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Emission Reductions from Federal Operations: An Update

Progress Report to Canada's Climate Change Voluntary Challenge and Registry Inc.

April 2001

Canada

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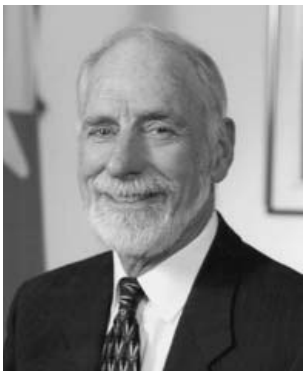

Ministers' Foreword

In serving Canadians, the Government of Canada oversees a large fleet of cars, trucks, airplanes and ships, and must light, heat and cool thousands of buildings across the country. We are aware that the amount of energy needed to operate these facilities and equipment contributes to greenhouse gas (GHG) emissions and, therefore, to climate change.

The Government of Canada has been leading the way in reducing GHGs and in helping Canadians meet the climate change challenge. In 1995, the Government pledged to reduce federal emissions by 20 percent from 1990 levels by 2005. In fact, total emissions from federal operations fell by 19 percent between 1990 and 1998. Last year's *Government of Canada Action Plan 2000 on Climate Change* set the 2010 emissions target at 31 percent below 1990 levels.

Implementing the Federal House in Order (FHIO) Initiative this past year is another important step forward. Natural Resources Canada and Environment Canada are leading this initiative, which monitors federal efforts to reduce emissions. FHIO targets the eleven departments and agencies that account for 95 percent of federal emissions, while inviting all Government of Canada entities to participate in emissions reduction efforts through the Leadership Challenge. This initiative urges the remaining departments and agencies to undertake their own program of emissions reductions and report on the results. With a better understanding of where and how we produce GHGs, the Government will be better able to improve existing programs and design new ones to bring down those emissions.

Emission Reductions from Federal Operations: An Update details the progress that the Government of Canada has made through previously established initiatives and the FHIO. Programs such as the Federal Buildings Initiative, FleetWise, the Federal Industrial Boiler Program and the Renewable Energy Deployment Initiative demonstrate how the Government does its part so that Canada meets its climate change commitment. We believe the strides we are making are examples for all Canadian businesses, showing that we can reduce GHGs while improving the services we offer.

Ralph Goodale
Minister
Natural Resources Canada

David Anderson
Minister
Environment Canada

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Executive Summary

The Government of Canada is serious about taking action to address climate change and demonstrating leadership by reducing greenhouse gas emissions within its own operations. The Federal House in Order Initiative formally centralizes the Government of Canada's efforts to monitor, track and reduce its own emissions in response to its Kyoto commitment. Supported by lead departments Natural Resources Canada and Environment Canada, the initiative involves 11 departments and agencies that together account for over 95 percent of all federal government emissions.

This report, *Emission Reductions from Federal Operations: An Update*, meets the government's commitment to report annually on its progress in reducing emissions. It is the sixth progress report submitted to Canada's Climate Change Voluntary Challenge and Registry Inc. Although this document covers the same time period as the progress report published in April 2000, it reflects a revised federal target, a significantly different methodology and new information, based on data collected under the Federal House in Order Initiative.

Some highlights include:

- Total GHG emissions declined by approximately 19 percent between 1990 and 1998. In 1998, approximately 80 percent of emissions came from facilities (i.e., buildings), while 17 percent were from vehicle fleets and 3 percent from non-energy sources.
- For the first time, emissions associated with off-road vehicles and field equipment are included. The off-road fleet accounts for 47 percent of the total federal fleet and an estimated 62 percent of fleet-related emissions.
- In 1995, the ministers of the Departments of Natural Resources and the Environment agreed to reduce federal emissions by 20 percent from 1990 levels by the year 2005. The *Government of Canada Action Plan 2000 on Climate Change* recently announced a revised target of almost 31 percent from 1990 levels by the year 2010. This revised target translates into a reduction of 11.2 percent in addition to the 19.4 percent achieved to the year 1998.

Introduction

Emissions from the combustion of fossil fuels such as coal, oil and natural gas account for most of Canada's greenhouse gas (GHG) emissions. In partnership with other levels of government, industry and energy consumers, the Government of Canada is working to limit these emissions and their contribution to global climate change.

Between 1990 and 1998, the Government of Canada reduced its GHG emissions from an estimated 3847 to 3102 kilotonnes (kt) or approximately 19.4 percent. By reducing emissions from its own operations and demonstrating leadership on the climate change issue, the government is in a strong position to encourage other sectors of the economy to do likewise and to build a national consensus on addressing climate change.

