and increase effectiveness, the plan will provide emission sources with as much flexibility as possible; however, regulations will continue to be used where appropriate. The plan will also include a number of actions that individuals can take to help reduce emissions. The Government will undertake several further studies so that final emission targets can be established to ensure that all of Canada's urban smog problems will be fully solved by 2005.

Recognizing that many of the sources of NO_x and VOC emissions contribute to global warming, acid rain and air toxics issues, the integration of emission management measures into the solution of these other problems will be an important feature of the management plan.

As a result, the Government will:

- by 1991, begin negotiation of agreements with the provinces, identifying interim NO_x and VOC emission targets for the year 2000 and setting out the actions each government will take;
- by 1993, in co-operation with provincial and municipal governments, provide public advisories in major urban areas in B.C., Southern Ontario, Quebec and the Maritimes on days when motorists could help reduce unacceptably high ozone concentrations by using public transit;



by 1994, begin adopting a comprehensive package of tighter emission standards for new motor vehicles, other transportation sources and transportation fuels;



by 1995, adopt all federal actions called for in the federal-provincial agreements.



by 1995, develop national consensus on the ultimate emission targets and actions necessary to achieve ozone air quality standards in all parts of Canada and amend the federal/provincial agreements accordingly.

There is evidence that a market-based approach to the problem can be quicker, more efficient and more effective in reducing emissions.

An Emission "Trading" Program

Tougher regulations and other traditional actions can, and will, help achieve emission reduction targets. But they are not the only tools available. There is evidence that a market-based approach to the problem can be quicker, more efficient and more effective in reducing emissions and the costs of achieving these reductions.

One market-based approach available to Canada is emission trading. An emission trading program would operate as follows:

- Companies are issued permits to emit NO_x and VOCs up to specified emission levels, consistent with the overall targets to be achieved.

- Companies participating in the program can buy and sell these emission level permits. For example, if an individual firm can reduce its emissions more cost-effectively than another, it has an incentive to do so and can then sell its unused permits to another company whose emission reduction costs are much higher, thus achieving the overall emission targets at the lowest cost.

- The number of emission permits issued can be reduced on a scheduled basis until environmental quality targets are achieved.

- The end result is a program that rewards those companies that achieve emission reductions well ahead of schedule, and imposes an economic penalty on those who are slow to change technologies and processes.

Emission trading incentives are now part of the acid rain abatement program recently approved by the U.S. Congress. The federal government believes that a similar process, utilizing market forces to

greatest effect, will enable Canada to meet its emission targets more quickly than relying on regulatory measures alone.

As recommended by Canadians during the *Green Plan* consultations:

In co-operation with the provinces, the federal government will pursue emission trading as part of its implementation of the overall smog control program. By 1992, the extent to which emission trading can be used in those urban centres most affected by smog, including the B.C. Lower Mainland and the Windsor/Quebec and Saint John areas, will be determined. By 1993, emission trading programs will be incorporated into the federal-provincial agreements for those areas where it is considered a feasible approach.

Verifying Progress

Setting interim emission reduction targets is only one aspect of the program. Verifying the extent to which those goals achieve the desired result is just as important as setting the final emission reduction targets.

To determine the effectiveness of the national program, the federal government will increase its monitoring of the amounts and environmental effects of NO_x, VOCs and ground-level ozone. Air quality models will also be developed by 1994 in order to better predict the effectiveness of further emission reduction measures under consideration.

By 1995, a national monitoring network will be in place that will be capable of assessing both reduced ozone levels attributable to national control measures and the U.S. contribution to the Canadian ozone problem.

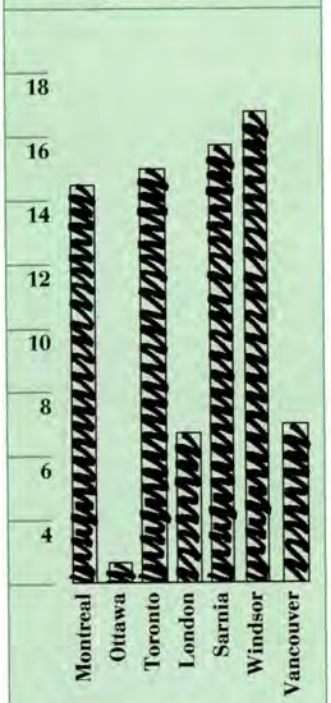
By 1995, the Government will determine final emission targets for all regions in Canada where problems exist and will determine emission reductions required in the U.S. to deal with transboundary smog pollution coming into Canada.

International Agreements

Ground-level ozone produced in major urban centres in the United States is a serious problem for Americans as well as contributing to high smog levels in some parts of Canada. For example, it is estimated that 50 to 60 per cent of the ground-level ozone in the Windsor-Quebec City corridor is of American origin.

Recent amendments to the U.S. Clean Air Act provide for major new emission control initiatives in order to deal with the American

Smog Levels in Canada



Average number of days per year when ozone levels were above acceptable levels.

ozone problem. These measures will also reduce the U.S. contribution to Canadian ozone concentrations. However, to ensure that these benefits are realized, Canada will negotiate specific emission reduction obligations with the United States under the Transboundary Air Quality Agreement. This will ensure that we control the cross-border flow of ozone and the emissions that cause it.

In 1988, Canada, the United States and other member nations of the United Nations Economic Commission for Europe (ECE) signed a protocol committing themselves to freezing NO_x emissions at their 1987 levels and to taking further actions necessary to achieve specified environmental quality objectives.



Canada will continue to work within the ECE to conclude an international protocol on VOC emissions which, in parallel with the NO_x protocol, will achieve specified environmental quality objectives.

E. Cutting Wastes in Half

Canada's Goal is to Cut Waste by 50 Per Cent by the Year 2000.

Canadians recycle only 10 per cent of our garbage.

Introduction

Canadians produce over 30 million tonnes of garbage annually, or more than a tonne of garbage for every man, woman and child. We recycle only 10 per cent of our garbage and send most of the remainder to our rapidly filling landfill sites. We produce eight million tonnes a year of hazardous waste and only 40 per cent of that is treated. The remainder is sent to landfill or discharged to municipal sewers.

Managing wastes inefficiently imposes an economic burden on Canadians. Waste collection in Canada is a big business, with collection and disposal costs exceeding $1.5 billion every year. A reduction in waste generation, through reduction, re-use and recycling programs, would save taxpayers money. By not recycling, Canadians are wasting valuable resources and missing profitable economic opportunities. For example, if we were to recycle 50 per cent of our waste paper, almost 50 million trees would be saved each year. As well, new investment opportunities and jobs in the paper recycling industry would be created.

Improper hazardous waste storage, poorly operated incinerators and landfill leachate contribute to environmental problems.

Canadians are well aware of their poor waste management practices. They recognize that one of the more important challenges we face in moving this country towards sustainable development is reducing the volume of wastes we produce. Governments across Canada have been actively pursuing strategies to reduce waste. Their efforts include the introduction of recycling programs at the municipal level, individual composting efforts and collection points for hazardous household substances such as paint, paint thinners and oils. These initiatives have received widespread support from individual Canadians and new waste reduction programs are springing up throughout the country.



In October 1989, the Canadian Council of Ministers of the Environment adopted as its goal the reduction of wastes in Canada by 50 per cent by the year 2000. This was complemented by a National

Packaging Protocol, announced in April 1990, to reduce the waste from packaging by 50 per cent by the year 2000. Packaging accounts for 30 per cent of the waste stream and constitutes the largest single component.

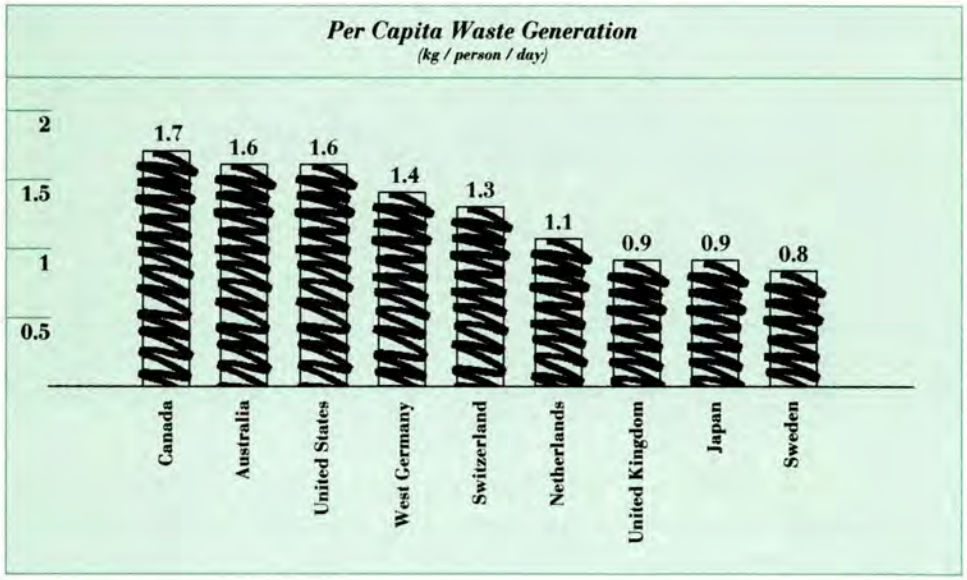
Packaging accounts for 30 per cent of the waste stream.

A National Waste Reduction Plan

The Government of Canada is committed to meeting the 50-per-cent reduction target.

To this end, and in co-operation with provincial and territorial governments, the private sector and community groups, the Government will promote the "four Rs" of waste management—reduce, re-use, recycle and recover—and will:

- by 1993, establish standards and regulations to reduce waste from packaging materials. They will be employed in the event that voluntary government and industry actions do not achieve the 1992 waste reduction target of 20 per cent, as set out in the National Packaging Protocol;
- by 1994, for other components of the waste stream, develop national standards, codes, policies and regulations for the reduction, re-use and recycling of wastes;
- support technological innovations aimed at waste reduction, recycling and re-use (see Chapter VI-D);
- support community action through an expansion of the Environmental Partners Fund;



provide information to individuals and businesses through new programs such as the Canadian Environmental Citizenship Program and ongoing programs such as the Environmental Choice Program;

commit the federal government to reducing waste from its own operations by 50 per cent by the year 2000;

expand the National Waste Exchange Program with the objective of making it self-sufficient by the year 2000. The purpose of the program is to improve market opportunities for the re-use and recycling of industrial and large-volume wastes;

establish an Office of Waste Management to co-ordinate federal programs under the National Waste Reduction Plan. With participation from the provinces, territories, business, non-government groups and women's organizations, this Office will also provide national co-ordination. The Office will issue regular progress reports.

The Government will take further action to reduce the generation of hazardous wastes and ensure the safe transportation and disposal of hazardous wastes in Canada.

Managing Hazardous Wastes

Hazardous wastes make up about 20 per cent of Canada's waste management problem. Complementary federal and provincial regulations and co-operative agreements are in place to control the handling, storage, disposal and destruction of these wastes in Canada. Full implementation of these control measures, however, is awaiting decisions by the provinces on the location of new hazardous waste destruction facilities. In the meantime, existing treatment and destruction facilities are handling larger amounts of wastes, and new facilities have been brought on line to safely eliminate PCBs.

The Government will take further action to reduce the generation of hazardous wastes and ensure the safe transportation and disposal of hazardous wastes in Canada. These measures will include:

by 1992, developing a computerized tracking system to monitor the movement of hazardous wastes in and out of Canada, which will allow Canadian industry to participate more easily in international market opportunities to recycle these products;

by 1996, destroying all PCBs under federal jurisdiction and establishing mobile incinerators in Atlantic Canada, Quebec and Ontario;

by 1996, in co-operation with the provinces, completing regulations and guidelines for the safe management of hazardous waste streams, including reduction, re-use, recovery, recycling, transportation, storage and disposal;

supporting technology aimed at reducing, recycling, and re-using hazardous wastes, or at their safe destruction (see Chapter VI-D).

Cleaning Up Contaminated Sites

In 1989, the federal and provincial governments initiated a $250-million, cost-shared, five-year program to clean up abandoned hazardous waste sites in Canada. The Government will work with the provinces to:

have in place, by 1991, agreements with participating provinces for the implementation of the program;

clean up 30 high-risk contaminated hazardous waste sites by 1995; and

support new technologies for site clean-up.

Canada's Waste Stream
(these figures have been rounded off)



A. paper.....36.4%
B. food wastes and decayable material.....27.6%
C. glass..... 6.6%
D. metals.....6.6%
E. yard wastes.....6.1%
plastics.....4.6%
textiles.....4.3%
wood.....4.2%
F. other.....3.5%

Working Internationally

Canada signed the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (the Basel Convention) on March 22, 1989. The Convention requires that countries that have ratified it and are exporting hazardous waste obtain the consent of the importing country in advance. The Convention also prohibits exports to, and importation from, countries that are not parties to the Convention. The signatories also agreed to co-operate in the exchange of information, technology transfer, and harmonization of standards, guidelines and codes.

Domestic regulations to implement the provisions of the Convention are being drafted by the federal government and will be issued in 1991. Canada will be able to ratify the Basel Convention as soon as the regulations become law.

II. Sustaining Our Renewable Resources

A. Moving Towards Sustainable Forest Development

Canada's Goal is to Shift the Management of our Forests from Sustained Yield to Sustainable Development.

Introduction

Forests are a key element of Canada's natural environment, contributing to clean air and water, supporting fish and wildlife, and providing recreational and wilderness areas. Endowed with about 10 per cent of the planet's forests, Canadians feel a strong sense of stewardship for this great heritage. The forest sector is also of overwhelming national economic significance. Current statistics indicate that this $44.3-billion industry generates one in every 15 Canadian jobs and is the economic mainstay of 350 single-industry towns.

Forests influence temperature, rainfall and other climatic conditions.

Forests play a major role in the planetary recycling of carbon, nitrogen and oxygen. They influence temperature, rainfall and other climatic conditions and they regulate the quality and quantity of freshwater systems. In addition, they contain an invaluable and irreplaceable diversity of plant and animal life.

The global forest community faces unprecedented challenges over the coming decades, and Canada has obligations and opportunities to demonstrate international leadership in the manner in which forests are managed.

Canada is playing a significant part in major international initiatives to assess forests and forestry practices for their contributions towards the solution of global problems. Canada is taking a lead role in efforts to develop an international convention on the conservation of biological diversity. Canada will also contribute to the development of a global forest convention called for by the G7 Summit countries.



"Sustainable development" is a term that sums up Canadians concern. In forestry, "sustainability" refers to our ability to manage our forest resource without prejudice to its future productivity, ecological diversity and capacity for regeneration.

During the *Green Plan* consultations, Canadians from coast to coast expressed concerns over the health of our forest resource. They expressed a strong sense of commitment toward the preservation and protection of the great variety of complex biological systems residing

in our forests. Canadians also see the maintenance of an abundant area of forest land, in a healthy state, as a trust for future generations as well as an international obligation.

Can Canadians meet the challenge? Clearly, the answer is "yes". In the ranks of industry and government, we have dedicated professionals with the requisite scientific, technical and management skills who have a commitment to excellence in the stewardship of the forest resource.

Our forests are part of our identity as a nation and Canadians properly hold certain expectations and views on how they should be managed. The evolution and enactment of informed forestry policy must reflect this fact appropriately.

The forestry initiatives of *The Green Plan* demonstrate the Government's commitment to balanced forest management practices. A network of "living forests" will be created to demonstrate, not only to Canadians but to the world community, that Canada is eminently qualified to manage its forest heritage. These models will exemplify the advances in Canadian forest management practices and will serve as national and international examples to the next generation of foresters and concerned citizens.

Partnerships for Sustainable Forestry

Becoming the Very Best — Models of Sustainable Forestry

Model forests will provide the opportunity for more Canadians to see first hand what is being done to upgrade our knowledge and skills in forest management techniques. Sustainable development is a dynamic concept, and living forest models are the logical and best choice to display our skills, talents and leadership in sustainable forest management to Canadians and the international community. These will be living laboratories dedicated to increasing the productivity of our resource and expanding its range of uses and benefits in ways that are consistent with the goal of sustainable development.



The Government, in partnership with provinces and industry in the major Canadian forest regions, will encourage the creation of up to eight demonstration projects as working models of sustainable development. Forestry Canada will provide scientific and financial support to its partners in the program, the land owners and the land managers.

Promoting Environmental Harmony

Every year, 600,000 hectares of our forests are damaged by insects and disease. This is a major problem that must be addressed and overcome to ensure the success of sustainable development.

The Government will accelerate and intensify its efforts to develop and deploy environmentally acceptable solutions. Reducing loss or damage will yield benefits to all Canadians through enhanced economic and recreational uses of the resource.

Throughout the *Green Plan* consultations, Canadians expressed their desire for more environmentally sensitive harvesting, processing, and manufacturing techniques. Canadian industry has demonstrated its commitment, desire, and ability to respond to these needs while retaining its international competitiveness.

The Government, in co-operation with the forest community, will continue to support research and development of improved products and environmentally sensitive processes in the forest sector.

An Informed Canadian Public

Canadians want relevant, timely and authoritative information about the state of our national resource. Informed debate and wise decisions are dependent on this information. Canada needs a new accounting system that will provide a continuous picture of how well we are doing — a picture that includes not only the economic benefits but also the more intangible assets of our forest heritage.

Basic Forestry Facts

Canada has about 10 per cent of the world's forest resources. Ninety-one per cent of Canada's productive land is publicly owned, nine per cent is privately owned.

Canada is the leading manufacturer of newsprint, providing 31 per cent of the global supply.

More than 70 species of mammals live in Canada's forests.

Approximately 300 species of birds nest in or near Canada's forests.

More than 60 per cent of all forest fires are caused by humans.

The average North American uses approximately seven trees a year in paper, wood and other products made from trees.

If your office recycled one ton/tonne of paper it uses, 17-19 trees would be saved. When paper is recycled, the wood fibres that were used as raw material for the original paper are used again to make the new one. The old paper is made into pulp, impurities are removed, and the pulp is used to make new paper.





In 1991, the Minister of Forestry will release Canada's first report to Parliament on the state of Canadian forests. The report itself will be the point of departure from which all stakeholders—the public, the provinces and the industry—will be able to measure improvements in the performance of our forest managers and to measure the appreciating value of Canadian forests.

The Canadian Council of Forest Ministers is committed to developing and maintaining a comprehensive national forestry data base.



The Government will support these efforts through a program that will build upon existing data in such areas as forest harvesting and forest regeneration, and that will be expanded to include important data on forest conservation and multiple-use opportunities.

Conserving Forest Diversity

Canadians have expressed concern that the use of our forests may lead to losses in the diversity of our natural environment. Although we know that forests are among the most important global ecosystems, we do not yet fully understand their complexity. *The Green Plan* will support the continued diversity of our forests through two specific initiatives.



Forestry Canada will establish a national forest seed and gene bank to ensure that we preserve the genetic elements that comprise our natural forest heritage.



The Government will seek the co-operation of provincial governments to support the identification and completion of a national network of ecological reserves, which will maintain, in their natural state, the genetic stock of Canadian forest ecosystems.

Best Technology

To guide the way successfully to sustainable development of our forest resources, we must continue to develop new information technologies and apply them in a manner that facilitates advances in forest management practices and enhances the quality of our forest resource.



Forestry Canada, in conjunction with its provincial and industrial partners, will accelerate the creation of computer-aided management tools and their transfer into the hands of forest managers.

National and International Obligations

Canada will respond to national concerns about global atmospheric change.

In co-operation with international partners, the science programs of Forestry Canada will be tailored to provide needed insights in such areas as climate change, biodiversity, acid rain and fire management.

Canada will participate actively in the development of the proposed international convention on forests in accordance with the agreement reached at the Houston Economic Summit. This will help to promote the sustainable development and conservation of the world's forests.

A Personal Contract with Our Environment through Tree Planting

Canadians want to make a personal contribution toward improving our national and our global environment. A community tree-planting program will offer all of us the opportunity to think globally, while acting locally. Details are described as part of the National Action Strategy on Global Warming (Chapter V-A).

Seeing the Forest as Well as the Trees

The St. Mary's River Forestry/Wildlife Project in Nova Scotia is taking a hard look at how to improve our waterways and wildlife. Woodlands contractors, biologists, and foresters in government and industry are co-operating to study the effects of clear-cutting on the environment. The information they gather will be used to find practical ways of meeting the needs of wildlife.

Many recommendations are already being put into practice. For example, the size of clear-cuts is being reduced to encourage wildlife to remain in the area. Portable bridges have been designed for use across feeder streams, to eliminate the build-up of harmful silt that results from the installation of permanent bridges. Waterways are being monitored to determine the impact of tree harvesting on animal populations along rivers. And ways of stopping soil erosion are being studied.

People are starting to realize that there's much more to our forests than just trees.

B. Achieving Environmental Sustainability in Agriculture

Canada's Goal is to Maintain and Enhance the Natural Resources that the Agri-Food Sector Uses or Affects, while Ensuring Environmental, Economic and Social Integration.

Introduction

The health of Canada's agri-food industry depends on a healthy environment as well as on the long-term sustainability of the resources required to produce the food we eat and the food products we export. At the same time, the health of all Canadians depends upon a secure supply of high-quality, safe food.

As with our other natural resource sectors, Canada's agri-food industry is vital to the health of the national economy as a whole. About 450,000 Canadians are involved in primary agricultural production, based largely on family farms. Their activities support an additional 1.5 million Canadians in related farm supply, processing, distribution and retail businesses—the agri-food industry. Sales of primary agricultural products alone amount to $22 billion annually.

The quality of soil, water and air; the impact of agricultural activities on wildlife habitat and water quality; and broad environmental issues, such as climatic change and air pollution: all provide interwoven challenges and opportunities affecting the viability and sustainability of Canada's agri-food industry.

Federal and provincial governments currently co-operate with producers to help conserve and protect the agricultural resource base. In recent years, the federal government has spent about $100 million annually on soil and water conservation and development. This sum includes expenditures for research and development of new techniques to help farmers address resource management and environmental challenges. In addition, federal and provincial governments have been co-operating in short-term, cost-shared agreements, such as the National Soil Conservation Program, designed to promote sustainable production practices.



In many farming areas of Canada, the fate of many species of wildlife is often closely linked to agricultural activities. The 15-year, $1.5-billion North American Waterfowl Management Plan to protect

waterfowl habitat is another example of good co-operation involving landowners, wildlife interests and governments.

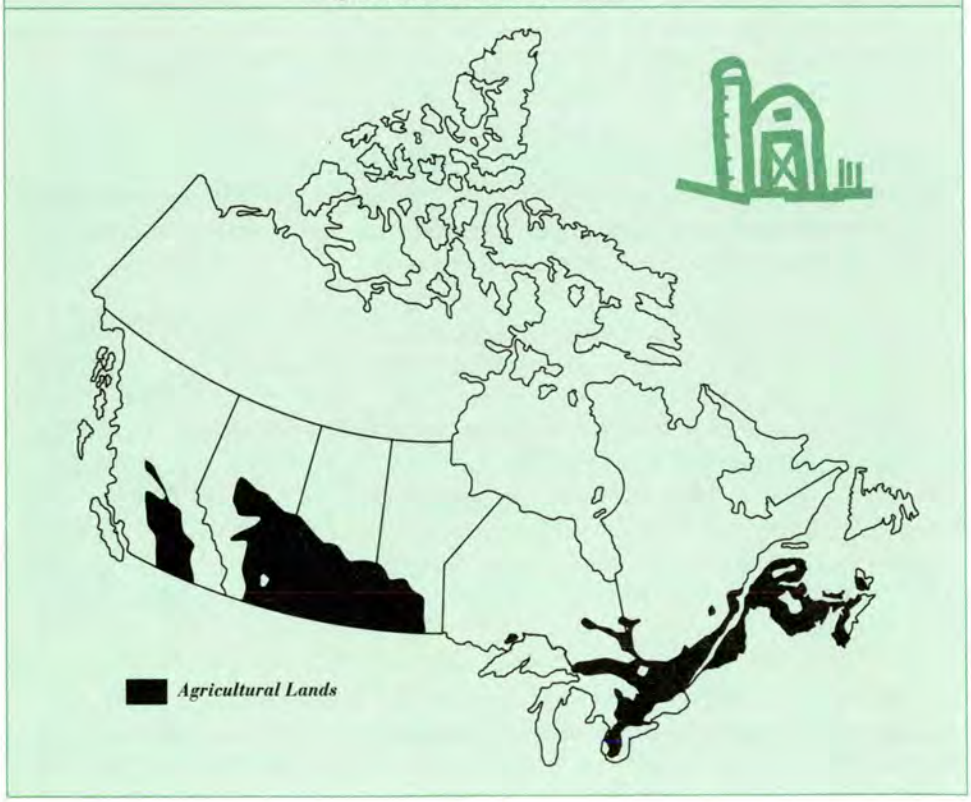
The health of all Canadians depends upon a secure supply of high-quality, safe food.

