



The State of Energy Efficiency in Canada

Report 2006



Office of Energy Efficiency
The State of Energy Efficiency in Canada, Report 2006

Natural Resources Canada's Office of Energy Efficiency
Leading Canadians to Energy Efficiency at Home, at Work and on the Road

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Executive Summary

The Office of Energy Efficiency (OEE) of Natural Resources Canada is the country's foremost centre for energy efficiency. It administers key programs that promote energy efficiency in the major energy-using sectors of the economy and collects and analyses energy efficiency data and trends. Clients range from individual consumers to industry and large corporations.

At the core of the OEE's analytical capacity is its annual assessment of trends in energy use and related greenhouse gas (GHG) emissions in Canada since 1990. These results are published in the technical report *Energy Efficiency Trends in Canada*. A key component of this report is the OEE Energy Efficiency Index, which shows changes in the efficiency of how Canadians use energy to heat and cool their homes and workplaces and to operate appliances, vehicles and factories. The OEE Index shows a sizable 13 percent improvement in energy efficiency over 1990–2003. As a result of this improvement, Canadians saved about \$13.4 billion in energy costs in 2003 alone.

Moreover, energy use in Canada increased by 22 percent between 1990 and 2003, rather than the 32 percent that would have taken place without increases in energy efficiency. In addition, energy-related GHG emissions are more than 52 megatonnes lower than they would have been otherwise. The OEE Index shows that even with the many barriers to improvement in energy efficiency, strong and measurable progress has been made, due in part to the programs of the OEE.

Guided by the OEE's vision statement of "Leading Canadians to Energy Efficiency at Home, at Work and on the Road," OEE programs target all energy consumers and

emphasize partnerships and economic investments. They aim to provide information, improve knowledge and overcome market barriers, such as institutional deterrents in energy end-use markets and financial and economic constraints on energy users.

The Government of Canada committed to "getting its own house in order" by reducing GHG emissions from its operations by 31 percent from 1990 levels by the year 2010. Since 1990, through building retrofits, better fleet management, strategic "green power" purchases and the downsizing of operations, the Government of Canada has already achieved a 26 percent emissions reduction. The OEE plays an important role in helping to achieve this reduction through its role as manager of the Federal House in Order initiative.

The OEE continues to expand and improve the programs that support Canadians in the key area of energy efficiency. Improving energy efficiency reduces GHG emissions, benefits the economy and contributes to energy security. A dynamic, flexible and proactive organization, the OEE will continue to evolve in response to new energy efficiency opportunities throughout society.

The most recent market trends data available are for 2003. This edition of *The State of Energy Efficiency in Canada* is available in CD-ROM format. To order the CD-ROM, visit the OEE's Web site at oe.nrcan.gc.ca or call 1 800 387-2000 (toll-free).

The Office of Energy Efficiency

The Office of Energy Efficiency (OEE) was established in April 1998 as part of Natural Resources Canada (NRCan) with a mandate to communicate the importance and value of energy efficiency and alternative transportation fuels and to advise the public on actions they can take to contribute to individual and societal benefits. The OEE builds on efforts by NRCan over the past three decades to promote energy conservation, continuous increases in energy efficiency and greater use of alternative sources of energy as ways to help protect the environment and strengthen Canada's economic competitiveness.

The OEE manages energy efficiency and alternative transportation fuels measures aimed at the residential, commercial/institutional, industrial and transportation sectors.¹ Guided by the OEE's vision statement of "Leading Canadians to Energy Efficiency at Home, at Work and on the Road," programs related to these sectors target all energy consumers and emphasize collaboration and economic investments. They aim to overcome the market barriers of inadequate information and knowledge, institutional deterrents in energy end-use markets and financial and economic constraints on energy users.

The OEE is also responsible for

- collecting and analysing data on energy end-use;
- developing new measures to increase the impact and reach of NRCan's support for energy efficiency improvement;
- modifying its existing programs to increase their effectiveness and efficiency;
- reporting annually on the state of energy efficiency in Canada and communicating up-to-date information on energy efficiency and alternative transportation fuels through its publications and Web site at oee.nrcan.gc.ca; and
- managing Canada's Energy Efficiency Awards.

OEE outreach projects provide information and activities to integrate energy efficiency into Canadians' energy-use decisions. The OEE and Environment Canada co-manage the One-Tonne Challenge, an initiative designed to increase Canadians' awareness and understanding of climate change and the link to energy use. The OEE also supports the EnerGuide for Low Income Households program delivered by the Canadian Housing and Mortgage Corporation.

¹ The OEE's efforts in the area of alternative transportation fuels encourage the transition to less carbon-intensive energy sources in the transportation sector.

The OEE is assisted by the National Advisory Council on Energy Efficiency, which is composed of energy efficiency experts and leaders from all sectors of the economy, all levels of government and all regions of the country.

National Energy Use Database

The National Energy Use Database (NEUD) supports the development of Canadian energy end-use data, knowledge and analytical capabilities. Through the NEUD, data are collected on energy consumption at the end-use level. Information is also collected on the characteristics of energy-using equipment and buildings, the behaviour of Canadian consumers toward energy use and the adoption of energy-efficient technologies.

For more information, visit the Web site at oee.nrcan.gc.ca/corporate/statistics/neud/dpa/data_e/databases.cfm.

Reporting

Informing key decision-makers in government, industry and the environmental and international communities about Canada's energy efficiency efforts and successes is another of the OEE's major tasks. Reporting on the state of energy efficiency in Canada is one element of this work. The OEE also publishes the annual technical report *Energy Efficiency Trends in Canada* and the statistical reference *Energy Use Data Handbook*. As well, the OEE coordinates the drafting and publication of the NRCan report *Improving Energy Performance in Canada – Report to Parliament Under the Energy Efficiency Act*, and the Government of Canada report *Federal House in Order – Annual Report on Emissions Reductions From Federal Operations*.

The OEE makes its publications and other documents on energy efficiency available to Canadians and others through a comprehensive Web site. The site provides details on OEE programs and offers practical, up-to-date information and tips for all energy users. It also provides access to the OEE's comprehensive, electronic Directory of Energy Efficiency and Alternative Energy Programs in Canada.

For more information, visit the Web site at oee.nrcan.gc.ca/corporate/statistics/neud/dpa/policy_e/programs.cfm.

Canada's Energy Efficiency Awards

Canada's Energy Efficiency Awards are managed by the OEE to encourage and honour Canadian innovation and achievements in energy efficiency by businesses, institutions, communities, governments and individuals. Now in their sixth year, the awards send a positive message that Canada is taking action on climate change.

Awards are presented annually in several categories – equipment and technology, housing, buildings, industry, transportation (on-road), outreach and media.

For more information, visit the Web site at oee.nrcan.gc.ca/awards.

Green Municipal Fund

The Government of Canada established the Green Municipal Fund (GMF) in 2000 to support municipal investments in innovative environmental infrastructure projects and practices to achieve cleaner air, water and soil and to reduce GHG emissions. The funds are operated by the Federation of Canadian Municipalities (FCM) at arm's length from the Government of Canada. The OEE participates in the GMF through representation on the Peer Review Committee and governing Council that recommend projects for approval by the FCM National Board of Directors.

As of July 2005, the GMF had provided \$248 million to support 419 feasibility studies and projects. An additional investment of \$1.1 billion had been provided by municipal governments and their partners. The federal budget of 2005 provided an additional \$300 million toward the GMF, setting aside \$150 million of it for brownfields remediation.

Energy Use and Emissions

Canada, like other industrialized countries around the world, depends heavily on fossil fuels to meet its energy needs. These fuels, when burned, release carbon dioxide (CO₂) and, to a lesser extent, nitrous oxide and methane, all of which are greenhouse gases (GHGs). In general, the more energy Canadians use, the more GHG emissions produced and the greater the impact on global climate change.