This Emission Reductions from Federal Operations (ERFO) report meets the government's commitment to report annually on its progress in reducing emissions. It is the sixth progress report submitted to Canada's Climate Change Voluntary Challenge and Registry (VCR) Inc. Although this document covers the same time period as the most recent progress report, published in April 2000, it reflects a revised federal target, as well as a significantly different methodology and new information based on data collected under the Federal House in Order Initiative (FHIO). This federal initiative formally centralizes the government's efforts to monitor, track and reduce its own emissions. For the first time, the data covers off-road vehicles and field equipment, as well as federal buildings and vehicle fleets. This report pertains only to federal departments and agencies: Crown corporations are responsible for registering their own action plans directly with VCR Inc.

The structure of the report outlined below reflects the changes between this and the ERFO report published in April 2000:

- Chapter 1 describes the scope of the study, including the background and the revised methodology for estimating federal GHG emissions based on extensive data collected under the FHIO.
- Chapter 2 reports federal GHG emissions for federal buildings and vehicle fleets, as well as for off-road vehicles and field equipment.
- Chapter 3 describes actions taken by federal departments and agencies to reduce energy consumption and related GHG emissions.

Chapter 1

Scope of the Study

1.1 Background

In 1992, Canada ratified the United Nations Framework Convention on Climate Change (UNFCCC). In 1995, federal, provincial and territorial ministers of Energy and the Environment approved the National Action Program on Climate Change to demonstrate leadership in reducing GHG emissions by "getting their own houses in order." By controlling emissions related to their own operations, participants sought to encourage other sectors of the economy to do the same.

Accordingly, the Government of Canada registered its action plan with VCR Inc. in 1995. The action plan stated the federal government's commitment to reduce GHG emissions from federal operations by at least 20 percent from 1990 levels by the year 2005.[1]

In December 1997, more than 160 nations attending the third UNFCCC Conference of the Parties negotiated the Kyoto Protocol. The Government of Canada agreed to reduce GHG emissions within Canada to 6 percent below 1990 levels between 2008 and 2012 and launched the FHIO aimed at developing a new target for reducing GHG emissions within its own operations. This new target, along with a strengthened reporting system, was announced in the *Government of Canada Action Plan 2000 on Climate Change*.

1.2 Federal House in Order Initiative

Because federal government operations produce GHG emissions, the Government of Canada must honour its share of the responsibility for meeting the Kyoto commitment. It is doing just that through the FHIO, which formally centralizes the government's efforts to monitor, track and reduce its own emissions. The initiative involves 11 departments and agencies that together account for over 95 percent of all federal government emissions, excluding those emitted by national security and safety activities. Natural Resources Canada (NRCan) and Environment Canada (EC) are the lead departments for the FHIO.

To demonstrate strong leadership in addressing climate change, the federal government recognized the importance of reducing its own GHG emissions, based on measurable data provided by individual departments and tracked through a central GHG inventory. A central GHG inventory will allow consistent, reliable and annual reporting on the effectiveness of the FHIO.

[1] This target has recently been revised as described in section 1.4.

1.3 Methodology for Estimating Federal Emissions

The methodology for estimating federal GHG emissions has evolved over the years. The first versions of this report were based on a combination of departmental reports and estimates. Federal government downsizing in the 1990s led to a reduction in departmental reporting on energy use,[2] which led to modifications in the methodology used to estimate GHG emissions from federal operations.

In the most recent ERFO reports, energy use in federal buildings was based on floor space occupied by the federal government and on estimates of improvements in energy intensity provided by the Federal Buildings Initiative. Energy use by federal fleets was based on studies of on-road sources of emissions undertaken by NRCan. Estimates were not available for the energy use of off-road vehicles and field equipment or for non-energy sources of emissions. Reductions in GHG emissions were estimated by applying conversion factors from EC to the calculated energy savings.

The methodology used to estimate federal GHG emissions in this update to the April 2000 ERFO report represents a major improvement on earlier methods. A preliminary exercise carried out among 22 federal departments and agencies (with support from the Climate Change Action Fund) revealed that 11 departments and agencies account for over 95 percent of all federal government emissions.

Table 1

Departments and Agencies Targeted under FHIO

Agriculture and Agri-Food Canada
Correctional Service Canada
Department of Fisheries and Oceans
Department of National Defence
Environment Canada
National Research Council
Natural Resources Canada
Parks Canada
Public Works and Government Services Canada
Royal Canadian Mounted Police
Transport Canada

This document reports federal GHG estimates based on measured data collected from the 11 departments and agencies (see Table 1) under the FHIO. Energy-use data was collected and verified by the departments themselves and by consultants who are experts in the buildings and transportation fields. GHG conversion factors from EC were applied to the data measured. The targeted reduction in federal emissions was forecast using the measured data and information on opportunities for further reductions identified by the 11 departments and agencies under the FHIO as described in section 2.2.