The Federal-Provincial Agriculture Committee on Environmental Sustainability, established under the Agri-food Policy Review, focused on environmental sustainability as one of four pillars of reform. The Committee reported to Agriculture ministers in June 1990 that the long-term survival of agriculture in Canada, as well as its competitiveness as an industry, were dependent upon taking advantage of opportunities associated with the greater use of more environmentally sustainable practices.

At their annual conference in August 1990, the federal and provincial ministers of Agriculture adopted the framework for action outlined in the Committee's report. This framework provides the basis for the federal government's policy on environmentally sustainable agriculture. The policy has three objectives:

- to conserve and enhance the natural resources that agriculture uses and shares;
- to be compatible with other environmental resources that are affected by agriculture; and

Agricultural Lands of Canada



- to be proactive in protecting the agri-food sector from the environmental impacts caused by other sectors and factors external to agriculture.

These objectives, also adopted in the *Green Plan* consultations, are vital to achieving sustainable agri-food systems.

A stable supply of high-quality water is essential for agricultural production.

A New Environmental Sustainability Initiative

The federal Minister of Agriculture, in co-operation with provincial Agriculture ministers, is now carrying out the agreed framework for action through a three-part implementation strategy. First, the strategy involves the strengthening of partnership processes on environmental sustainability. This is being accomplished through the broadening of existing federal-provincial soil and water accords in each province to encompass the full range of environmental sustainability issues, and the formation of a new Canadian Agri-food Advisory Council for Environmental Sustainability.

Second, additional steps are being taken to ensure that environmental, economic and social considerations are all taken into account in the reform of agricultural policies and programs.

Third, programming involving all partners is being developed to facilitate a range of approaches including, where appropriate, awareness, education, monitoring, research, technology transfer, demonstrations, technical and financial assistance, contracting, multi-resource planning and complementary regulatory measures.

As part of this new environmental sustainability initiative, *The Green Plan* will enable the Minister of Agriculture, on behalf of the Government of Canada, to enter into cost-shared agreements with the provinces to implement preventative and corrective programs to address environmental sustainability issues in the agri-food sector. The actions to be undertaken through these agreements will reflect the diverse needs and opportunities that exist in the various agro-ecosystems across Canada. Initiatives that have been identified as priorities to be developed in co-operation with the provinces, farmers and other partners in the agri-food industry, include the following:

Promoting Soil Conservation

Canadians understand the importance of achieving a secure and well-managed resource base of agricultural land and soil. Actions that will be pursued with the provinces include extension of the existing National Soil Conservation Program, establishment of permanent cover on environmentally sensitive lands, development of shelterbelts, research on soil-conserving production systems, and creation of a new Eastern Canada Soil Conservation Centre.

The Right Thing To Do

Oats are good to see on the breakfast table, but in the wrong place they are weeds. That's why Manitoba farmers growing other crops have been using herbicides to kill off wild oats in their fields.

Now, with the help of Manitoba Agriculture, farmers could reduce herbicide use by 10 to 17 per cent. A computer model is being used to calculate exactly when wild oat chemicals should be applied and when they need not be used. The model could help reduce the amount of time farmers spend on mixing, loading and spraying herbicides and it could help cut down on the overall amount of herbicide being released into the environment. Herbicides still will be required – farmers can't simply till the soil to kill off wild oats, because that can lead to excessive soil erosion.

The reduction in herbicide use brings financial benefits too. For the individual farmer, it can save up to $12,000 over a 6-year period – that means yearly savings across Manitoba as high as $12 million. So, economically and environmentally, it's obviously the right thing to do.

Providing a Clean Water Supply



A stable supply of high-quality water is essential for agricultural production. At the same time, agricultural activities can contribute to both surface and groundwater quality problems. Improper manure management can pollute lakes and streams; fertilizers and pesticides can contaminate groundwater. In areas susceptible to drought, more stable water supplies and improved irrigation can help conserve water and provide opportunities for both agriculture and other water users.

In co-operation with the provinces, the Government will pursue initiatives that include water quality research and enhancement to reduce pollution of water resources by pesticides, nutrients from fertilizers and manure, and other wastes. Priority for action will also include extension of activities under the south-western Ontario Soil and Water Environmental Enhancement Program; development of similar initiatives for other watersheds; financial and technical assistance to address serious pollution problems involving agricultural operations; assistance to develop more stable water supplies and distribution systems; and improved information for farmers on efficient water use.

Integrating Agriculture and Wildlife

While agriculture has contributed to the loss of wildlife habitat, it has also suffered losses caused by wildlife. There are opportunities to reduce conflicts between agriculture and wildlife through the management of shared resources in ways that are mutually beneficial and that contribute to environmental sustainability. They include the development and promotion of agricultural production systems that are compatible with the needs of wildlife, reduction of diseases such as rabies in wildlife populations, and greater use of multiple land-use strategies that reflect the natural characteristics and potential of land.

Major Influences on Canadian Farmland

Factors	*Pacific Maritime*	*Montane Cordillera*	*Boreal Plain*	*Prairie*	*Borela Sheild*	*Mixed Wood Plain*	*Atlantic Maritime*
Loss of Soil Quality							
Loss of organic matter	Primary	Primary	Primary	Primary	Secondary	Primary	Primary
Nutrient content	Secondary	Secondary	Primary	Primary	Secondary	Secondary	Secondary
Acidification	Primary	Primary	Primary	Secondary	Primary	Primary	Primary
Salinization		Secondary		Primary			
Erosion (wind and water)	Primary	Primary	Primary	Primary	Secondary	Primary	Primary
Compaction	Primary	Primary	Secondary	Secondary	Secondary	Primary	Primary
Land Use Change							
Agriculture to urban	Primary	Secondary	Secondary	Secondary		Primary	Secondary
Wetlands to agriculture	Secondary	Secondary	Primary	Primary	Secondary	Primary	Secondary

Primary Importance
Secondary Importance

Managing Waste and Pollution

The agri-food sector is affected by, and contributes to, industrial/urban pollution and waste generation. To achieve a major reduction in the impact of agricultural pollution and waste, priority initiatives that will be pursued include research and technology transfer on composting, recycling, manure management, effluent irrigation systems and other management practices; research into alternative uses of agri-food wastes, and the development, testing and demonstration of alternative packaging technologies; and increased education and awareness of the best management practices for handling agri-food wastes. Research on the effects of air and water pollution on agriculture will also be pursued.

Protecting Genetic Resources

Our genetic resources risk being diminished by, for example, increased specialization of agriculture involving fewer breeds of plants and animals. The Government will pursue actions to preserve and enhance Canada's genetic resources by acquiring and/or developing, adapting, monitoring, utilizing and/or releasing plant, animal and other biological genetic resources. Research will also be conducted on integrated pest management, and on biological and alternative pest control programs. Genetic resources will provide the basis for research on advanced technology and breeding procedures to enhance resistance to diseases, insects, and other environmental stresses.

Climate Change and Agriculture

The Government will pursue actions that, in addition to encouraging sound soil conservation practices, will also limit greenhouse gas emissions. For example, stabilizing and increasing the organic matter content of soil will have a beneficial impact in terms of reducing carbon dioxide levels in the atmosphere. In addition, the Government will also consider pursuing research and demonstration initiatives on farm energy conservation.

Other climate change measures that will provide benefits to the agri-food sector are covered elsewhere in *The Green Plan*. See, for example, smog (Chapter I-D), and the National Action Strategy on Global Warming (Chapter V-A), which includes measures to increase scientific understanding and an initiative to encourage renewable energy options such as ethanol.

Dealing with Pesticides



Recognizing the wide range of concerns about pesticides and public interest in pesticide regulation, in April 1989 the Government of Canada announced a broad multi-stakeholder review of the federal pesticide regulatory process. In July 1990, the Federal Pesticide Registration Review Team released its preliminary report outlining a proposal for a revised regulatory system. The report was used as the basis for public consultation meetings across Canada. A final report is expected in 1991.

C. Sustainable Fisheries

Canada's Goal is the Long-Term Sustainability of Our Fisheries Resource.

Fisheries are an important environmental and economic resource for Canada.

Introduction

Fisheries are an important environmental and economic resource for Canada. Our vast inland and marine waters support a diverse and abundant population of fish species, which in turn support a commercial fishing industry with revenues of $3.2 billion and employment of 130,000 commercial fishermen and plant workers. Commercial fishing is essential to many regional economies, representing the only real employment opportunity in some 1,500 coastal and remote inland communities.

For many of Canada's aboriginal people, the fishery is both a source of food and an important element of their culture. It also provides recreational opportunities to more than five million Canadians and one million foreign visitors annually.

Environmentally, fish serve as an important barometer of the state of the aquatic environment, where developing problems first appear in fish stocks.

The *Fisheries Act* is the federal legislative base for the Government's responsibility to conserve and protect fish in Canada's oceans and inland waters. Through this Act, the federal government is able to allocate the catch among competing users, licence fishermen and vessels, and protect fish habitat. However, administrative arrangements have been developed with some provinces to foster co-operative conservation and development of Canada's fisheries. British Columbia, the Prairie provinces, Ontario, Quebec and Yukon have assumed responsibility for managing their freshwater fisheries on behalf of all Canadians.



Over time, the Government's approach to harvesting practices has evolved to meet the challenges of regulating an increasingly complex, competitive and technologically sophisticated industry, while at the same time recognizing the limits of the resource to sustain itself. From open-access regimes we have progressed to limited-entry ones with catch quotas, gear restrictions, trip limits and the like. The Government has also been supporting fish stock rebuilding through such programs as the Salmonid Enhancement Program on the west coast.

The sustainability of our fisheries depends on both sound harvesting practices and healthy and productive fish habitat.

The sustainability of our fisheries depends on both sound harvesting practices and healthy and productive fish habitat. Harvesting rates must not exceed the capacity of the fish stock to maintain itself. Fish populations, however, cannot be maintained if their habitat is endangered. For that reason, habitat protection is also an essential element of national fisheries policy. In 1986, the Government announced a new Policy for the Management of Fish Habitat, based on the goal of a "net gain" of productive habitat, with a working principle of "no net loss".

Despite these efforts, overfishing and habitat destruction are threatening the sustainability of Canada's fisheries resource. Atlantic groundfish stocks outside and straddling our 200-mile fishing zone have been seriously depleted by fleets from certain European Community nations and other countries. In the Pacific Ocean, foreign driftnet fleets operating beyond the Canadian zone hang thousands of kilometres of fine-meshed nets which indiscriminately trap and kill millions of fish and thousands of seabirds and marine animals. Fish in our inland waters are being threatened by the activities of both commercial and recreational fishermen, as well as by habitat destruction.

Agriculture, mining, forestry, transportation, energy development, urban growth and industrial activity are damaging fish habitat everywhere in Canada. For example, close to 50 per cent of the shellfish-growing areas in Nova Scotia, and 500 square kilometres of shellfish-harvesting areas in British Columbia, are now closed due to contamination. One in every seven eastern Canadian lakes has been damaged by acid rain. So many toxic substances have been found in St. Lawrence beluga whales that their carcasses could be considered hazardous wastes.

A National Sustainable Fishery

The *Green Plan* consultations confirmed a widespread concern that Canada has reached the sustainable limits of its fish resources. Canadians are looking to the federal government to take corrective actions as quickly as possible. To this end, the Government has designed a three-part strategy to address existing pressures on the fisheries resource and to ensure the long-term viability of Canada's fishery. The strategy includes provisions for a national action plan on sustainability, protection of the fish habitat and the promotion of sustainable fisheries practices. In addition, international action is essential to ensure that the practices of other countries do not prevent Canada from achieving these goals.

Canada's Green Plan sets out additional actions that will protect and restore fish habitat. Described elsewhere, these include measures to control toxic substances (Chapter I-C), protect and enhance water quality (Chapter I-B) and reduce the risk of ocean spills and enhance Canada's ocean spill response capability (Chapter VIII-A).

Sustainability

The first part of the national strategy is to develop a national policy on sustainable fisheries.



By 1992, the Government, in co-operation with the provinces, territories, the commercial, recreational and native fishing communities and other interested parties, will develop a National Sustainable Fisheries Policy and Action Plan. The purpose of the Plan will be to focus national attention on the importance of the fisheries and aquatic ecosystems, identify key issues and establish the national framework for co-operation to achieve sustainable fisheries. Once the national Policy and Action Plan has been established, detailed federal strategies and operating procedures will be put in place.

By 1992, the Government, in co-operation with other interested parties, will develop a National Sustainable Fisheries Policy and Action Plan.

Protecting Fish and Fish Habitat

The second element of the five-year strategy is immediate action to protect fish and fish habitat. *Green Plan* measures to clean up and prevent habitat destruction and pollution in Canada's waters include:

Enforcement



By 1991, amendments will be made to the *Fisheries Act* to increase fines substantially for all domestic fisheries and fish habitat violations and to strengthen the enforcement powers of fishery officers.



By 1991, the Compliance Policy for the habitat provisions of the *Fisheries Act* will be implemented, thereby supporting amendments to the Act.

Partnership



The federal government will take the necessary legal and administrative steps, in consultation with provincial governments, to improve the level of habitat protection across the country through a more consistent application of the *Fisheries Act*.

Pollution Prevention



Better knowledge of the ecological effects of toxic chemicals, in particular, are mandatory for the effective implementation and evaluation of regulatory and prevention programs. To enhance Canada's capability to anticipate and respond to the threat of toxic chemical pollution, the Government will expand scientific assessment, monitoring and research on toxic substances and their effects on fish and fish habitat.



Further, pollution prevention regulations contained in the *Fisheries Act* are being updated and strengthened, beginning with



the Pulp and Paper Regulations and the Metal Mining Liquid Effluent Regulations.

Net Gain of the Productive Capacity of Fish Habitat

Conservation of existing habitat, as well as reclamation of fish habitats previously lost or degraded, will require the balancing of unavoidable habitat losses with habitat replacement on a project-by-project basis. By 1993, the Government will ensure that this principle is fully implemented with respect to development plans and activities that have the potential to damage fish habitat. A federal authorization scheme, developed in co-operation with those provinces and Yukon that have been delegated responsibility for managing the freshwater fisheries, will be established for these projects.

Promoting Sustainable Fisheries Practices

The third element of the five-year strategy is domestic and international measures to promote the sustainable use of Canada's fisheries resource.

Domestic Action

Ocean fish stocks have generally been viewed as "common property" available to anyone who wishes to catch them. This view is largely responsible for the "race for fish" that results in much of the overcapacity in the fisheries industry. The Government believes that creating a transferable entitlement to a specific share of the fish harvest would promote more rational investment decisions and reduce pressures on the fishery.

Individual quotas, sometimes called "boat quotas" or "enterprise allocations", are an important feature of the management of several Atlantic fisheries, including groundfish and offshore scallop. They are shares of the Total Allowable Catch (TAC), or fleet allocation, assigned to individual licence holders. Individual Transferable Quotas (ITQs) take the approach one step further by allowing transfers among licence holders. This provides greater flexibility and promotes more efficient utilization of fishing capacity. ITQs have been implemented in several domestic fisheries and are in place in other parts of the world, including the fisheries of New Zealand and Australia.

Accordingly, in consultation with the fishing industry and the provinces, the Government will put in place a system of Individual Transferable Quotas (ITQs) for various fisheries.

In addition, the Government will implement more sustainable practices in its fisheries management, using innovative approaches such as more selective, less environmentally damaging gear.

In addition, in order to pursue sustainable development objectives with respect to the recreational fishery and the aquaculture sector:

The Government will develop, by 1991, an action plan to implement the Recreational Fisheries Policy. This will be undertaken in consultation with the provinces as well as recreational fishing groups.

In consultation with the industry and provincial governments, the federal government will complete the implementation of the Aquaculture Strategy announced earlier this year.

International Efforts

Since October 1989, the Government of Canada has undertaken a high-level political initiative to make leaders of the European Community, its member states, and other nations aware of the serious, long-term consequences of overfishing outside the Canadian 200-mile limit. A comprehensive information campaign in Europe has also underlined the ecological risks of overfishing and pressed the European public to call for an end to overfishing in the Northwest Atlantic Fisheries Organization (NAFO) Regulatory Area. These efforts will continue.

The Government of Canada has undertaken a high-level political initiative to make leaders of other nations aware of the serious, long-term consequences of overfishing outside the Canadian 200-mile limit.

In addition, with the unanimous support of other NAFO members, work has begun to improve surveillance and control in the area adjacent to the Canadian zone and to eliminate fishing by countries that are not members of NAFO and receive no quotas from the organization. Proposals for short-term and long-term action will be submitted to NAFO at the 1991 Annual Meeting.

Over the longer term, Canada is also calling on all states to support international acceptance of the practical measures needed to make the Law of the Sea Convention work as it was intended. Increased international understanding and co-operation is vital to achieve effective conservation and resource management of fisheries on the high seas.

As a key sponsor of the U.N. resolution on large-scale pelagic driftnet fishing, Canada is committed to the implementation of the resolution for a moratorium on all large-scale pelagic driftnet fishing by June 30, 1992, in the absence of effective conservation and management measures. The resolution calls for a scientific review by the international community by June 30, 1991, of the best available data on the impact of large-scale driftnet fishing. The resolution also calls for agreement on future regulations and monitoring measures.

Canada is committed to taking all further actions necessary to eliminate this damaging and unsustainable fishing practice. These will include:

- international co-operation to monitor driftnet operations and enforce agreements; and
- through the International North Pacific Fisheries Commission (INPFC) and the Food and Agriculture Organization of the U.N. (FAO), the development of alternative fishing methods and technologies.

At the upcoming 1992 United Nations Conference on Environment and Development, Canada will pursue four specific objectives to ensure fisheries habitat protection and sustainability:

- an international sustainable fisheries strategy;
- an international framework for controlling land-based sources of ocean pollution (see Chapter I-B.);
- a strengthening of the provisions of the London Dumping Convention to combat ocean dumping; and
- a global ocean observing system.

III. Our Special Spaces and Species

A. Protecting Our Unique Ecological Areas

Canada's Long-term Goal is to Set Aside as Protected Space 12 Per Cent of the Country.

Introduction

The federal government believes that protecting and enhancing Canada's natural heritage is of vital importance. Canada's rich biological diversity must be a major component of our legacy to future generations. It represents a significant portion of the world's biodiversity, provides millions of Canadians with highly valued recreational opportunities and forms the basis of many subsistence and recreation-based economies.

Protecting Canada's special places from major human development pressures plays a dual role in protecting our natural heritage. It preserves important landscapes from the forces of change that accompany the economic activities of humans, and it contributes to conserving our biological diversity by protecting wildlife habitat.

Since the first national park was established in Banff in 1885 by Sir John A. Macdonald, the federal, provincial and territorial governments have acted to preserve those special places that best represent the landscapes and the ecological diversity of Canada.

Currently, about 6.9 per cent of Canada's land and freshwater area has been protected through the combined efforts of the country's different jurisdictions and conservation agencies. Today, 21 of Canada's 39 terrestrial regions are represented in the national parks system, but only two of Canada's 29 marine regions are adequately represented in the national marine parks system. In total, about 1.8 per cent of Canada's non-marine territory is protected in national parks.



Increasing development pressures in many parts of Canada are seriously affecting our natural and historical heritage. Old-growth forests, native grasslands and wetlands continue to disappear. For example, in southern Ontario, more than 68 per cent of the original wetland has been drained for agricultural or other uses, and draining continues to remove about one per cent per year from the remaining stock of wetlands. On the Prairies, over 90 per cent of the original grasslands have gone, and in the last decade, one third of the remaining grassland was converted to cropland.

In its 1987 report *Our Common Future*, the Brundtland Commission recommended that countries set aside 12 per cent of their lands and waters in order to protect representative samples of the Earth's ecosystems.

The Government of Canada will establish at least five new national parks by 1996, and three new national marine parks by 1996.

The Government of Canada believes that, while we are making progress, we must accelerate our efforts towards meeting the target of setting aside 12 per cent of Canada's total territory as protected space.

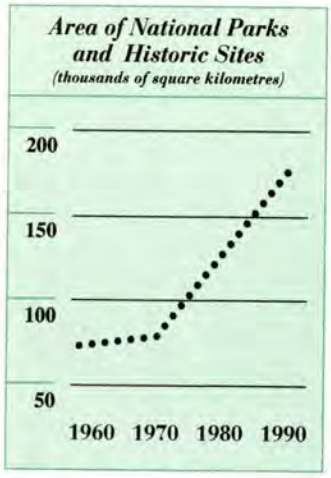
Completing the Parks Systems

The national parks system is by far Canada's best-known way of preserving and protecting land. Since its beginnings with Banff National Park, the national parks system has grown steadily, protecting more and more of Canada's natural heritage and beautiful landscapes. The federal goal is to have each of Canada's 39 terrestrial regions represented by a national park. When this has been accomplished, the national parks system will be complete, providing protection for about 3 per cent of Canada's land area.

Similarly, the national marine parks system comprises 29 marine regions. The federal goal is to represent each of these through a national marine park. As well, 18 rivers or sections of rivers have been nominated to the Canadian Heritage Rivers System. To date, 11 of these rivers have been officially designated.

To accelerate this important process, the Government of Canada will:

- establish at least five new national parks by 1996;
- negotiate agreements for the remaining 13 parks required to complete the terrestrial system by 2000;
- establish three new national marine parks by 1996, including South Moresby/Gwaii Haanas and Saguenay;
- establish an additional three national marine parks in areas to be confirmed by the year 2000; and
- provide additional assistance in undertaking studies, plans, resource evaluations and monitoring of designated rivers to provincial and territorial governments participating in the Canadian Heritage Rivers System.



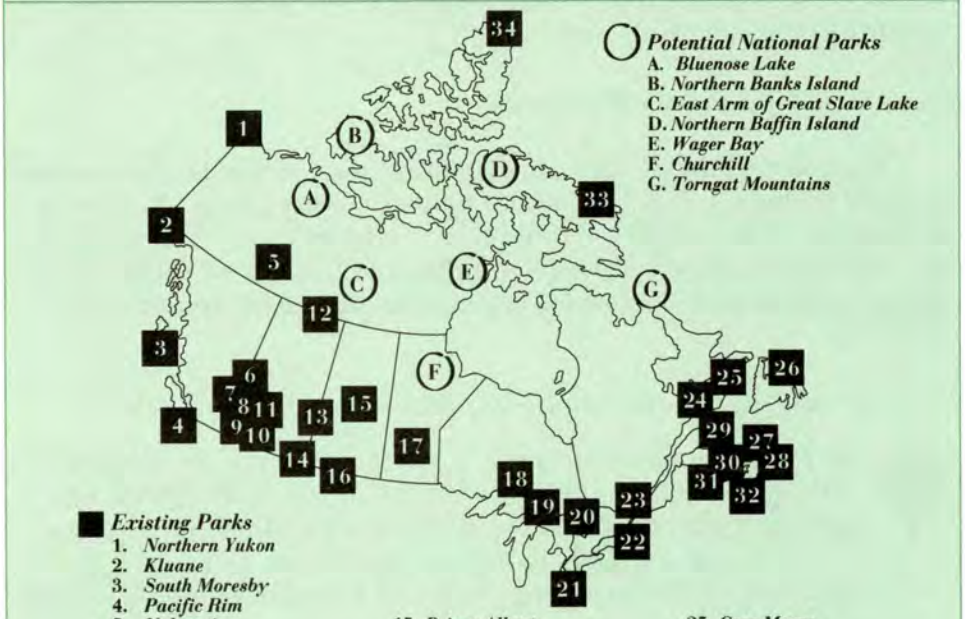
The national park system is intended to protect for all time representative natural areas of Canadian significance.