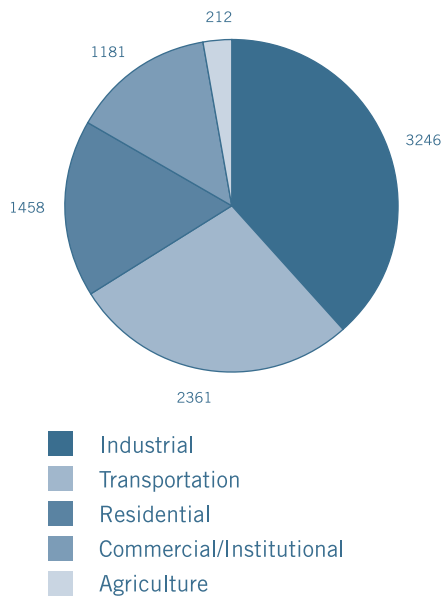
Between 1990 and 2003, the amount of energy that Canadians used to heat and cool their homes and workplaces and to operate their appliances, vehicles and facilities – known as secondary energy use – increased by about 22 percent. In this report, the components of secondary energy use are discussed. GHG emissions associated with this energy use increased by approximately 23 percent, accounting for 69 percent of all GHG emissions in Canada in 2003.

One of the most pressing environmental challenges is global climate change. The international scientific community has concluded that the rapid increase in the concentration of greenhouse gas (GHG) emissions in the atmosphere can be expected to change our climate. Most human-generated GHG emissions are produced through the combustion of fossil fuels. Although Canada accounts for only about 2 percent of the world's GHG emissions, it needs to be part of the solution. Substantially reducing GHG emissions is a challenge, particularly given Canada's highly industrialized and resource-based economy. Solutions require a multifaceted, coordinated domestic response and a high level of cooperation among all nations.

For more information, visit the Government of Canada Web site at www.climatechange.gc.ca.

Figure 1

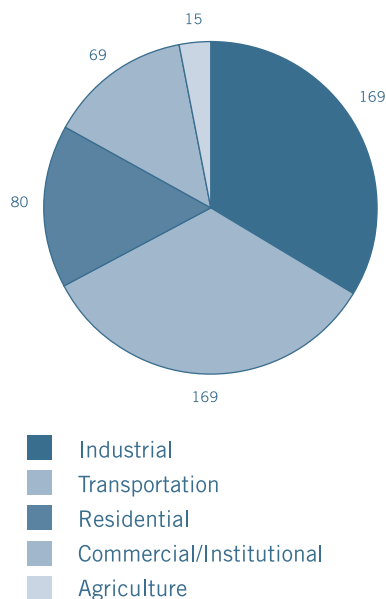
Secondary Energy Use by Sector, 2003 (petajoules)



Total: 8457 petajoules

Figure 2

Secondary Energy-Related Greenhouse Gas Emissions by Sector, 2003 (megatonnes of CO₂ equivalent)



Total: 502 megatonnes of CO₂ equivalent

Factors That Affect Energy Use

Several factors affect how much energy the Canadian economy uses. These include the level of economic activity in a sector (e.g. production by industry, floor space in the residential or commercial/institutional sector); the weather; structure (the mix of activities that consume energy in a sector); a higher service level (increased penetration of auxiliary equipment in commercial/institutional buildings); and how efficiently each sector uses energy.

Canada's increased energy use between 1990 and 2003 was primarily due to growth in economic activity in each end-use sector. For example, activity in the industrial sector increased by 45 percent during this period. In the residential sector, there was a 26 percent increase in activity (which is represented by a mix of households and floor space).

Likewise, the amount of commercial floor space in Canada grew by 25 percent over 1990–2003. In the transportation sector, there was a 27 percent increase in passenger-kilometres travelled and a 46 percent increase in tonne-kilometres moved.

Changes in structure – the mix of activities that consume energy – contributed to decreased energy use between 1990 and 2003. The decrease was mainly due to changes in the industrial sector.

The industrial sector accounted for approximately 38 percent of total secondary energy use in Canada in 2003 (see Figure 1 on page 8) and 34 percent of secondary energy-related GHG emissions (see Figure 2 on page 8).²

The second largest energy-using sector – transportation – accounted for almost 28 percent of secondary energy use and about 34 percent of GHG emissions in 2003. The energy used in transportation, primarily gasoline and diesel fuel, produces more GHG emissions than other energy sources when combusted.

Of the factors that affect Canada's end-use energy markets, energy efficiency is the primary focus of the Office of Energy Efficiency. The following chapter takes an in-depth look at the state of energy efficiency in Canada.

² There are other sources of GHG emissions (e.g. fugitive emissions and non-energy industrial process emissions). For further information, refer to Environment Canada's *Canada's Greenhouse Gas Inventory: 1990–2003*. A copy is available at www.ec.gc.ca/pdb/ghg/inventory_e.cfm.

The State of Energy Efficiency in Canada

The Office of Energy Efficiency (OEE) has become Canada's foremost centre for collecting and analysing energy efficiency data, analysing trends in energy use and developing and delivering key programs that promote energy efficiency in the major energy-using sectors of the economy. One of its goals is to improve Canada's ability to track the influence of its energy efficiency programs on market trends and identify opportunities to further improve energy efficiency.

At the core of the OEE's analytical capacity is its annual assessment of trends in energy use and related greenhouse gas (GHG) emissions in Canada since 1990. The results are published in the technical report *Energy Efficiency Trends in Canada*. Changes in energy efficiency cannot be measured directly at the sectoral or economy-wide level. Thus, to track changes in energy efficiency, the OEE uses a factorization methodology to develop the OEE Energy Efficiency Index,³ the only one of its kind in Canada.

The OEE Index depicts annual changes in energy efficiency in the Canadian economy. Note that the OEE Index is only an estimate of changes in energy efficiency in the economy. Even after accounting for the other principal factors that influence energy intensity, namely activity, weather, structure and service level, the resulting estimate of energy efficiency includes some factors not related to efficiency. For example, the estimate of industrial energy efficiency will include the effect of changes in sub-sector mixes of products or in the products themselves.

The OEE Index shows that, even with the many barriers to improvement in energy efficiency, strong and measurable progress has been made, due in part to the programs of the OEE. For 1990–2003, the OEE Index shows an increase in value, indicating that energy efficiency improved by 13 percent (see Figure 3 on page 11). As a result of this improvement, Canadians saved approximately \$13.4 billion in energy costs in 2003 alone.

Energy use increased between 1990 and 2003. Without improvements in energy efficiency, increases attributable to activity, weather, structure and service level would have led to an increase of 32 percent. However, as a result of a 13 percent improvement in energy efficiency, actual energy use increased by 22 percent (see Figure 4 on page 11).

Each of the four principal end-use sectors in the Canadian economy (residential, commercial/institutional, industrial and transportation) contributed to this improvement in energy efficiency. The following are a few highlights from the analysis:

- In the **residential sector**, the combined effects of a 26 percent increase in activity (which is represented by a mix of households and floor space), an increase in energy demand due to weather (a colder winter and a warmer summer in 2003 relative to 1990) and an increase in the average number of appliances per household were partially offset by a 19 percent improvement in energy efficiency. This kept the increase in residential energy use over the period to about 13 percent over 1990 levels.

³ For more information on the OEE Energy Efficiency Index, see *Energy Efficiency Trends in Canada, 1990 to 2003 – June 2005*. The document can be viewed on the OEE Web site at oee.nrcan.gc.ca/corporate/statistics/neud/dpa/data_e/trends05/index.cfm.

- A 1 percent improvement in energy efficiency in the **commercial/institutional sector** over 1990–2003 reduced GHG emissions by one megatonne.
- Although there was a 45 percent increase in **industrial** activity, much of it occurred in less energy-intensive industries, such as electrical and electronic products. That, along with a 13 percent improvement in energy efficiency between 1990 and 2003, restrained the increase in energy use in the industrial sector to 19 percent, which reflects changes in activity, structure and efficiency.
- **Passenger transportation** energy use increased by 15 percent, and **freight transportation** energy use increased by 40 percent. Thus energy use increased an average of approximately 26 percent in the transportation sector. A 16 percent improvement in energy efficiency helped offset increases in energy use.