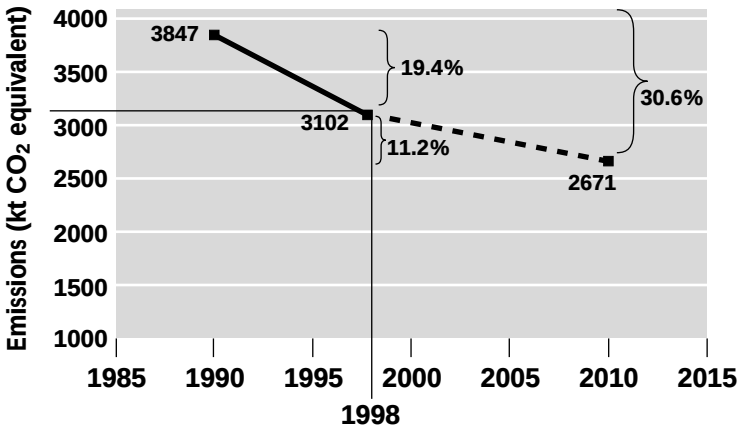
[2] Due to the decentralization of facilities management, many departments and agencies no longer maintained centralized records of energy use and were not able to provide this information as they did in past years.

1.4 Federal Target Setting

In 1995, the ministers of Natural Resources and the Environment agreed to reduce federal emissions by 20 percent from 1990 levels by the year 2005. Through building retrofits, better fleet management and the downsizing of operations, the federal government achieved a 19.4-percent reduction in federal emissions between 1990 and 1998. Following an extensive exercise in collecting and analysing data under the FHIO, the federal target has been revised to almost 31 percent from 1990 levels by the year 2010. Figure 1 shows that the revised target translates into a reduction of 11.2 percent in addition to the 19.4 percent achieved to the year 1998.

Figure 1

Targets for Emission Reductions from Federal Operations



The forecast for further reductions is also based on an assessment of cost-effective opportunities identified by the departments and agencies concerned. One aspect of emissions reduction unique to federal operations concerns national security and safety (NSS) functions (e.g., military operations, search and rescue). To avoid impairing the ability of the federal government to provide for the safety and security of Canadians, and until international guidelines are developed, emissions from activities related to NSS are not included in the overall federal target.[3]

The federal target will be allocated across the 11 departments and agencies based on the availability of cost-effective opportunities for reductions to minimize the cost to government. Targets for individual departments and agencies may be adjusted over the 10-year period as a result of government reorganization, unexpected growth or a change in the overall target.

The 11 departments and agencies will estimate and report GHG emissions in accordance with agreed-upon guidelines; most already collect information for environmental or financial management purposes and will only need adjustments. Other federal departments and agencies, which do not emit significant GHG emissions, will not have targets; however, they may participate in the Leadership Challenge described in Chapter 3.

[3] Emissions reported herein do not include NSS estimates. NSS emissions are tracked separately and were estimated to be 1949 kt in 1990 and decreased to 1226 kt in 1998. More than 95 percent of these emissions are attributable to the Department of National Defence. The Department of Fisheries and Oceans and Transport Canada also report a small share of emissions associated with NSS activities.

Chapter 2

Federal Greenhouse Gas Emissions

GHG emissions result directly from the combustion of fossil fuels to run cars, trucks, planes and ships and indirectly from the use of electricity to heat, cool, light and power buildings. The use of energy derived from fossil fuels results in three types of GHG emissions: carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). GHG emissions are also generated from non-energy sources such as solvents, agriculture and decomposition of solid waste. Carbon dioxide accounts for most GHG emissions from federal operations, with small volumes of N_2O (principally from agriculture and road transportation) and CH_4 (principally from non-energy sources). Emissions from federal operations are reported in this document in CO_2 equivalent units.