Protecting Canada's Natural Heritage

It is not sufficient simply to set aside land for parks. The vast array of natural resources within the national parks system must be protected. To meet its sole responsibility in this area, the Government will strengthen its scientific and protective measures over the next five years, including:

- expanding forest fire protection;
- developing an enhanced resource management program involving applied studies for ecological integrity and regional integration;
- supporting staff training in natural resource protection; and
- promoting the concept of parks as "living" scientific laboratories and models of sustainable development management.

Completing the National Parks System



Canada is on the way to completing the national park system, with 21 of 39 terrestrial regions represented.

Distribution of Wetlands in Canada
(total: 1.27 million km²)



- *A. Ontario.....23%*
- *B. Northwest Territories.....22%*
- *C. Manitoba.....18%*
- *D. Alberta.....11%*
- *E. Quebec.....10%*
- *F. Saskatchewan..... 8%*
- *G. Newfoundland and Labrador.....5%*
- *H. British Columbia... 2%*
- *I. Yukon..... 1%*
- *J. Prince Edward Island less than..... 1%*
- *New Brunswick less than..... 1%*
- *Nova Scotia less than..... 1%*

Further Actions for Protecting Endangered Spaces

Besides the national parks system, the federal government contributes to the national goal of protecting 12 per cent of Canada through a number of other means, some of which were set up primarily to protect wildlife habitat. For example, migratory bird sanctuaries, covering over 11 million hectares, and national wildlife areas, covering an additional 300,000 hectares, not only protect wildlife habitat, but also form important components of Canada's system of protected lands.

In 1991, the Government of Canada will adopt the Federal Policy on Wetland Conservation.

In addition to these ongoing measures, the Government will protect valuable ecological spaces through three new actions: establishing forest ecological reserves, enhancing the conservation of wetlands, and protecting wildlife habitat on agricultural lands. The agricultural action is described in more detail in both the wildlife (Chapter III-B) and agriculture (Chapter II-B) sections of this document.

Establishing Forest Ecological Reserves

The federal government will co-operate with provincial governments to establish a network of forest ecological reserves. These reserves will preserve representative examples of distinctive forest ecosystems in their natural state.

Function of Wetlands



Wildlife habitat
Storing excess floodwater
Stabilizing streamflows
Purifying runoff
Absorbing pollutants
Recharging groundwater
Trapping silt
Controlling salinity of soil
Controlling water erosion

Conserving Canada's Wetlands

Canada's wetlands form an important part of our landscapes and harbour perhaps the richest mix of wildlife of any group of complex ecosystems in the country. In addition, wetlands are an integral part of our freshwater systems, providing a range of benefits to Canadians, including natural flood control, water cleansing, and groundwater recharge.

To enhance national efforts to protect Canada's wetlands:

- In 1991, the Government of Canada will adopt the Federal Policy on Wetland Conservation. Elements of the Policy will include a system of secured wetlands of national importance; protection of wetlands on federal lands such as national parks, national wildlife areas and National Capital Commission lands; and wetland conservation as a fundamental goal of all federal land-use decisions.

B. Sustaining Canada's Wealth of Wildlife

Canada's Goal is to Maintain and Enhance the Health and Diversity of Our Wild Animals and Plants.

Today, 175 species of wildlife are known to be at risk. Almost half are classified as threatened or endangered.

Introduction

Wildlife populations in Canada are under considerable stress. Reasons include loss and degradation of habitat, overharvesting and poaching, disease, and the impact of toxic substances. Evidence of decline is manifold: migratory birds, particularly waterfowl, continue to show declines. Today, 175 species of wildlife are known to be at risk. Almost half are classified as threatened or endangered and about 10 species are added to the list each year.

In order for wildlife to thrive in the presence of man, two things are needed: habitat—a place to live that meets all their needs for food, shelter and reproduction; and a measure of protection from the harmful effects of human activity.

The federal government has been active in protecting wildlife populations in the past. Environment Canada's Canadian Wildlife Service has for years conducted research into wildlife concerns such as the effects of toxic chemicals on seabird populations, and has reintroduced endangered or extirpated species, such as peregrine falcons, into their former ranges. In addition, the Government signed an agreement in 1988 with World Wildlife Fund Canada for a four-year program to support the recovery of Canada's endangered wildlife species. To combat poaching in national parks, in 1988 the federal government passed major amendments to the *National Parks Act* to provide stiffer penalties for poaching.

In addition to the national parks system, the federal government helps to protect valuable wildlife habitat and ecosystems through means such as migratory bird sanctuaries and national wildlife areas. Internationally important wetlands are designated under the Ramsar Convention on the Conservation of Wetlands of International Importance, which, since its drafting in 1971, has been signed by 60 nations.



Co-operative efforts to protect valuable wildlife habitat are becoming more and more important across the country. For example, in 1989, Canada committed over $30 million to the North American Waterfowl Management Plan, which is designed to halt and reverse the

decline in many waterfowl populations. This is a $1.5-billion plan through which the national governments of Canada and the United States, together with provincial, territorial and state governments and many other partners from the private sector, co-operate to deal with wetlands of continental importance. Another example is the Grasslands Trust Fund, established by two non-profit conservation organizations to raise money to accelerate the expansion of Grasslands National Park. Every dollar raised from the public for this fund is being matched by the federal government.

But more has to be done, and we must broaden our vision to include species that are not considered game species. The federal government intends to meet, head on, the challenge of maintaining and enhancing the health and diversity of Canada's wildlife. Helping wildlife populations to survive and flourish must become a national effort, involving all levels of government and the public at large.

Endangered Species in Canada

✔ **Mammals**
Bowhead Whale
Eastern Cougar
Eastern Wolverine
Right Whale
St. Lawrence River Beluga Whale
Sea Otter
Ungava Bay Beluga Whale
Vancouver Island Marmot

✔ **Birds**
Eskimo Curlew
Greater Prairie Chicken
Kirtland's Warbler
Mountain Plover
Peregrine Falcon (subspecies anatum)
Piping Plover
Spotted Owl
Whooping Crane

✔ **Fish**
Acadian Whitefish
Aurora Trout
Salish Sucker

✔ **Plants**
Cucumber Tree
Eastern Mountain Avens
Eastern Prickly Pear Cactus
Furbish's Lousewort
Gattinger's Agalinis
Heart-leaved Plantain
Hoary Mountain Mint
Large Whorled Pogonia
Pink Coreopsis
Pink Milkwort
Skinner's Agalinis
Slender Bush Clover
Southern Maidenhair Fern
Small White Lady's Slipper
Small Whorled Pogonia
Spotted Wintergreen
Water-pennywort

✔ **Reptiles**
Leatherback Turtle

Protecting Wild Species: The National Wildlife Strategy

The *Green Plan* wildlife strategy flows from the National Wildlife Policy adopted by the Wildlife Ministers' Council of Canada in September 1990. The goal of the policy is to maintain and enhance the health and diversity of Canada's wildlife for its own sake and for the benefit of current and future generations of Canadians.

The wildlife initiatives of Canada's *Green Plan* will put the federal government firmly on the road to full implementation of the National Wildlife Policy.

The strategy consists of five main thrusts, as follows.

Improved Wildlife Science and Health Research

Wildlife is a valuable indicator of the health of ecosystems and the environmental stresses they are under. For example, the decline of the peregrine falcon as a result of the widespread use of DDT alerted public attention to the fact that there was something seriously wrong in the environment.

The ability to detect and measure the effects of toxic substances on wildlife and distinguish these from wildlife diseases is essential in order to assess the overall health of wildlife species, predict pollutant impacts and provide an early warning system for potential environmental and human health problems.

The developmental pressures on both habitats and wildlife populations bring an increasing need to manage wildlife populations more

actively. This requires making more informed decisions based upon better science and research.

To develop the knowledge necessary to make better wildlife management decisions, the federal government will strengthen its wildlife research programs, focusing on ecological and toxicological research.

This effort will include establishing, by 1992:

a Co-operative Wildlife Ecology Research Network at Canadian universities;

a national Co-operative Wildlife Health Network at Canadian veterinary colleges; and

new laboratory facilities to measure trace organic contaminants in wildlife populations and to support toxicological research.

Direct Action to Protect Wildlife Diversity

The second thrust of the National Wildlife Strategy is to protect wildlife diversity by increasing the populations of both endangered and non-endangered species. Canadians share a responsibility to preserve Canada's biodiversity for both future generations of Canadians and the rest of the world. Programs to protect and rehabilitate some species at risk—the piping plover, the whooping crane, peregrine falcon and white pelican, to name a few—are showing some success. However, the number of Canadian wildlife species at risk continues to grow by about 10 per year.

To exercise its responsibility to ensure biodiversity, Canada must secure the future of its own wildlife species. Accordingly, the Government will:

complete recovery plans for 11 at-risk migratory bird species and start recovery programs by 1992;

renew, in co-operation with World Wildlife Fund, Canada's contribution to the Endangered Species Recovery Fund by 1992; and

increase the participation of universities and ENGOs in research and recovery efforts directed to threatened and endangered species.

Lands under federal jurisdiction will be managed appropriately to meet protection and recovery needs.

Threatened Species in Canada

✔ **Mammals**
Eastmain Beluga Whale
Maritime Woodland Caribou
Newfoundland Pine Marten
North Pacific Humpback Whale
Peary Caribou
Prairie Long-Tailed Weasel
Wood Bison

✔ **Birds**
Baird's Sparrow
Burrowing Owl
Ferruginous Hawk
Henslow's Sparrow
Loggerhead Shrike
Peregrine Falcon (subspecies tundrius)
Roseate Tern

✔ **Fish**
Black Redhorse
Blackfin Cisco
Copper Redhorse
Enos Lake Stickleback
Great Lakes Deep-Water Sculpin
Lake Simcoe Whitefish
Margined Madtom
Shorthead Sculpin
Shortjaw Cisco
Shortnose Cisco

✔ **Plants**
American Chestnut
American Waterwillow
Athabasca Thrift
Blue Ash
Bluehearts
Colicroot
Giant Helleborine
Ginseng
Golden Crest
Kentucky Coffee Tree
Mosquito Fern
Nodding Pogonia
Pitcher's Thistle
Plymouth Gentian
Purple Twayblade
Red Mulberry
Sweet Pepperbush
Tyrell's Willow

By 1993, a federal policy will be put in place to ensure recovery programs for all threatened and endangered species within federal jurisdiction, and to ensure that information relating to threatened species is available to, and used in, federal environmental assessment processes.

By 1993, a federal policy will be put in place to ensure recovery programs for all threatened species within federal jurisdiction

In addition, the Government will take steps to enhance the populations of non-endangered species. Actions will include:

- augmenting and increasing co-ordination of a network of enforcement co-ordinators for the *Migratory Birds Convention Act* by 1992;
- by 1992, developing a co-operative management regime with Northern Ontario native communities, as an important step in the establishment of co-operative regimes throughout Canada; and
- establishing, by 1994, an integrated system of non-game bird studies in co-operation with a network of volunteers.

As plant and animal species disappear throughout the world at an alarming rate, people and governments are beginning to recognize a responsibility for maintaining the planet's biological diversity. Negotiations are under way under the auspices of the United Nations Environment Programme and other international organizations on a convention on the conservation of biological diversity. Canada supports this concept, and will support international efforts to sign such a convention before the end of 1992.

New Legislation to Attack Poaching and Illegal Trading



The third objective of the National Wildlife Strategy is protection of wildlife from illegal poaching and trade. The illegal trade in wildlife and wildlife products is big business both in Canada and around the world. In some circumstances, it is having a devastating effect on wildlife populations. For example, the future of the world's rhinoceros population is in grave danger because of the demand for the animals' horns for traditional Asian medicines and for dagger handles in the Middle East. In Canada, there is a growing export market for bear gall bladders, again for traditional Asian medicines.

- In support of Canada's international obligations under the Convention on International Trade in Endangered Species (CITES), Canada will reduce the threats that poaching and illegal trade pose to domestic and foreign wildlife conservation by introducing the Wild Animal and Plant Protection Act (WAPPA) in 1991.

Strengthened Wildlife Law Enforcement

The fourth thrust of the National Wildlife Strategy is tougher laws and bigger penalties.

Under the proposed Wild Animal and Plant Protection Act, as well as other applicable legislation, federal controls over the import, export and interprovincial transport of wild animals and plants (and their derivatives) will be strengthened, penalties stiffened and enforcement mechanisms improved.

Conserving Wildlife Habitat

By 1992, the Government will establish a National Wildlife Habitat Network.

The fifth and final thrust of the National Wildlife Strategy is protection of valuable wildlife habitat. In addition to actions taken to preserve wildlife habitat by protecting Canada's endangered spaces (see Chapter III-A), the Government will act to protect and conserve additional lands that are of prime importance to the goal of preserving valuable wildlife habitat. Building on the impressive success of the North American Waterfowl Management Plan, the Government will stress co-operative measures with industry, other governments, native organizations and private-sector organizations. For example:

By 1992, the Government will initiate an integrated forestry and wildlife conservation program with other governments and the private sector.

As announced under the North American Waterfowl Management Plan, the Government will establish the Pacific Coast Joint Venture as a co-operative effort to protect estuary and other coastal wildlife habitats.

By 1992, the Government will establish a National Wildlife Habitat Network.



Protecting Wildlife Habitat on Agricultural Lands

In some areas of Canada, the future of our wildlife is directly linked to agricultural practices. For example, extensive drainage systems are established on farmlands to drain wetlands, but as a consequence, they inadvertently destroy wildlife habitat. In some of the more intensively farmed parts of southern Ontario and the Prairies, good wildlife habitat is limited to scattered woodlots, shelterbelts, and water-filled potholes on agricultural land.



To encourage the maintenance and expansion of these remnant wildlife habitats, the federal government, in co-operation with the province, will pursue a program to develop and transfer to farmers agricultural practices that are compatible with wildlife habitat needs. For example, farmers will be encouraged to preserve wildlife habitat such as wetlands and buffer zones on their lands.

C. Building Upon Our Historical Heritage

Canada's Goal is to Commemorate and Protect the Historical Heritage that is Important to All Canadians.

The Government will commemorate seven key historic themes currently under-represented in the system by 1996, and an additional eight by the year 2000.

Introduction

Canada's national historic sites commemorate and protect nationally significant aspects of human interaction with the environment spanning thousands of years of human life on this part of the North American continent. They provide unparalleled educational opportunities for Canadians to experience first-hand the nature of this relationship and how it has helped to shape this country's modern destiny.

Canada's national historic sites system currently consists of 112 sites located in all parts of the country. Eight historic canals are also operated within the system.

However, valuable historical resources both inside and outside the national historic sites system are still deteriorating or are being lost. The federal government is committed to protecting and preserving our historical heritage.

Commemorating Canada's Historical Heritage

To make progress towards this goal, the Government will act swiftly on two fronts: it will fill the major thematic gaps within the national historic sites system, and it will improve its protection of historical resources currently in the system.

The Government will commemorate seven key historic themes currently under-represented in the system by 1996, and an additional eight by the year 2000. The eight additional priority sites will represent most of the key resource development industries and settlements that were important to Canada's early history.

At the same time, the Government will provide additional financial assistance to other governments and organizations for nationally important historic sites through cost-shared and co-operative agreements. This assistance will help provide opportunities for the restoration and interpretation of significant



native heritage sites and sites representing the history of people's relationships with the land.

Protecting Canada's Historical Resources

The Government is directly responsible for protecting a vast quantity of historical resources in Canada. These include artifacts, historical objects, cultural resources and documents key to Canada's history.

To exercise this responsibility more effectively, the Government will support new conservation, management, scientific and training measures over the next five years. These new initiatives will include:

- expanding the protection of artifacts and historic objects;
- developing the nation's archaeological and historic resource conservation capabilities; and
- supporting staff training in historical resource protection.



IV. Canada's Unique Stewardship: The Arctic

A. Preserving the Integrity of our Northland

Canada's Goal is to Preserve and Enhance the Integrity, Health, Biodiversity and Productivity of Our Arctic Ecosystems.

Introduction

Canada's northland is a vast and diverse region, containing some of our largest river systems, extensive forested areas, open tundra and unspoiled wilderness. This area comprises 40 per cent of Canada's total land mass and is surrounded by two thirds of Canada's marine coastline. More than 30 per cent of our freshwater resources are found in this area, yet much of the North is considered to be a cold desert because of the low precipitation it receives. Though less than one per cent of Canadians live in this region, it is the home of many aboriginal societies which, for generations, have come to depend on the land as a basis of their culture and have relied on its resources for food, clothing and income. Canada is one of eight countries that share the Arctic region.

Despite the climatic extremes, which are a characteristic of the region, the North provides a home for a myriad aquatic, terrestrial and marine species of plants and animals. The species that are found there have developed adaptive strategies to take full advantage of the available resources. Slow growth and reproductive rates, as well as long seasonal migrations, are characteristic of the adaptations that many animal species have made over thousands of years.

We tend to take this enormous expanse of land and water, its people and wildlife, for granted. The common image of Canada's North is a cold, monotonous and unchanging region — but one that is also clean and beautiful. But Canadians are becoming increasingly aware that we cannot take the North for granted. Northerners know only too well that the remote area is being made more accessible by modern transportation and communication technologies. They know that their land, water and air, once considered pristine and untouched, are particularly susceptible to environmental contaminants and atmospheric change. The Arctic environment is showing disturbing evidence of toxic contaminants, including PCBs, dioxins, pesticides and heavy metals. Most of these chemicals are not locally produced; they are the products of industrial activities in southern Canada and in other parts of the world. Further, these substances tend to accumulate in the food chain. There are over 800 sites across the North containing hazardous



or abandoned materials that are potentially dangerous to man, wildlife and the environment. There is a great deal of concern over the industrialization of northern watersheds, such as the Mackenzie River, where water quality may deteriorate as a result of increasing effluent from pulp mills and oil sands development. Present and proposed hydroelectric developments involve significant areas of northern Quebec, British Columbia, Yukon and the Northwest Territories.

The federal government is committed to protecting the Arctic environment and ensuring sustainable use of its resources.

There are major petroleum and mineral resources in the North that can be developed for the benefit of northerners and all Canadians. But large-scale resource development in Arctic watersheds and offshore, if undertaken without adequate environmental precautions, has the potential to cause further environmental degradation. Development must therefore be done in a manner that protects the northern environment, consistent with the needs of native northerners. The development of the renewable resource and tourism sectors is in its infancy, but holds the promise of diversifying the economic base of the North. In the Arctic, we must act responsibly for the benefit of northerners, Canadians and the world community; we must reconcile competing cultural and economic interests. The challenge of protecting the environment so that it can continue to support economic growth, while sustaining the people and the diverse resources on which they depend, is shared by all circumpolar nations.

The Arctic Environmental Strategy

In the face of development pressures on the North as well as environmental stresses originating in the South, strong action is required. The federal government is committed to protecting the Arctic environment and ensuring sustainable use of its resources.

To pursue this commitment, the federal government will implement an Arctic Environmental Strategy, a plan to achieve sustainable development in the Canadian Arctic. This five-year initiative is being developed in partnership with northern governments, and will be discussed extensively with northern residents. Details of the Arctic Environmental Strategy will be contained in a companion document, which will be released in the next few weeks by the Minister of Indian Affairs and Northern Development.

The major elements of the Strategy are closely aligned with the priorities established by all Canadians during the *Green Plan* consultation process. They include dealing with Arctic contaminants, managing waste in the North, improving northern water quality, expanding research and information activities, integrating environmental and economic issues, and protecting Arctic ecosystems.

Contaminants

This element of the Strategy is designed to determine accurately the risks to the health of the Arctic ecosystem and residents posed by the long-range transport of persistent contaminants. The findings will facilitate the provision of sound advice to northerners (particularly native people who rely on country foods) concerning the risks of these contaminants in their diets. Further, it will lay the groundwork for Canada to pursue better controls on these substances in the international forum.

Canada will continue to work with circumpolar nations toward an Arctic Environmental Protection Strategy.

- Specific actions will include research on the sources, sinks, pathways and trends of contaminants, assessment of ecosystem effects, and evaluation of their risk to human health.
- Knowledge gained from this research will equip Canada to develop strategies for the international control of persistent contaminant emissions through the Convention on Long-Range Transboundary Air Pollution of the United Nations Economic Commission for Europe.
- Canada will continue to work with circumpolar nations toward an agreement on an Arctic Environmental Protection Strategy that will address, amongst other things, the accumulation of persistent contaminants.



Waste Clean-up and Management

Hazardous and non-hazardous wastes have accumulated at over 800 sites across the Arctic, and they pose a threat to health and the environment. To correct this situation, the federal government will:

- clean up all known hazardous wastes on Crown lands in the North;
- clean up all hazardous wastes at abandoned military sites;
- clean up all abandoned DEW Line sites across the North; and
- begin clean up of non-hazardous wastes near communities.

To involve northerners in the clean-up efforts, the Government will establish waste management plans that recognize the problem. Strategies for municipal, industrial and hazardous waste management will be developed in concert with territorial governments and the communities.

Water Quality and Quantity

The federal government will increase its capability to monitor and evaluate water quality in order to maintain the quality of water resources, and thereby to meet our commitments for the protection of northern aquatic ecosystems. The Government, in co-operation with the territorial governments, will undertake the following measures:

- It will develop and implement a comprehensive and systematic network of water quality stations throughout the North to provide baseline information required for analysis, prediction and assessment of potential development effects on northern ecosystems. This program is also critical for understanding the sources of contaminants to be found in northern ecosystems. In addition, specific monitoring programs will be established to determine how water use and developments affect specific areas.

- It will expand and modernize the network of water quantity monitoring stations in all major water basins. Also, snow and sediment monitoring programs for the Mackenzie River Basin will be developed and implemented to augment the water quantity network. The Government will obtain accurate and comprehensive information on the availability and distribution of water. This information will be used in water management decision-making about such matters as community flood protection, development impact assessment, hydro-electric development, and protection of wetlands and deltas.

- It will provide increased analytical and interpretation capabilities to support these programs.

Integrating Environment and Economy

The Government will assist communities in developing and implementing strategies to meet economic and environmental objectives and to achieve more direct participation by northerners in the management of natural resources. These strategies will build on successful pilot projects in Yukon and the Northwest Territories and will involve partnerships among the federal and territorial governments, non-governmental organizations, business and communities. The emphasis will be on:

- the development of, access to, and use of information bases that incorporate both scientific and traditional knowledge;



Beverly-Kaminuriak Caribou Management Board

Caribou are a valuable renewable resource for more than 10,000 people living in Canada's North. So in 1982, when it was found the animals were in decline, the Beverly-Kaminuriak Caribou Management Board was formed.

The Board, made up of representatives from government agencies, Indians and Inuit, studied how to remedy the situation. It gave advice on population levels for the herds and recommended ways of minimizing the effects of industrial development on the animals.

As a result, some 19,000 caribou, worth about $15 million, can now be harvested each year, and another $57 million comes from the outfitting of non-resident hunters. That's a lot of money! And, just as important, safeguarding these herds has made it possible for traditional users to maintain their lifestyle.

- environmental education;
- training for conservation area management and "ecotourism"; and
- development and introduction of appropriate technology.

V. Global Environmental Security

A. Global Warming: Action at Home and Abroad

Canada's Goal is to Stabilize National Emissions of CO_2 and Other Greenhouse Gases at 1990 Levels by the Year 2000.

Introduction

Over the past decade, the world has become increasingly aware that a growing human population and accelerating development are changing our global climate. Concern focuses on man-made emissions of so-called "greenhouse gases" which could lead to a significant warming of the earth's surface.

