2006

Report of the

Commissioner of the Environment and Sustainable Development

to the House of Commons

Chapter 3

Reducing Greenhouse Gases Emitted During Energy Production and Consumption

Office of the Auditor General of Canada

The 2006 Report of the Commissioner of the Environment and Sustainable Development comprises five chapters, The Commissioner's Perspective—2006, Climate Change—An Overview, and Main Points. The main table of contents is found at the end of this publication.

This report is available on our Web site at www.oag-bvg.gc.ca.

For copies of this report or other Office of the Auditor General publications, contact

Office of the Auditor General of Canada
240 Sparks Street, Stop 10-1
Ottawa, Ontario
K1A 0G6

Telephone: 613-952-0213, ext. 5000, or 1-888-761-5953 (toll-free)
Fax: 613-943-5485
Hearing impaired only TTY: 1-613-954-8042
E-mail: distribution@oag-bvg.gc.ca

Ce document est également publié en français.

Cat. No. FA1-2/2006-3E
ISBN 0-662-43953-8

Chapter

3

Reducing Greenhouse Gases Emitted During Energy Production and Consumption

The audit work reported in this chapter was conducted in accordance with the legislative mandate, policies, and practices of the Office of the Auditor General of Canada. These policies and practices embrace the standards recommended by the Canadian Institute of Chartered Accountants.

Table of Contents

Reducing Greenhouse Gases Emitted During Energy Production and Consumption

Main Points

What we examined

Natural Resources Canada (NRCan) is the department that receives the majority of the federal funds aimed at reducing greenhouse gas emissions. It is responsible for implementing federal energy policies and for most federal programs intended to reduce greenhouse gas emissions from energy production and consumption in Canada. The Department is accountable for delivering reductions in greenhouse gas emissions through its policies and programs.

We looked in detail at three NRCan programs that each received $100 million or more in federal funding earmarked for climate change programs. They provide examples of different areas where NRCan supports efforts to reduce greenhouse gas emissions: the Wind Power Production Incentive (renewable energy), the EnerGuide for Existing Houses program (energy efficiency), and the Ethanol Expansion Program (renewable fuels). We examined what greenhouse gas emission reductions the three programs have achieved, what they have cost, and how the Department monitors and reports on program results and spending. We also examined to what extent NRCan has learned from experience and taken steps to reduce risks in managing its programs. (Near the end of our audit, one of these programs, EnerGuide for Existing Houses, was discontinued).

Finally, we looked more broadly at other emission reduction efforts in the oil and gas sector, and the areas of wind power and home energy efficiency to see whether the Department can demonstrate what its programs and other activities have contributed to the emission reductions targeted in the federal government's plans for addressing climate change.

Why it's important

Energy production and consumption account for more than 80 percent of the greenhouse gas emissions in Canada. And compared with 1990, emissions have risen considerably, largely due to the production and consumption of fossil fuels like oil, natural gas, and coal.

In almost every aspect of their daily lives, Canadians need energy in the form of fuel, electricity, or heat. The national economy also depends on the production of energy, both for domestic use and for

export. However, producing and consuming non-renewable energy releases pollutants into our air, water, and soil. Among those pollutants are greenhouse gases, which governments of many countries, including Canada, have formally linked to climate change.

Changing the way Canadians produce, distribute, and consume energy is therefore critical. As part of its response to climate change, the federal government has announced billions of dollars to support actions aimed at reducing emissions from major Canadian sources.

What we found

- Each of the three programs we examined in detail was funded to reduce greenhouse gas emissions, and they have made progress. As of March 2006, spending on the programs had achieved about 22 percent of the 4.8 million-tonne reduction that NRCan expected the programs to achieve by 2010. However, emission reduction targets for these programs were confusing, making it difficult to determine the actual results that were expected. Further, NRCan did not consistently report publicly on how these programs performed against emission reduction and other targets, making it difficult to hold the Department to account for its results.

- The Wind Power Production Incentive has stimulated investment in Canada's wind power industry during its infancy. The program has made progress toward its targets for electricity generation and greenhouse gas emission reduction, though less than anticipated. NRCan is adjusting the program based on lessons learned, to be ready should additional funds be approved. The Department has yet to lead the establishment of a long-term strategy for wind power in Canada, identifying where governments can be most effective.

- Oil and gas production, particularly the rapid development of Canadian oil sands, is significantly increasing greenhouse gas emissions. Yet few federal efforts are underway to reduce these emissions, and those efforts have had minimal results to date. For its part, the federal government is counting on regulatory and long-term technological solutions to achieve future reductions in this sector. However, it is not leading the way by clearly stating how and to what degree Canada will reduce greenhouse gas emissions when oil and gas production is expected to increase.

The Department has responded. Natural Resources Canada generally agrees with the recommendations in this chapter. However, in some circumstances, we note that its response does not fully indicate what action it intends to take and the timing for doing so.

Introduction

Energy, sustainable development, and climate change

For a detailed description of the climate change issue, please consult **The Commissioner's Perspective**, which includes a section called **Climate Change—An Overview**.

3.1 Energy represents a major sustainable development challenge for Canada. Canadians use it to heat their homes, power their lights, computers, and appliances, commute to and from work, and travel. Canadian businesses need energy to manufacture and distribute their goods, and the economy depends on it. But Canada's latest greenhouse gas inventory shows that the production and consumption of energy is also responsible for more than 80 percent of Canada's greenhouse gas emissions.

Energy and Sustainable Development

Sustainable development requires us to examine the present mix of energy production in Canada; to develop new, more environmentally benign energy technologies; to use energy more efficiently; and to ensure that the generations that follow enjoy an equally secure energy future and unimpaired environmental quality.

Source: Energy and Sustainable Development: A Canadian Perspective, Government of Canada, 2001

3.2 Canada's energy future is facing several challenges, including

- rising energy prices,
- the adequacy and reliability of the electricity supply,
- the availability and affordability of renewable energy sources,
- high demand for energy exports, and
- energy-related air pollution and its impact on the health of Canadians.

3.3 Transforming the way Canadians produce, distribute, and consume energy is key to addressing greenhouse gas emissions and climate change. It involves many players, including the federal and provincial governments, which share jurisdiction over energy, as well as the private sector and individual Canadians. The federal government's goals for reducing greenhouse gases emitted during energy production and consumption are contained in its climate change plans (Exhibit 3.1).

Natural Resources Canada: The federal lead for energy

3.4 The federal government's mandate with respect to energy includes interprovincial and international aspects of energy resource management, trade and commerce, transboundary environmental protection as well as policies of national interest, such as economic development, security of the energy supply, and federal research and development.

3.5 Natural Resources Canada (NRCan) is the federal department with primary responsibility for energy. As part of its mandate, NRCan is expected to co-ordinate, promote, recommend, and implement energy policies, as well as undertake programs and activities pursuant to those policies. The Department is expected to do so in co-operation with provincial and territorial governments, while considering the sustainable development of Canada's natural resources. Its efforts focus on energy efficiency, renewable energy, energy in transportation, and energy research and development. NRCan uses a range of approaches including providing grants and contributions, disseminating information, and regulating industry.

3.6 NRCan received the majority of funds allocated to federal government departments for programs to address climate change. This funding exceeded $1.5 billion from 1997 to 2006 for NRCan. At the time of our audit, NRCan was responsible for more than 30 programs aimed at reducing greenhouse gas emissions.