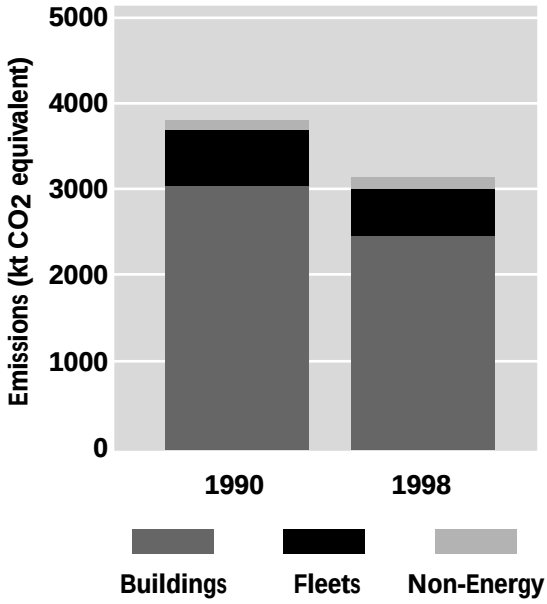
2.1 Historical GHG Emissions: 1990–1998

Figure 2 shows the reduction in GHG emissions by source, for the 11 federal departments and agencies listed in Table 1 (excluding NSS emissions) for 1990 and 1998. Federal GHG emissions declined by approximately 19.4 percent from 3847 kt in 1990 to 3102 kt in 1998, largely as a result of reduced energy use and government downsizing (i.e., reductions in floor space and fleet size).

Energy use in federal buildings declined by 16 percent, 5 percent due to improved energy efficiency and 11 percent due to reductions in floor space. GHG emissions from buildings declined by 19 percent. Energy use in the federal fleet declined by 22 percent, 6 percent due to improvements in the average fuel economy of the fleet and 16 percent due to decreases in fleet activity (number of kilometres travelled). The decline in emissions from the federal fleet was 19 percent, which was less than the decline in energy use. The lower reduction in emissions is the result of a higher proportion of trucks and vans in the federal fleet compared with 1990. This segment of the fleet produces higher emissions per unit of fuel consumed because as a group these vehicles were produced with less stringent emission standards.

Figure 2

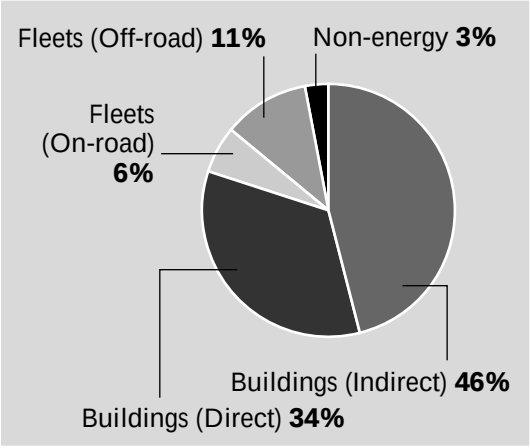
1990 and 1998 GHG Emissions from Federal Operations by Source (11 Departments and Agencies)



In 1998, emissions from federal operations were equivalent to approximately 0.4 percent of Canada's overall GHG emissions. Approximately 80 percent (2474 kt) were associated with buildings, 17 percent (528 kt) with vehicle fleets and 3 percent (100 kt) with non-energy sources. Figure 3 shows the share of emissions from federal operations by source.

Figure 3

Federal GHG Emissions by Source, 1998



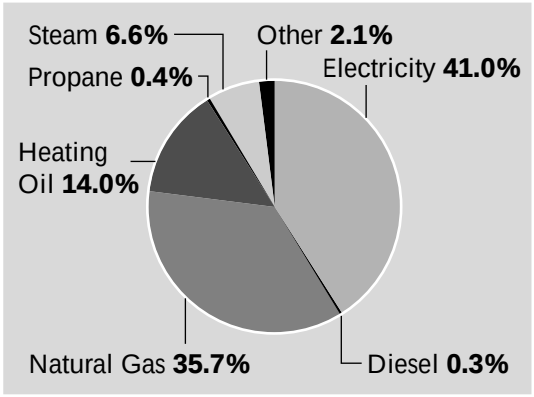
2.1.1 Federal Buildings

In 1998, federal facilities emitted approximately 2474 kt of GHG emissions; of these, about 78 percent were from three federal departments. The Department of National Defence (DND) accounted for approximately 47 percent (1153 kt), Public Works and Government Services Canada (PWGSC) for approximately 25 percent (609 kt) and Correctional Service Canada (CSC) for about 7 percent (176 kt).

More than 40 percent of energy use in federal facilities was from electricity, while most of the remaining energy use was from the combustion of fossil fuels (see Figure 4). Reducing the use of fossil fuels leads to reductions in direct GHG emissions. There are no GHG emissions directly associated with hydro, wind, solar or nuclear-generated electricity, but indirect emissions are associated with electricity generated by the combustion of fossil fuels. Reducing the use of electricity does reduce GHG emissions, however, because electricity generated cleanly can displace electricity generated by fossil fuels. Lower GHG emissions resulting from reduced electricity demand are assumed to emanate from reductions in the use of natural gas.[4] The federal government makes this assumption when calculating and reporting GHG emission reduction targets for every region of Canada.