Our atmosphere is made up of several gases. About 99.9 per cent of it is a stable mix of nitrogen, oxygen and argon, and a variable amount of water vapour fluctuating naturally according to changes in temperature. The next most abundant gas is carbon dioxide, which is very important because it is one of the greenhouse gases. Others are methane, nitrous oxide, ground-level ozone and chlorofluorocarbons (CFCs).

In normal concentrations, the greenhouse gases are vital to our survival since they "trap" warmth released by the earth. Without the greenhouse effect, the earth's average surface temperature would drop 33 degrees Celsius, to about -18 degrees Celsius.

Usually, changes in the concentration of these greenhouse gases take place gradually; we know, for example, that their concentration was quite different during the so-called Ice Ages. Over the past 200 years, however, the concentrations have changed faster than at any other time in known history. In fact, emissions of greenhouse gases and their concentrations in the atmosphere have both increased dramatically. Half the carbon dioxide added to the atmosphere throughout human history has been emitted in just the past 30 years. Methane levels have doubled in the past 100 years. Concentrations of CFCs are doubling every 10 to 20 years and nitrous oxide emissions have been increasing significantly.



Concern about these changes led, in 1988, to the establishment of the Intergovernmental Panel on Climate Change (IPCC), under the auspices of the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP). The IPCC is a panel of international experts who examine worldwide scientific

research efforts on climate change, assess the potential impact of such change, and advise governments on possible response strategies.

In the autumn of 1990, the report of the Intergovernmental Panel concluded unequivocally that concentrations of greenhouse gases in the atmosphere are increasing rapidly. This increase will enhance the natural greenhouse effect of the earth's atmosphere and result in additional warming of the earth's surface.

There is consensus that the risks associated with inaction on greenhouse gas emissions are too great to wait.

The IPCC attributed these rising concentrations largely to the burning of fossil fuels (particularly for transportation), changing land use practices, and various industrial processes.

The IPCC predicted that, under its "reference" case, the average temperature of the earth will rise by about 0.3°C per decade over the next century—a rate of change significantly greater than those that occurred naturally on this planet over the last 10,000 years. As a result, the average temperature would be about 1°C warmer by 2025, and 3°C above the current level before the end of the next century.

In general, global warming could threaten coastal settlements all over the world, increase the intensity and frequency of severe weather conditions, produce more heat waves and droughts, and shift climate zones so rapidly that many plant and animal species could not adjust quickly enough to ensure their own survival.

Although scientists are in general agreement that climate change will occur and that it could have serious consequences, there are still many scientific and socio-economic uncertainties as to the extent and pace of change. However, there is consensus that the risks associated with inaction on greenhouse gas emissions are too great to wait upon the results of further research before tangible steps are taken to address the problem. This "precautionary principle" was expressed in the following statement from the Ministerial Declaration of the Second World Climate Conference held in November 1990 in Geneva:

> Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent such environmental degradation.

Global Warming and Cold Canada

Many Canadians might welcome an increase in temperature as an alternative to cold winters. However, the risks posed by an uncontrolled warming of the global climate are just as serious for our country as they are for the world as a whole.

Scientists predict that the temperature rise will not be steady and that there will be significant regional variation. For example, warming is likely to be much greater in polar regions, such as Canada's Arctic, during winter. Central North America's temperature increase will also be greater than the global mean, probably bringing in its wake less summer rainfall and reduced soil moisture. A general increase in global temperatures could cause a rise in sea levels of about six centimetres per decade.

Concentrations of greenhouse gases in the atmosphere are increasing rapidly.

Canadians could also be exposed to flooding in many communities on both of our coasts. For example, a one-metre rise in sea levels would affect more than 250 buildings in Charlottetown, Prince Edward Island, and would contaminate vital local groundwater supplies with sea water. Warmer temperatures would affect agricultural production across Canada. In the Arctic, a gradual thaw of the northern permafrost would produce a release of large amounts of methane from the decomposition of organic materials. This would contribute to further greenhouse warming effects.

In global terms, Canada is not a major contributor to climate change. We produce no more than two per cent of the world's CO_2, two per cent of nitrous oxide, one per cent of methane and two per cent of CFCs. This means Canada cannot deal with climate change alone and in isolation from the rest of the world. We must work globally towards a solution. At the same time, we should not allow our relatively small emissions to be an excuse for not taking action at home.

Impacts of Global Warming on Canada



1. *Warmer temperatures could cause changes in fish populations.*
2. *Changes in rainfall patterns could increase drought in the Prairies.*
3. *Water supplies in southern Canada could decline significantly.*
4. *Soil degradation and erosion of prairie land may increase due to moisture loss.*
5. *Great Lakes winter ice system may disappear.*
6. *Forest region could shift northward, with deciduous trees growing as far north as James Bay.*
7. *Many coastal areas could be flooded.*
8. *Inshore fisheries season could be extended.*
9. *Southern Ontario snow seasons could disappear.*

The Government of Canada believes that initial domestic action on climate change should not await the signature of an international convention.

Canada is an energy-intensive country for a variety of reasons, including our cold climate, dispersed population and resource-intensive economy. Because we use a relatively large amount of hydroelectric power and nuclear energy, we are a relatively low producer of CO_2 per unit of energy consumed. Despite that, the amount of energy we produce is high in comparison to our small population and economy. As a result, we rank high in per capita production of greenhouse gases and in emissions per unit of gross domestic product (GDP). Canada is second among industrialized nations in terms of CO_2 emissions per capita and sixth in terms of emissions per unit of GDP. We know there are many ways in which we could reduce emissions, particularly in areas such as energy efficiency and conservation.

Under the "business as usual" scenario, Canada could expect continued growth in greenhouse gas emissions through the 1990s, with CO_2 emissions rising at an average annual rate of 1.6 per cent over the years from 1990 to 2000. Under this scenario, total CO_2 emissions in 2000 would be 17 per cent *above* their 1990 level, primarily as a result of economic growth.

The National Action Strategy on Global Warming

Lasting solutions to the threat of climate change will take years to implement and will require co-ordinated international action.

However, the Government of Canada believes that initial domestic action on climate change should not await the signature of an international convention. Indeed, at last May's Bergen Conference of the United Nations Economic Commission for Europe, all countries represented agreed to establish national strategies and/or targets and schedules, no later than the start of negotiations on the convention, to limit or reduce carbon dioxide emissions and other greenhouse gas emissions as much as possible and to stabilize them.

More recently, at the Second World Climate Conference, ministers and other representatives from 137 countries and from the European Community agreed that the ultimate global objective should be to stabilize greenhouse gas concentrations at a level that would prevent dangerous human interference with the climate. As a first step, the need to stabilize emissions of greenhouse gases not controlled by the Montreal Protocol (such as CFCs) was stressed. Canada confirmed its commitment to this first step through a program to stabilize emissions of CO_2 and other greenhouse gases at 1990 levels by the year 2000. Canada has already pledged to eliminate controlled CFCs by 1997.

The Conference also urged developed countries, before the 1992 United Nations Conference on Environment and Development (UNCED), to analyze the feasibility of and options for a staged

approach for achieving reductions of all greenhouse gas emissions, including CO_2, methane and nitrous oxide, over the next two decades and beyond. The Government of Canada believes that further reductions in greenhouse gas emissions are required and that these should be based on a program of targets and schedules agreed upon internationally. In this context, the technical feasibility and the cost and trade implications of further reductions in emissions will be examined, including the 20-per-cent reduction in CO_2 emissions called for by the 1988 Toronto Conference.

Canada has stated consistently since 1988 that its diplomatic energy will be focused on achieving a global framework convention on climate change, to be signed in time for UNCED in 1992. This convention would seek an overall agreement of all nations to reduce effects on our global climate, along with appropriate protocols with binding commitments to specific actions needed to achieve the objectives of the convention.

At home, the Government of Canada has been working with its provincial partners to develop the National Action Strategy on Global Warming—a comprehensive framework for addressing the global warming issue within Canada.

The federal and provincial governments are considering a three-part approach to climate change issues, namely to:

- limit net emissions of greenhouse gases;



The 'Advanced House' - A Home To Warm Up To

Just because you look like everyone else doesn't mean you're the same. The Advanced House in Brampton, Ontario, fits right in with the rest of the homes in the subdivision – but it uses only a quarter of the energy of a conventionally built home!

Funded by Ontario Hydro and the governments of Ontario and Canada and building on the success of the R-2000 home program, the Fram Building Group constructed the house using energy-saving technologies. The home has a passive-solar sunroom; energy-efficient windows and lighting, appliances and fireplace; airtight construction; and extra insulation made from recycled newspapers. It also uses just one piece of equipment to replace the furnace, hot water tank, air-conditioner and ventilation system.

Building houses such as this brings benefits all round. The long-term economies in energy more than cover the extra construction costs, as well as easing the burden on heavily loaded hydro systems. And energy efficiency is much less harmful to the environment than adding new power-generating stations.

The federal Minister of Energy, Mines and Resources will table a National Energy Efficiency and Alternative Energy Act.

- help Canadians anticipate and prepare for the potential effects of any warming that might occur; and
- improve scientific understanding and increase predictive capability with respect to climate change.

Strategy No. 1: Limiting Net Emissions

Principles of Limitation Strategy

The National Action Strategy's approach to limiting emissions of greenhouse gases incorporates the following four principles:

- Canada will embrace a *comprehensive response* to climate change, addressing all major sources and kinds of greenhouse gases in addition to all potential new "sinks" for greenhouse gases, such as reforestation to increase Canada's absorption of CO_2.
- Canada will plan its domestic program taking into consideration the wider *international context*, and recognizing that the most cost-effective approach is international co-operation and co-ordination.
- Canada's response will emphasize *flexibility* in recognition of the fact that scientific and economic understanding of the problem is not yet complete and that, over time, we shall have to take into account new information and developments.
- Canada's strategy will give due recognition to the importance of *regional differences*.

Limiting Greenhouse Gases by Federal-Provincial Planning

Specific action programs to limit greenhouse gas emissions will be announced independently by the federal, provincial and territorial governments as they are developed. However, the federal government will seek to formalize these action programs by concluding bilateral agreements with the provinces and territories. Under these agreements, a comprehensive inventory and reporting system for the greenhouse gases (including CO_2 and methane) will be established. All agreements will be reviewed periodically as progress towards stabilization is assessed over time.

For its part, the measures the Government of Canada will put in place first are those that make economic sense in their own right (such as energy efficiency and tree planting) or that serve multiple policy objectives (such as elimination of CFCs). However, more far-reaching

initiatives, particularly changes in the way we use energy, will likely be required to achieve Canada's stabilization goal or go beyond it. Both the federal and provincial governments will begin discussions with Canadians on some of these additional measures as quickly as possible. It will be important to monitor and report on progress over time, especially on the evolution of energy demand, so that governments can consider the need for new or revised initiatives.

Limiting Greenhouse Gases by Improving Energy Efficiency

The consumption of fossil fuels is the primary source of CO_2 emissions and is an important source of some other greenhouse gases. In the short term, there is limited scope for substitution of alternatives to fossil fuels. The immediate emphasis, therefore, must be on improving energy efficiency across a broad spectrum of uses, from consumer products to buildings, transportation and our major industrial sectors.

The federal Minister of Energy, Mines and Resources will table a National Energy Efficiency and Alternative Energy Act dealing specifically with:

- regulation of minimum energy efficiency levels in energy-using equipment;
- labelling of products to convey information on energy use; and
- collection of statistics on energy use.

To improve energy efficiency in buildings and equipment in the short term, the federal Minister of Energy, Mines and Resources will undertake the following measures:

- Minimum energy efficiency standards will be developed for appliances and equipment, to remove the least energy-efficient from the marketplace.
- By 1992, Energuide labelling for home appliances will be enhanced to provide consumers with information on opportunities for financial and energy savings. The program will be expanded over later years to other appliances and products in consultation with provincial authorities, industry and other stakeholders.
- The 1983 federal Measures for Energy Conservation in New Buildings will be updated and regionalized, and their incorporation into more federal, provincial and municipal building codes will be encouraged. This program will include promoting the R-2000 energy-efficient standard in home construction and improving awareness of opportunities for energy efficiency in new and renovated buildings.

The Government of Canada believes that strategic and competitive economic advantages exist for nations capable of improving energy efficiency.

- Development and commercialization of promising technologies for energy-efficient buildings (for example, better windows, lighting and heating or cooling) will be enhanced.

To improve the energy efficiency of Canada's transportation system, the Minister of Energy, Mines and Resources will undertake measures to:

- initiate a further round of fuel efficiency targets for new vehicles;
- work with the provinces and municipalities to develop strategies for reducing CO_2 and other emissions from transportation; and
- develop educational packages for fleet managers and drivers.

The Government will seek industry's commitment to help achieve energy efficiency gains as well as to share information on new energy efficiency technologies and practices. Government-industry co-operation will take place on several fronts:

- The Minister of Energy, Mines and Resources will establish a National Advisory Council to promote industry-government co-operation and to establish energy efficiency targets for each of Canada's industrial sectors.



Agropur – Converting Waste into Energy

It seems a lot of people have been throwing away money. At least, that's what Quebec's Agropur Dairy discovered when it found its discarded waste could be converted into energy.

By installing two anaerobic wastewater treatment systems in 1986, Agropur was able to use waste from its milk products to make methane gas to power the factory machinery. The dairy now saves some $30,000 a year by not having to buy natural gas, a non-renewable resource. It also earns $10,000 a year from the sale of leftover sludge for use as an animal feed supplement.

But Agropur achieves its biggest savings by not having to dispose of these wastes at landfill sites. Dairies can pay as much as $700,000 a year for such facilities, and valuable land is taken out of use in the process. So Agropur's approach benefits both the company and the environment.

- Programs will be developed to train and certify energy efficiency managers in industrial firms as well as to identify and develop promising technologies specific to each industry sector.

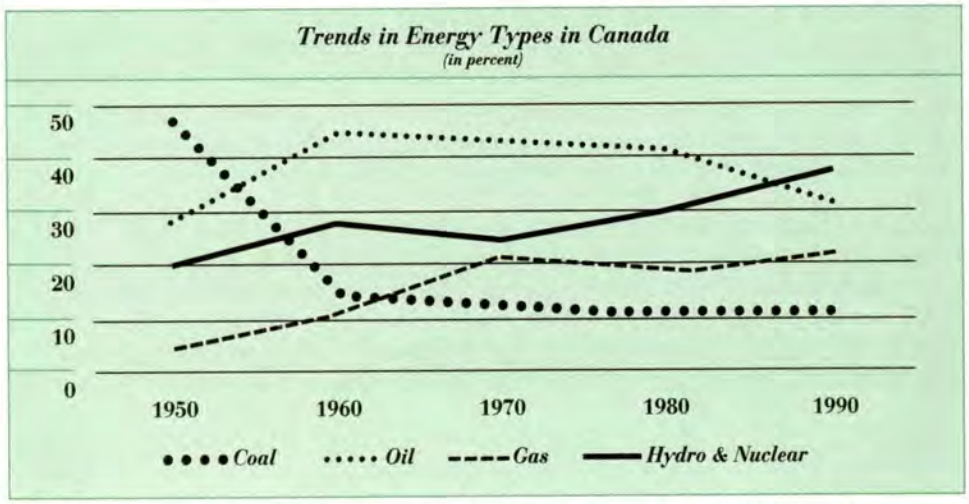
The Government of Canada believes that strategic and competitive economic advantages exist for nations capable of improving energy efficiency. Energy savings will help maintain Canadian competitiveness and support the development of new Canadian technologies and business opportunities. In short, improved energy efficiency is an opportunity as well as a challenge for Canada.

Limiting Greenhouse Gases by Promoting Alternative Energy

While energy efficiency measures are important in the short term, Canada's ability to meet its longer-term goal to reduce greenhouse gas emissions depends upon our ability to move to less carbon-intensive energy sources. Alternative transportation fuels from plentiful, diverse sources such as natural gas and biomass can have a major role to play in meeting these goals as well as improving urban air quality. Initiatives in this area will include:

- accelerated development and market penetration of alternative transportation fuels, including expansion of natural gas markets, increased availability of alternative fuel vehicles, and encouragement of ethanol and methanol as automotive fuels and fuel feedstocks, and support for research and development of alternative fuel sources such as hydrogen.

Renewable energy sources such as passive, active and photovoltaic solar energy options will be studied in co-operation with utilities and other industry partners, in particular with reference to use in northern



In the 50s, coal was a primary source of energy. This chart shows the changes in the types of energy used over the years.

and remote communities. Federal efforts will focus upon systems design and engineering as well as standard-setting and certification programs. Initiatives will include:

- enhanced research and development of alternative energy sources, including photovoltaics, fuel cells, landfill gas recovery, passive solar energy and other renewable energy technologies;
- cost-shared market assessments of non-fossil energy sources; and
- increased research, development and demonstration of advanced energy systems (e.g., combined cycle generation to improve the efficiency of coal-to-electricity conversion, co-generation or district energy systems).

Limiting Greenhouse Gases by Informing and Challenging Canadians

While the Government has identified a number of areas where there is room for improvement in energy efficiency, it does not claim to have all the answers. The Minister of Energy, Mines and Resources will therefore issue a challenge to Canadians to take advantage of all opportunities to save on energy consumption. Under this challenge program:

- agreements will be reached with major energy-using organizations in Canada on performance and/or prescriptive energy-saving initiatives they will undertake;



GO Transit

Commuting to work isn't something most people look forward to. But the Ontario government's GO Transit has made it much more pleasant for those in the Toronto area. Carrying about 110,000 passengers a day, this combination bus and rail system gets people to work fast while keeping cars off the highways.

Since it began in 1967, GO transit has come to be recognized as one of the finest commuter services in the world. Servicing an area of some 8,000 square kilometres, the transit system has greatly reduced the need for highway construction and repair, more than justifying its costs. Passenger drop-off areas called "Kiss and Ride" have been established and there are over 17,000 free parking spaces for those who wish to leave their cars and use the transit. Bi-level coaches have been introduced on many lines as the system continues to grow in popularity. People like taking it, and that means fewer cars on the roads, less gas used and cleaner air. Everyone wins!

- an annual report will be made to Parliament on progress in meeting energy efficiency objectives; and

- detailed information on Canadian energy consumption by end-use will be conveyed to the public.

An informed population is essential in addressing and adapting to climate change. Actions by individual Canadians are part of the problem and can be part of the solution. Therefore:

- The Government of Canada will launch a major public information campaign, beginning in 1991, in order to stress the importance of individual action and to put Canadians in a position to make more informed decisions.

In 1991, the Government of Canada will launch a community tree-planting program.

Limiting Greenhouse Gases through Tree Planting

Canada's forests can make an enhanced contribution to global warming solutions. Trees are an important storehouse or "sink" for carbon and, therefore, are a vital part of our strategy for dealing with the most pervasive greenhouse gas, carbon dioxide. One hectare of forest can absorb and store between 150 and 300 tonnes of carbon. In addition, in urban areas, trees can lower peak energy demands by 20 to 40 per cent simply by providing shade and windbreaks.

- In 1991, the Government of Canada will work co-operatively to launch a community tree-planting program. This program will encourage activities by individuals and organizations, and will greatly accelerate the already significant momentum towards tree planting and reforestation in Canada. The goal of this program is to encourage the planting of up to 325 million trees in rural areas as well as in and around 6,000 cities, towns and communities across Canada. Our success over the next five years could mean the planting of 325,000 hectares of forest. This would help us to reduce CO_2 levels by the year 2000.

Limiting Greenhouse Gases in Agriculture

The Government will pursue co-operative actions with the provinces and farmers to limit greenhouse gas emissions from the agricultural sector.

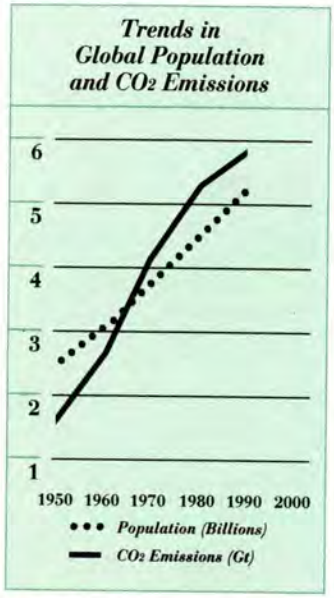
- One example of this action is an initiative to encourage a reduction in cultivated summerfallow acreage. Stabilizing and increasing the organic content of soil will have a beneficial impact in terms of reducing carbon dioxide levels in the atmosphere.

Limiting Other Gases: CFCs and Ground-Level Ozone

Perhaps the most potent greenhouse gases on a molecule-by-molecule basis are CFCs—chemicals that have been used extensively as cooling agents, solvents, sterilants, and foam blowing agents. CFCs have also been identified as the main man-made substances responsible for the depletion of the stratospheric ozone layer. The federal government is taking steps to eliminate new production and consumption of CFCs completely by 1997.

The IPCC has noted evidence that ground-level ozone, a main constituent of urban smog, is also a greenhouse gas, even though its contribution to climate change is difficult to quantify. Canada and the provinces are acting to reduce the amount of ground-level ozone in our country. In addition to limiting global warming, reductions in this gas will have important benefits for the health of Canadians and their environment.

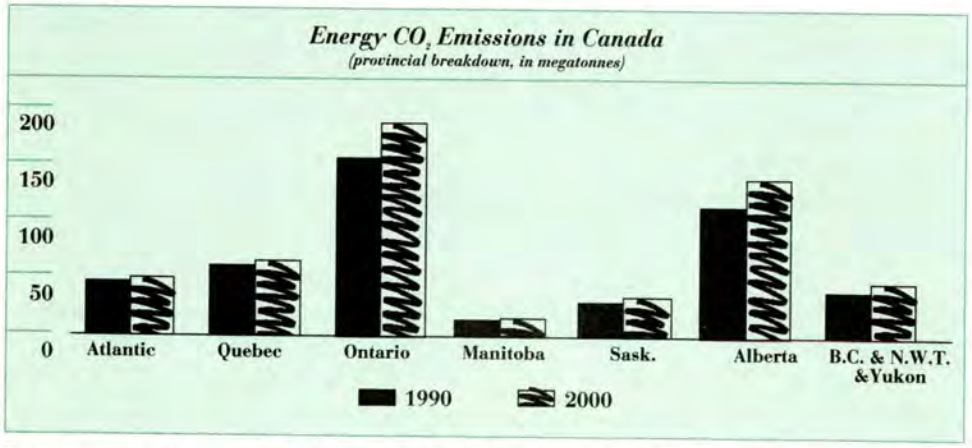
Measures to reduce both CFCs and ground-level ozone are detailed elsewhere in *The Green Plan*.



As the global population grows, more energy is used, causing more CO_2 to be released into the atmosphere.

Limiting Greenhouse Gases — Beyond the First Steps

In terms of meeting Canada's goal of stabilizing greenhouse gas emissions at 1990 levels, the measures outlined here will have varying effects. Clearly, control measures will eliminate the production and new consumption of CFCs by 1997, thereby reducing emissions to below current levels by 2000. Significant reductions in ground-level ozone should also be achieved by 2000 through the smog control program. While the initiatives dealing with methane and nitrous oxide are expected to have a significant impact on emissions, it is not yet possible to quantify that impact.



Forcast emissions do not include the positive effects of the initiatives in The National Action Strategy on Global Warming.

As for carbon dioxide emissions, the measures outlined on the previous pages are, of themselves, unlikely to realize Canada's stabilization target. However, these initiatives will lay the foundation for achieving this objective. In addition, no account has been taken of new initiatives that may be introduced by the provinces and territories under the National Action Strategy.

Canada cannot afford to sit still and simply hope that climate change does not occur.

Evidence suggests that there is considerable untapped potential for energy efficiency improvements in the Canadian economy. In this respect, the energy challenge program, through the important contribution of all our partners in this effort, will build on the initial foundation by helping to identify and implement further improvements. Ongoing monitoring, feedback and assessments will lead to a continuing adjustment and possible expansion of programs to ensure that our objectives are met.