Exhibit 3.1 **Programs included in this chapter are linked to federal climate change plans**

Action Plan 2000 (October 2000)	Climate Change Plan for Canada (November 2002)	Project Green (April 2005)
This plan set out a package of initiatives to take Canada one third of the way to its Kyoto target. It aimed at key sectors and included initiatives in areas such as transportation, energy, and buildings.	This plan's goals were to help Canadians become efficient energy producers and consumers. The 2002 plan promoted Canadian leadership in developing new and cleaner technologies, and identified a broad range of actions based on the earlier 2000 plan.	This plan built on the two previous plans. Its goals were to help mobilize Canadians around Canada's Kyoto commitments, and help transform the economy while maintaining our competitiveness.
The following programs are included in this chapter and are linked to the goals of the federal climate change plans		
• Canadian Industry Program for Energy Conservation • Carbon Dioxide Capture and Storage Initiative • EnerGuide for Existing Houses • EnerGuide for New Houses • Equipment program • Ethanol Expansion Program • Market Incentive Program • Purchase of Electricity from Renewable Resources	• Canadian Industry Program for Energy Conservation • Carbon Dioxide Capture and Storage Initiative • EnerGuide for Existing Houses • EnerGuide for New Houses • Equipment program • Ethanol Expansion Program • Large Final Emitter System • Market Incentive Program • Purchase of Electricity from Renewable Resources • Wind Power Production Incentive	• Carbon Dioxide Capture and Storage Initiative • EnerGuide for Existing Houses • Equipment program • Large Final Emitter System • Purchase of Electricity from Renewable Resources • Wind Power Production Incentive

Challenges facing Canadian energy policy

3.7 The biggest challenge facing Canadian energy policy is balancing the need to reduce greenhouse gas emissions with the need to maintain energy production and exports and meet growing consumption, according to a 2004 review of Canadian energy policies conducted by the International Energy Agency. The Agency also noted a need for intensive talks between the federal and provincial governments to reach national energy policy goals.

3.8 Related to this challenge, the federal government sought advice from the National Round Table on the Environment and the Economy on a long-term strategy on energy and climate change. In addition, the Canadian Council of Energy Ministers is working collaboratively to ensure continued prosperity from Canada's energy resources and to enhance the security, reliability and sustainability of Canada's energy systems. Both industry and non-governmental organizations have called for a Canadian energy strategy or framework.

National Round Table on the Environment and the Economy

The National Round Table on the Environment and the Economy was created by the Prime Minister in 1988 as an independent advisory body reporting to the federal government. Its status was formalized in a 1993 Act of Parliament. It is dedicated to exploring new opportunities to integrate environmental conservation and economic development, in order to sustain Canada's prosperity and secure its future. Appointed by the Governor in Council on the recommendation of the Minister of the Environment, its members are distinguished leaders in business and labour, universities, environmental organizations, Aboriginal communities, and municipalities.

In June 2006, the Round Table released its advice to the federal government on a long-term strategy on energy and climate change. It noted that significant greenhouse gas emission reductions could take place in Canada by mid-century only if energy is used more efficiently and if it is produced while emitting less carbon. It pointed to the need to increase energy efficiency, to perfect carbon capture and storage, and to transform electricity generation to clean coal technology, co-generation, and renewable energy, particularly wind power.

Focus of the audit

3.9 We looked in detail at three of NRCan's programs to reduce greenhouse gas emissions:

- the Wind Power Production Incentive (WPPI),
- the EnerGuide for Existing Houses progam (EGH), and
- the Ethanol Expansion Program (EEP).

These programs have a high public profile, and each received $100 million or more in federal government funding earmarked for climate change programs. Our choice of programs was also influenced

by the variety they presented in terms of departmental approaches to reducing greenhouse gas emissions, covering renewable energy, energy efficiency, and alternative transportation fuels. A significant increase in funding for WPPI was announced in 2005, though it received approval for only a portion of it by the end of our audit. Furthermore, though a quadrupling of funds for the EGH program had also been announced, the program was discontinued near the end of our audit.

3.10 We also examined more broadly other programs aimed at reducing greenhouse gas emissions and related to

- developments in the oil and gas sector,
- advancements in wind power as a renewable and clean source of electricity, and
- improvements in the energy efficiency in homes.

3.11 We also assessed a selection of federal commitments related to energy and greenhouse gas emission reductions found in NRCan's 2004 sustainable development strategy. (Chapter 4, Sustainable Development Strategies, summarizes and presents these assessments.)

3.12 More details on the audit objectives, scope, approach, and criteria are in **About the Audit** at the end of this chapter.

Observations and Recommendations

3.13 To provide an overview of the programs examined in this chapter and their greenhouse gas emission reduction targets and results, summaries have been prepared (Exhibits 3.2, 3.3).

Exhibit 3.2 **Targets, results, and spending for programs examined in detail in this chapter**

Program	Greenhouse gas emission reduction targets (Mt/yr) by 2010	Greenhouse gas emission reduction results (Mt/yr) as of 31 March 2006	Total spent as of 31 March 2006 ($ millions)
Wind Power Production Incentive	0.9	0.36	21.3
EnerGuide for Existing Houses (discontinued in 2006)	2.2	0.7	103.8
Ethanol Expansion Program (one plant operating as of February 2006)	1.7	–	62.2
Total	**4.8**	**1.06**	**187.3**

Exhibit 3.3 **Targets and results for other programs included in this chapter**

Program	Greenhouse gas emission reduction targets (Mt/yr)	Greenhouse gas emission reduction results (Mt/yr) as of 31 March 2006
Purchase of Electricity from Renewable Resources	0.235 by 2006	0.025 (as of March 2004)
Market Incentive Program	0.5 by 2006	0.22
EnerGuide for New Houses	0.3 by 2010	0.26
Equipment Program		
• entire program	2.8 by 2010	0.62
• for the housing sector	None specified	0.52
Canadian Industry Program for Energy Conservation		
• entire program	5.8 by 2010	1.33
• for the oil and gas sector	None specified	0.04
Carbon Dioxide Capture and Storage Initiative	3.5 by 2006	0.08
Large Final Emitter System (not operational until 2008)		
• entire system	45 by 2010	–
• for the oil and gas sector	20 by 2010	–

Note: Numbers are rounded.

Renewable electricity from wind power

Wind power reduces greenhouse gas emissions

3.14 Wind power is a renewable form of energy that does not emit greenhouse gases while it produces electricity. It affects greenhouse gas emissions indirectly by displacing the electricity and emissions that would have been generated by other means, such as coal-fired or natural gas electricity-generating plants.

3.15 Another benefit of generating electricity by wind power is its contribution to securing a competitively priced supply of electricity. The National Energy Board (NEB) is an independent federal regulatory agency reporting to Parliament through the Minister of

Natural Resources. It has projected that electricity demand could exceed supply in some regions of Canada as early as 2007 if steps are not taken. The NEB concluded that renewable resources such as wind power are playing an increasingly important role in addressing the adequacy of Canada's electricity supply.

How wind power works

Most wind-generated electricity is created with wind turbines that are essentially giant windmills. The key components of modern wind turbines are rotor blades, some nearly half a football field in length, an electrical generator, and a tower. The wind blowing against the blades causes them to move. This movement turns a main shaft connected to a generator, which produces the electricity. The electricity produced by wind turbines is fed to consumers through the electricity distribution systems that public utility companies operate.

The Wind Power Production Incentive has stimulated investment

Did you know?