Figure 4

Energy Used by Federal Buildings by Fuel Type, 1998



[4] Because this study assumes that supplementary electricity generation is fueled by natural gas combustion, reduced electricity demand entails lower natural gas use in electricity generation, which reduces GHG emissions in the process.

Table 2

Federal Fleet Characteristics

	1998–1999
Total Federal Fleet	40 471 units
Number of light-duty on-road vehicles	21 522 units (53.2 percent of total)
Fleets larger than 1000 vehicles*	6
Average age	4.3 years
Vehicles using alternative fuels	718**
Off-road Fleet	18 949 units (46.8 percent of total)
Aircraft	3 percent (1.4 percent of total)
Marine vessels	2 percent (0.8 percent of total)
Field equipment	95 percent (44.6 percent of total)

* Departments and agencies with on-road fleets larger than 1000 vehicles include DND, the RCMP, Parks Canada, DFO, CSC and Agriculture and Agri-Food Canada.

** Based on the 1998–99 *Report on the Application of the* Alternative Fuels Act – *Annual Report to Parliament*

2.1.2 Federal Fleet

The federal fleet is made up of on-road, field, air and marine equipment. This ERFO report includes, for the first time, an estimate of the federal off-road vehicle and field equipment inventory and its associated GHG emissions.

In 1998, the federal vehicle fleet consisted of just over 40 000 light-duty on-road vehicles, aircraft, marine vessels and field equipment such as snowmobiles, tractors and out-board motors. Figures 5 and 6 and Table 2 provide additional details on the federal fleet.

In 1998, total GHG emissions from vehicles were estimated at 528 kt; of these, on-road vehicles accounted for 38 percent. Three federal departments (the RCMP, DND and the Department of Fisheries and Oceans (DFO)) accounted for 81 percent of on-road emissions, while three federal departments (DFO, DND and Transport Canada) accounted for 86 percent of off-road emissions.

According to the 1998–99 *Report on the Application of the* Alternative Fuels Act – *Annual Report to Parliament*, the federal fleet consumed 2433 terajoules (TJ) of energy or 70.2 million litres of gasoline equivalent.[5] This includes an estimated 2719 thousand litres of

Figure 5

Federal Fleet Units by Type, 1998

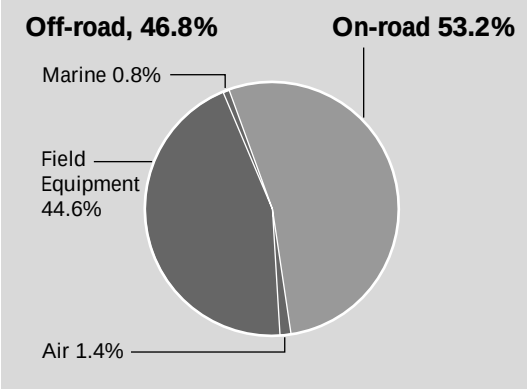
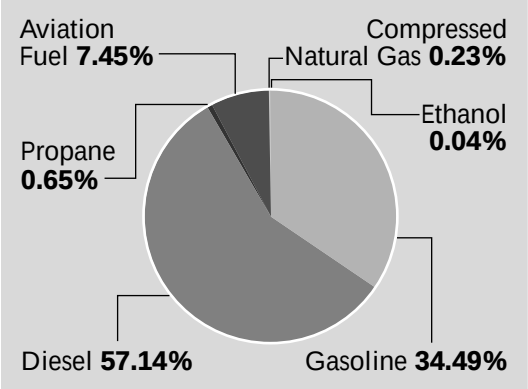


Figure 6

Fuel Use by Federal Fleet by Fuel Type, 1998



[5] One TJ equals about 28 851.7 litres of gasoline equivalent.

alternative fuel consumed by the federal fleet, with propane being the most widely used alternative fuel (approximately 71 percent).

As reported in the April 2000 ERFO report, the reduction in fuel consumption of the federal fleet that occurred between fiscal year 1995–96 and 1997–98 was primarily due to reductions in the number of kilometres travelled by the fleet (approximately 16 percent) partly as a result of downsizing. At the same time, energy use per kilometre increased slightly, mainly due to an increased use of vans, trucks and sport utility vehicles within the federal fleet.