Figure 3

The OEE Energy Efficiency Index, 1990 to 2003

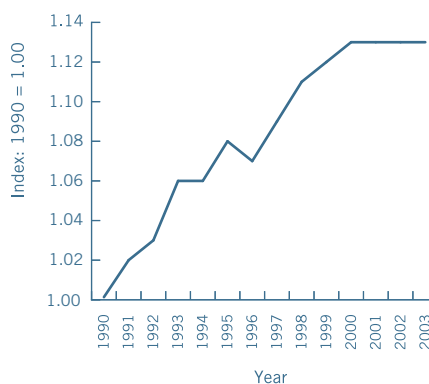
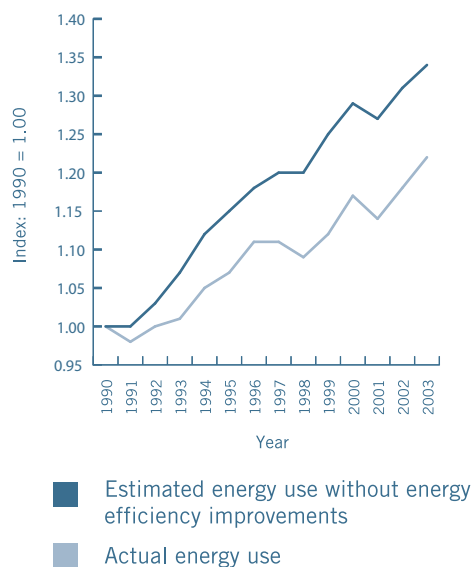


Figure 4

Impact of Energy Efficiency Improvements on Energy Use, 1990 to 2003



Improving Energy Efficiency

The Office of Energy Efficiency Approach

Guided by the vision statement “Leading Canadians to Energy Efficiency at Home, at Work and on the Road,” the Office of Energy Efficiency’s (OEE’s) programs target all energy consumers and emphasize partnerships and economic investments. The OEE uses five basic policy instruments to overcome market barriers to improving energy efficiency in the energy end-use market:

- leadership by the Government of Canada in reducing emissions from its own use of energy;
- information programs to advise energy users of the benefits of energy efficiency and to increase awareness, acceptance and adoption of energy-efficient technologies and practices;
- voluntary programs that support actions by energy users to improve their energy efficiency;
- direct financial incentives to encourage investment in energy-efficient buildings and building retrofits in order

to stimulate more rapid deployment of energy-efficient technologies and practices; and

- regulations that set minimum performance standards to eliminate less energy-efficient products from the market.

The OEE maintains strong links with Natural Resources Canada’s (NRCan’s) research and development programs for advanced energy-efficient technologies. It works closely with NRCan’s CANMET Energy Technology Centre to ensure that Canadians are kept abreast of technology developments that can either reduce the consumption of fossil fuels or enable the transition to less greenhouse-gas-intensive energy sources, including renewable energy.

The OEE manages energy efficiency and alternative transportation fuels measures aimed at all sectors of the Canadian end-use energy market. The following sections identify market trends and outline the efforts made and progress achieved by the OEE’s programs.

Equipment

Market Trends

Energy-using equipment plays a critical role in energy consumption in the residential, commercial/institutional and industrial sectors. Although individually such items consume relatively modest amounts of energy, the total energy requirement for an average building's energy-using equipment, or to produce an industrial output, can be significant.

In 2003, 13 percent of energy use in the residential sector was attributable to appliances. Major appliances (refrigerators, freezers, dishwashers, ranges, clothes washers and clothes dryers) accounted for 62 percent of this amount, or 8 percent of the total. In the commercial/institutional sector, lighting fixtures (including lamps and ballasts) accounted for a significant amount of energy use – 13 percent in 2003. Space heating and cooling equipment accounted for almost 61 percent of energy use in the residential and commercial/institutional sectors.

Although the stock of major appliances increased by 33 percent between 1990 and 2003, the energy used by these appliances actually decreased by 12 percent (see Figure 5). The increasing popularity of minor appliances (e.g. televisions, digital videodiscs, satellite dishes, digital cable receivers, computers and audio equipment), for which energy use during the same period increased by 63 percent, resulted in an overall increase in energy use of 2 percent in the residential sector.

Figure 5

Average Energy Consumption of New Appliances, 1990 and 2003 Models

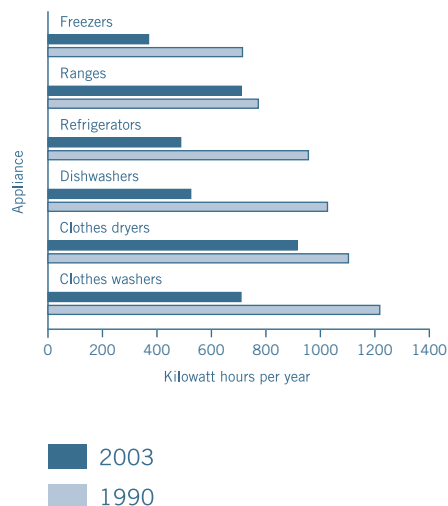


Figure 6

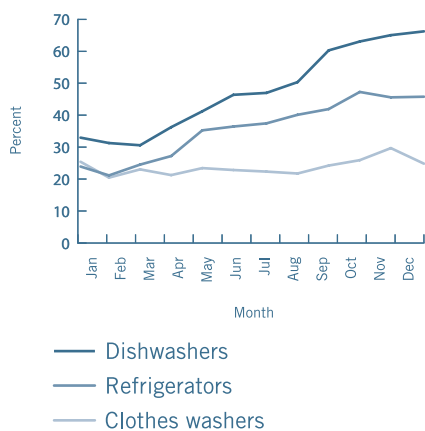
Estimated Impact of *Energy Efficiency Regulations*, 2010 and 2020
(aggregate annual savings)

Product (Amendment number in brackets)	Energy Savings (petajoules)		CO ₂ Reductions (megatonnes)	
	2010	2020	2010	2020
Residential appliances	117.20	133.84	13.26	15.60
Lamps – fluorescent/ incandescent	11.60	13.40	7.55	9.80
Motors	16.30	17.70	2.03	2.14
Commercial HVAC	6.40	7.50	0.43	0.57
Refrigerators (5)	4.92	10.96	0.49*	1.10*
Ballast/Room A/C, PAR lamps (6)	3.96	9.44	0.39*	0.94*
Clothes washers, domestic hot water, exit signs, chillers (8)	16.20	42.67	1.29	3.61
A/C, commercial refrigeration (draft 9)	1.57	5.35	0.16	0.53
Total	178.15	240.86	25.60	34.29

*Values different from Regulatory Impact Analysis Statement (RIAS) due to emission factor change (using 99.3)

Figure 7

ENERGY STAR® Qualified Appliances
as a Percent of Total Category Sales
in Canada, 2003



Promoting Energy Efficiency

Energy-using equipment offers the potential for significant energy efficiency improvements in the residential sector. Residential energy-using equipment is an important area for program support because equipment has a shorter life span than residential buildings. Because lighting fixtures comprise a significant proportion of equipment energy use in the commercial/institutional sector, they are periodically evaluated for opportunities in efficiency gains. In the industrial sector, energy efficiency improvements are most readily achieved in equipment and processes that are common to many industries, such as motors and auxiliary systems.

The Office of Energy Efficiency's (OEE's) approach to improving the energy performance of equipment in the marketplace is to

- use regulations that set minimum performance standards to gradually exclude the least efficient equipment from the market; and
- influence consumers to select – and manufacturers to produce – energy-efficient products that outperform the minimum standards, through mandatory and voluntary labelling, information and promotion activities.