- A watt is a unit of power, and a watt-hour represents the amount of energy produced or consumed by a one-watt device in one hour. This provides a measure of energy production and consumption, such as for power plants and home appliances.
- Multiples are typically used when expressing watt-hours, such as kilowatt-hours (kW-h) for one thousand watt-hours, megawatt-hours (MW-h) for one million, gigawatt-hours (GW-h) for one billion, and terawatt-hours (TW-h) for one trillion.
- The WPPI program target of generating 2.6 TW-h of electricity per year by wind power is enough to meet the annual needs of about 260,000 homes.

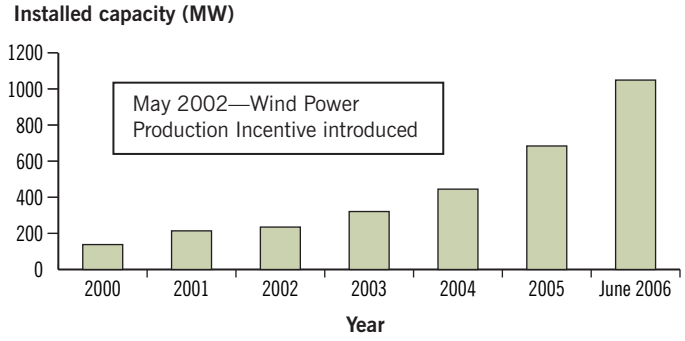
3.16 To support wind power directly, NRCan introduced the Wind Power Production Incentive (WPPI) program in May 2002 to encourage the production of electricity primarily from large wind turbines. WPPI began as a $260-million multi-year program that provides a financial incentive to wind farm owners for the electricity their projects produce. The incentive averages 1¢ for every kilowatt-hour (kW-h) of electricity produced during the first 10 years of a project's operation and is intended to help offset the higher cost of producing electricity from wind power. The program's targets are an annual production of 2.6 terawatt-hours (TW-h) of electricity and the installation of new turbines with a combined wind power capacity of 1,000 megawatts by 2007. The annual greenhouse gas emission reduction target for WPPI is currently 0.9 million tonnes (Mt) by 2010.

3.17 In Budget 2005, the federal government announced that it was expanding the program's multi-year funding to $1.18 billion. The corresponding targets to be achieved by 2010 would increase to an annual electricity production of 10.5 TW-h and a total installed wind power capacity of 4,000 megawatts, should this expanded funding be approved. By the end of our audit, interim funding of $69.9 million had been approved for WPPI, though the remainder of its expanded funding from Budget 2005 was not yet approved.

3.18 WPPI is one of several public and private initiatives that have contributed to the growth in installed wind power capacity in Canada (Exhibit 3.4). Though NRCan and others cannot attribute this growth to specific initiatives like WPPI, we found broad-based support for the

program and clear statements from provincial governments, companies and utilities about WPPI's influence on their decisions to invest in or support wind power projects.

Exhibit 3.4 Total installed wind power capacity in Canada is growing



Source: Based on information provided by the Canadian Wind Energy Association

The Wind Power Production Incentive is progressing toward its targets

3.19 Based on our review of WPPI financial data, authorized funding from its initial and expanded budgets was $329.9 million (April 2002 to March 2006). By March 2006, NRCan had committed $299.7 million to 22 signed projects. Eighteen of the projects were commissioned, producing electricity, and receiving the incentive. The remaining four projects were in development. NRCan spent $21.3 million of this funding, including $19.0 million paid to project proponents under the terms of signed contribution agreements. Firm commitments to future payments amount to $278.4 million (Exhibit 3.5). A total of 1 TW-h of electricity was produced by WPPI-supported projects in the year ending March 2006, equivalent to an annual greenhouse gas emission reduction of 0.36 million tonnes.

A wind farm on Mont Miller in Quebec.

Photo: Natural Resources Canada

3.20 NRCan reported in a 2005 discussion document on WPPI that operating wind farms were producing about 20 percent less electricity than expected in the signed contribution agreements. The Department has stated that the program will not meet its initial target for electricity production if this trend continues. Since greenhouse gas emissions are directly related to the amount of electricity produced, the emission target may not be met either. In terms of the initial program target of 1,000 megawatts for installed wind power capacity, the projects supported by WPPI's initial funding represent a total capacity of 729 megawatts. This number increased to 924 megawatts by March 2006 after additional projects received commitments based on WPPI's expanded funding.

Exhibit 3.5 **Financial information as of 31 March 2006 on the three programs examined ($ millions)**

Program	Total authorized funding	Payments for grants and contributions	Payments for other operating expenses	Committed to grants and contributions	Total spent and committed
Wind Power Production Incentive	329.9	19.0	2.3	278.4	299.7
EnerGuide for Existing Houses (discontinued in 2006) • program administrative costs • payments to contractors for home evaluations	452.2	37.1	 24.5 42.2	–	103.8
Ethanol Expansion Program	100.0	61.7	0.5	20.5	82.7
Totals	**882.1**	**117.8**	**69.5**	**298.9**	**486.2**

Source: Based upon financial data provided by Natural Resources Canada.

3.21 Meeting program targets is not assured because the Department and the wind farm developers agreed in the signed contribution agreements to electricity production levels that were over-estimated. NRCan committed its funds on the basis of these levels. Since payments are for electricity actually produced, some funds may lapse and not be available for additional new projects. Our audit found that $2.3 million had lapsed by 31 March 2006. More will lapse if electricity production levels continue to fall short.

3.22 NRCan's 2005 discussion document was used to consult with stakeholders on improvements to the program, should it be expanded. The document identified issues and options for dealing with them, many based on the experience gained in implementing the program during its first funding period. The Department intends to revise WPPI's terms and conditions to incorporate the lessons learned (for example, estimates of production levels).

3.23 In addition, during the course of our examination, NRCan conducted an internal audit of this program's financial and management controls. The recommendations and management responses relate to issues with program design, financial management, and program administration (Exhibit 3.6).

The wind power sector in Canada is changing

3.24 In 2002, when WPPI began, there were few wind farms in Canada and little investment or experience in operating them. Also, with a relative abundance of electricity in Canada, there was no pressing need

Wind power in two leading countries

In Germany and Denmark, wind power has emerged in the last 20 years as a key source of electricity. These countries experienced a pressing need to find alternative energy sources to generate electricity. They became leaders in wind power through national policies such as legislated requirements to purchase wind-generated electricity. They also have an adequate wind resource, encourage research and development, and are home to leading wind turbine manufacturers.

to use wind power, as there was in other countries. Though the provinces have a major role in encouraging large wind farms, they were not heavily engaged in wind power at that time (Exhibit 3.7).

3.25 Since 2002, some important changes have occurred in Canada's wind power industry. Installed wind power capacity has grown, as has government and industry experience with wind power. Costs associated with wind power have changed: some have decreased while others increased. Several provinces have become more engaged and are offering large contracts for new wind power projects. This has resulted in requests from some provinces for improved co-ordination between WPPI and their own efforts.

Exhibit 3.6 Main elements of the 2006 NRCan internal audit of the Wind Power Production Incentive

Internal audit recommendations	Management responses
Modify the capacity factor [the projected productivity of a wind farm] to an acceptable level (for example, 30 percent), or include a clause in the agreements to allow for reduction of eligible amounts in cases where production levels are not expected to be met.	Under an expanded program, the capacity factor will be fixed to a reasonable level and reflected in the terms and conditions of the program. Timing: by September 2006
Clarify information available to the public on the costs of applying to the program, including environmental and technical costs.	The cost of applying to the program is minimal. However, the costs of developing a wind farm are extremely high because its development requires regulatory approvals, the purchase of expensive equipment; and depending on the size of the project; an environmental assessment. The program's documentation will include information on the range of costs associated with the development of a wind farm as a function of $/MW of installed capacity. Timing: by September 2006 and updated by March 2010.
Improve budget management, accounting, and reporting practices by providing training and assessing available tools.	The program will work with the sector's financial advisor to identify opportunities for training program administrative personnel in the area of financial management and to use existing General Financial System tools. Timing: by March 2007
Prepare a resource plan for immediate and future needs of the WPPI program, including monitoring environmental assessments, security of confidential information, and accommodation.	A resource and accommodation plan will be developed in the context of the expanded program. Timing: accommodation plan by July 2006 and resource plan by September 2006.