Although the preceding measures will reduce emissions, continuing reassessment is required for stabilization to be assured. The Government of Canada and its partners will commence examination and preparation of additional measures that would yield more far-reaching changes in the way Canadians use energy. For its part, the Government of Canada will:

- release a discussion paper in the spring of 1991 on the use of economic instruments to achieve environmental objectives, including analysis of taxes and the possible use of an emissions trading system in attaining reductions in greenhouse gas emissions; and
- establish an inquiry into the environmental impact of electrical generation options.

The Government of Canada believes that the provinces and municipalities should give serious consideration to other possible measures, including more aggressive demand-side management on the part of electrical utilities, changes in electrical utility pricing and regulatory structures, and systemic changes in urban centres to reduce greenhouse gas emissions (for example, increased public transit and improved traffic flows).

Strategy No. 2: Anticipating and Preparing for Global Warming

Canada's National Action Strategy on Global Warming recognizes that, regardless of the effectiveness of greenhouse gas limitation programs, scientific evidence shows that some degree of change is now likely.

Canada cannot afford to sit still and simply hope that climate change does not occur. Planning must take place now. The Govern-

ment of Canada will identify those areas that are at risk and will provide Canadians with a wide range of new information on effects and mitigation. Federal government efforts will include:

- by 1994, adopting guidelines to ensure that the potential changes in the Canadian environment as a result of climate change are considered in major projects;
- by 1996, assessing the socio-economic repercussions of climate change on the Great Lakes and St. Lawrence River Basin, the Prairies and the MacKenzie Basin; and
- by 1996, assessing policy changes that might be needed to deal with rising sea levels along both the east and west coasts of Canada.

Canada has been a world leader in research and modelling with respect to climate change.

Strategy No. 3: Improving Our Understanding of Global Warming

Canada has been a world leader in research and modelling with respect to climate change. The Canadian global circulation model is considered among the world's best. Data produced by this model were instrumental in helping achieve international consensus at the Bergen Conference on the need to stabilize CO_2 and other greenhouse gas emissions at 1990 levels by the year 2000 as a "first step".

Through the National Action Strategy on Global Warming, as well as through *The Green Plan*, the Government of Canada will significantly increase its commitment to scientific research on climate change. The goal of Canada's research effort is significant improvement by 1994 in our understanding of the rate of climate change and, by 1995, in our understanding of the distribution of regional repercussions.

The research effort will include more sophisticated climate modelling and monitoring, development of a network of private-sector and university labs, and active participation in international research programs. Additional emphasis will be placed on improving our ability to detect climate change and research into the relationship between oceans and climate change, and the impact of agricultural practices on climate.

Specific elements of the program will include:

- annual reports on the state of the Canadian climate, beginning in 1991;
- a climate change detection network consisting of stations operated by volunteers across all of Canada's climate zones, to be completely in place by 1996; and

a national program, by 1992, for ocean research related to climate.

Stimulating International Action on Global Warming Solutions

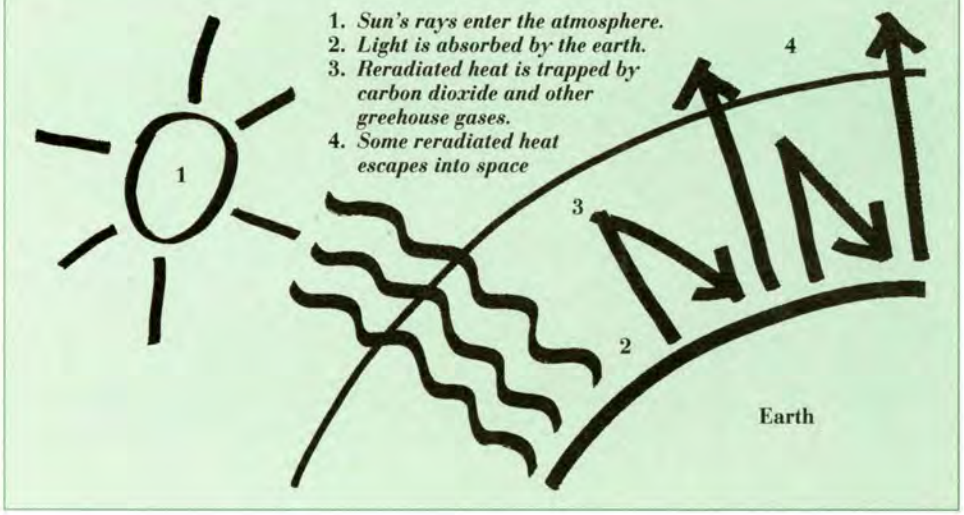
Canada will work to address the special concerns of developing countries.

Canada is committed to full implementation of the National Action Strategy. However, Canada also recognizes that the only effective solutions entail global action. Accordingly, Canada is also vigorously promoting the development of the required international agreements to co-ordinate climate change strategies in developed and developing countries alike.

Canada will aggressively pursue an International Framework Convention on Climate Change and development of any necessary protocols. The Government will also press for the conclusion of negotiations on the Framework Convention and appropriate binding protocols by 1992. In pursuing the Convention, Canada will be seeking a comprehensive international agreement on targets and schedules for the reduction of CO_2 and other greenhouse gas emissions.

Canada will also seek to ensure that the Framework Convention includes provision for enhanced co-operation on international climate change science.

The Greenhouse Effect



The Government recognizes that the proposed International Framework Convention can be successful only if it has widespread support. Canada will therefore encourage the widest possible participation of the world's countries in the negotiations.



In particular, Canada will work to address the special concerns of developing countries so that they can participate fully. To this end, Canada has committed $1 million at the recent Second World Climate Conference in Geneva.



Canada will pursue bilateral diplomacy to encourage other countries to abide by essential international agreements.



Canada will seek enhanced international co-operation in the development and commercialization of technologies that reduce greenhouse gas emissions.

B. Ozone Depletion: Accelerating Control Measures

Canada's Goal is to Phase Out the Use of CFCs by 1997 and the Use of Methyl Chloroform and Other Major Ozone-Depleting Substances by the Year 2000.

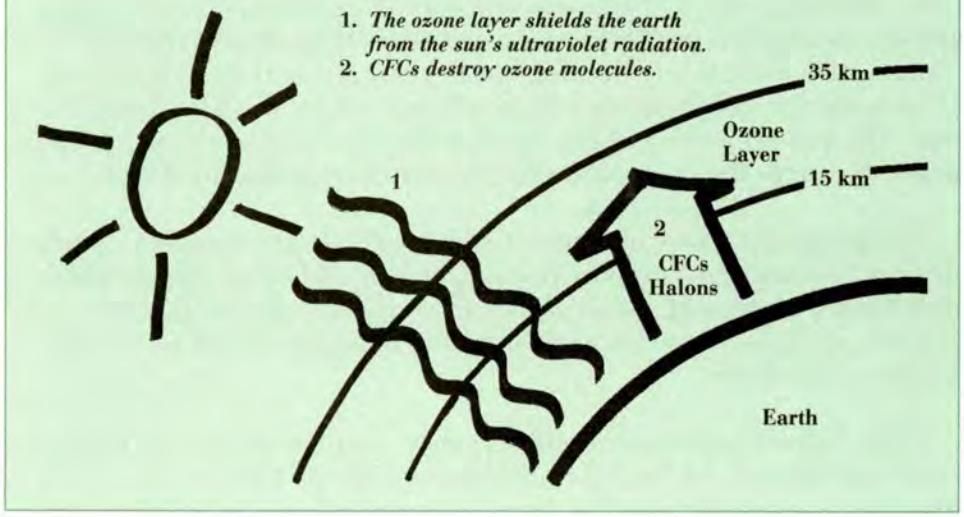
Introduction

The ozone layer is a thin protective covering located in the stratosphere between 15 and 40 kilometres above the earth. This naturally produced chemical layer acts as a barrier against the sun's ultraviolet radiation, which is harmful to the natural environment and to human health. Ultraviolet radiation is known to cause skin cancer, reduce crop yields and kill the phytoplankton that are at the base of the marine food chain. Protecting the ozone layer is therefore necessary to safeguard the health of all Canadians and the entire ecosystem upon which we rely for our existence.

Protecting the ozone layer is necessary to safeguard the health of all Canadians and the entire ecosystem upon which we rely for our existence.

Emissions of chlorofluorocarbons (CFCs) and other chemicals are now depleting the ozone layer. Although only very minor fluctuations have been detected over populated regions of the world, ozone loss of more than 50 per cent has been discovered over the Antarctic, and reductions approaching five per cent have been occurring over the Canadian Arctic.

CFCs and the Ozone Layer



At the London Conference in June 1990, Canada was the first nation to ratify a strengthened protocol.

Over the past 50 years, CFCs have been employed in a wide variety of applications, including refrigeration and air conditioning, cleaning, foam production and aerosol propellants. There has also been a significant increase in the use of halons, another group of major ozone-depleting substances employed in fire extinguishers. Once released into the air, these substances slowly rise into the stratosphere, where they attack the ozone layer. These same chemicals also act as powerful greenhouse gases.

Canada has been at the forefront of international efforts to control ozone-depleting substances. Canada played a key part in the development of the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, and was among the first countries to sign the protocol. Domestic controls are already in place to ensure that Canada meets its obligation under the protocol to reduce the use of ozone-depleting substances by at least 50 per cent of 1986 levels by 1999. Canada has already made considerable progress towards this goal, reducing CFC consumption by 19 per cent between July 1989 and June 1990.

At the London Conference in June 1990, Canada was the first nation to ratify a strengthened protocol calling for the phase-out of CFCs by 2000 and of other major ozone-depleting substances by 2005. Canada announced, however, that it would adopt a faster schedule for eliminating CFCs and other ozone-depleting substances.

CFC Use in Canada



A. foam.....44%
B. refrigeration and air conditioners..... 34%
C. miscellaneous.....11%
D. solvents..... 11%

Accelerating Controls and Other Measures

Canada will accelerate its commitments under the Montreal Protocol, as amended in London, by phasing out CFCs completely by 1997. By 1992, the Government will publish regulations to eliminate specific uses before the 1997 phase-out date, thus demonstrating Canada's leadership role through tough domestic actions. The use of CFCs in car air conditioners will be phased out by the 1995 model-year. The Government will also work with provincial and local governments to ensure the harmonization of control programs by 1992.

In particular, the Government will accelerate the domestic regulatory control program, support recovery and recycling of ozone-depleting substances, strengthen its ability to verify the effectiveness of controls, and provide more assistance for international efforts to protect the ozone layer.

The federal government will seriously consider the use of market-based instruments, including tradeable permits for CFCs and product taxes on ozone-depleting substances, as mechanisms for meeting our targets in a cost-effective manner.

Recovery and Recycling

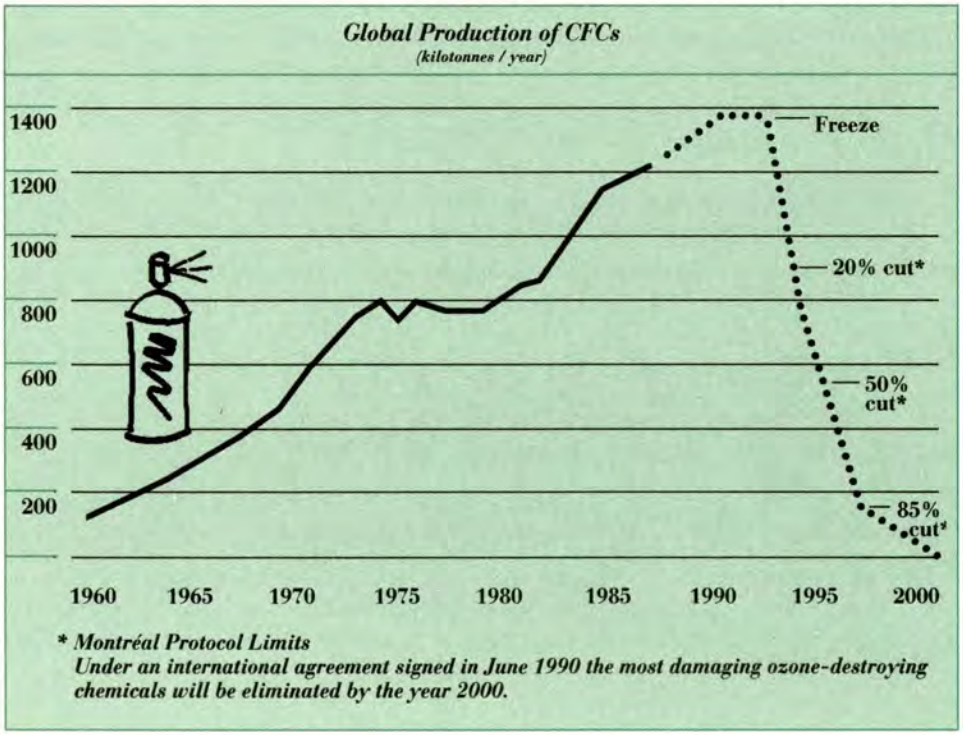
There is significant short-term potential for reducing emissions of ozone-depleting substances, particularly CFCs, through recovery and recycling. Moreover, recycling may be needed to mitigate shortages of CFCs over the next few years. Industry is beginning to invest in CFC-recovery programs but these efforts need to be expanded and given broader support to ensure their success. Therefore:

A new federal program will be established in co-operation with the provinces to promote the conservation, recovery and recycling of CFCs, halons and other major ozone-depleting substances.

Montreal has been chosen as the location for the United Nations secretariat.

Verifying Effectiveness

While there is no doubt that ozone depletion is caused by CFCs, continuing research efforts are needed to verify the effectiveness of control strategies. For example, prediction of future ozone depletion is extremely uncertain. Our understanding of the human and environmental health implications of increased radiation levels is also poor. Research is needed to determine the adequacy of the current phase-out targets and schedules, and the measures to be taken with regard to the use of HCFCs, which are currently being promoted as substitutes for CFCs.



** Montréal Protocol Limits*
Under an international agreement signed in June 1990 the most damaging ozone-destroying chemicals will be eliminated by the year 2000.

To meet these needs, the Government will strengthen its support of domestic and international scientific efforts on stratospheric ozone. Programs will focus on increased monitoring, improved data analysis and ozone chemistry research. As part of this effort, the Government will:

- in 1992, establish an Arctic observatory for research and monitoring of the Arctic stratosphere as Canada's contribution to a series of such observatories in the Arctic nations;
- by 1992, augment the Canadian Ozone Monitoring Program to determine the effects of ozone depletion on people in all parts of the country;
- by 1993, provide warnings of ultraviolet radiation levels for major cities across Canada so that the public can guard itself against excessive exposure to direct sun; and
- by 1993, participate in and support joint research programs with the United States, the Soviet Union, Japan and Europe to ensure that global solutions to the ozone depletion problem are developed.

International Assistance

At present, the developing countries account for only a very small percentage of the total world use of CFCs. Increasingly, however, these nations are looking to chemicals like CFCs to assist them in improving living standards for their people. Many developing countries do not have the technical or financial resources to use the more expensive—but less damaging—substitutes, such as HCFCs.

The Effects of Ozone Destruction

Depleted ozone layer absorbs less of sun's ultra-violet light allowing more to reach the earth's surface.



Changes in the earth's climate.

Destruction of cells and micro-organisms in animals and plants.

Efficiency of earth's natural water purification is reduced.

Reduced yields and possible genetic changes in plants.

Skin cancer increased. Possible DNA damage causing mutation and birth defects.

Photosynthesis reduced in plankton-the basis of the ocean's food chain.

At the London conference in June 1990, developed countries agreed to establish a US$240-million Montreal Protocol Multilateral Fund to assist developing countries in meeting the targets set out in the amended Montreal Protocol. The fund will help identify and assess the scientific and technical requirements of developing nations, facilitate technical assistance and technology transfer, and provide training and information. Canada will contribute up to $15 million to the fund over the next three years. Montreal has been chosen as the location for the United Nations secretariat that will manage the fund.

C. Acid Rain: Building on Success

Canada will Cap Acid-Rain-Related Emissions in Eastern Canada Beyond 1994 through Extended Federal-Provincial Acid Rain Control Agreements. In Addition, It will Expand the Control Program to Establish a National Emission Cap for the Year 2000.

Over 80 per cent of Canadians live in areas with high levels of acid-rain-related pollution.

Introduction

Acid rain is an environmental concern familiar to many Canadians. It is caused by emissions of sulphur dioxide (SO_2) and nitrogen oxides (NO_x). These pollutants originate from coal-burning electric power utilities, base-metal smelting, and vehicles and fuel combustion on both sides of the Canada-U.S. border. Once released into the atmosphere, the emissions are carried long distances by prevailing winds and return to earth as acid rain, snow, fog or dust. When the environment cannot neutralize the acid being deposited, damage occurs.

Acid rain threatens important economic sectors in some regions, including forestry, tourism and agriculture in eastern Canada, with total damage estimated at about $1 billion annually. It is responsible for major damage to lakes and fish populations, with over 150,000 lakes already suffering from acid damage and more than 14,000 considered "dead". More than 15 million hectares of forests receive high levels of acid rain, and it is widely considered to be the cause of extensive damage to materials, historic buildings and monuments.

Over 80 per cent of Canadians live in areas with high levels of acid-rain-related pollution. There is evidence that acid air pollutants are contributing to respiratory problems in children and other susceptible groups. In addition, acid rain can increase the levels of toxic materials such as aluminum, copper and mercury in untreated water supplies.



More than half of the acid deposition in eastern Canada originates in the United States. Both Canadian and U.S. emission reductions are essential to solve the problem.

In 1985, the federal government announced a comprehensive program, the Canadian Acid Rain Control Program, to cut Canada's acid

rain emissions. Under co-operative agreements with the seven easternmost provinces and industry, measures have been implemented to reduce sulphur dioxide emissions by 1994 to levels that will be 50 per cent of 1980 emission levels.

All evidence indicates that Canadian and U.S. acid rain control programs will solve Canada's acid rain problem.

The Canadian Acid Rain Control Program is a model of federal-provincial-industrial co-operation. Under this remarkably successful program, each of the seven easternmost provinces is implementing an abatement program, with targets and schedules to achieve its commitments. The federal government funded a cost-shared program for technology development and demonstration, and assisted companies in implementing specific pollution-abatement measures.

As a result of these efforts, sulphur dioxide emissions from sources in eastern Canada have already been reduced by 40 per cent, and the 1994 targets will be achieved.

For a decade, Canada has been pressing the United States to implement a comprehensive acid rain control program and to negotiate a bilateral agreement. These efforts have paid off. The U.S. Congress recently legislated a 10-million-ton reduction in U.S. SO_2 emissions and has permanently capped these emissions at the reduced level. By the year 2000, the program will reduce the transboundary flow of acid rain into eastern Canada by more than 50 per cent.

All evidence indicates that Canadian and U.S. acid rain control programs will solve Canada's acid rain problem. What remains to be done is to make the solution permanent and to verify that it is adequate.

Expanding Acid Rain Controls

During the *Green Plan* consultation process, Canadians expressed a need to cap emissions permanently in eastern Canada. They also wished to avoid potential problems in western Canada, and called for emissions to be capped permanently at an appropriate level. They also called for easily understandable progress reports on Canada's current control program, and proposed examining the use of economic instruments either to reduce further or to maintain the 1994 target levels.

As a result, the federal government will work with the provinces to develop a permanent acid rain control strategy.



Agreements will be re-negotiated in 1991 with the eastern provinces to cap sulphur dioxide emissions permanently at their reduced 1994 levels until the year 2000.

By 1994, agreements will be negotiated with all provinces to permanently cap national sulphur dioxide emissions at no more than 3.2 million tonnes by the year 2000.

Beginning in 1991, the federal government will provide regular progress reports on the extended and expanded Canadian Acid Rain Control Program.

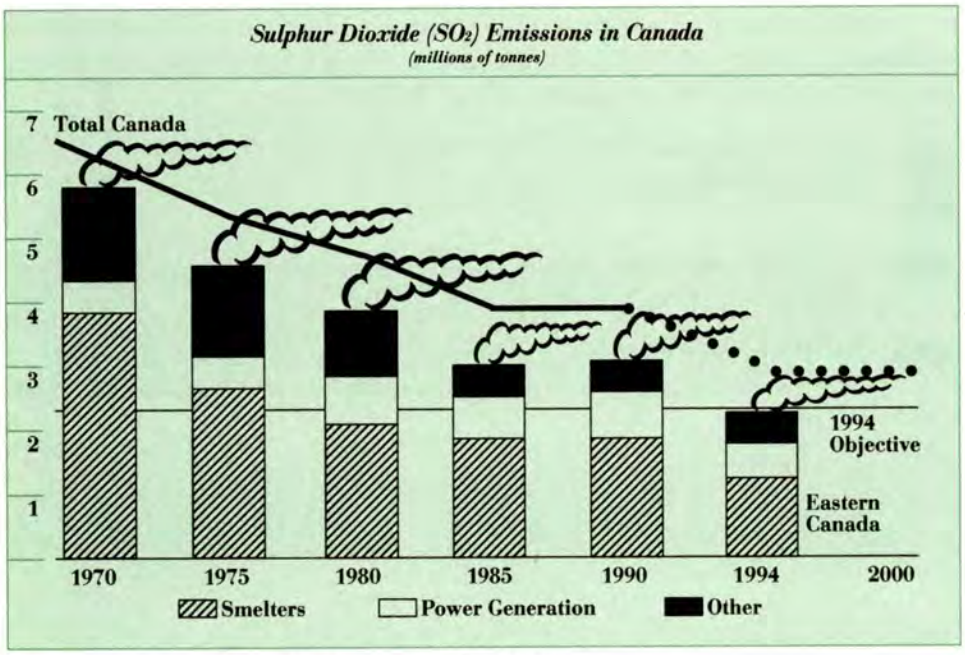
In addition, the Government will determine with the provinces the feasibility of using emission trading as a means of controlling emissions in both eastern and western Canada in a more cost-effective manner.

The control of nitrogen oxides will also be tightened as part of a federal-provincial NO_x/VOCs management plan, which was developed over the past two years in wide consultation with stakeholders (see Chapter I-D).

Canada will conclude a Transboundary Air Quality Agreement with the United States as quickly as possible.

International Agreements

A Canada-U.S. agreement is required to ensure continued protection from acid rain and to provide the means for dealing with other transboundary air pollutants. Formal negotiations on such an agreement began in the summer of 1990.



Canadian efforts are reducing SO_2, a major cause of acid rain.

Canada will conclude a Transboundary Air Quality Agreement with the United States as quickly as possible. The agreement will, among other things, formalize each country's commitments to controlling pollutants causing acid rain, and will provide a framework for developing control programs to deal with other transboundary pollution problems such as urban smog and airborne toxics.

Recognizing that acid rain is also a problem in other areas of the world, Canada actively supports the work of the United Nations Economic Commission for Europe. Canada was a leader in the negotiation, under the Economic Commission for Europe, of the 1985 Helsinki Protocol to control the transboundary flow of sulphur dioxide.

By 1992, Canada will press for re-negotiation of the Helsinki Protocol under the United Nations Economic Commission for Europe.

Verifying Progress

Environmental conditions must be monitored to verify the effectiveness of the Canadian and U.S. acid rain control measures, particularly those relating to human health and forestry.

The federal government will continue its acid rain research and monitoring efforts to verify the adequacy of both Canadian and American acid rain control programs. These will include:

determining the rate and extent of lake and river recovery from acid rain damage;

by 1994, reporting on the causes of forest decline and whether further emission reductions are needed; and

by 1996, reporting on the human health effects of acid-rain-related pollutants, and on the need for further emission control actions.

D. Accelerating International Progress on the Environment

A Cornerstone of Canada's Foreign Policy Will Be to Accelerate Global Co-Operation, Understanding and Progress on Environmental Issues.

Introduction

Environmental problems have no respect for national boundaries. The increased prominence of regional and global environmental issues makes it imperative for Canadians to strengthen international co-operation and to forge new international partnerships—bilateral and multilateral—so that those issues can be addressed effectively. Global warming, ozone depletion and acid rain are three issues that demonstrate the importance of co-operative action at the international level. Indeed, finding lasting solutions to the increasing scope and complexity of environmental issues will demand greater international co-operation than ever before.

The global environment is a shared resource and all countries must be partners in the solution to world environmental problems.