Selected Progress Indicators for Equipment

The 1992 *Energy Efficiency Act* provides the authority for the Government of Canada to make and enforce regulations concerning performance and labelling requirements for energy-using products (and doors and windows) that are imported or shipped between provinces. The Act also gives the Government of Canada the authority to collect statistics on energy use and alternative energy.

Regulations under the Act require that eight specified types of new household appliances for sale display an EnerGuide label. This label shows the yearly energy consumption rating of an appliance and positions it on a scale between the most and least efficient comparable models.

- The first *Energy Efficiency Regulations* under the *Energy Efficiency Act* came into force in 1995. Regulations have been established for more than 30 products. It is estimated that the Regulations implemented to date will, by 2020, result in energy savings of over 240 petajoules per year (see Figure 6 on page 14).
- Amendments to the *Energy Efficiency Regulations* have raised the efficiency standard in the residential and commercial/institutional sectors. The eighth amendment has been published, and it increases the minimum energy-performance standards in the residential sector for clothes washers and gas-fired and electric-storage water heaters and in the commercial/institutional sector for water chillers and exit signs. At time of writing, Amendment 9 is about to be pre-published. This amendment increases the stringency of performance standards for residential and commercial air conditioners and institutes standards for commercial refrigeration products.

The OEE's Equipment Program

The objective of the OEE's standards setting and conformity assessment under its Equipment Program is to eliminate the less energy-efficient models of energy-using equipment from the market through minimum performance regulations under the *Energy Efficiency Act*. The Regulations incorporate national consensus performance standards that include testing procedures to determine the energy performance of equipment. They prohibit imports of, or interprovincial trade in, prescribed products that fail to meet minimum energy performance levels and labelling requirements.

For more information, visit the Web site at oee.nrcan.gc.ca/regulations.

The OEE's equipment labelling activities aim to promote the production, purchase and use of more energy-efficient major electrical household appliances in addition to heating, ventilating and air-conditioning (HVAC) and industrial equipment.



Labelling activities consist of rating, labelling and promotion to encourage manufacturers to produce, and consumers to purchase and use, energy-using equipment that is more energy efficient. EnerGuide provides comparative information on the energy

performance of major household appliances. The voluntary EnerGuide HVAC Energy Efficiency Rating System provides information on home HVAC products. Introduced in 2001, the ENERGY STAR® Initiative in Canada allows the consumer to identify the most energy-efficient products available in their class, based on a standard set of criteria. The percentage of ENERGY STAR qualified appliances as a percent of total sales in Canada in 2003 is shown in Figure 7 (on page 14).

EnerGuide for Industry promotes and encourages the manufacture, purchase and use of industrial equipment that is more energy efficient. Implemented in 2001, this labelling/rating program follows principles similar to those for EnerGuide. The initiative targets commonly used “off-the-shelf” industrial equipment, such as motors, pumps, transformers, compressors, boilers and lights.

For more information, visit the following Web sites:
oee.nrcan.gc.ca/Publications/infosource/Pub/appliances
oee.nrcan.gc.ca/equipment
energystar.gc.ca
oee.nrcan.gc.ca/egi

Housing

Market Trends

The residential sector accounted for 17 percent of secondary energy use in Canada and 16 percent of related greenhouse gas (GHG) emissions in 2003. Between 1990 and 2003, residential energy use increased by 13 percent. The increase in energy use was largely driven by an increase in activity and a colder winter and warmer summer in 2003 relative to 1990. Without energy efficiency improvements, energy use would have risen by 32 percent between 1990 and 2003, instead of the observed 13 percent. These energy use improvements saved Canadians almost \$4.3 billion in 2003 alone.

GHG emissions from the residential sector increased by about 15 percent between 1990 and 2003. This was principally due to increased energy consumption and a rise in the average GHG intensity of fuels used to generate electricity.

Promoting Energy Efficiency

It is usually more economical to make energy efficiency improvements during home construction, rather than after a home is built. However, existing housing will remain a significant proportion (over half) of Canadian housing for many years to come; therefore, energy use in the existing stock of houses also needs to be improved.

Over 81 percent of residential energy is used for space and water heating, and significant potential exists for continued

energy efficiency gains in this area. Residential energy-using equipment is an important area for program support because equipment has a shorter life span than residential buildings.

With these opportunities in mind, the Office of Energy Efficiency's (OEE's) approach to the residential sector is to

- use regulations and information programs to gradually exclude the least efficient equipment from the market and to influence consumers to select – and manufacturers to produce – energy-efficient products that outperform the minimum standards (discussed previously in the section on equipment);
- improve the energy performance of new and existing housing by supporting energy codes and the construction of benchmark energy-efficient housing, showing home buyers and owners the economic and environmental benefits of energy-efficient housing and renovation, and increasing builders' knowledge of energy-efficient housing technologies and practices; and
- use financial incentives to encourage homeowners to retrofit their homes to make them more energy efficient.

Selected Progress

Indicators in Housing

- Energy-efficient practices and technologies are increasingly being adopted in mainstream construction. Signs of this trend can be seen in Figure 8 (on page 17), which shows that national trends in air leakage in houses are on the decline.

The OEE's Housing Program



The R-2000* Standard is an industry-endorsed, voluntary certification for new houses. It features a technical performance standard for energy efficiency, indoor air quality and environmental responsiveness and a quality assurance process for industry training and house evaluations and inspections. The R-2000 Standard affects the new housing market by encouraging Canadians to build homes that require less energy to heat than conventional new houses.

For more information, visit the Web site at r2000.gc.ca.



EnerGuide for Houses is an energy performance evaluation and rating initiative. It gives homeowners the facts they need to make informed decisions about energy efficiency when they are buying a house or improving their home. EnerGuide for Houses encourages Canadians to improve the energy efficiency of their homes, especially when undertaking home renovation and maintenance projects. Figure 9 depicts evaluation-identified energy savings after retrofits.

For more information, visit the Web site at energuideforhouses.gc.ca.

*R-2000 is an official mark of Natural Resources Canada.

Figure 8

National Trends in Air Leakage in Houses, pre-1945 to 2000–2004 Construction

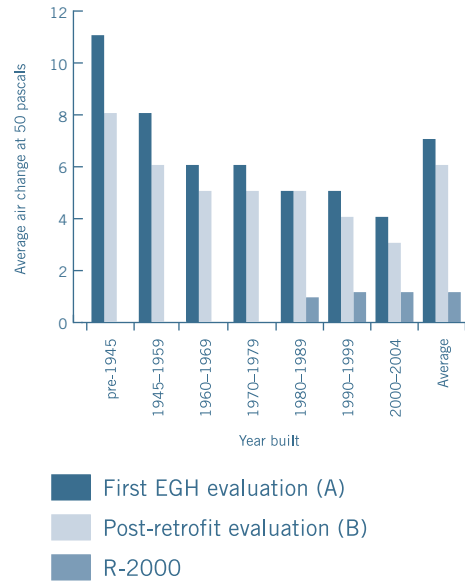


Figure 9

Residential Energy Use and Energy Savings per Household, pre-1945 to 2000–2004

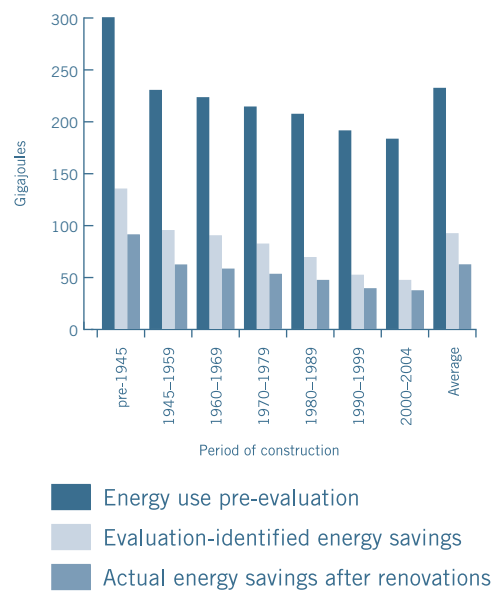
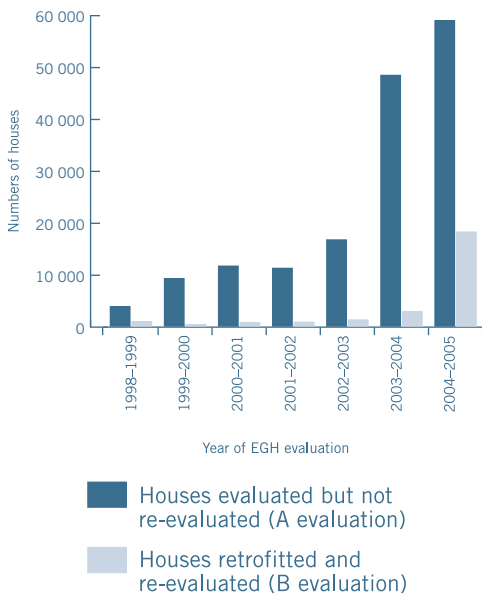