Source: Natural Resources Canada

Exhibit 3.7 **Installed wind power capacity in the provinces and territories**

Province/territory	Installed capacity prior to April 2002 (MW)	Total installed capacity by June 2006 (MW)
Alberta	92.9	284.4
Ontario	3.1	220.7
Québec	102.0	212.3
Saskatchewan	17.1	171.2
Manitoba	0	104.0
Nova Scotia	0	41.5
Prince Edward Island	5.3	13.6
Yukon	0.8	0.8
Newfoundland and Labrador	0	0.4
British Columbia	0	0
New Brunswick	0	0
Northwest Territories	0	0
Nunavut	0	0
Total for Canada	**221.2**	**1,048.9**

Note: Numbers are rounded.

Source: Based on information provided by the Canadian Wind Energy Association

Where the wind blows

Environment Canada maintains an atlas of wind energy in Canada based on more than 40 years of collected data. Planners of wind power projects draw on this atlas to evaluate areas with the greatest wind potential and to justify more in-depth analysis of specific wind resources.

3.26 A wind power strategy for Canada reflecting these changes does not exist to guide the co-ordination of government efforts and decisions about programs, their role, and funding. NRCan reported publicly that it has started developing a discussion paper supporting such a strategy. Though it committed to consulting on this paper by early 2006, it has not yet done so.

3.27 **Recommendation.** Natural Resources Canada should lead the development of a wind power strategy for Canada, in collaboration with the provinces and wind industry. The strategy should provide a vision for wind power in Canada and identify what governments will do to support it, and over what timeframe.

Natural Resources Canada's response. The federal government is currently assessing its program, the Wind Power Production Incentive, which provides direct support for wind energy development in Canada. Should the government elect to continue a major initiative of this type, Natural Resources Canada would take a leadership role by complementing this with actions to develop a comprehensive framework for supporting wind energy development in Canada, in collaboration with the wind energy industry, and with other federal

departments and levels of governments. To that end, the government would complete and engage in consultations on a discussion paper regarding an enabling policy framework for wind energy development in Canada.

The evaluation of programs supporting wind power production is incomplete

3.28 In addition to WPPI, the federal government has several programs to support wind power. Wind power projects benefit from tax incentives that have been introduced over time to encourage investment in energy efficiency and renewable energy. Under these provisions, wind turbines became eligible for accelerated capital cost allowance in 1986. Since 1996, start-up expenses of renewable energy projects, including the cost of test wind turbines, have been immediately deductible or eligible for financing using flow-through shares. The federal government has not evaluated the performance of these measures.

3.29 In 1997, the federal government took a first step to purchase electricity from emerging renewable energy, including wind power, which led to the Purchase of Electricity from Renewable Resources (PERR) program. The federal government signed four contracts supporting wind power projects between 1997 and 2001. Chapter 5, Environmental Petitions, presents the results of our audit involving the PERR program and what actions the federal government has taken toward purchasing renewable energy and helping develop markets for it. It notes that the federal government has not undertaken a program evaluation of PERR.

3.30 In 2002, the Market Incentive Program (MIP) for Distributors of Electricity from Emerging Renewable Energy Sources was launched to stimulate markets for renewable electricity such as wind power by providing incentives to electricity distributors to encourage their residential and small business customers to buy renewable electricity. According to a 2004 NRCan study evaluating the program, uptake of the incentive by electricity distributors faced several challenges, the main one being unfavourable conditions for renewable energy sources when competing in retail electricity markets. Since performance was poor, the federal government announced that funding for MIP would not be renewed and the program will be wound down by March 2007.

3.31 In the case of WPPI, the Department committed in 2002 to complete a formal program evaluation by March 2006 to address such things as program relevance, design, and delivery, as well as success in achieving its objectives. In our opinion, the program discussion

document and the internal audit NRCan has conducted represent substantive steps toward the formal evaluation, but the Department has not addressed all aspects. Furthermore, since the WPPI is based on a need to counterbalance what have been higher costs of wind-generated electricity, it is our view that a current, thorough economic analysis is warranted. Such an analysis could clarify the extent to which the economics of wind power have changed across Canada and the role that WPPI needs to play in support of wind power. An economic analysis could also support the development of a strategy for wind power in Canada.

3.32 **Recommendation.** Natural Resources Canada should complete the evaluation of the Wind Power Production Incentive that it committed to in 2002. It should also complete a thorough economic analysis to clarify the extent to which the economics of wind power are changing across Canada and whether there are implications for this program.

Natural Resources Canada's response. Natural Resources Canada agrees with the recommendation and will undertake an evaluation in fiscal year 2008–09. The Department will continue to work with the wind energy industry to monitor economic factors related to the development of wind power in Canada. The Department will also collaborate with the wind industry in assessing the economics of wind power and the potential implications for possible federal initiatives in the future.

Energy efficiency in homes

Housing programs have reduced energy consumption

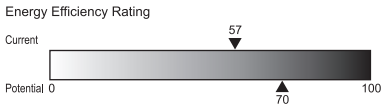
Did you know?

- Based on Canada's last published census in 2001, there were 11.6 million dwellings in Canada, home to almost 30 million people.
- Canadian households use energy primarily for space and water heating, appliances, lighting, and space cooling.
- The use of this energy contributes to greenhouse gas emissions, accounting for 77 Mt in 2004 when electricity use is included.

3.33 NRCan has a mandate to strengthen and expand Canada's commitment to energy efficiency in order to help address the challenges of climate change. To do so, it relies on a variety of instruments that range from information programs to regulation. It is implementing programs aimed at reducing energy use in existing and new houses, and appliances and other equipment. These programs are described below.

3.34 NRCan introduced the EnerGuide for Existing Houses program to improve the energy efficiency of existing houses, reduce their consumption of heating fuel and electricity, and thereby reduce greenhouse gas emissions. It had two components: subsidized home evaluations introduced in 1998; and grants for renovations introduced late in 2003. Home evaluations provided homeowners with expert advice, at roughly half the normal cost, on how to make their houses more energy efficient. Homeowners received a personalized report

containing their EnerGuide for Houses rating and recommendations and supporting information on retrofitting their homes. The second component provided grants to homeowners after they completed their renovations and had a second evaluation of their home's EnerGuide for Houses rating. Near the end of our audit, the EnerGuide for Existing Houses program was discontinued.



Source: Natural Resources Canada

EnerGuide for Houses Ratings

Home evaluations estimate the total energy consumption of a dwelling by conducting various on-site measurements, including air leakage and insulation, and by using standard energy use conditions and background weather data for the locality. This estimate is expressed as an EnerGuide for Houses rating on a scale of 100. After renovations take place, a second evaluation determines the improvement in energy consumption.

NRCan used the change in rating to determine the size of the grant that it would provide to homeowners to help offset the cost of their renovations. A number of provinces and public utility companies also use it for similar purposes.

A homeowner receiving advice from an energy consultant about how to improve the energy efficiency of her home.