Canada's environmental foreign policy is based on the recognition that the global environment is a shared resource and that all countries must be partners in the solution to world environmental problems. At the same time, Canada and other industrial countries must be prepared to live up to their responsibilities as privileged members of the international community. We must recognize that to exert influence and act on the international stage, we must have our own environmental house in order: that is, we must practise at home what we advocate abroad.

The Government of Canada will play its full part in efforts to accelerate progress on the international environmental agenda. We will continue to seek early agreement on the international accords necessary to protect the atmosphere, the oceans and the world's plant and animal life. We will increase our support for essential international organizations. We will increase our efforts to help developing countries gain access to the latest skills and technologies so that they can make the transition to sustainable development. And we will improve and formalize bilateral partnerships with our neighbours and allies who have common environmental concerns, particularly the United States.

Strengthening International Institutions

International law and environmental institutions need to be strengthened in order to meet the unprecedented demands posed by global environmental challenges. Many international environmental institutions were established at a time when no one foresaw the kinds of demands that are now being placed upon these organizations. They require additional support from all countries to be effective agents of environmental change.

To meet this need, over the next five years Canada will increase its funding of key international environmental institutions such as those listed below.

- The United Nations Environment Programme (UNEP) is the principle environmental agency within the United Nations. It promotes international co-operation in matters related to the environment, and plays a catalytic role in advancing environmental considerations within the UN. Present priority issues for UNEP are climate change, ozone depletion, hazardous waste management, biodiversity, and desertification and deforestation.

- The World Meteorological Organization (WMO) facilitates worldwide co-operation on meteorology and climatology services. Canada is pressing for a re-orientation of the organization towards broader atmospheric issues such as climate change and the changing chemistry of the atmosphere.

- The International Union for Conservation of Nature and Natural Resources (IUCN) promotes co-operation on the conservation, protection and proper management of nature. The IUCN has been particularly active in devising measures to ensure that species of fauna and flora do not become endangered or extinct. The IUCN provides expert advice on the implementation of the Convention on International Trade in Endangered Species and has been central to the preparations for a biodiversity convention. The IUCN is also active in preserving tropical rain forests.

- Other important international organizations include the UNESCO World Heritage Committee, and the International Maritime Organization. Additional support for these institutions, among others, will help maintain world cultural and natural heritage sites, preserve wildlife, and protect the marine environment.

Advancing International Law

An important body of international environmental law has been developed on a wide range of global and regional issues. Canada has played a key part in negotiating international conventions and protocols to protect the oceans and the ozone layer as well as to control acid rain, international movements of hazardous wastes and trafficking in endangered species.

Canada has played a key part in negotiating international conventions and protocols.

Further efforts are needed to strengthen international law on other environmental issues, including climate change, biodiversity, forests, transboundary repercussions of environmental accidents and pollution of the Arctic. New approaches may also be needed to deal with the complex nature and global scope of these issues and others that may arise in the future. Canada will work with its international partners to establish strong and effective international laws for the protection of the global environment.

1992 United Nations Conference on Environment and Development

The United Nations Conference on Environment and Development will very likely be the most significant international conference on environmental issues in many years. The conference will mark the 20th anniversary of the historic Stockholm Conference, which represented a pioneering effort in the development of a global environmental outlook. The conference will consider new directions for national action and international co-operation on sustainable development issues. Agreements on climate change, forests and biodiversity will be priorities, with preparatory meetings already under way.

The conference will be hosted by Brazil from June 1 to 12, 1992, and will be attended by heads of government from around the world. Private-sector and non-government organizations will also play an important role in the conference. Maurice Strong, a Canadian and the first executive director of the UN Environment Programme, has been appointed Secretary General of the conference.



Canada will establish a national secretariat to assist the participation of Canadians in the conference. Consultations will take place with governments, industry, non-government organizations women's groups and other stakeholders.



Canadian youth organizations have been asked by the UN to organize the participation of international youth organizations. The federal government will support these efforts.

Canada will also provide funding to the Secretary General for studies needed to define the issues to be discussed by the conference and for assistance to delegates from developing countries.

Developing countries require new, additional financial and technological assistance.

Building International Partnerships

Canada's international environmental activity cannot stop with support for international institutions, legal agreements and conferences. We must also strengthen our multilateral and bilateral environmental partnerships. In particular, Canada must give special recognition to the environmental needs of developing countries.

One of the greatest challenges to resolving global environmental problems will be the need to help developing countries follow environmentally sustainable development paths. Canada believes that industrialized countries must accept a special responsibility in this regard. Developing countries require new, additional financial and technological assistance to participate fully in the resolution of global environmental problems and the implementation of international agreements. Such assistance must be flexible and give due recognition to the differences in social and economic conditions between developed and developing countries.

A prime example of the type of international co-operation that is possible is the Multilateral Fund established under the Montreal Protocol—the mechanism that has been established to help developing countries in tackling ozone depletion through technology transfer and financial assistance. Canada's contribution to the fund has already been approved. The United Nations has announced that Montreal will be the headquarters for the UN secretariat managing the fund. Canada will support the creation of similar initiatives, and related funding arrangements will be established under future international environmental agreements.

In anticipation of these agreements, Canada will undertake a number of demonstration projects to transfer Canadian expertise to other countries, particularly in areas related to climate change, forest management and biodiversity. The Government will work with other sectors domestically and other international partners to complement its own contribution.

Canada is also promoting international partnerships through the International Institute for Sustainable Development, located in Winnipeg. In addition to the $5-million federal commitment to start-up funding, core funding will be provided by the federal government and the Government of Manitoba over the next five years. The primary focus of the Institute will be international. It will promote the integration of sustainable development into decision-making processes

through better education, information, scientific research and technology transfer.

Canada is also a founding member of the Regional Environmental Centre for Central and Eastern Europe. This Budapest-based centre was launched to assist individuals and public and private organizations in Eastern Europe to mitigate environmental damage and promote environmental protection. The centre will collect and disseminate environmental information, promote the development of the institutional framework required to deal with environmental problems, support environmental education and provide technical assistance.

Canada will continue to play an active role in the Organization for Economic Co-operation and Development (OECD) and the Economic Commission for Europe (ECE). Both institutions have contributed significantly in the past to international co-operation on the environment and to strengthening international environmental law. Canada has also promoted environmental co-operation among the thirty-five member states of the Conference on Security and Co-operation in Europe (CSCE) and will build on these efforts to strengthen the links between North America and Europe in the environmental field.

Canada recognizes that in the Third World, development and the environment are closely linked, with profound implications for the daily lives of millions. Poverty contributes to much of the environmental degradation now taking place in developing countries. This ecological destruction, in turn, often further deepens poverty.

Through the Canadian International Development Agency (CIDA), Canada has established sustainable development as a priority. In support of this philosophy, CIDA screens every project for its environmental repercussions. Increasing priority is being given to projects designed to improve or restore the environment. CIDA is also helping to strengthen environmental institutions in developing countries, to improve information and to increase environmental awareness. Of particular importance are measures to promote environmentally sustainable population growth.

From Globe '90 to Globe '92

The first Globe '90 conference was a great success domestically and internationally. More than 3,000 delegates from over 70 countries attended, including representatives of industry, governments, environmental groups and international environmental organizations. At the associated trade fair, nearly 400 Canadian companies and 200 firms from about 20 other countries exhibited environmental products, services and technologies.

The Government of Canada will continue to sponsor the "Globe" series of integrated environmental conferences and trade fairs, which will take place in Vancouver every two years. The emphasis of the 1992 conferences will be on practical solutions to environmental challenges and the business opportunities they represent.

Science needs to serve and inform us, rather than merely providing us with more material possessions.

Thames Region Ecological Association, London, Ontario, Green Plan Consultations

Bilateral Relationships

Canada will work to develop stronger bilateral relations on environmental issues. Through these bilateral partnerships, Canada pursues the protection of our environment and global resources, and the exchange of knowledge and commercial opportunities.

Geography necessitates that our most important bilateral environmental relationship is with the United States. In many ways, this relationship is a model to the world. Canada and the United States have put in place, over the past century, institutions and mechanisms to manage our environmental relationship and minimize the environmental repercussions of our actions on each other. Joint efforts at dealing with common resource management and environmental problems must continue, and *The Green Plan* sets out a number of specific bilateral initiatives that will be pursued by the two countries in such areas as transboundary air quality and Great Lakes pollution prevention.

However, the United States is not our only bilateral partner. Canada has complemented its active participation in multilateral institutions by developing co-operative relationships on the environment with other nations on a one-to-one basis. These bilateral partnerships are increasingly important and must be strengthened.

Canada has a long history of co-operation with countries with whom it shares resources such as migratory species. There have also been many successful ventures in exchanges on science and technology. Canada currently has bilateral environmental co-operation agreements with the Soviet Union, Mexico, Germany and the Netherlands.

Canada's new commitment to strengthen bilateral co-operation will include efforts to promote conservation, trade in environmental products and services and, where appropriate, the transfer of technology. Special consideration will be accorded to developing countries and the countries of eastern and central Europe.

With the United States and Mexico, Canada will also explore ways to strengthen co-operation on continental environmental issues such as long-range transboundary air pollution, toxic chemicals and migratory birds and mammals. New institutional arrangements to support this co-operation will be studied.

VI. Environmentally Responsible Decision-Making

A. Partnerships Equal Solutions

Canada's Goal Is to Strengthen Existing Environmental Partnerships within Canada While Also Building New Ones.

No single individual, group or government can meet Canada's environmental challenges by acting alone.

Introduction

The environment is everyone's responsibility. But that responsibility can only be met through co-operative efforts at all levels of society. No single individual, group or government can meet Canada's environmental challenges by acting alone, just as no nation acting alone can solve the planet's problems.

Overall, new domestic partnerships will play a critical role in shaping Canada's response to environmental issues. The recently established provincial and national Round Tables on Environment and Economy represent important mechanisms for developing partnerships. They bring together decision-makers from a wide range of backgrounds and often competing interests. Leaders from government, industry, labour, science, academia and citizens groups look for common ground in exploring how to change the way decisions are made at all levels of Canadian society.

The Government of Canada is committed to strengthening existing partnerships and forging new ones to ensure that this country's sustainable development objectives can be achieved. Co-ordinated national action is also critical to ensuring that all men and women in Canada can enjoy a consistent-high level of environmental quality, and that we can work successfully towards the resolution of global environmental problems.

The Federal-Provincial-Territorial Partnership

In Canada, co-ordinated national action requires a close working relationship between the federal, provincial and territorial governments. The Canadian Constitution does not expressly allocate jurisdiction over the environment to particular levels of government. In fact, no specific reference to the environment is to be found in the Constitution. As a consequence, governments have relied upon the jurisdiction accorded to them under the Constitution for subjects that have a relation to the environment. For example, important federal environmental authority has been derived from a number of powers, especially those

related to fisheries; interprovincial and international trade and commerce; criminal law; and peace, order and good government. Key provincial environmental responsibilities derive from, among other things, jurisdiction over the management of resources, property and civil rights, and local works and undertakings.

Until recently, the severe effects of pollution tended to be restricted to air and bodies of water near population centres or dumping sites, and these effects were felt most directly at local levels. But today many pollutants, including acid rain, toxic chemicals and CFCs, have an impact over large geographic regions. While control over the source of the problem may still require local action, the policy direction is often determined at a regional, national or even global level.

In this context, Canadians are demanding that their national government play an active leadership role on environmental issues. This means that the federal government must and will act to protect the environment in its own areas of jurisdiction. At the same time, the federal government is committed to respect the jurisdiction of other levels of government. Overall, however, the environmental needs of the 1990s and beyond will place new demands on governments—federal, provincial and territorial—for more effective and efficient co-operation.

The Canadian Council of Ministers of the Environment (CCME) has recognized this need and has adopted a Statement on Interjurisdictional Co-operation on Environmental Matters that establishes the overall framework for joint environmental action between the two levels of government. The Statement commits governments to work together to:

- harmonize environmental legislation, policies and programs across jurisdictions;
- develop national environmental objectives and standards in order to ensure that a consistent level of environmental quality is maintained across the country;
- ensure that consistent strategies are developed to address emerging environmental issues of national, international and global importance;
- improve the linkages between domestic and international policies and programs on environmental matters; and
- harmonize environmental assessment and review procedures.

Other federal-provincial-territorial ministerial councils such as those dealing with wildlife, parks, forestry, agriculture and energy will continue to play an important role in ensuring co-ordinated national action on the environment.

Elsewhere in *The Green Plan*, the federal government re-affirms its commitment to national goals on a wide range of environmental issues, and details the direct contribution that it will be making. This includes national action plans to address such issues as climate change, water management, hazardous and non-hazardous waste management, and wetlands conservation. At the same time, of course, the implementation of existing joint plans (e.g., the National Packaging Protocol, the Canadian Acid Rain Control Program, the National Wildlife Policy, and the National Contaminated Sites Remediation Program) will continue.

The Federal Government is also intent on accelerating the development of nationally consistent standards and practices for environmental protection.

The federal government is also intent on accelerating the development of nationally consistent standards and practices for environmental protection. Co-operation will extend to the regulation of industrial effluents, state-of-the-environment reporting, monitoring and the establishment of scientific data bases.

The federal government also places a high priority on formalizing agreements with the provinces to work co-operatively in key areas to fulfil our joint environmental obligations and responsibilities. For example, under the *Canadian Environmental Protection Act*, the federal government can enter into equivalency and administrative agreements with the provinces. Equivalency means that as long as provincial environmental protection requirements are equivalent to federal ones, only the provincial law will apply to prevent duplication of effort. Moreover, under the proposed Canadian Environmental Assessment Act, joint federal-provincial environmental impact assessment panels can be established to ensure that the requirements of both levels of government are met successfully without delay, overlap or duplication.

Strengthening Partnerships with Aboriginal Peoples

Canada's aboriginal communities have long understood the importance of resource management and environmental stewardship. Native peoples depend upon nature for traditional and commercial activities and cultural well-being. In recent times, however, they have experienced rapid changes that increasingly threaten their natural environment.

Aboriginal peoples are more and more affected by clear cut logging, new roads, mines, pipelines, hydroelectric plants and other development pressures. The land, water and wildlife on some reserves contain high levels of toxic substances. Aboriginal peoples are not

always opposed to development but would like the impact of development on their lives to be considered. There is a growing recognition of the need to deal with these pollution problems and to address conflicts.

The Federal Government will assist Indian communities to develop environmental action plans.

For environmental matters affecting aboriginal Canadians to be resolved effectively and constructively, natives themselves must be active participants in decision-making processes as well as implementation activities that affect their communities.

To that end:



The federal government will assist Indian communities to develop environmental action plans. This assistance will help Indian communities to respond to environmental crises, undertake environmental assessments, improve environmental standards on reserves, and participate in provincial environmental assessment and regulatory processes.



The federal government will also support the creation of an aboriginal environmental consultation mechanism, the training of Indian administrators, and the development, with Indian organizations, of an inventory of on-reserve environmental problems.

Special priority will be given to accelerating the provision of water and sewer systems to Indian communities. (See Chapter I-B.)

A number of other initiatives in the health area, in the Arctic and in enforcement will focus primarily on aboriginal peoples. (These initiatives are set out in more detail in Chapters I-A, IV-A and VI-E.)

Governments have also recognized that aboriginal peoples have an important role to play in wildlife management in this country. The National Wildlife Policy for Canada, which was approved by wildlife ministers in September 1990, calls for effective co-operation between governments and aboriginal peoples in wildlife conservation, research, education and enforcement.

Partnerships with Non-Government Organizations

All Canadians have a direct stake in the resolution of environmental issues, not only for themselves but also for the sake of their children. Canadians want to play a meaningful role in environmental efforts. Often, this wish leads them to join special interest and pressure groups (environmental non-government organizations or ENGOs, and non-government groups, or NGOs).

The ENGOs

There are some 1,800 ENGOs across Canada, with a total membership in excess of one million. There are also many other groups that care about their environment and act to protect it without considering their mission strictly environmental.

The Federal Government will provide additional funding to Canada's ENGOs, beginning in 1991.

Environmental groups play a vital role in raising the level of environmental awareness in national and business institutions, and in our communities. Environmental activists have been, and no doubt will continue to be, important spurs to the policy development processes of government and industry.

In support of Canada's commitment to promoting the development of partnerships that address our environmental problems, the federal government will provide additional funding to Canada's ENGOs, beginning in 1991. The funding will take two forms:

- an increase in the Class Grant Fund to support the basic operational requirements of smaller, regionally based organizations; and
- an increase in the annual contribution to the Canadian Environmental Network (CEN).

This additional federal support should be particularly helpful in allowing the ENGOs to participate meaningfully in active and balanced discussions of environmental issues, including the ongoing consultative and planning processes of *The Green Plan*. In extending additional financial resources, however, the federal government does not wish to encourage a dependency relationship or diminish the rights and abilities of any group to pursue an independent course of action with respect to environmental priorities and change strategies.

Government assistance will also be provided to ENGOs and other NGOs to support projects or services that are of particular value in helping to achieve sustainable development in Canada.

Other NGOs

The Government of Canada is fully committed to building productive partnerships with *all* environmental stakeholders. The Government will work to expand co-operation and to facilitate regular consultation and information exchange with environmental stakeholders, including business. Additional resources will also be deployed to expand co-operation and consultation with business, labour, women's groups, academia, and associations at the national and regional levels.

By 1991, Environment Canada will establish annual conferences to consult business and labour representatives on current environmental issues and concerns.

By 1991, federal funding will assist NGOs to organize environmental fora involving multi-stakeholder discussions.

By 1991, additional support will be available to facilitate personnel exchanges between Environment Canada and a wide selection of NGOs.

Environment Canada will establish annual conferences to consult business and labour representatives on current environmental issues and concerns.

Ensuring Women's Perspective

Women have played, and continue to play, a crucial role in issues related to the environment. Women have a unique and vital perspective on strategies for achieving sustainable development that must be taken into account. The Government of Canada recognizes that women must be full partners in *The Green Plan*.

Building Partnerships with Industry

The business community is an essential partner in the search for and implementation of sustainable development. The creative research resources of industry are needed to help Canadians identify and solve environmental problems. Innovative scientific know-how will be essential to the discovery of timely and effective new technology.

The private sector is beginning to take individual and co-operative actions to address a number of environmental problems, and many businesses are beginning to respond to the increased market demand for environmentally friendly products. Business leaders are also becoming more actively involved in a wide range of consultation and discussion forums. Examples are the national and provincial Round Tables on Economy and Environment, projects such as the FOCUS 2000 study on the environment and industry by the Canadian Chamber of Commerce, the development of codes of environmental conduct for groups such as the Canadian Petroleum Association and the Canadian Chemical Producers Association, and consultations on *The Green Plan* itself.

Concern about the environment has also opened up new business opportunities to Canadian entrepreneurs. The environmental industry sector is now valued at $7 to $10 billion annually and employs, directly or indirectly, about 150,000 people. There are thousands of businesses in environment-related fields, including water and air pollution control, waste disposal, chemical analysis, and environmental information and monitoring systems. Further opportunities exist in

such fields as waste storage, recycling, sewage system maintenance and upgrading, and energy conservation and alternatives.

Given the size and growth rate of the environment industry, it is not surprising that companies engaged in this field have come together to form a Canadian Environment Industry Association. The CEIA should help the industry expand and prosper, with benefits to the environment and the economy.

Changing individual action is the key to environmental change.

The Government of Canada will also help Canadian industry meet its environmental challenges while maintaining and increasing its competitiveness. The strategy will be based on:

- fostering the development and diffusion of new and more efficient technologies;
- improved analysis of economic characteristics of industries and markets; and
- enhanced information dissemination and strategic advice to Canadian industry.

The Government will work with the private sector to ensure the growth and development of new environmental industries through programs such as the Environmental Industry Sector Initiative of the federal Department of Industry, Science and Technology.

Government, Industry and Consumers Working Together

Changing individual action is the key to environmental change overall. While an individual Canadian's contribution to environmental degradation is small, the cumulative result of 25 million individual actions can be huge. By the same token, changes in attitudes and behaviour that yield small environmental improvements individually can have monumental significance when they are multiplied 25 million times.

There are a great many things that individuals can do to help protect the environment. These include choices in lifestyle, consumer purchasing, workplace activities and collective actions. For example, making greater use of public transportation, avoiding goods that have a lot of packaging and supporting community recycling programs are all individual decisions that can have an extensive cumulative impact.

The federal government has stressed individual empowerment in a number of different programs, including:

Environmental Partners Fund

The Environmental Partners Fund contributes up to 50 per cent of the expenses (to a maximum of $200,000 over three years) associated with such community projects as water conservation, wildlife habitat restoration and waste reduction and recycling. Individuals and organizations such as community service clubs and youth groups may apply for funding. Industry, municipalities and provincial governments are encouraged to participate, but must designate a non-government, non-commercial group as lead partner.

Consumers are making sustainable development choices that turn the power of the marketplace towards environmental ends.

As it now stands, the Environmental Partners Fund Program is scheduled to expire in March 1994. To provide additional support to the development of community partnerships:

The federal government will extend the Partners Fund program for an additional two years and expand the eligibility criteria to include support for non-formal environmental education initiatives, commencing in April 1991.

Environmental Choice Program

The Environmental Choice program was first announced by the Prime Minister in June 1988 as a means to help consumers identify products that pose less of an environmental burden. The EcoLogo (three doves intertwined to form a maple leaf) appears on products that meet specified environmental criteria and performance measures, as determined by an independent advisory board. To date, certification criteria have been established for fourteen product categories, including automotive fuels, composting systems for household waste, and reusable cloth diapers.

Logo for "Environmental Choice" Products



Each dove represents a sector of society: consumer, industry and government. The doves intertwine, symbolizing that these sectors must work together to improve the quality of Canada's environment.

By demanding more environmentally friendly products, consumers are making sustainable development choices that turn the power of the marketplace towards environmental ends. Industry is keen to take advantage of this new consumer demand. Environmental labelling is increasingly becoming a focus for marketing, and innovative R&D on environmentally friendly products is being encouraged.

The federal government will strengthen the Environmental Choice program by providing additional funding for increased marketing efforts over the next five years. The program will continue to operate at arm's length from the Government. The expectation is that the Advisory Board will reduce the program's financial dependency, through licensing revenues, over the next three to five years.

Environment Week

The Canadian Environment Week program is a community outreach mechanism to increase public environmental awareness and action. It capitalizes on the concentrated attention given to environmental issues during a week dedicated to the environment.

The federal government will expand Environment Week to promote a stronger environmental vision across Canada. New measures will be designed to involve more individuals, provide practical and constructive guidance at the grass roots level and help Canadians understand the implications of adopting sustainable development as the new social and economic imperative.

The Federal Government will expand Environment Week to promote a stronger environmental vision across Canada.

Involving Young Canadians

Today's young people are tomorrow's decision-makers. It is they who will be forced to clean up the environmental mistakes we make today; alternatively, it is they who will carry on our successful transition to a sustainable development society.

Young people who understand and appreciate the importance of the required environmental changes can act as catalysts for change at home, in their communities, in the marketplace and abroad.

Recycling Symbol



Based on the Möbius loop, this recycling symbol signifies the use and re-use of materials. The three arrows stand for the different substances that can be recycled: solids, liquids and gases.

The increasing number and complexity of environmental problems pose real challenges for Canada's youth. To meet these challenges, they need to become more environmentally literate, through the formal education system as well as less structured learning experiences. Such experiences give young people the opportunity to enhance their decision-making and leadership skills, participate in decisions that will ultimately affect them and develop positions on emerging environmental issues.

In order to engage young Canadians more fully in the environmental debate and to support them in their efforts to co-ordinate national and international youth action on the environment, the following measures are planned:

In 1991, the federal government will establish a Canadian Youth Advisory Council on Environment and Development to provide the Minister of the Environment with direct and ongoing advice on environmental issues and programs geared to young people.

A Canadian Youth Secretariat on Environment and Development will be established within the Canadian Youth Foundation. The secretariat will organize Canadian and world youth participation in the United Nations Conference on Environment and Development in Brazil in 1992.