Figure 10

Evaluations Under EnerGuide for Houses, 1998–1999 to 2004–2005



In October 2003, the EnerGuide for Houses Retrofit Incentive was launched to encourage Canadian homeowners to make their homes more energy efficient. Homeowners can now qualify for a nontaxable grant, which represents about 10 to 20 percent of expenditures for energy retrofits to a home. Figure 10 shows significant growth in 2003–2004 and 2004–2005 evaluations under EnerGuide for Houses, largely due to the retrofit incentive. Additional funding of \$225 million was announced in Budget 2005 in February, and a further \$170 million to enrich the incentive was announced in October 2005.

For more information, visit the Web site at energuideforhouses.gc.ca/grants.

EnerGuide for New Houses was developed to provide independent expert advice on energy-efficient home construction to homebuilders and new home buyers. An energy advisor works with the builder to assess their building plans and develop energy upgrades that have money-saving features that can be included in a new home. The builder can then offer different options to the home buyer, who makes the final choice about what to include in the new home.

For more information, visit the Web site at egnh.gc.ca.

Buildings

Market Trends

The commercial/institutional sector of the economy accounted for 14 percent of Canada's secondary energy use and 14 percent of the related greenhouse gas (GHG) emissions in 2003.

Due to increased commercial activity and the additional use and penetration of auxiliary equipment (e.g. computers) between 1990 and 2003, energy use in the sector increased by about 36 percent. The energy efficiency of commercial/institutional buildings, heating and cooling equipment, lighting technology, electric motors and control systems improved. Without these advances, energy use in the sector would have increased by 37 percent.

GHG emissions from the commercial/institutional sector increased by 45 percent during 1990–2003. Part of the increase was due to a shift toward heavy fuel oil in the fuel mix and the use of more GHG-intensive fuels to generate electricity.

Promoting Energy Efficiency

Space heating accounts for more than half of the energy used in this sector and offers significant opportunities for gains in energy efficiency. Auxiliary motors, auxiliary equipment and lighting account for about 32 percent of commercial energy use. Energy efficiency improvements are also possible in these areas.

As is the case in the residential sector, it is generally more economical to make energy efficiency improvements during the construction of a building, rather than afterward. However, given the slow turnover of the building stock in this sector and the opportunities for energy-efficient retrofits, the energy performance of existing buildings must also be improved.

The Office of Energy Efficiency's (OEE's) approach to the commercial/institutional sector is to

- use regulations and information to gradually exclude the least efficient equipment from the market and to influence consumers to select – and manufacturers to produce – energy-efficient products that outperform the minimum standards (discussed previously in the section on equipment); and
- accelerate changes in building design, construction and operation by
 - marketing the benefits of more energy-efficient construction,
 - increasing the awareness and knowledge of building owners, designers and builders,
 - supporting energy codes,
 - providing incentives for designing more energy-efficient buildings, and
 - encouraging investments in energy-efficient building retrofits to lower costs and reduce emissions by forming partnerships with key associations, emphasizing corporate energy management planning and providing incentives for implementing energy-efficient retrofits.

Figure 11

Estimated Average GHG Reductions by Type of Institution Under CBIP, 2004

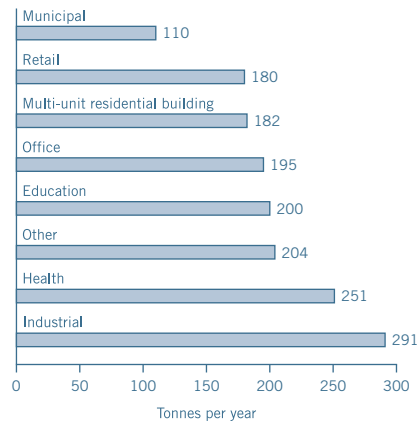
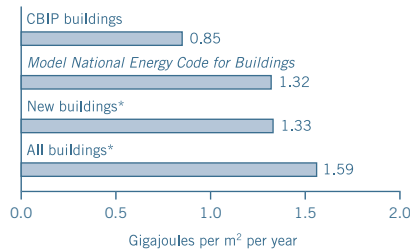


Figure 12

Energy Use in Commercial Buildings



*Source: Commercial and Institutional Buildings Energy Use Survey (CIBEUS), 2000. Estimates relate only to the surveyed area of populations over 175 000 and, in Atlantic Canada, to populations over 50 000.

Figure 13

EnerGuide for Existing Buildings – Incentive Projects, 1998 to 2005

	millions of dollars
Federal incentive	52.3
Client investment	888.1
Annual energy cost savings	122.8

Selected Progress Indicators for Buildings

- Since the inception of the Commercial Building Incentive Program (CBIP), 541 projects aimed at improving the energy efficiency of new commercial, institutional and multi-unit residential buildings have been supported. Results indicate that, on average, CBIP buildings are 35 percent more energy efficient than similar buildings constructed to the *Model National Energy Code for Buildings*. Figure 11 shows the estimated average GHG reductions by type of institution under CBIP.
- Energy-efficient practices and technologies are increasingly being adopted in mainstream building construction. In 2005, CBIP buildings accounted for 18 percent of new commercial and institutional floor space constructed. As shown in Figure 12, CBIP buildings are designed to consume half the energy of buildings in the existing stock.
- EnerGuide for Existing Buildings (EEB), formerly known as the Energy Innovators Initiative, encourages commercial businesses and public institutions to become more energy efficient and reduce their GHG emissions. Since 1992, EEB has recruited more than 2000 commercial and institutional organizations across Canada representing over 30 percent of the floor space in these sectors.
- In the 2004–2005 fiscal year, EEB funded 167 energy retrofit implementation projects and more than 223 retrofit planning activities in commercial businesses, public institutions and multi-unit residential buildings. Since 1998, EEB has contributed \$52.3 million and clients have invested more than \$888 million for these planning activities and implementation projects. Retrofit projects have been implemented in over 4800 buildings, with energy savings averaging about 20 percent (see Figure 13).

- In fiscal year 2004–2005, five contribution agreements were signed through the Industrial Building Incentive Program (IBIP), bringing the number of projects supported since the program's launch in 2002 to 20.

The OEE's Buildings Program

The Commercial Building Incentive Program provides financial incentives to eligible building owners who construct new commercial, institutional and multi-unit residential buildings that are at least 25 percent more energy efficient than similar buildings constructed to meet the *Model National Energy Code for Buildings*. Up to \$60,000 may be given to owners of eligible buildings.

For more information, visit the Web site at oeenrcan.gc.ca/newbuildings.

EnerGuide for Existing Buildings (formerly known as the Energy Innovators Initiative) helps commercial businesses and public institutions make their buildings more

energy efficient. EEB offers a variety of tools and services, including publications, training and financial incentives. After joining EEB, organizations can receive up to 25 percent of eligible costs to a maximum of \$250,000 – based on projected energy savings – for energy-saving retrofit projects.