Photo: Natural Resources Canada

3.35 The authorized funding and spending for the EnerGuide for Existing Houses for the period 1998 to 2006 has been summarized (Exhibit 3.5), and includes a quadrupling of funds approved in 2005 but no longer available to the program. If all funding had continued, the Department expected to achieve 2.2 million tonnes in greenhouse gas emission reductions annually by 2010. An evaluation of the EnerGuide for Existing Houses was scheduled for completion in 2006 but was not done because of the program's discontinuation. NRCan will wind the program down by March 2007.

3.36 NRCan's Office of Energy Efficiency produces a series of public reports each year, including its report to Parliament under the *Energy Efficiency Act*. In its 2005 report, NRCan reported that the renovations carried out under the EnerGuide for Existing Houses program resulted in 27 percent reductions in energy consumption, on average. As of March 2006, more than 49,000 houses received the retrofit grant. NRCan can demonstrate that by this date, the EnerGuide for Existing Houses program reduced greenhouse gas emissions by 0.7 million tonnes (Exhibit 3.8).

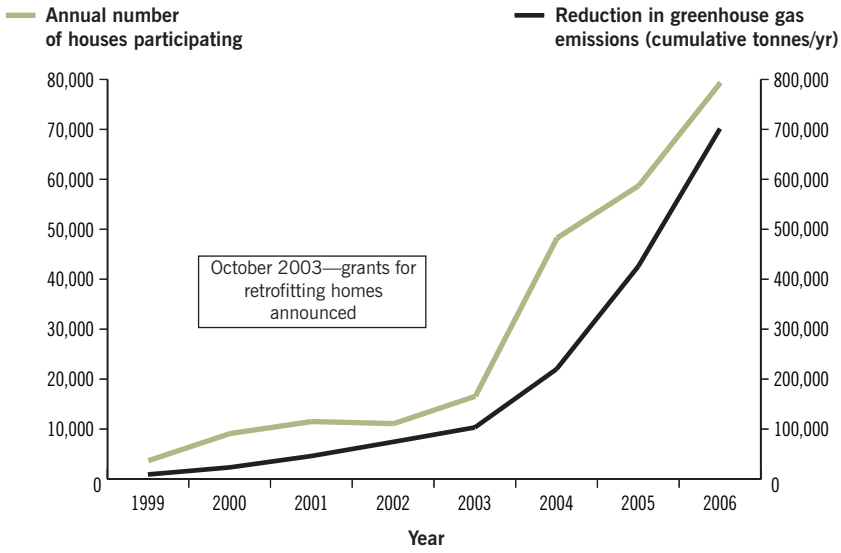
3.37 In addition to existing houses, NRCan has implemented an EnerGuide for New Houses program, building on a program that dates back to 1982. The program aims to reduce emissions by encouraging the home construction industry to build, and consumers to purchase, more energy-efficient houses. NRCan proposes building standards for use by the provinces and promotes technologies for use in the design of new houses. According to the Department, this program is expected to

contribute greenhouse gas emission reductions of 0.3 million tonnes annually by 2010. By March 2006, the program had reduced emissions by 0.26 million tonnes.

NRCan's **equipment program** has several components related to equipment regulation, labelling, and promotion, each with its own name. The name of the program has also evolved over the years. We are referring here to the generic equipment program, which includes all of the components.

3.38 As well, NRCan has implemented an **equipment program** that establishes more energy efficient standards for residential, industrial, and commercial equipment including household appliances. It also rates their energy efficiency and requires equipment labelling. Doing so helps Canadians make energy-efficient choices when buying, selling, or manufacturing energy-using equipment. As of March 2006, NRCan estimates that this program achieved a total of 0.52 million tonnes per year of emission reductions in the housing sector.

Exhibit 3.8 Participation in the EnerGuide for Existing Houses program resulted in emission reductions



Source: Based on data provided by Natural Resources Canada

Natural Resources Canada is not reporting publicly about the performance of its housing programs against targets

3.39 NRCan's public reports contain a variety of information such as residential energy use, average energy savings and emission reductions per home, and percentage of appliances certified. However, these reports do not refer to targets, including expectations for greenhouse gas emission reductions, and results are not presented in a way that explains program performance.

3.40 Using the EnerGuide for Existing Houses program as an example, the Department's 2005 report to Parliament presents many of the numbers needed to estimate the program's performance against its

long-term emission reduction target. However, neither the target nor an indication of progress toward it is included. Based on what we examined, NRCan could supply this information for its housing programs. In our view, it is important to do so to help Canadians understand the contribution that programs are making to the federal government's climate change objectives. Later in this chapter (paragraph 3.66), we make a recommendation to this effect that applies to the programs we examined, including housing programs.

The Ethanol Expansion Program

Ethanol in vehicle fuel is part of the federal government's efforts to reduce greenhouse gas emissions

Did you know?

Vehicles made after 1980 can use a 10 percent ethanol blend without modifications or damage. However, most vehicles require modifications to use gasoline blended with more than this amount.

3.41 Chapter 1, Managing the Federal Approach to Climate Change, notes the importance of the transportation sector to climate change since it accounted for about 25 percent of the greenhouse gases emitted in Canada in 2004. Changing vehicle fuel mix by blending in ethanol is a strategy for reducing emissions associated with this sector. NRCan has calculated that gasoline blended with 10 percent ethanol produced from corn or wheat reduces greenhouse gas emissions by about 4 percent compared with normal gasoline, even accounting for the energy required to grow the grain. In 2004, roughly 0.2 billion litres of ethanol were produced at existing facilities, enabling 5 percent of the national gasoline supply to be blended with 10 percent ethanol content.

An ethanol production plant in Ontario.

3.42 The federal government's Action Plan 2000 began pursuing this fuel mix strategy. It set a target to increase Canada's ethanol production capacity so that 25 percent of the national gasoline supply could contain a 10 percent blend of ethanol by 2010. In 2002, it increased the target to 35 percent.

3.43 In October 2003, NRCan launched the multi-year Ethanol Expansion Program (EEP) with total climate change funding of $100 million. These funds were intended to offset some of the costs of constructing or expanding Canadian facilities to produce fuel grade ethanol. The funds provided by NRCan may be repayable, and the terms and conditions of the contribution agreements with individual companies indicate where this is required.

3.44 NRCan has publicly announced its intention to support eleven projects under the EEP. It approved contributions worth $72 million for six projects under the first round of funding in 2004. In a second round of funding in 2005, five additional projects were identified that are worth $46 million. NRCan reports that the commercial costs of all projects total nearly $900 million, demonstrating that EEP contributions spurred significant private sector investments. As of

March 2006, the Department had made $61.7 million in contribution payments (Exhibit 3.5). Before the end of our audit work, one of the plants receiving EEP contributions was fully constructed and producing ethanol.

The Ethanol Expansion Program contributes to federal ethanol goals but lacks its own targets

Did you know?

Several other countries invested in ethanol-blended fuels a number of years ago for a variety of reasons, including to increase security of their energy supplies, improve air quality, particularly in cities, improve the rural economy, and combat climate change. As the world's leaders in fuel grade ethanol, Brazil and the United States each produced about 16 billion litres in 2005.

3.45 Although the federal government was clear in 2000 and 2002 that it was setting out to increase the amount of ethanol available for blending into the national gasoline supply, departmental officials have indicated that specific targets for ethanol production volume and greenhouse gas emission reductions were not set for the EEP when funding was authorized. They claim the program adopted the ethanol goals of the federal government's first two climate change plans as the program's implied targets. NRCan estimates the volume of ethanol that the EEP-supported projects could produce amounts to 1.2 billion litres, enough to meet these goals. As well, the Department has calculated that this volume of ethanol is equivalent to an annual greenhouse gas emission reduction of 1.7 million tonnes if all projects proceed as planned.