2.2 Projected GHG Emissions: 1998–2010

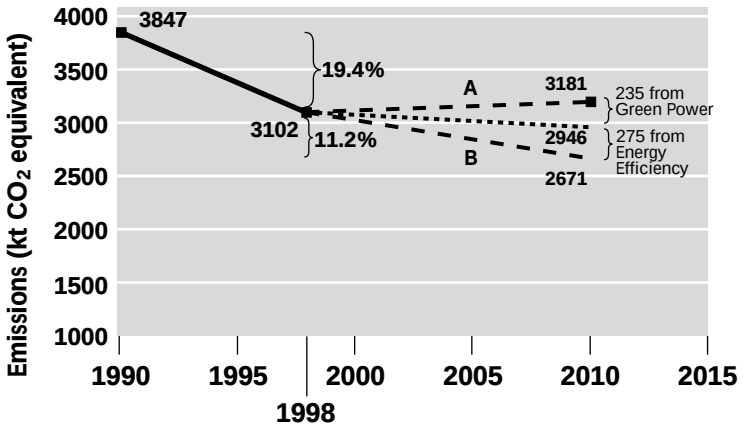
This section discusses two projections of GHG emissions from federal operations for the period 1998 to 2010 based on a business-as-usual scenario and, in comparison, the impact of measures identified through the FHIO.

2.2.1 Business-as-usual Scenario

Line A in Figure 7 illustrates the projected increase in GHG emissions from federal operations under the business-as-usual scenario.

Figure 7

Projected Federal GHG Emissions, 1990 to 2015



If no new actions are taken, federal GHG emissions are projected to grow by a total of 2.5 percent to 3181 kt by 2010. This estimate is based on planned growth in floor space reported by departments and agencies in their capital plans.

It is assumed that new construction will be to current building practices and performance levels between 1998 and 2010; for building stock existing in 1998, the efficiency would remain largely unchanged in the absence of FHIO measures. It is assumed that emissions from vehicle fleets will also remain relatively constant in the absence of government measures.

2.2.2 Impact of Measures through FHIO

Line B of Figure 7 illustrates the projected decrease in GHG emissions taking into account the impact of new energy management action plans. As a result of the FHIO, GHG emissions from federal operations are projected to decrease an additional 11.2 percent from 1990 levels by the year 2010. Comprehensive departmental reviews estimated that these reductions could be realized based on energy management actions with a simple payback of 8 years or less. These actions can be implemented by departments themselves or through energy service companies that provide performance contracting services.

Emissions will be estimated based on measurable energy-use data provided annually by individual departments and agencies, and tracked through a central GHG inventory. Information will be reported annually to enable the Government of Canada to track its progress in reducing GHG emissions from its own operations. It will also serve to measure the effectiveness of the FHIO.

Chapter 3

Reducing Emissions from Federal Operations

Between 1990 and 1998, the Government of Canada successfully reduced GHG emissions from its own operations by approximately 19.4 percent (745 kt) with the assistance of programs and initiatives offered by such federal departments as NRCan, PWGSC and EC. Contributions to the reduction of GHG emissions since 1990 are outlined below.

3.1 Current Program Highlights

Programs such as the Federal Buildings Initiative, the Federal Industrial Boiler Program and Green Power helped reduce emissions by supporting energy retrofits, providing the public and staff with information about energy efficiency and GHG issues, and encouraging the design of more energy-efficient buildings.

3.1.1 Federal Buildings Initiative

The Federal Buildings Initiative (FBI) is a voluntary program developed and administered by NRCan to help federal departments and agencies improve the energy efficiency of their facilities. It provides departments and agencies with a model framework for updating federal government buildings with energy-saving technologies and practices. Since 1991, NRCan's FBI program has resulted in retrofits of over 5500 facilities, and the FBI reports that it expects its program to result in a reduction of 16 kt of emissions per year from new projects. Examples of FBI initiatives include the following:

- Fourteen Canadian Forces bases have awarded energy performance contracts to energy service companies that will result in approximately $90 million of private sector investment in energy efficiency improvements and produce energy savings of over $10 million per year.
- The energy management industry has retrofitted more than 1.2 million square metres of federal space managed by PWGSC. PWGSC has signed 32 energy performance contracts representing over $41 million in private sector investment in energy efficiency improvements and $6.3 million in annual energy savings.
- In 1998, EC and PWGSC launched the first FBI energy improvement project in a facility leased by the federal government. Duroc Enterprises Ltd., the owner and landlord of the Place Vincent Massey complex in Hull, Quebec, entered into a $1.8-million energy performance contract that will generate some $200 million in annual energy cost savings. This pilot project extends the reach of the FBI program beyond federally owned facilities to all facilities that accommodate federal employees.
- NRCan invested $7.6 million in the national retrofit of its custodial sites, which led to annual energy savings of about $1 million and avoided GHG emissions of about 4 kt per year since 1998.