For more information, visit the Web site at oeenrcan.gc.ca/eeb.

The Industrial Building Incentive Program (IBIP) aims to increase the energy efficiency of newly constructed industrial buildings. IBIP consists of an evaluation and selection of 8–10 projects annually from proposals. It offers an incentive of up to \$80,000 to companies that are building new industrial facilities to offset additional design costs inherent in the initial attempts at energy-efficient design.

For more information, visit the Web site at oeenrcan.gc.ca/newbuildings.

Industry

Market Trends

For the purposes of this report, the industrial sector includes all manufacturing activities, all mining activities, forestry and construction, but it excludes the electricity generation sector. In 2003, the industrial sector accounted for approximately 38 percent of secondary energy use in Canada and 34 percent of related greenhouse gas (GHG) emissions – including electricity-related emissions. Pulp and paper, an important sector in Canada's economy, accounted for about 26 percent of total industrial energy demand in 2003.

Actual industrial energy use increased by approximately 19 percent between 1990 and 2003. This is the result of an increase in industrial activity, which grew by about 45 percent. Some of the increase in energy use was offset by improvements in energy efficiency and structural change – the shift to less energy-intensive industries (such as the electrical and electronics industry).

GHG emissions from the industrial sector increased by 19 percent between 1990 and 2003. However, a significant shift toward the use of less GHG-intensive fuels in the industrial sector has meant that the level of GHG emissions is lower than it would have been otherwise.

Promoting Energy Efficiency

In the industrial sector, energy is used primarily to produce heat, to generate steam or as a source of drive power. Energy efficiency improvements are most readily achieved in equipment and processes that are common to many industries, such as motors and auxiliary systems. Continued switching from fossil fuels to GHG-neutral

energy sources (such as wood and pulp waste) represents another opportunity to reduce emissions from this sector.

The Office of Energy Efficiency's (OEE's) approach in the industrial sector is to

- encourage and make voluntary action easier, both industry-wide and at the company level, to improve energy efficiency; and
- implement more stringent minimum efficiency standards for electric motors, fluorescent and incandescent lamps, exit signs, dry-type distribution transformers and medium duty electric motors (as previously discussed in the "Equipment" section).

OEE initiatives at the sector and company levels address barriers to planning, implementing, tracking and reporting energy efficiency projects in industry.

Selected Progress Indicators for Industry

- During fiscal year 2004–2005, 124 new Industrial Energy Innovators were recruited (see Figure 14 on page 23).
- The Canadian Industry Program for Energy Conservation (CIPEC) has a network of more than 45 trade associations that targets all of industry, including industrial mining, manufacturing, construction, upstream oil and gas and electricity generation. Effective energy management by CIPEC companies resulted in \$3.4 billion in savings in 2003. As Figure 15 (on page 23) demonstrates, significant energy intensity improvements occurred in the latter part of the decade. Between 1996 and 2003, energy intensity decreased by 12 percent.

- According to a recent study, there is a statistically significant difference between energy consumed by CIPEC participants and non-participants. The growth of energy consumption for CIPEC participants was about half that of non-participants. Three times more participants reported reduced energy use than non-participants. And 15 percent fewer participants reported an increase in energy use than non-participants.

The OEE's Industry Program

The Canadian Industry Program for Energy Conservation and Industrial Energy Innovators are sectoral- and company-level initiatives, respectively. They address barriers to planning, implementing, tracking and reporting energy efficiency projects in Canadian industry. Key elements include the establishment and tracking of energy efficiency improvement targets and plans, and the development of products and services that overcome barriers to continued energy efficiency improvement. The OEE provides support via employee awareness kits and events, best-practices guides, technical information, energy audits, benchmarking and workshops on energy management.

For more information, visit the Web site at oee.nrcan.gc.ca/cipec.

Figure 14

Industrial Energy Innovators, 1995–1996 to 2004–2005

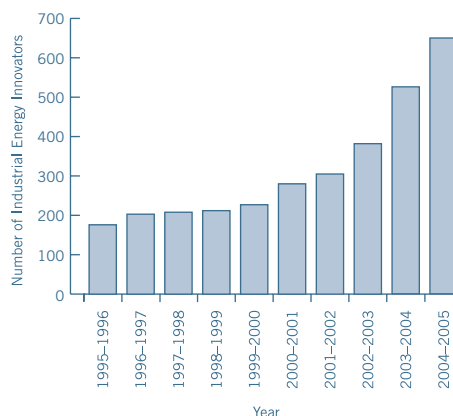
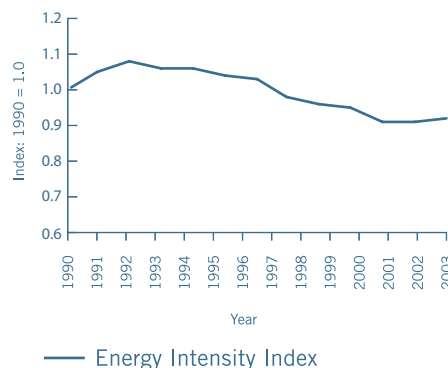


Figure 15

CIPEC Energy Intensity Index, 1990 to 2003



Transportation

Market Trends

In 2003, the transportation sector accounted for approximately 28 percent of secondary energy use in Canada and about 34 percent of related greenhouse gas (GHG) emissions.

Energy efficiency improvements in freight and passenger transportation limited the growth in transportation energy use to 26 percent between 1990 and 2003. Without these improvements, transportation energy use would have increased by 41 percent over the period. Of interest, light and heavy trucks, with a combined increase of 404.2 petajoules, accounted for 84 percent of energy growth in the transportation sector over this period.

GHG emissions from the transportation sector increased by 25 percent from 1990 to 2003, consistent with the increase in energy use and the sector's reliance on fossil fuels.

The transportation sector consists of three sub-sectors: passenger, freight and off-road. The passenger sub-sector comprises three modes (road, rail and air), and the freight sub-sector comprises four modes (road, rail, air and marine). Road transport uses the most energy, accounting for more than 79 percent of total transportation energy use. Of this, over 59 percent is for passenger transportation and the remainder is for freight transportation.

Figure 16 (on page 25) illustrates an improvement in trucking energy intensity despite an increase in average activity over 1990 to 2003. Improved fleet practices, caused by an increase in transportation sector competitiveness and the introduction of electronic engines, have significantly improved engine fuel efficiency in medium- and heavy-duty trucks.

Promoting Energy Efficiency

Opportunities to improve the energy efficiency of road transport include manufacturing vehicles that are more fuel efficient; encouraging private and commercial owners to purchase such vehicles; and promoting fuel-efficient driving and maintenance practices. In addition, there are opportunities for passenger and freight users to employ more energy-efficient modes of transportation, such as route optimization, active transportation and modal shifts.

The Office of Energy Efficiency (OEE) works to improve the efficiency of fuel use in road transportation. Its approach is to

- improve the energy efficiency of vehicles offered to and purchased by consumers and fleet owners; and
- influence driver behaviour, vehicle maintenance practices and fleet management.

The OEE also promotes the development and use of alternative transportation fuels, seeking ways to reduce GHG emissions in the transportation sector through such energy sources as natural gas, ethanol, bio-diesel and fuel cells.