3.46 It is our view that not setting clear targets for this program hinders accountability and the public's ability to conclude whether the program will contribute as expected to climate change plans. This observation is consistent with a 2006 internal audit's recommendations that called for a more current and specific Accountability Framework and performance reporting, particularly on the program's contribution to reducing greenhouse gas emissions. In response, the Department committed to developing and reporting on targets, although it has yet to do so. Later in this chapter (paragraph 3.66), we make a recommendation to this effect that applies to the programs we examined, including the EEP.

Did you know?

- The federal government exempted ethanol from the federal excise tax on gasoline in 1992.
- Alberta, British Columbia, Manitoba, Ontario, Quebec, and Saskatchewan have similar exemptions from provincial fuel tax.
- In addition, three of these provinces (Manitoba, Ontario, and Saskatchewan) are enacting regulations requiring that ethanol be blended in a minimum amount of the gasoline supply.

Future financial risks exist for the program

3.47 A recent internal audit found that the management approach and financial systems currently in place for the EEP are sufficient for now. However, it noted that better management would be necessary throughout the 10-year period covered by the contribution agreements. Resources, roles, and responsibilities for managing the program's future performance and repayment-related information have not been clearly defined and documented. In our view, failure to ensure future repayments when required by the contribution agreements is a risk that

should be averted. In responding to the internal audit, program management committed to addressing this risk.

A new fuel initiative has been put forward

3.48 The federal government announced in 2006 a new initiative to increase the average renewable fuel content in Canada's gasoline and diesel fuel supply to 5 percent by 2010. This commitment differs from the federal ethanol goals being pursued by NRCan through the EEP because it focuses on renewable fuels which include more than ethanol (for example, biodiesel). Also, it applies to all of the vehicle fuel supply, which includes diesel fuel.

Reducing emissions from the oil and gas sector

Oil and gas production is a major source of emissions

3.49 Canada's oil and gas reserves are regionally distributed but are of national interest, economically and environmentally. The oil and gas sector contributed $27.4 billion (or 2.3 percent) to Canada's Gross Domestic Product in 2004. Based on information provided by NRCan, over $18 billion in royalties, taxes and other payments were received from this sector by federal and provincial governments in 2004. A major development in the oil and gas sector is the growth in the oil sands in Alberta, one of the world's largest oil reserves. The National Energy Board estimates that the capital expenditures associated with the construction of oil sands development projects over the period 2006 to 2015 will total about $95 billion. The National Energy Board also estimates that oil sands production will grow from 1.1 million barrels per day in 2005 to 3.0 million barrels per day by 2015.

Did you know?

- In 2004, Canada exported two and a half times more oil and gas than it did in 1990.
- Oil and gas represent over 90 percent of Canada's energy exports.
- Canada has been the largest foreign supplier of crude oil to the United States for seven consecutive years, from 1999 to 2005.
- Since 1990, over 28 percent of the increase in Canada's total greenhouse gas emissions is attributable to exports of oil and gas.

3.50 Oil and gas activities, including mining (of oil sands), production, refining, and transport, accounted for 152 million tonnes of greenhouse gases emitted in 2004, a 51 percent increase compared to 1990. With the rapid development of Canada's **oil sands**, greenhouse gas emissions in this sector are expected to grow. The contribution that expanded oil sands operations will make to annual greenhouse gas emissions could double between 2004 and 2015.

Oil sands—Generally a mixture of bitumen, sand, and clay. Bitumen is a naturally occurring viscous mixture of hydrocarbons that contains high levels of sulphur and nitrogen compounds. In its natural state, bitumen is not recoverable at a commercial rate through a well because it is too thick to flow. It must either be mined or extracted by processes that generally involve heating the sand and the oil it contains to enable it to flow. Though the energy used to process each barrel of oil has decreased since 1990, two to four times more greenhouse gases are emitted per barrel by the processing of oil sands than by conventional drilling for crude oil.

Emission reductions are minimal to date

3.51 We asked NRCan to identify all federal government programs aimed at reducing greenhouse gas emissions from the oil and gas sector. The Department identified three programs: the Canadian Industry Program for Energy Conservation, the Carbon Dioxide Capture and Storage Initiative, and the Large Final Emitter System. It also identified a number of technology research and development activities,

such as the Bitumen and Heavy Oil Program, which have a potential to reduce greenhouse gas emissions in the future.

3.52 The Canadian Industry Program for Energy Conservation (CIPEC) was created in 1975 as a voluntary partnership between the Government of Canada and industry to encourage energy efficiency actions to improve industrial productivity and cut costs. It focuses on all industries, including mining, manufacturing, construction, and electricity generation, as well as upstream oil and gas and oil sands. We found that formal participation by the oil and gas sector in the CIPEC voluntary program was stalled when the sector faced impending regulation controlling greenhouse gas emissions under the Large Final Emitter System. Actual participation was limited to individual companies that conduct energy audits and send staff to energy efficiency workshops. As of March 2006, NRCan estimates these companies achieved a total of 0.04 million tonnes per year of emission reductions as a result of their participation.

Did you know?

Three types of geological formations have received extensive consideration for the geological storage of carbon dioxide:

- oil and gas reservoirs,
- deep saline formations, and
- coal beds that cannot be mined.

To geologically store carbon dioxide, it must be compressed into a fluid then injected into suitable deep rock formations.

3.53 The Carbon Dioxide Capture and Storage Initiative was established in 2001 to advance the understanding and promote the commercialization of technology that captures carbon dioxide from industrial processes and stores it in geological formations. Total announced climate change funding was $25 million, ending in March 2006. There are two main parts to the program: support for research aimed at establishing the feasibility of this technology, including an international storage and monitoring project in Weyburn, Saskatchewan and a financial incentive for projects demonstrating the technology's application in Canada. This program's target for reducing greenhouse gas emissions is 3.5 million tonnes annually by 2006 and applies only to the demonstration projects.

3.54 Research to establish the viability of carbon dioxide capture and storage in Weyburn is continuing. For the other part of the program, NRCan has agreements with companies for five demonstration projects and indicates that these projects will achieve less than the program's emission reduction target because their scale is smaller than anticipated. As of 31 March 2006, the initiative had achieved an annual emission reduction of 0.08 million tonnes. Large-scale deployment of this technology in Canada will depend on funding for the installation of pipelines and related infrastructure to move the carbon dioxide from its industrial source, where it is captured, to its destination storage site. Industry, the province of Alberta, and the Government of Canada are co-operating on this but have yet to commit the required funding.

Key emission reductions are being left to the future

3.55 In 2002, NRCan initiated work on a system to secure reductions in greenhouse gases emitted from several key industrial sectors, including oil and gas. It was to involve individual contractual agreements ("covenants") between the federal government and industry. Responsibility for this initiative, now called the Large Final Emitter System, was transferred to Environment Canada in 2005, before any agreements were reached with the oil and gas sector. Current plans for the system involve federal regulations for each of the sectors covered and other measures (Chapter 1, Managing the Federal Approach to Climate Change).

3.56 The overall greenhouse gas emission reduction target for the Large Final Emitter System has been reduced from 55 million tonnes in 2002 to 45 million tonnes in 2005. According to internal documents, roughly 20 million tonnes of this target are expected from the oil and gas sector annually by 2010. Since federal regulations are not expected to take effect until 2008, no greenhouse gas emission reductions are yet attributable to this system.