As part of the preparations for Brazil, this secretariat will organize a National Youth Conference on Environment and Development in 1991 and an International Youth Forum in 1992 to precede the Brazil Conference. The United Nations Environment Programme has agreed to co-organize the latter event with Canadian youth.

There is no question that education in our schools must aim to improve attitudes towards the environment and that this has to be legislated as compulsory for early graders.

J.R. Orlando, Camp Hill Medical Centre, Halifax, Nova Scotia, Green Plan Consultations

Improving Public Consultations

The Federal Government recognizes that if Canadians are going to be called upon to achieve our national environmental goals, they expect to be consulted on the development and implementation of Government policies and programs. Consultation cannot end with the release of *The Green Plan*.

The Government of Canada will explore ways of improving the consultation process to involve as many Canadians in as meaningful a manner as possible. To this end, the Government will build on the lessons learned from the *Green Plan* consultations and similar public processes.

B. Environmental Information: The Key to Sound Decision-Making

Canada's Goal Is to Provide Timely, Accurate and Accessible Information to Enable Canadians to Make Environmentally Sensitive Decisions.

The Government of Canada is committed to providing accurate, timely and accessible environmental information to Canadians.

Introduction

Increasingly, Canadians are demanding access to better information about the environment. They seek authoritative, easy-to-use indicators to measure national, regional and local progress in achieving sustainable development. Such information is essential to sound decision-making on all environmental matters. It can also alert us to emerging problems, thus making possible successful implementation of preventive policies.

The Government of Canada is committed to providing accurate, timely and accessible environmental information to Canadians.

State of the Environment Reporting

In 1986, the Minister of the Environment released Canada's first national State of the Environment (SOE) Report. It provided Canadians with a snapshot of the health of the natural surroundings in which they and their families live.

The product of consultations at the federal and provincial levels and of discussions with non-government experts, the report traced how the environment accommodated a myriad of human uses, particularly during the 1970s and early 1980s.

- In 1991, the second national State of the Environment Report will be released.
- Beginning in 1992, the Government will introduce an annual address to Parliament providing a State of the Environment Policy Statement.
- By 1993, Canada will establish a long-term State of the Environment monitoring and assessment capability to study resources at risk, ecosystem response and the impact of major disruptions to ecosystems.

Canada will also continue to play a leadership role internationally on environmental reporting. For example, in May 1991, Canada will host an international forum on environmental information for the 21st century.

Canada's traditional national accounts will be extended to incorporate environmental components.

Innovative National Accounting and Environmental Indicators

Canadians have been well served by systems of economic reporting that provide information on the state of the economy. Since the 1940s, Statistics Canada has been providing National Economic Accounts that constitute a comprehensive and systematic framework for presenting information used in economic policy analysis and formulation. Accounts such as the Gross National Product have contributed to better economic decision-making, both individually and collectively.

As the importance of the relationship between the environment and the economy is recognized, there is a growing need for these accounts to be adjusted to show environmental impact and changes in natural resource flows. The United Nations, the World Bank and other major multilateral organizations have begun work on how these adjustments can be made.

Our traditional national accounts will be extended to incorporate environmental components, and Canada will also participate in international accounting efforts.

- Over the next 18 months, the Government will implement pilot accounts for two natural resources and consultations will begin with potential users.
- A draft environmental accounting framework will be ready by 1993, with regular publication of the new environmental components to be initiated by 1996.

In addition to the national accounts, there is a need to develop a simple set of indicators so that the state of complex environmental systems can be presented concisely and understandably. We all know the value of indicators such as body temperature for the state of our health. Similar indicators should be developed for the state of the environment, both nationally and internationally.

- The Government of Canada will, by mid-1991, develop a preliminary national set of environmental indicators and initiate stakeholder consultations.

By 1993, the Government of Canada will develop and release, on a regular basis, a comprehensive set of indicators that measure Canada's progress in achieving our environmental goals.

National Environmental Information Network

Canadians have demanded better access to credible environmental information from a wide range of sources. The Government will respond by providing "one-window" access to environmental information. It will establish a network using state-of-the-art technology, including direct access and/or referral to data from federal departments, provincial and territorial governments, universities, the private sector and voluntary groups.

By 1994, a National State of the Environment Reporting Organization will be established.

By 1994, computer services and a national network will be established to support indicator development, State of the Environment Reporting and environmental forecasting.

National State of the Environment Organization

In the longer term, the Government of Canada believes that environmental information can best be provided through an organization operating at arm's length from government departments.

By 1994, a National State of the Environment Reporting Organization will be established. Advice on the structure and mandate of this organization will be sought from interested stakeholders.

C. Environmental Citizenship Must be Paramount

Canada's Goal is to Develop an Environmentally Literate Society—One Where Citizens are Equipped With the Knowledge, Skills, and Values Necessary for Action.

Canadians believe that environmental problems can be prevented.

Introduction

Canadians are increasingly knowledgeable and concerned about environmental issues. Some are seeking greater understanding of these issues and the scientific, social, and economic factors that underlie them; many are demanding immediate action. During *the Green Plan* consultations, Canadians identified environmental education as the vehicle par excellence for resolving environmental problems over the long term. They wanted support to make environmental learning a clear priority that *The Green Plan* would address.

The messages were clear. Canadians believe that environmental problems can be prevented and costly clean-ups can be avoided. They feel that self-regulation is better than government regulation, and that voluntary action is the most effective way to achieve enduring results. They believe that compromise is better than polarization, that society must work out solutions balancing competing interests and points of view. And finally, they seek a national consensus on the best way of dealing with environmental problems. Prevention, voluntary action, compromise, and consensus are their four clear objectives. The way to attain these, Canadians assert, is through enhanced environmental awareness, greater understanding of the complexity and dimensions of the issues, and appropriate action by all members of society. In short, they demand environmental citizenship.

The Canadian Environmental Citizenship Program

To enable Canadians to move from awareness to understanding and responsible action, the Government of Canada will establish the Canadian Environmental Citizenship Program. The Program will seek to encourage constructive and informed discussion through a number of initiatives, including the following:

- campaigns designed to enhance environmental awareness and promote public participation;

- development of learning materials and programs designed to promote understanding and motivate informed decision-making at all levels of society;
- development of specialized campaigns on such issues as climate change, waste management, the prevention of water pollution, and water conservation;
- exchange of environmental learning resources on a national and international basis;
- development and implementation of environmental action and training plans appropriate for specific target audiences; and
- support for partnership activities designed to enhance general environmental awareness and increase understanding of specific issues.

The Government of Canada must act as a catalyst. The necessary expertise and capacity for improving the environmental literacy of Canadians lies largely outside of government. Wherever possible, therefore, the program will seek to enter into partnership arrangements with other organizations and institutions. The Government of Canada will also use its own resources such as the National Parks and National Historic Sites to develop and deliver programs consistent with the environmental citizenship objectives. Co-operative projects will be assessed, in part, by the contribution that other partners are prepared to make.

The benefits of the citizenship initiative will be many. It will eliminate critical problems before they arise, mitigate the severity of the environmental effects that necessarily accompany most human activity, enhance co-operation among interest groups, develop shared objectives, instil broader and deeper understanding of environmental issues, and motivate responsible decision-making throughout all of Canadian society.

D. Supporting New Science

Canada's Goal is to Strengthen the Nation's Environmental Science and Technology with a Special Emphasis on Understanding Regional Ecosystems.

Introduction

Scientific information has been the single most important force in shaping the environmental agenda. Canadian scientists have been in the forefront of efforts to detect the causes and effects of environmental stresses. They have earned an outstanding reputation for their work on the Great Lakes and for their investigation of contamination of the Arctic, acid rain, climate change and numerous other pioneering endeavours.

The science and the technology needed for the 21st century will require a significant increase in support.

Their research has become even more far-reaching as they have shifted their attention from local or even national effects to the global ones. This trend suggests that the science and the technology needed for the 21st century will require a significant increase in support at both the national and international levels.

Natural scientific disciplines such as biology, chemistry and geology help us understand the individual elements that make up ecosystems and the processes that link them. The social sciences and humanities provide the understanding necessary to make long-term changes in human behaviour; this understanding is the key to moving from "react-and-cure" to an "anticipate-and-prevent" approach.

Science provides Canadians with important information needed to make sound environmental choices. Such information also forms the basis of state of the environment reports, which enhance public awareness and understanding of environmental problems.

Environmental science provides governments with reliable data and information critical to the development of effective policy and laws and to the enforcement of regulations.

For industry, environmental science helps measure the progress being made in complying with regulations. Through research and development focused on environmental technology, science provides industry with additional options for meeting regulatory requirements.

Innovative environmental technology will equip Canadian industry with the means to remain competitive in international markets while at the same time protecting the environment.

The Federal Government is already the largest supporter of environmental science and technology in the country.

During *The Green Plan* consultations, Canadians called on the Government of Canada to increase its commitment to environmental science in order to improve decision-making at all levels of society. There was also support for research and development to provide environmentally benign technologies.

The federal government is already the largest supporter of environmental science and technology in the country. University research is funded through the granting councils, and co-operative programs are undertaken with provincial and territorial governments and the private sector. In addition, departments and agencies of the federal government, through their own scientists and research establishments, have gained worldwide recognition and established the basis for many environmental laws and regulations. For example, the Canadian acid rain research program, begun in 1980, forms the basis of our efforts to resolve this problem. Our understanding of the atmospheric chemistry of acid rain and of the sources of sulphur dioxide emissions has made it possible for us to devise policies and actions to counter acid precipitation.

Canada is also a world leader in the continuing effort to understand the complex phenomena of climate change. It has developed one of the best global climate models in the world today. However, uncertainty still surrounds this complex issue and further research is urgently required.

The Government also directly supports the development of environmental technologies. For instance, Environment Canada's Wastewater Technology Centre in Burlington, Ontario, has developed a number of technologies that are international commercial successes.

Private-sector research and development of environmental technologies promises new investment opportunities and the creation of jobs in Canada's environmental industries. However, the private sector is often cautious about investing in industrial R&D because of the cost and risky prospect of financial returns. As a result, technological solutions are frequently slow to be developed and potential economic opportunities are lost. The Government recognizes these risks, and helps offset them, through tax and other financial incentives, to make private-sector investments in industrial R&D more attractive.

Science and Technology Action Plan

With our growing realization of the interdependencies and complexities of environmental problems such as climate change and ozone depletion, it becomes clear that we need more and better science. Further, the better we understand our own ecosystems, the more able we are to contribute solutions to global environmental problems. For these reasons, the federal government is launching a five-year environmental science and technology action plan that will:

- promote new directions in the scientific exploration of both domestic and global environmental problems, the goal being an integrated, ecosystem-based understanding;
- ensure a strong federal scientific presence to provide reliable scientific data for policy and legislation development and regulation enforcement; and
- encourage the development of environmental technologies to provide solutions to environmental problems and offer economic opportunities to Canadians.

The Government will fund scholarships, professorial chairs, and strategic university grants in the environmental sciences.

Promoting New Directions in Environmental Science

Canadian Global Change Program

Under the auspices of the Royal Society of Canada, the Canadian Global Change Program acts to develop, co-ordinate and promote awareness of comprehensive nation-wide research into all aspects of global change, including both the natural sciences and human sciences. It is the most ambitious research program ever attempted in Canada, involving over 200 researchers from universities, the federal and provincial governments and other institutions.



The government will increase its direct financial support for the next five years to ensure that the Global Change Program continues to function as a national information base and as the focal point for co-ordination with international activities.

Training Canada's Future Environmental Scientists

The demand for highly trained environmental researchers and technologists continues to grow. To help meet Canada's future requirements for environmental scientists and foster academic excellence in environmental policy:

The federal government will revitalize its research facilities and equipment and augment its scientific staff over the next five years.

The Government will fund scholarships, professorial chairs and strategic university grants in the environmental sciences. This program will focus on research activities with an ecosystem perspective. By late 1991, the first round of university chairs will be established; by mid-1992, a full slate of scholarships and strategic grants will be put in place. The program will be managed by the three granting councils—the Natural Sciences and Engineering Research Council (NSERC), the Medical Research Council (MRC), and the Social Sciences and Humanities Research Council (SSHRC).

Supporting Sound Policy and Regulation

Demands have increased for scientific information and advice as a result of environmental assessment procedures, the development and enforcement of regulations, and the international environmental agenda.

To meet these demands, the federal government will revitalize its research facilities and equipment and augment its scientific staff over the next five years.

Technology for Solutions

Cleaning up the environment while preventing further degradation is not only a challenge, it is an important opportunity for Canada. The environmental technology industry is among the fastest-growing sectors of the Canadian economy. It will play an increasing role in positioning Canada favourably in highly competitive world markets. The federal government, with the provinces and the private sector, will work to increase our ability to capitalize fully on our economic opportunities. It will provide venture capital, funds, and other support for the demonstration and commercialization of environmental technologies.

Bringing Technology to Market

The federal government will provide cost-shared funding for programs to help encourage the development, demonstration, commercialization and dissemination of environmentally favourable technologies.

During 1991, the Government of Canada will augment its Technology Development Program to provide technology transfer services to firms.

To facilitate technology transfer activities in government laboratories, the Government will establish a federal-provincial Environmental Technology Network.

During 1991, the Government will also launch the Environmental Technology Commercialization Program to provide financial resources on a cost-shared basis for partnerships and joint ventures. Up to 50 per cent of funding will be provided by the Government to attract private venture capital for environmental technology demonstration projects. Joint venture and consortium opportunities will be developed for Canadian firms in the environmental technology industry, both in Canada and internationally.

Up to 50 per cent federal funding will be provided to attract private venture capital for environmental technology demonstration projects.

Innovation Program

The Government of Canada will promote Canadian environmental innovation outside government.

In 1991, the Government will introduce an Environmental Innovation Program. The program will invite proposals from any source outside the federal government for research and development that would contribute towards the goals and objectives of *The Green Plan*. New ideas are the key ingredients, and attention to longer-term issues will be encouraged.

E. Legislative, Regulatory and Market Tools for Change

Canada's Goal is the Balanced Use of Strong and Effective Environmental Laws, with Market-Based Approaches for Environmental Protection.

Introduction

Improved science, a strong commitment to environmental citizenship and more authoritative information are all important means of enhancing environmental decision-making in Canada. The Government of Canada recognizes, however, that legislation, regulation and enforcement will continue to play essential roles in the achievement of our environmental objectives. Market forces are also powerful instruments that can and should be harnessed in the pursuit of sustainable development. Indeed, given the breadth and complexity of the environmental challenges facing Canada, all avenues for new and cost-effective methods of meeting those challenges should be explored.

An Effective Legislative Framework

The Government makes use of a wide range of legislative and regulatory instruments to achieve national environmental policy objectives. These include legislation to protect Canada's wildlife, parks and heritage resources; to control pollution of Canada's water and air; to manage properly our valuable fishery resources; and to protect the Arctic and offshore regions.

The centrepiece of the Government of Canada's environmental legislation is the *Canadian Environmental Protection Act* (CEPA), proclaimed in June 1988. This act provides for the protection of the environment and the life and health of Canadians from the effects of toxic substances through a life-cycle approach to management—from development and manufacture through transportation, distribution and use to final disposal. CEPA includes innovative mechanisms to promote federal-provincial co-operation, strong public accountability, and a structure of fines and penalties that reflect the seriousness with which Canadians view environmental offences.

In addition to enforcement, the federal government has introduced a number of innovative measures to promote voluntary compliance with the provisions of CEPA. For example, Environment Canada has undertaken extensive public education and information-transfer

initiatives, including measures in the area of technology demonstration, evaluation and transfer. The Government has supported the development of environmental codes of practice and guidelines, and encouraged the use of environmental audits by companies and government agencies.

The Government has supported the development of environmental codes of practice.

A Regulatory Process that Works

All departments of the federal government follow guiding principles set out in the Regulatory Reform Strategy developed in 1986. These principles stress limiting the proliferation of regulations as well as requiring that any proposed regulations be economically feasible and enforceable. In addition, the regulatory development process must be open and accessible, and must ensure the full participation of those most affected as well as the general public.

Any regulations developed by the Minister of the Environment under the *Canadian Environmental Protection Act* will follow these principles of openness, fairness, efficiency and accountability. CEPA gives the Government broad powers to define national standards for the control of any substance that threatens to harm the health of Canadians or Canada's environment. In exercising these powers, the federal government has developed a regulatory process that works.

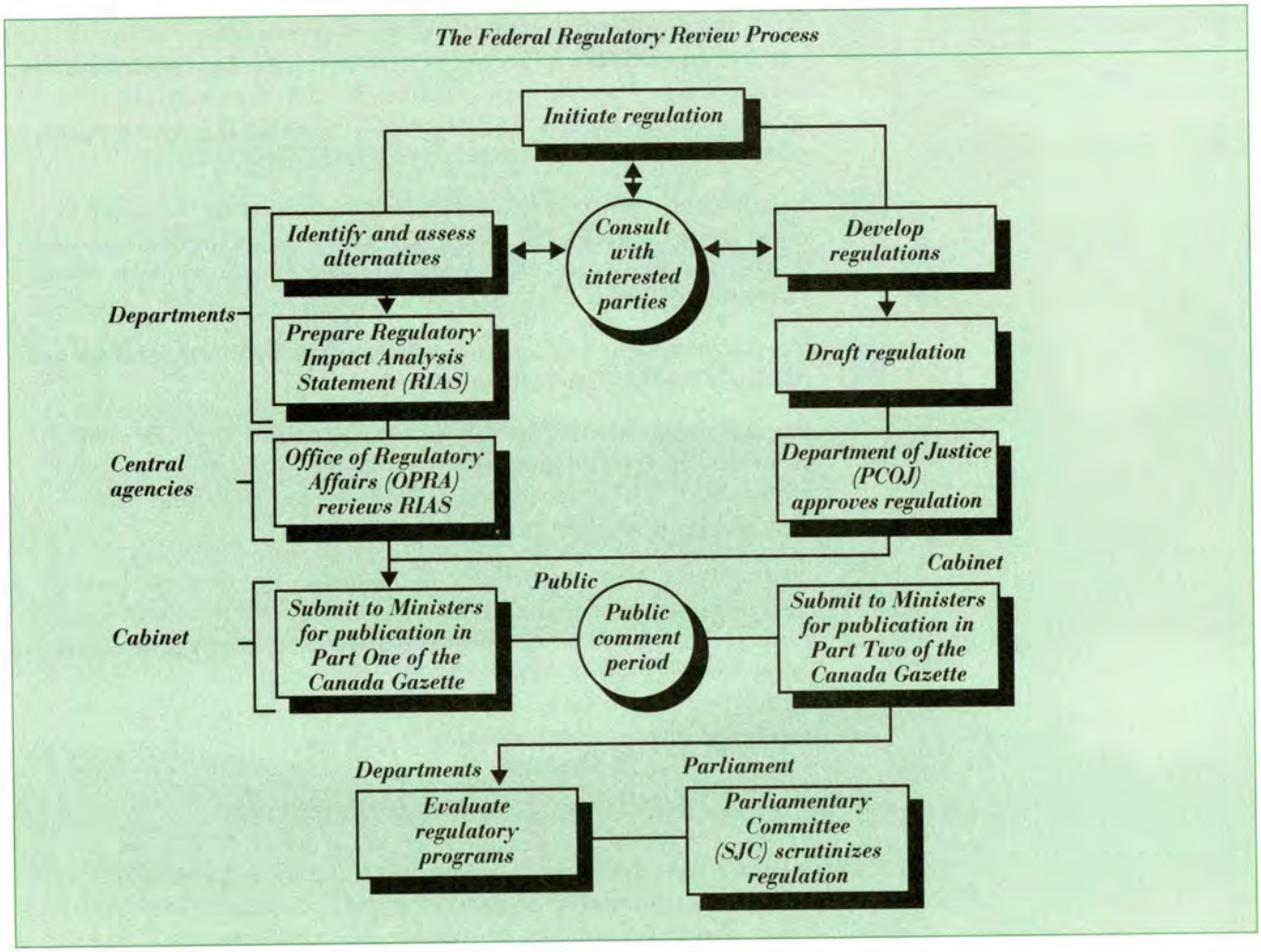
- The first step is the Assessment Report, which details the toxicological problem and determines the scientific basis for control action.
- Next comes the development of a control-options report, which identifies the various options—along with their associated costs—available to control a substance.
- The control-options report is made available for public consultation and input, after which a decision is made as to the control option most likely to achieve the desired result, in conformity with the principles identified earlier.
- If the preferred option is a regulatory one, the drafting process begins. This usually involves further consultation with key stakeholders before the draft is finalized. At the same time, a Regulatory Impact Analysis Statement (RIAS) is prepared to document social and economic benefits and compliance costs associated with the proposed regulation.
- Lastly, Cabinet committee reviews the proposed regulations and their supporting RIAS. If the regulations are approved, they are published in the *Canada Gazette Part I*. A period of 60 days is

then allowed for further public comment before the regulations have the force of law.

Depending upon the complexity of the issues at stake, this process can take up to three years from inception to final publication of new regulations. Though this may seem like a lengthy process, it assures public review and involvement as well as a full and open examination of the implications of new regulatory measures.

The federal government is open to all input that could improve or streamline the regulatory development process while at the same time maintaining its effectiveness and accessibility.

The Federal Regulatory Review Process



Stronger Enforcement Mechanisms

Canadians must be assured that polluters, poachers and other offenders will be prosecuted.

Legislation and regulation are only as good as their enforcement. Canadians must be assured that polluters, poachers and other offenders will be prosecuted. Firm, fair and consistent enforcement also ensures that good environmental citizens are not penalized by the environmentally abusive acts of others.

Over the next five years, the Government will enhance its ability to enforce environmental laws. The enforcement program will cover a wide range of remedial and preventive measures to control threats to the environment in a manner that supports sustainable development.



With the co-operative efforts of many enforcement agencies such as the RCMP, Customs and Excise and Transport Canada, Environment Canada will enhance its ongoing program of inspections, information exchange and investigations leading to vigorous enforcement of environmental regulations.



In addition, enforcement will be strengthened by working in close co-operation with the provinces to avoid duplication and deliver the most cost-effective and efficient enforcement of environmental laws.



The Government will make special efforts to recruit native people for its enforcement program.



Special measures will be taken to enforce the *Migratory Birds Convention Act* and the proposed Wild Animal and Plant Protection Act. These measures will reduce the poaching and smuggling of wildlife in Canada.



Law enforcement capabilities in Canada's national parks will also be improved in the initial response to offences and infractions of the law, assistance to other enforcement agencies and detection of wildlife poaching. By 1993, regional intelligence and investigative units will be established, along with corresponding technical capabilities.

Utilizing Economic Incentives

Canadians are most familiar with a regulatory approach to achieving our environmental objectives as well as other social and economic goals. There is evidence to suggest, however, that economic instruments can also be effective tools in promoting more environmentally benign behaviour.

Economic incentives can be used to harness powerful market forces to environmental ends. They can have advantages over the

traditional regulatory approach on which Canada has relied for decades. Economic instruments can be less costly to administer. They can provide a greater, ongoing incentive to develop and implement new technology to control pollution; and they can be less economically intrusive and distorting, while still ensuring that our environmental goals are realized.

The Government of Canada will establish a program to support practical research into the use of these economic instruments to address Canada's major environmental problems.

A wide variety of economic instruments are available to pursue sustainable development and environmental protection goals. They include subsidies that encourage particular forms of environmental behaviour; charges that incorporate the environmental costs of production and consumption decisions into prices (e.g., product and effluent taxes); tradeable emission permits; deposit/refund systems for the control of waste products; and appropriate pricing of natural resources.

Different economic instruments are suitable for dealing with different environmental problems, and will have varying economic and distributional effects. While, economic instruments can theoretically be effective in incorporating the environment into decision-making, in practice they can be complex to design and apply. For example, it is very difficult to quantify environmental costs, and therefore hard to determine the appropriate level of an economic incentive or disincentive. In addition, the actual measurement or monitoring of polluting actions can be costly. Finally, the economic instrument may require changes in production and consumption patterns. The cost of these adjustments could fall more heavily on particular firms, regions, or income groups.