Selected Progress Indicators in Transportation

- The Motor Vehicle Fuel Efficiency Initiative aims at improving the fuel efficiency of new light-duty vehicles sold in Canada. The indicator used to measure annual progress is new vehicle fuel consumption, expressed in litres per 100 kilometres (L/100 km). Canada has a voluntary system of fuel consumption standards for each manufacturer, known as company average fuel consumption (CAFC). These standards – 8.6 L/100 km for passenger cars and 11.4 L/100 km for light trucks – are consistent with the regulatory standards in the United States. In 2004, passenger cars were, on average, 12 percent below the standards at 7.6 L/100 km, and light trucks were 6 percent below the standard at 10.7 L/100 km (see Figure 17).
- On April 5, 2005, the Government of Canada and the Canadian automotive industry signed a landmark agreement on climate change action. Under a memorandum of understanding, automobile manufacturers voluntarily agreed to reduce emissions from new vehicles sold in Canada, targeting an annual reduction in GHG emissions of 5.3 megatonnes from vehicle use by 2010.
- While vehicle fuel efficiency remained fairly flat between 1990 and 2003, new vehicles changed significantly due to technological advances. There was a marked increase in power in the average vehicle sold in Canada over this period and an increase in vehicle weight due, in part, to a market shift towards light trucks from passenger cars. While incremental improvements to vehicle fuel efficiency continued, they were partially offset by increases in vehicle power and size (see Figure 18). While the market share of new passenger cars and light trucks sold in Canada has stabilized at approximately 62 percent and 38 percent respectively, the trend of increasing average horsepower continues.

Figure 16

Trucking Energy Intensity and Average Activity per Truck, 1990 to 2003

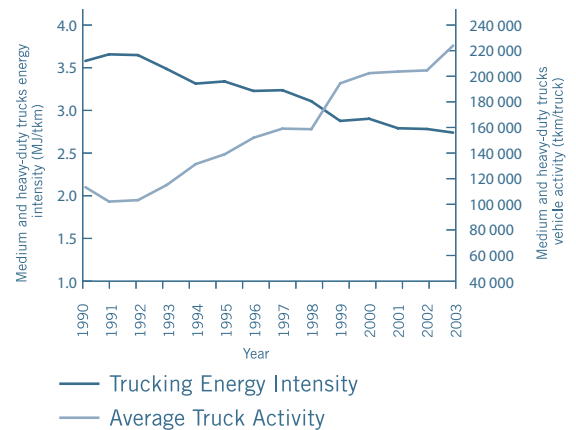


Figure 17

Company Average Fuel Consumption (CAFC) vs. Canadian Voluntary Standards, 1990 to 2004

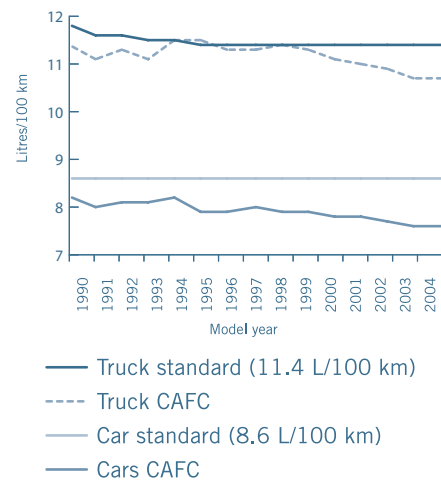


Figure 18

New-Car Fuel Efficiency, Normalized for Weight and Power, 1990 to 2003

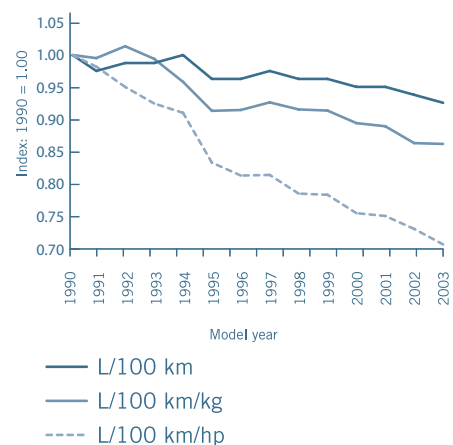


Figure 19

Vehicle Fuel Efficiency Awareness
– EnerGuide Labels

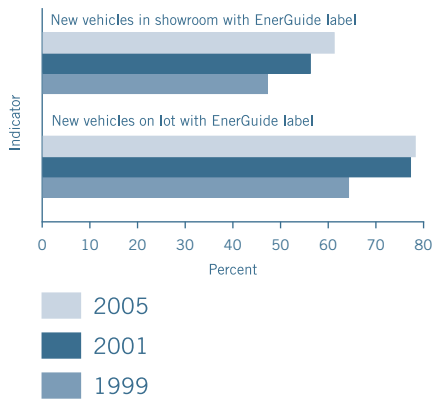
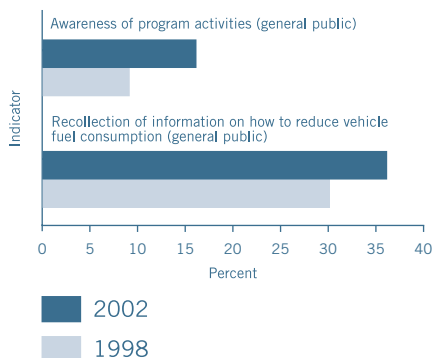


Figure 20

Vehicle Fuel Efficiency
Awareness – Initiative Impacts



- For personal vehicles, transportation initiatives aim to improve the energy efficiency practices of private motorists by influencing car purchase decisions, on-road driving practices and vehicle maintenance practices through driver education and awareness initiatives. Figures 19 and 20 illustrate the awareness levels of Canadians with respect to transportation initiative activities.
- In fiscal year 2004–05, the “Auto\$mart – A New Point of View” Driver Education initiative was launched (visit the Web site at vehicles.gc.ca). The Idle-Free initiative completed an idling campaign in the Greater Vancouver Regional District and initiated partnerships with the Clean Air Partnership, representing the Greater Toronto Area, and the Halifax Regional Municipality (visit the Web site at idling.gc.ca). The Be Tire Smart campaign, in partnership with the Rubber Association of Canada, launched a national Be Tire Smart Week and regional campaigns in British Columbia and Quebec (visit the Web site at betiresmart.ca).
- For fleet vehicles, the Transportation Program is aimed at improving the fuel efficiency and use of alternative fuels in commercially and publicly managed vehicle fleets. In fiscal year 2004–2005, the Commercial Transportation Energy Efficiency Rebate initiative provided over \$2.8 million in incentives to certified idling-reduction technology purchasers. As well, the SmartDriver initiative trained more than 200 000 new and experienced commercial drivers. Over the same period, the annual truck-stop Idle-Free Quiet Zone campaign was conducted at more than 80 sites across Canada.

The OEE's Transportation Program

The vehicle efficiency component of the OEE's Transportation Program is intended to bring about a 25 percent improvement in the fuel efficiency of new light-duty vehicles sold in Canada by 2010. The initiative targets a significant voluntary improvement in new-vehicle fuel efficiency through The initiative targets a significant voluntary improvement in new-vehicle fuel efficiency through an agreement with the automobile industry, signed April 5, 2005, that targets an annual reduction in GHG emissions of 5.3 megatonnes by 2010. The initiative also involves consumer education activities and the evaluation of advanced vehicle technologies to facilitate their introduction and use in Canada.

For more information, visit the Web site at oee.nrcan.gc.ca/transportation/fuels/motorvehicles.cfm.

The Personal Vehicles initiative has developed campaign resources, information, tools and messaging in association with its partners to improve the public's fuel-efficient vehicle operation and maintenance practices. National campaigns and education initiatives were developed to increase motorists' awareness of the effect their vehicle-purchasing decisions and driving and maintenance practices have on their fuel use and costs as well as the environment. In addition, under a voluntary agreement, manufacturers affix an EnerGuide label to new cars, vans and light-duty trucks sold in Canada. The label indicates the vehicle's fuel consumption rating and estimated annual fuel costs, to help consumers select the most fuel-efficient vehicle that meets their everyday needs.

For more information, visit the Web site at vehicles.gc.ca.

The OEE's activities regarding fleet vehicles provide private-sector fleet managers with information, workshops, technical demonstrations and training programs on fuel-efficient practices for fleet vehicles.

For more information, visit the Web site at fleetsmart.nrcan.gc.ca.