3.1.2 Federal Industrial Boiler Program

Fossil fuel combustion in industrial-sized boilers is a major source of GHGs and oxides of nitrogen (NO_x), a principal ingredient of smog and acid rain. The federal government operates over 270 boilers located in 52 heating plants. The Federal Industrial Boiler Program (FIBP) was established in 1991 to ensure that environmentally responsible, energy-efficient technologies are considered when departments and agencies replace or modify their heating plants. Under the FIBP, GHG emissions are reduced by an average of 4.7 kt per year. Examples of initiatives under the FIBP include the following:

- NRCan's Bells Corners complex, home of the FIBP, completed a project that converted the entire heating system from a hot water system to a thermal fluid system using low-NO_x burners.
- FIBP has been working with DND at CFB Bagotville to upgrade the central heating plant heating equipment. This $1.5-million project involved the installation of energy-efficient boilers with low-NO_x burners and the upgrade or replacement of controls and ancillary equipment.
- FIBP performed a study on cogeneration at Dorchester Penitentiary in New Brunswick for CSC. The study evaluated a heating plant upgrade for the penitentiary and recommended a conversion from No. 6 fuel oil to No. 2 oil to significantly reduce NO_x and sulphur dioxide emissions.
- FIBP is participating in CSC's Sustainable Development Strategy by inspecting heating systems in federal penitentiaries across the country to identify problems and recommend options for improving energy efficiency, reducing operating costs and reducing emissions. The central heating plant at the Leclerc Institution in Laval, Quebec, which has been identified as one of the largest contributors to GHG emissions in CSC, will undergo a complete $3.8-million refurbishment. The work will include the installation of four new boilers, which offer an eight-percent reduction in natural gas consumption and CO_2 emissions, and new low-NO_x burners for a reduction in NO_x emissions.
- FIBP prepared drawings and specifications for a new replacement boiler complete with low-NO_x burners at the National Research Council in Ottawa.

3.1.3 Emerging Renewable Electricity

In 1997, NRCan and EC made a commitment to purchase 15 to 20 percent of their electrical energy in the form of green power by the year 2010. Under their first pilot project, ENMAX, an Alberta electric utility company, provides NRCan with 10 000 megawatt hours and EC with 2200 megawatt hours of electricity every year for 10 years for their operations in Alberta. During 1998 and 1999, ENMAX reported reductions of 10.4 and 10.9 kt of GHG emissions respectively as a result of the actual displacement of electricity generated by a mix of coal and natural gas.

In the 2000 budget, the federal government committed $15 million to expand its green power purchases into Saskatchewan and Prince Edward Island. The first agreement with SaskPower, announced in October 2000, will see federal facilities receiving at least 25 gigawatt hours per year of wind energy, amounting to reductions of at least 20 kt of GHG emissions per year. With respect to Prince Edward Island, negotiations with Maritime Electric and the provincial government are well advanced and an announcement is expected in the spring of 2001. Preliminary discussions have taken place with Nova Scotia Power Inc. with respect to eventual purchases of electricity for federal facilities in Nova Scotia.

In response to a proposal made by the Electricity Table under the climate change consultations, the *Government of Canada Action Plan 2000 on Climate Change* announced a commitment that 20 percent of federal electricity requirements will be from emerging renewable electricity by 2010. This measure is expected to yield two main benefits. First, it will help suppliers of these emerging sources to become more experienced

and cost-competitive. Second, the Government of Canada expects to avoid producing at least 240 kt of GHG emissions by 2010.

3.1.4 Renewable Energy Deployment Initiative for Federal Facilities

NRCan's Renewable Energy Deployment Initiative (REDI) was a three-year, $12-million program launched in April 1998 to encourage the use of renewable energy systems for space and water heating. In the 2000 budget, the federal government announced funding that will allow the extension of the program for an additional three years.

REDI for Federal Facilities is a component of the overall program and provides support (i.e., marketing, industry and infrastructure support, and financial incentives) for four types of renewable energy projects in federal facilities: solar hot water; solar air heating; high-efficiency/low-emissions biomass combustion for systems with a capacity of 75 kilowatts or more; and earth energy systems (there is no financial incentive for earth energy systems). Examples of initiatives under REDI include the following:

- In 1997, the first solar air heating system was installed on an exterior wall of a laboratory building at NRCan's CANMET complex in Bells Corners, Ontario. This has resulted in a reduction of 44 tonnes of CO_2 per year.
- In 1998, NRCan's Energy Diversification Laboratory in Varennes, Quebec, installed a 220-square-metre SolarWall® that will be capable of supplying 340 m^2 of warmed air per minute or approximately 400 gigajoules of renewable energy to the building per year, resulting in a reduction of 30 tonnes of CO_2 per year.
- Also in 1998, the Canadian Coast Guard installed a solar air heating system in a maintenance building in Prescott, Ontario, that has resulted in a reduction of 11 tonnes of GHG emissions per year.