However, it is important to note that these same considerations and constraints are also problems affecting regulatory instruments. It is often difficult to determine how much regulation is appropriate. Regulations entail measurement and monitoring costs, and can have major economic and distributional effects.

Therefore, the appropriateness of using an economic instrument to deal with a particular environmental problem cannot be evaluated in isolation. It must be assessed against the costs and benefits of alternative regulatory approaches.



In 1991, the Government of Canada will establish a program to support practical research into the use of economic instruments to address Canada's major environmental problems. The program will consist of:

independent academic research on how economic instruments might be applied in the Canadian context;

an academic research network to exchange ideas and information as well as encourage the widespread review of practical research results; and

contributions to the study programs of independent research and policy institutes, which can provide consulting expertise to the federal government in this area.



In addition, in the spring of 1991, the Government will also release a discussion paper on the use of economic instruments in environmental protection.

VII. Starting in Our Own House

A. Federal Environmental Stewardship

The Federal Government's Goal Is to Ensure that All of its Operations and Procedures Meet or Exceed National Targets and Schedules for Sustaining our Environment.

Federal operations must be exemplary in meeting and frequently exceeding all regulations and standards.

Introduction

The federal government is the largest single "business" in Canada, with expenditures of $125 billion and over 585,000 public servants and employees of Crown corporations. As the largest commercial landlord, it owns or leases 25 million square metres of office space. There are more than 50,000 buildings and facilities in its inventory, ranging from office buildings to laboratories, parks and military bases. Government purchases from the private sector total more than $9 billion each year from thousands of categories of consumer, commercial and industrial goods.

Clearly, all this activity has an immediate and significant impact on the environment. Federal environmental stewardship addresses the immediate need to demonstrate the federal government's commitment to the principle of sustainable development.

Federal operations must be exemplary in meeting and frequently exceeding all regulations and standards as well as being compatible with provincial and international environmental objectives.

In pursuing the domestic environmental objectives established in *The Green Plan*, there are many avenues open to the federal government. The Government can lead by advocating; it can lead by legislating; and it can lead through its programs. But, first and foremost, the federal government must lead by "doing". We cannot preach to others what we are not prepared to advocate for ourselves.

Since the strength of our commitment will be measured largely by how federal institutions are prepared to change, the Government of Canada is ready to move as quickly as possible to ensure that it becomes one of the most environmentally sensitive jurisdictions in the developed world.

To achieve environmentally responsible decision-making, we must change decision-making structures, institutions and processes. Environmental factors must be formally recognized as essential decision-

making criteria within governments, businesses and other organizations. As the World Commission on Environment and Development noted in its report entitled *Our Common Future:* "The real world of interlocked economic and ecological systems will not change; the policies and institutions concerned must."

Federal Government Management Initiatives To Date

Institutional reform was a major recommendation of the National Task Force on Environment and Economy and a prominent theme during *The Green Plan* consultations. The federal government is committed to integrating environmental considerations into policy-making processes and day-to-day operations. In this regard, a number of institutional reforms have already taken place, most notably the following:

- The Minister of the Environment chairs the new Cabinet Committee on the Environment, with a mandate to manage the Government's environmental agenda and ensure that policies, programs and other initiatives requiring federal support are fully compatible with the Government's environmental goals.

- The Minister of the Environment is also a member of the key Cabinet Committee on Priorities and Planning, which determines the Government's major priorities.

More recently, in June 1990, after extensive public consultations, the Government of Canada introduced major reforms to the federal environmental assessment process. Environmental assessment is a systematic method of identifying potential environmental consequences of a particular action early in its planning. If adverse environmental repercussions are pinpointed before projects are undertaken, plans can be altered and the negative effects mitigated. In some cases, proposals must be abandoned if those effects are unacceptable.

Environmental assessment has been used by the Government of Canada as a planning tool since 1973, when the Federal Environmental Assessment and Review Process was created to ensure that potential environmental repercussions of proposals were considered as early as possible in the planning process and before irrevocable decisions were made. The process was reinforced in 1984, when the Environmental Assessment and Review Process (EARP) Guidelines Order was issued.

The most recent reform package significantly broadens the scope of the process. In addition to a legislated environmental assessment process, the package includes a separate process for the assessment of

all projects requiring Cabinet decision. For the first time, legislation will entrench the federal government's obligation to integrate environmental considerations into all of its project planning and implementation. As the cornerstone of the Government's institutional reform, these changes ensure that no policy, program legislation or project of the federal government goes ahead without a proper accounting of the potential environmental consequences.

A new federal agency, the Canadian Environmental Assessment Agency (CEAA), will replace the existing Federal Environmental Assessment Review Office (FEARO).

Implementing the Canadian Environmental Assessment Act

Tabled in Parliament on June 18, 1990 as Bill C-78, the Canadian Environmental Assessment Act requires that federal departments and agencies conduct environmental assessments of all proposed projects for which they have decision-making authority. The act ensures a clear and balanced process for all stakeholders and authorizes the Minister of the Environment to initiate public reviews of projects with potentially significant environmental effects.

A new federal agency, the Canadian Environmental Assessment Agency (CEAA), will replace the existing Federal Environmental Assessment Review Office (FEARO). Reporting directly to the Minister of the Environment, the CEAA will provide advice and assist the Minister in the administration of the process, will evaluate its effectiveness and report on its implementation.

Under *The Green Plan*, sufficient funds will be provided to ensure that all federal departments and agencies fully implement the reformed environmental assessment process.

Public participation is essential to an effective environmental assessment process. The Canadian Environmental Assessment Act will provide greater opportunity for public input at all stages of the assessment process. Participation will be encouraged through several means, including early public notification of reviews, public hearings, a mediation process and public registries containing all material generated in connection with a project. The Minister of the Environment will also be required to table an annual report in Parliament on the implementation of the process.

In 1991, a Participant Funding Program will be established to ensure that stakeholders have the opportunity to participate effectively in this process. Participant funding will help interested groups prepare and present interventions in both panel reviews and mediations.

Assessment of Government Policy and Program Initiatives

We must weigh the environmental costs of all development before proceeding. The time has come to err on the side of caution when dealing with environmental issues.

S.A. Gelfand, Calgary, Alberta, Green Plan Consultations

Government policies and programs can have unintended but significant adverse effects on the environment. Since June 1990, the federal government has required environmental impact assessments for all proposals coming before the Cabinet for decision. A statement of the environmental implications of new policies and programs will be made public at the time that the Cabinet initiative is announced. The Minister of the Environment will be available to appear before the Standing Committee on Environment to discuss the environmental assessment and the resulting decisions.

Existing Policy and Program Review

Reform of the federal Environmental Assessment and Review Process will provide an effective mechanism for ensuring that environmental factors are taken into account in future decisions. However, federal departments and agencies administer several thousand *existing* laws, policies and regulations. Though such measures are designed to achieve worthwhile social or economic goals, they may also have significant inadvertent or unanticipated effects upon the environment. In some cases, these measures were developed with full consideration of environmental costs and benefits, and adopted to fulfil overriding social or regional goals. However, older policies and legislation that have not been reviewed for some time were generally enacted at a time when there was less systematic attention to environmental needs.



Early in 1991, the Government of Canada will begin a comprehensive review of the environmental implications of existing statutes, policies, programs and regulations, and will propose modifications as necessary. While much of the initial work will take place over the period from 1991 to 1996, the review itself will be an on-going process.

Federal Code of Environmental Stewardship

Over the past two decades, the Federal Government has made progress towards becoming more environmentally sensitive in its activities. The pace of change has accelerated, especially in the past five years. For example, in 1986, the Department of National Defence commenced environmental baseline studies of all its Canadian Forces bases. Transport Canada has developed a comprehensive environmental management plan for its airports, covering the period from 1990 to 1995. Environmental considerations are being incorporated into the acquisition, use and disposal of all real property. In December 1989, the Government announced the expansion of its "Papersave Program" to recycle paper.

Code of Environmental Stewardship

To demonstrate the federal government's continued commitment to the principle of sustainable development, the Government of Canada plans the following measures:



In 1991, the Government will adopt a comprehensive Code of Environmental Stewardship covering all areas of federal operations and activities.

The Government of Canada will adopt a comprehensive Code of Environmental Stewardship.

Federal departments and agencies will develop environmental action plans indicating how they will implement the Code; they will also report regularly on implementation.

The Code clearly demonstrates the Government's firm commitment to the principle of sustainable development. It integrates environmental concerns into both policy and program planning as well as into day-to-day operations. It ensures that all operations and activities of the federal government meet or exceed the standards and practices that the government recommends to others. In this way, the Code establishes federal leadership by example.

The Code will be complemented by a list of targets or objectives. These targets will reflect environmental commitments that the Government has made or is making, and that will be implemented in its operations. They will cover a broad range of issues, from waste generation to contaminated site clean-up and emission standards. By their very nature, the targets will need to be subject to regular revisions, additions and modifications as we learn from experience and as there are developments in the environmental field.

The Government will establish an Office of Environmental Stewardship to act as a focal point for co-ordination, assist the adoption of the Code and targets, provide information and guidance, and serve as a link between operating managers and scientific experts.

In addition, and as part of its Code of Environmental Stewardship, the Government will ensure that environmental considerations are integrated into purchasing policies and practices.

Implementation of the Code will ensure that the activities and operations of the federal government meet or exceed the standards and practices it is recommending for others.

Raising Staff Awareness of the Code

Through the Office of Environmental Stewardship, the Government will develop a series of stewardship services directed at federal employees. This program is designed to promote *Green Plan* initiatives, raise employee awareness of the Code of Environmental Stewardship and encourage employee activities in support of the Code.

Beginning in 1992, federal departments and agencies will implement policies and procedures for environmental auditing.

The Canadian Centre for Management Development and the Public Service Commission will undertake the necessary training of employees and managers required to achieve Code objectives.

Environmental Audits

Environmental audits are emerging as highly useful tools. With them, managers can assess the degree to which they are achieving environmental objectives, can monitor performance and detect potential problems. Similar in function to the financial audit process, environmental audits track the flow of materials used in industry or corporate operations.

Environmental audits can focus upon waste disposal, fuel and chemical storage, groundwater conditions, air and water quality, emergency preparedness and spill control, and energy use and efficiency. In addition, employee training and internal communications programs can be assessed through the environmental audit process. In essence, the environmental audit evaluates organizational compliance with standards and policies. It also measures performance against desired goals and objectives.



Beginning in 1992, in co-operation with the Office of the Comptroller General, federal departments and agencies will implement policies and procedures for environmental auditing.

VIII. Emergency Preparedness

A. Environmental Emergencies

Canada's Goal Is to Respond Quickly and Effectively to Threats Posed by Pollution Emergencies due to human activity and Naturally Occurring Environmental Emergencies.

Introduction

We are often shocked into an awareness of the powerful, unpredictable and life-threatening stresses that we impose on the environment—for example, spills of oil and other hazardous substances. Equally powerful are the stresses that the environment imposes on us: earthquakes, tornadoes, floods and other extreme weather conditions. Sometimes human and natural forces combine with devastating effect.

In the recent past, Canadians have had several first-hand experiences with man-made environmental emergencies such as the PCB fire at St. Basile le Grand, Quebec, the *Nestucca* oil spill on the West Coast and the tire fire in Hagersville, Ontario. In addition, while not receiving the media attention of major emergencies, an estimated 10,000 smaller spills of oil and other hazardous substances occur every year in Canada.

Natural forces are also responsible for changing our environment, sometimes suddenly and dramatically—with the result that we may find ourselves in the midst of natural disasters of stunning proportions. Examples are the 1987 tornado in Edmonton, Alberta, which took 27 lives, injured 250 and caused hundreds of millions of dollars in damage, the 1982 Ocean Ranger storm off Newfoundland, in which 86 oil-rig workers perished.

Through regulatory and other co-operative actions by the provincial and federal governments and by industry, Canada's capacity to respond to these threats has improved over the last two decades. At the federal level, several acts, including the *Canadian Environmental Protection Act*, the *Arctic Waters Pollution Prevention Act* and the *Canada Shipping Act*, reduce the risk of pollution emergencies and help to ensure effective responses. Federal government agencies also advise on such matters as environmental impact, containment procedures, clean-up technology and remedial action. Consultative forums such as the Major Industrial Accidents Co-ordinating Committee have brought government and industry together to improve prevention and



response capabilities for pollution emergencies. Canada has also signed bilateral agreements with the United States, Denmark and the Soviet Union regarding co-operation on oil spills.

Military service to Canada includes readiness to respond to national emergencies.

National weather warning and information services help protect Canadians from extreme weather conditions and other natural hazards such as earthquakes and hurricanes. Governments at all levels, including the federal government, also offer relief aid to Canadians who suffer direct property losses.

It is a truism that emergency responses are responses of last resort. In such circumstances, all else has failed and we are left to cope with disasters that may have been preventable. Even with the best environmental commitments, legislative and regulatory frameworks and prevention programs, it is inevitable, however, that Canadians will have to deal with emergency response of some magnitude. Leadership in this area demands that the federal government can respond quickly and effectively to environmental threats, and can help ensure that Canadian businesses and industry are similarly able to do so.

The Role of Canada's Military

The primary role of the Canadian Forces is to prepare for and to perform military tasks assigned by the Government of Canada. However, the Canadian Forces' structure, organization and disciplined, flexible military skills gives them an inherent secondary capability to respond to a wide range of public emergencies, including environmental disasters. For example, upon request, regional military units, bases or formations could assist civil agencies in restoring order, and national military authorities could assist by deploying specialist resources. The nature of each response would vary depending on the circumstances, but clearly military service to Canada implicitly includes readiness to respond to national emergencies as and when required.



By 1993, the federal government will develop and define the role of Canada's Armed Forces in providing assistance to civil authorities in response to environmental emergencies, natural or man-made. Supportive measures could include: command and control centres, temporary communications, rapid reconnaissance, prompt repairs to roads and utilities, security and rescue services, transportation and convoy assistance, temporary accommodation, logistics support, and the supply of equipment and materiel.

Pollution Emergencies

As a priority, the Government aims to prevent pollution emergencies from occurring. Unfortunately, pollution accidents are inevitable in an economy that is so dependent on substances such as oil and chemicals. When emergencies occur, the federal government will act with others to minimize the impact on humans and the environment through swift, effective, and co-ordinated response.

Over the next five years, preventative measures will be enhanced.

Preventing and Responding to Marine Spills

In June 1989, as a result of the *Nestucca* and Exxon *Valdez* oil spills, the federal government ordered a comprehensive public review of tanker safety, and of Canada's capability to respond to marine spills. On November 2, 1990, the Public Review Panel on Tanker Safety and Marine Spills Response Capability released its report, the *Brander-Smith Report*.

The Public Review Panel held 31 days of public hearings in eight provinces and two territories, reviewed hundreds of public submissions and reports, and heard over 225 presentations from a broad cross-section of interested groups, individuals, unions, corporations, associations and governments officials.

Major findings of the panel include the projection that Canada can expect over 100 small oil spills, 10 small spills, and at least 1 major spill every year. A catastrophic spill (over 10,000 tonnes) can be expected about once every 15 years. Many of these spills are caused by human error or occur as a result of routine tanker operations, and many can be prevented. In addition, the panel found that the capability to respond effectively to a spill of any magnitude does not exist anywhere in Canada.

The *Brander-Smith Report* makes 107 recommendations, with an overall emphasis on spill prevention. One of the report's recommendations is that Canada should replace its entire fleet of tankers and tank barges with double-hulled vessels to reduce greatly the likelihood of a catastrophic spill. The report recommends the cost of replacement be paid for, in part, through a levy of $2 per tonne imposed on all oil and oil products transported in Canadian waters. To promote the use of double hulls, oil-carrying vessels already fitted with this safety device would be exempt from the levy. Other major prevention recommendations focus on increasing the activities of the Coast Guard to prevent both intentional and accidental spills.

Major recommendations concerning spill response focus on better response planning, co-ordination, and co-operation between industry, governments at all levels and the Coast Guard.

Oil and Chemical Spills in Canadian Waters
(by cause)



Arctic

A. mechanical.....36%
B. natural sources.....7%
C. human error..... 27%
D. intentional.....2%
E. unknown.....20%
F. other.....8%



West Coast

A. mechanical.....16%
B. natural sources.....7%
C. human error..... 50%
D. intentional.....8%
E. unknown.....14%
F. other.....4%



Great Lakes

A. mechanical.....19%
B. natural sources.....1%
C. human error..... 42%
D. intentional.....4%
E. unknown.....29%
F. other.....5%

The *Green Plan* spill response initiatives are an important first step in the Government's overall response to spill prevention and response in Canada. A more detailed response will be made public after completion of the review, which will include consultation with the affected groups.

Over the next five years, preventive measures will be enhanced. They will include improvements to highest-priority radar and vessel traffic control facilities, electronic charting for tankers, increased inspection of vessels and increased aerial surveillance. By the end of 1991, on-board inspections of foreign-flag vessels will be increased.

Seagoing tankers that bring chemical and petroleum products to this country or export them from Canadian ports represent a major potential marine pollution threat. The Government's objective is to implement measures that will result in an environmentally safer method of transporting petroleum products by sea. Although no single design feature can completely eliminate accidental oil spills, the Canadian Coast Guard advises that double hulls have the potential to prevent or significantly reduce outflows from low-impact groundings or collisions.

For this reason, the federal government will begin consultations with the marine industry on the phase-in of this important measure.

The federal government believes that Canadians have a right to expect adequate compensation when they are directly affected by marine pollution incidents. It also believes that compensation coverage for the Arctic must be improved. Therefore, the federal government is re-assessing compensation levels and considering the potential uses of the existing Ship-Source Oil Pollution Fund, as well as other funding mechanisms.

On the response side, the federal government will improve Canada's existing response capability for oil and chemical spills into coastal waters. The role and responsibilities of the Canadian Coast Guard as lead agency in responding to marine spills will be more clearly defined and strengthened.

Over the next five years, measures will be introduced to improve marine spill contingency planning, upgrade clean-up equipment, improve and expand training programs for response personnel, and increase research and development focusing on spill response techniques and technologies.

Working in co-operation with industry, the Government will ensure that more, better-equipped and better-trained response personnel are in place by the end of 1991. New training programs will be implemented by mid-1992 and a program will be developed to include trained volunteers in clean-up operations.

The Government has begun a complete assessment of Canada's state of marine spill contingency planning, as recommended by the Public Review Panel.

Non-Marine Spills

To deal more effectively with oil and chemical spills on land or in inland waters and with toxic gas releases into the air, the Government will launch a major program to improve national co-operative spill response and prevention capabilities.

Working with industry and local and provincial governments, the federal government will promote measures to prevent and respond to spills. These will include regulations and guidelines, training materials and public education. The Government will continue to support the Major Industrial Accidents Co-ordinating Committee as a consultative forum for developing programs on spill prevention, emergency preparedness and public education.

The federal government will act to ensure that it is well prepared to handle spills and other environmental emergencies across Canada through better contingency planning, improved environmental sensitivity mapping, upgraded training and routine testing of emergency preparedness. By the end of 1993, more, better-equipped and better-trained response crews will be in place throughout Canada. The Government will also ensure that response teams have high-quality technical support, including modern reliable communication systems. An artificial-intelligence "expert system" will be in place by the end of 1994 to improve spill response decision-making.

In co-operation with the private sector and universities, the Government will increase research into and knowledge of the properties, behaviour and repercussions of oil and chemical spills, and will promote the development of new technologies in spill detection, monitoring and clean-up. The Government will also introduce guidelines for all spill-treating agents by the end of 1994.

Oil and Chemical Spills in Canadian Waters

(by cause)



St. Lawrence

A. mechanical.....23%
B. natural sources.....4%
C. human error..... 49%
D. intentional.....7%
E. unknown.....14%
F. other.....2%



Maritimes

A. mechanical.....31%
B. natural sources.....1%
C. human error..... 51%
D. intentional.....6%
E. unknown.....9%
F. other.....2%



Newfoundland and Labrador

A. mechanical.....26%
B. natural sources.....17%
C. human error..... 33%
D. intentional.....5%
E. unknown.....14%
F. other.....5%

Naturally Occurring Emergencies

The Government is announcing a five-year program to improve early detection, prediction and warning of extreme weather events.

Naturally occurring environmental emergencies cannot be prevented. The environmental, economic and human repercussions of natural hazards can, however, be minimized through effective and timely warnings and a quick and co-ordinated response.

Despite efforts to date, the Government believes that more can be done to reduce the loss of life and the damage caused by natural hazards in Canada. The Government is announcing a five-year program to improve early detection, prediction and warning of extreme weather events, upgrade weather and emergency surveillance systems, and enhance public awareness of the risks of natural disasters and appropriate responses to them.

Prediction and Warning

Natural hazard prediction and warning systems as well as extreme weather tracking facilities will be upgraded over the next five years to provide Canadians with earlier detection and better prediction of severe weather events and other potential natural environmental disasters, and to improve response capability for man-made emergencies. These measures will include the following initiatives:

- Environment Canada will provide earlier detection, better prediction and more timely warnings of severe weather events and of major airborne pollution emergencies such as volcanic eruptions and nuclear accidents. It will support scientific efforts to achieve better understanding of severe weather, and will seek to increase use of satellite data in weather prediction models.
- Four Doppler radar facilities will be installed by the end of 1996. Some existing weather offices will be restructured to provide better delivery of weather warning in priority areas where gaps in service currently exist.
- Emergency communication capabilities will also be upgraded, including, by the end of 1994, demonstrations of a national television environmental warning capability that will flash emergency information on television screens, and a simultaneous telephone call-out system to emergency organizations and civil authorities.



Expanded iceberg surveillance will be implemented. Modern, automated local area environmental weather observation networks and detection systems will be set up in priority areas to monitor natural and man-made environmental disasters. For example, automated water-level monitoring equipment will be installed in streams above flood-prone, major urban centres by the end of 1994. Flood forecasting agreements with other parties will also be in place, together with better computer facilities and improved models of nuclear and volcanic contamination.

CONCLUSION

Canada's Goal Is to Secure for Current and Future Generations a Safe and Healthy Environment, and a Sound and Prosperous Economy

Canada's Green Plan sets out an ambitious national program for achieving sustainable development in this country. The Government believes that Canadians, individually and collectively, are prepared to accept and meet this challenge. That is what Canadians told us during *Green Plan* consultations. And that is what they have been demonstrating through changes in attitudes and activities over the past years in their homes, communities and workplaces.

The Government of Canada is prepared to take a lead role in achieving this country's environmental goals. Our *Green Plan* identifies actions that the federal government will take across the broad front of environmental issues:

- helping to ensure that Canada has clean air, water and land;
- supporting the sustainable use of our renewable resources;
- protecting our special spaces and species;
- preserving the integrity of Canada's Northland;
- promoting global environmental security;
- encouraging environmentally responsible decision-making at all levels of society; and
- working to minimize the impacts of environmental emergencies.

In all these areas, new programs, policies and regulations are being introduced. Existing programs that have proved successful are being expanded. Overall, the Government has allocated $3 billion in new financial resources to *Canada's Green Plan*.

Leadership, however, does not mean exclusive responsibility for environmental issues in Canada. The federal government is prepared and eager to do its part. However, the Government does not have a monopoly on good ideas when it comes to achieving our environmental goals. More important, the environment is not the responsibility of any single order of government, organization or individual. It is the responsibility of us all. For these reasons, our *Green Plan* emphasizes that we must work together here in Canada and with our international



neighbours to meet our shared responsibility. Forging new partnerships, and strengthening existing ones, will be vital to the success of this *Green Plan*.

Our *Green Plan* sets out a national challenge that will require the efforts of all Canadians. If Canadians are to take up the challenge, they will rightly expect to be consulted every step of the way in implementing *The Green Plan*. The Government of Canada is committed to such consultation. Only in this way will our *Green Plan* be a living document that turns theory into practice; that allows us to respond to new and emerging priorities over time; and that truly makes our national environmental agenda a plan for life.

Canada's Green Plan is optimistic about our environmental future. The achievement of sustainable development will be a challenge for Canada—and through commitment, partnership and consultation, that challenge can be met.

Notes



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