3.57 The federal government's technology research and development activities for the oil and gas sector are future oriented. They generate knowledge and develop technologies for the long term. We found that these activities have not yet established targets for reducing greenhouse gas emissions and minimal reductions have been achieved.

The main challenge with the oil and gas sector is not being addressed

3.58 In our view, the oil and gas sector exemplifies the sustainable development challenge of Canada's energy supply noted by NRCan, the International Energy Agency, and others. The nation's challenge is to reduce greenhouse gas emissions while oil and gas production for export and domestic consumption is expected to increase. The rapid expansion in oil sands development adds to this challenge.

Mining of Canada's oil sands.

Photo: Suncor Energy Inc.

3.59 Furthermore, each level of government has different constitutional powers related to energy, including oil and gas (Exhibit 3.9). In representing national interests, the federal government has a major role to play in coherently and transparently addressing this jurisdictional complexity.

3.60 NRCan, as the federal lead for energy, is developing an energy strategy. During a parliamentary hearing in June 2006, the Minister of Natural Resources stated that an energy strategy for Canada has been in the works for some time and that something concrete would be

Exhibit 3.9 Constitutional division of responsibilities for energy

Federal government	Provincial governments
• Resource management on Canada Lands • Uranium/nuclear power • Interprovincial/international trade and commerce • Interprovincial and international works and undertakings • Transboundary environmental impacts • Policies and legislation in the national interest: - economic development - security of energy supply - federal energy research and development	• Development and management of resources within provincial boundaries • Property and civil rights within the province, specifically pertaining to, for example, the environment, health, safety, land use, and consumer protection • Regulation and legislative framework for electricity and natural gas, including ownership of Crown corporations engaged in these activities • Securing appropriate economic return as resource owner from Crown mineral rights • Policies in the provincial interest, such as economic development, and energy science and technology • Intraprovincial trade

Source: Based on *Energy Policies of International Energy Association Countries—Canada 2004 Review*, International Energy Association, 2004

available by the end of 2006. The Department has not yet given any indication of what its strategy might be to achieve immediate and longer term greenhouse gas emission reductions from the oil and gas sector. It will miss opportunities to tackle this important sector the longer it takes to develop and implement the strategy. In our view, it is important that NRCan, in consultation with the provinces and territories, develop this energy strategy together with an implementation plan soon.

3.61 Recommendation. Natural Resources Canada, on behalf of the Government of Canada, should make clear to Parliament by the end of 2006 how and to what degree the country will reduce greenhouse gas emissions in the oil and gas sector, both in the immediate and longer term. At the same time, NRCan should develop a corresponding implementation plan.

Natural Resources Canada's response. Natural Resources Canada agrees that addressing the growth in emissions from the oil and gas sector is an important issue. The Department will work to see that the challenge posed by the link between energy production and use, and air emissions is considered as the Government of Canada develops its Made-in-Canada environmental agenda for reducing air pollution and greenhouse gas emissions.

Managing for emission reductions in selected programs

3.62 The federal government endorses the concept of "managing for results," which means departments need to focus on results in every aspect of management. Among other things, organizations that perform successfully are clear about what they want to achieve and how well they are achieving it. They issue public reports, making them more transparent and accountable. Managing these organizations for results involves a transition from basic awareness of the concept toward full implementation. In the Auditor General's 2000 Report, Chapter 20, Managing Departments for Results and Managing Horizontal Issues for Results, we found that managing for results was still not an integral part of departmental management in the federal government.

3.63 Because NRCan receives the majority of federal climate change funds to reduce greenhouse gas emissions, we expected the Department to manage its programs for this result. As such, it would publicly account for results achieved against clearly stated emission reduction targets, and the money spent. However, for the programs we examined in detail, we found that expectations were confusing and NRCan did not publicly and consistently report performance against them. This makes it difficult to hold the Department to account for results and the money spent.

Setting expectations and public reporting against them are not adequate

3.64 Our audit of the three programs we examined in detail identified the confusing nature of expectations regarding greenhouse gas emission reductions. This confusion stems from a lack of clarity and transparency about the actual targets that NRCan is accountable to achieve. To illustrate:

- The emission reduction target for WPPI was adjusted several times, from 3 million tonnes to its current target of 0.9 million tonnes, but NRCan has not widely communicated this;
- For the EnerGuide for Existing Houses program, funding was complex, leading to confusing targets. We found five Treasury Board decisions that authorized funds for the program and which did not clearly describe emission reduction results expected for this money; and
- For the Ethanol Expansion Program, there was no specific program target against which the Department was being held accountable, though Departmental officials referred to the ethanol goals announced in federal climate change plans as their implied targets.

3.65 A lack of public reporting of performance against targets is also of concern to us. Though NRCan reports publicly on the activities and results of its programs, it was not consistent in reporting on how well these programs are performing compared to expectations, particularly greenhouse gas emission reduction targets. For the programs we examined, the Department compiles information that could be used for assessing program performance, but it does not report on program performance unless required for other purposes. For example, NRCan provided us with an internal document dated January 2005 that represented an assessment of all its programs that are funded to reduce greenhouse gas emissions. It developed this document to support departmental and government-wide reviews of climate change programs. To meet expectations for effective accountability, it is our view that information of this nature should be available to Parliament and Canadians.

3.66 **Recommendation.** Natural Resources Canada should ensure that clear and concrete greenhouse gas reduction targets are established for each of its programs funded for this purpose. The Department should provide clear and detailed information to Parliament about the performance of its programs compared with greenhouse gas emission targets, and the costs incurred.

Natural Resources Canada's response. Natural Resources Canada is proud of its record for managing programs for results, as approved by Treasury Board in Accountability Frameworks for programs and for the Department. In its annual Report to Parliament under the *Energy Efficiency Act*, the Department reports clearly and comprehensively on its emission reduction programs, including program sectoral costs and performance in improving the economy's use of energy. In agreement with the recommendation, the Department will take care to report on greenhouse gas emission reduction program targets and costs, as suggested by the Commissioner.

Tracking the money is overly complicated

3.67 We expected the Department to have fair and reliable information on all funding and spending associated with the programs we examined in detail that could be used to establish the actual costs of the greenhouse gas emission reductions achieved. We found a variety of financial tools and reports related to funding and spending, which made it difficult to accomplish this. NRCan maintains a central system for recording and reporting all financial information, but each of the programs also developed and maintains a variety of separate spreadsheets. They use these to plan and monitor program budgets and

results across fiscal years, or to provide reports at the program level. Furthermore, monitoring and reporting was done according to a mix of departmental and central agency requirements, making it difficult to establish total program funding and spending. In our view, more consistent accounting and reporting of all funding and spending at the program level are warranted.

3.68 **Recommendation.** Natural Resources Canada should establish consistent practices for financial management and reporting of authorized funding and spending at the program level.

Natural Resources Canada's response. Natural Resources Canada agrees with the recommendation. When the Department upgrades its financial system, it will make enhancements that will render financial tracking and reporting less complicated, and establish consistent practices for consolidated management and reporting of funding and spending at the program level.

Conclusion

3.69 Natural Resources Canada (NRCan) is accountable for achieving greenhouse gas emission reductions from the Wind Power Production Incentive, EnerGuide for Existing Houses (until it is wound down), and the Ethanol Expansion Program. Though these programs are only a sample of those under the Department's responsibility, they represented more than $800 million in authorized funding. NRCan's performance expectations for emission reductions from these programs were confusing. While the Department achieves results, it does not consistently report publicly on program performance against emission reduction and other targets. This hinders Parliament's and Canadians' ability to hold the Department accountable for climate change results.