To increase participation by federal departments, REDI has finalized an agreement with the FBI. Under this agreement, a range of technical services are offered to energy service companies and federal departments to enable them to assess potential opportunities for reliable, cost-effective applications of renewable energy deployment.

3.1.5 FleetWise

The FleetWise program was developed by NRCan to assist federal departments to increase the energy efficiency of their motor vehicle fleets and to promote the *Alternative Fuels Act* within the federal fleet. The goal of the FleetWise program is to reduce the amount of GHG emissions emitted from the on-road vehicle fleets by 25 percent from 1999 levels. This goal can be achieved by reducing the fleet size and by creating a mix of vehicles that are more appropriate for particular tasks; for example, using a sub-compact car instead of a van when only two passengers are in the vehicle. Other methods include the introduction of alternative fuel vehicles and advanced technology vehicles. The reduction in GHG emissions through FleetWise initiatives is expected to be 20 kt for 2001. An annual rate of reduction projected from 2001 to 2010 is close to 3 percent. Examples of initiatives under FleetWise include the following:

- DND has developed its ON-TRACK system to incorporate FleetWise's QTOOL SE vehicle acquisition software. The ON-TRACK system provides a comprehen-

sive package of information for computer-based planning and analysis of vehicle acquisitions, fuel availability and use. The QTOOL SE software is particularly useful in addressing the acquisition of alternative fuel vehicles to meet the requirements of the *Alternative Fuels Act*. The QTOOL SE database is the only complete Canadian source of information on alternative fuel vehicles; it provides details on the specifications and availability of alternative fuel vehicle platforms, different vehicle configurations, rebate programs and taxation issues in different provinces across Canada.

- FleetWise participated in energy efficiency demonstrations at DFO and at conferences in Montréal and Ottawa where technical presentations were provided to federal materiel and fleet managers.
- *FleetWise Update* was produced as a communications tool for distribution to fleet managers and vehicle users to keep them apprised of issues and activities affecting departmental fleet vehicle operations.
- FleetWise completed technical demonstrations and reports evaluating alternative fuel vehicle conversions and Original Equipment Manufacturer applications.
- FleetWise initiated FHIO studies of the on-road vehicle fleet to assess the possibilities for fleet sharing and vehicle pooling, to investigate increasing the availability of alternative fuel vehicles and the use of alternative fuels in selected regional centres, and to assess integrating GHG emissions data as a basis for vehicle selection and acquisitions.

3.1.6 Awareness, Education and Training

There are several federal initiatives aimed at increasing awareness and encouraging actions by federal employees and industry to address climate change and reduce GHG emissions. Some examples of activities include the following:

- Events that celebrate and promote the benefits of energy efficiency have been held by several departments, including Statistics Canada, DND, NRCan, EC and PWGSC. A number of federal departments have offered climate change workshops to employees to raise awareness of the issue and to encourage them to take action. FHIO also ran an employee awareness pilot project.
- In October 2000, NRCan hosted Canada's Energy Efficiency Conference and Trade Show 2000 in Ottawa. This two-day event was attended by more than 500 delegates from academic, industrial, government and non-governmental organizations, and provided a forum for experts to share knowledge and inspire innovation in the field of energy efficiency as a means of helping Canada achieve its climate change commitments.
- NRCan's Office of Energy Efficiency has delivered energy management workshops to over 2000 industrial, institutional, commercial and government clients over four years to help participants develop action plans to reduce energy consumption in their organizations. These workshops complement the comprehensive energy management training that facility managers and operators undergo as part of energy efficiency retrofit projects.

- The Government of Canada established a climate change Web site (www.climate-change.gc.ca) with links to other key government and non-government sites that provide information on policy, and scientific, technical and program resources related to climate change.

3.2 New Initiative: The Leadership Challenge

The Leadership Challenge is a component of the FHIO designed to demonstrate leadership by issuing a challenge to all federal departments, agencies and Crown corporations to implement a GHG emissions reduction program of their own design and to report on their progress annually. The Leadership Challenge will develop and promote best practices, check delivery of FHIO communications, assist in developing GHG emissions reduction programs, and deliver annual awards and provide recognition. As part of the federal government's broader commitment to sustainable development and greening government operations, the Leadership Challenge will also provide an overall focus for GHG emissions reduction in federal operations.

The best practices component of the Leadership Challenge invites all departments, agencies and Crown corporations to undertake specific actions based on a Code of Best Practices developed by EC and NRCan. The code will provide principles and guidelines for the design of new buildings, building retrofits and operations, fleet selection and management, procurement, waste management, green power, staff training and employee awareness. The Leadership Challenge will also work with Transport Canada to promote best practices for reducing GHG emissions resulting from commuting and business travel.