3.70 Natural Resources Canada monitors and reports on funding and expenditures for the programs we examined in detail. However, the financial systems and processes are overly complicated, making it difficult to track and report authorized funding and spending at the program level.

3.71 Oil and gas production, particularly the rapid development of Canadian oil sands, is significantly increasing greenhouse gas emissions. However, federal initiatives aimed at this sector have achieved minimal reductions to date and have not yet contributed as expected to federal climate change objectives. The federal government, under the leadership of NRCan and in co-operation with

the provinces and territories, is not clear on how it intends the country to balance the need to reduce these greenhouse gas emissions with the growth expected to take place in the oil and gas sector.

About the Audit

Objectives

Our audit had the following objectives:

- Determine, through the examination of selected federal government programs intended to reduce the quantity of greenhouse gases emitted during the production and consumption of energy in Canada, whether the federal government can demonstrate that these programs achieved expected results.
- Determine whether the federal government can demonstrate that programs intended to reduce the quantity of greenhouse gases emitted during the production and consumption of energy are contributing, as expected, to the achievement of its broader short-term commitments and long-term goals for greenhouse gas emission reductions.

Scope and approach

Our examination covered a number of programs and initiatives funded and implemented through NRCan from 2000 to March 2006. Under Objective 1, we examined the Wind Power Production Incentive, the EnerGuide for Existing Houses program, and the Ethanol Expansion Program, each of which were allocated funding of $100 million or more. Before the end of our audit work, the EnerGuide for Existing Houses program was discontinued.

Under Objective 2, we examined programs intended to reduce greenhouse gas emissions associated with the oil and gas sector, advance wind power as a renewable source of electricity, and enhance energy efficiency in homes in Canada.

In carrying out our audit, we interviewed government officials from Natural Resources Canada, Environment Canada, and a number of other departments, and reviewed program files, reports, financial statements, and other documents. As well, we interviewed selected recipients of government funding under the programs audited, provincial government officials who were responsible for similar programs, other key stakeholders, and officials of countries considered leaders in the areas of wind power, energy efficiency, and energy policy. We also undertook field visits to several sites receiving funding.

Criteria

Under Objective 1, we focused on two audit criteria drawn primarily from various federal government sources: one criterion related to results and the other related to financial management. In the first case, we expected NRCan to have fair and reliable information on the results achieved by the programs for which it is responsible. In essence, we looked for

- established results indicators and evidence that these were being measured, compiled, and reported on;
- measures that assure the quality of this information;
- measures that identified and managed key risks associated with the programs; and
- adjustments and corrective actions based on analysis of results, performance, barriers, and success factors.

With respect to finances, we expected the Department to have fair and reliable information on all appropriations and expenditures associated with the administration and implementation of the programs for which it is responsible. Specifically, we were looking for

- systems in place that provide financial and management controls, and
- measures that assure the quality of financial information.

Under Objective 2, we expected that, where the federal government has made associations among programs, NRCan has fair and reliable information on how these programs contribute to the achievement of the government's larger goals for greenhouse gas emission reductions. Specifically, we were looking for

- clearly defined common goals and relationships among individual programs;
- performance indicators based on these goals that are applicable to individual programs and their results;
- evidence that performance was measured, compiled, and reported on the basis of these indicators, and determination of the extent to which individual programs are contributing to the achievement of common goals;
- measures that identified and managed key risks influencing the contribution individual programs were able to make; and
- adjustments in the choice of programs on the basis of this information.

Audit work completed

Audit work for this chapter was substantially completed on 14 June 2006.

Audit team

Principal: John Affleck
Lead Director: David McBain
Director: Caroline Smallman

Christine Allen
Valérie Boulet-Thuotte
Hélène Charest
Sébastien Defoy
Tracey Lue
Tammy Meagher
David Normand
Josée Petitclerc
Eimer Sim
Marc Tessier
Elyot Waller

For information, please contact Communications at 613-995-3708 or 1-888-761-5953 (toll-free).

Appendix List of recommendations

The following is a list of recommendations found in Chapter 3. The number in front of the recommendation indicates the paragraph number where it appears in the chapter. The numbers in parentheses indicate the paragraph numbers where the topic is discussed.

Recommendation	Department's response
Renewable electricity from wind power	
3.27 Natural Resources Canada should lead the development of a wind power strategy for Canada, in collaboration with the provinces and wind industry. The strategy should provide a vision for wind power in Canada and identify what governments will do to support it, and over what timeframe. **(3.14–3.26)**	The federal government is currently assessing its program, the Wind Power Production Incentive, which provides direct support for wind energy development in Canada. Should the government elect to continue a major initiative of this type, Natural Resources Canada would take a leadership role by complementing this with actions to develop a comprehensive framework for supporting wind energy development in Canada, in collaboration with the wind energy industry, and with other federal departments and levels of governments. To that end, the government would complete and engage in consultations on a discussion paper regarding an enabling policy framework for wind energy development in Canada.
3.32 Natural Resources Canada should complete the evaluation of the Wind Power Production Incentive that it committed to in 2002. It should also complete a thorough economic analysis to clarify the extent to which the economics of wind power are changing across Canada and whether there are implications for this program. **(3.28–3.31)**	Natural Resources Canada agrees with the recommendation and will undertake an evaluation in fiscal year 2008–2009. The Department will continue to work with the wind energy industry to monitor economic factors related to the development of wind power in Canada. The Department will also collaborate with the wind industry in assessing the economics of wind power and the potential implications for possible federal initiatives in the future.

Recommendation	Department's response
Reducing emissions from the oil and gas sector	
3.61 Natural Resources Canada, on behalf of the Government of Canada, should make clear to Parliament by the end of 2006 how and to what degree the country will reduce greenhouse gas emissions in the oil and gas sector, both in the immediate and longer term. At the same time, NRCan should develop a corresponding implementation plan. **(3.49–3.60)**	Natural Resources Canada agrees that addressing the growth in emissions from the oil and gas sector is an important issue. The Department will work to see that the challenge posed by the link between energy production and use, and air emissions is considered as the Government of Canada develops its Made-in-Canada environmental agenda for reducing air pollution and greenhouse gas emissions.
Managing for emission reductions in selected programs	
3.66 Natural Resources Canada should ensure that clear and concrete greenhouse gas reduction targets are established for each of its programs funded for this purpose. The Department should provide clear and detailed information to Parliament about the performance of its programs compared with greenhouse gas emission targets, and the costs incurred. **(3.62–3.65)**	Natural Resources Canada is proud of its record for managing programs for results, as approved by Treasury Board in Accountability Frameworks for programs and for the Department. In its annual Report to Parliament under the *Energy Efficiency Act*, the Department reports clearly and comprehensively on its emission reduction programs, including program sectoral costs and performance in improving the economy's use of energy. In agreement with the recommendation, the Department will take care to report on greenhouse gas emission reduction program targets and costs, as suggested by the Commissioner.
3.68 Natural Resources Canada should establish consistent practices for financial management and reporting of authorized funding and spending at the program level. **(3.67)**	Natural Resources Canada agrees with the recommendation. When the Department upgrades its financial system, it will make enhancements that will render financial tracking and reporting less complicated, and establish consistent practices for consolidated management and reporting of funding and spending at the program level.

Report of the Commissioner of the Environment and Sustainable Development to the House of Commons—2006

Main Table of Contents