The OEE's work in alternative transportation fuels promotes the development and use of alternative and future fuels in Canada. Information on conventional and alternative fuels is disseminated through reports, brochures and public events. Information on economic impacts, GHG emissions and general technical aspects are shared with the public and private sectors. The OEE forms partnerships with industry, research and other organizations in transportation, industry and energy. Such partnerships allow the OEE to follow and promote new developments in alternative transportation fuels, including further improvements in environmental and economic performance. Alternative transportation fuels include propane, natural gas, alcohols, electricity and hydrogen; conventional fuels include gasoline and diesel.

For more information, visit the Web site at oee.nrcan.gc.ca/vehiclefuels.

Measures for Alternative Transportation Fuels

- Ethanol Expansion Program (EEP) – Co-managed with Agriculture and Agri-Food Canada, the EEP aims at increasing the production and use of fuel ethanol in Canada by providing financial contributions for the construction or expansion of ethanol plants. Seventeen applications were received under the first round of the EEP, which closed in December 2003. An amount of \$72 million was allocated in 2004 to six ethanol plant projects that represent a total annual production of 660 million litres of fuel ethanol per year (current fuel ethanol production is 200 million litres per year). Four of these plants were under construction in summer 2005. Round 2 of the program was launched in December 2004.

- Future Fuels Initiative – This initiative aims to increase the supply and use of fuel ethanol produced from biomass, such as plant fibre, corn, wheat and other grains. It includes three main activities: analytical work, public awareness and policy development. In 2004, a major biofuel study, including two national workshops, was conducted on the economic, financial and social analysis of ethanol and biodiesel and to assess public policy options. In March 2004, a national ethanol awareness survey was completed; results indicated that 85 percent of Canadians are in favour of increased ethanol-blended gasoline use in Canada (Ipsos-Reid).
- Canadian Transportation Fuel Cell Alliance (CTFCA) – This private-public partnership is co-managed by NRCan’s OEE and CANMET Energy Technology Centre (CETC). The CTFCA encourages advancements in hydrogen and fuel cell technologies through demonstration projects.
- Biodiesel Initiative – This \$11.9-million initiative is led by CETC and supported by the OEE. The initiative supports the Government of Canada’s proposed target of 500 million litres of biodiesel production per year by 2010. A biofuels quality registry was established with the Alberta Research Council to set an industry protocol and standard for fuel analysis.

Government Operations

The Government of Canada is committed to “getting its own house in order” by setting a target of 31 percent reduction in greenhouse gas (GHG) emissions from its own operations by 2010.

Since 1990, through building retrofits, better fleet management, strategic “green power” purchases and the downsizing of operations, the Government of Canada has already achieved a 26 percent emissions reduction (see Figure 21 on page 29).

The Office of Energy Efficiency (OEE) plays an important role in helping to achieve this reduction by providing programs targeted to improving the efficiency of energy use in government operations. The OEE’s goal is to assist Government of Canada organizations in implementing energy efficiency improvements, leading to reductions in energy use, GHG emissions and operating costs. It offers two initiatives in this area – one for federal buildings and one for federal vehicles.

The OEE also contributed to the development and implementation of the Federal House in Order (FHIO) initiative. This initiative formally centralizes the Government of Canada’s efforts to monitor, track and reduce its own GHG emissions.

For more information, visit the Web site at www.fhio.gc.ca.

The Federal Buildings Initiative (FBI) is a voluntary initiative that helps Government of Canada departments and agencies improve the energy efficiency of their facilities. It provides them with a model framework for updating their facilities with energy-saving technologies and practices. FBI energy management service contracts with private-sector energy management firms have financed \$250 million in energy efficiency improvements, resulting in \$35 million in annual energy savings and about 250 kilotonnes of GHG emissions reductions. The energy intensity improvement has averaged more than 20 percent per project undertaken.

For more information, visit the Web site at oee.nrcan.gc.ca/fbi.

The Federal Vehicles Initiative (FVI) assists Government of Canada departments and agencies in reducing operating costs by increasing the energy efficiency of their motor vehicle fleets and making greater use of alternative transportation fuels. This initiative provides federal fleet managers with information and tools to improve the operational efficiency of their fleets and increase their use of alternative fuels. In 2004–2005, the Government of Canada acquired 125 “leadership vehicles,” of which 64 were alternative fuel vehicles, in compliance with the *Alternative Fuels Act*, and 61 were hybrid vehicles (see Figure 22).

For more information, visit the Web site at oee.nrcan.gc.ca/communities-government/transportation.cfm.

Figure 21

GHG Emissions Reductions From Federal Operations, 1990 to 2010

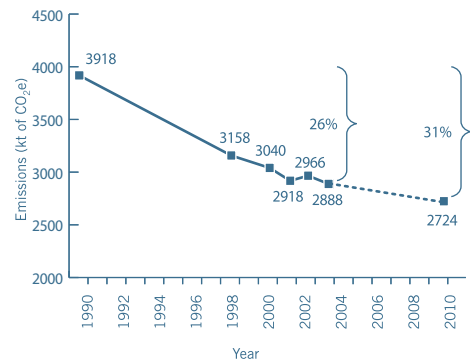
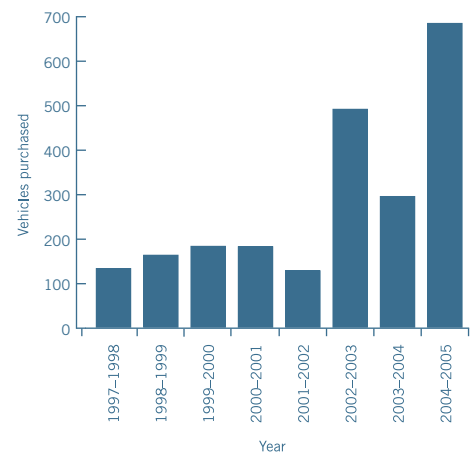


Figure 22

Purchases of Alternative Fuel Vehicles (Including Hybrids) for the Federal Fleet, 1997–1998 to 2004–2005



Government Operations Initiatives

Federal Buildings Initiative – The FBI provides project facilitation, planning advice and contracting help to secure energy management services for projects in federal facilities.

Federal Vehicles Initiative – The FVI promotes life-cycle costing, best-in-class vehicle identification and greater use of alternative fuels. It also supports increased penetration of ethanol-blended fuels in the federal fleet.

Federal House in Order – The OEE, together with Environment Canada and Public Works and Government Services Canada, plays an important role in helping departments meet the Government of Canada's GHG emissions reduction target.

- Eleven key departments are responsible for 95 percent of Government of Canada GHG emissions. They have been assigned specific targets and must report annually on their progress. The task of target sharing entails assigning specific targets to these departments based on the emissions reduction opportunities identified within each organization.
- The FHIO's Leadership Challenge component, led by Environment Canada, encourages all Government of Canada departments and agencies to participate in emissions reduction efforts by engaging the active participation of the departments, agencies and Crown corporations that were not designated with a target.

Outreach

In addition to delivering sector-specific programs, the Office of Energy Efficiency (OEE) manages Outreach measures on all energy-using sectors of the economy.

The OEE's Outreach Program provides Canadians with information on reducing energy use and directs them to Natural Resources Canada (NRCan) programs that can help them improve energy efficiency in their transportation and home energy choices. Outreach supplements program communications activities with publications, exhibits, joint projects and the OEE Web site.

The Public Education and Outreach shift from raising awareness to motivating action has raised the profile of OEE Outreach and led to increasing integration with the One-Tonne Challenge (OTC). Launched in March 2004, the OTC initiative is co-led by NRCan and Environment Canada. It is a call on all Canadians to reduce their greenhouse gas emissions by one tonne, or about 20 percent.

Selected Progress Indicators

- Each year the OEE distributes more than 300 energy efficiency and alternative energy publications to individuals and program partners. More than 75 percent of these publications are available on-line.
- Interest in and demand for energy efficiency information has continued to increase – a 53 percent increase in the

volume of publications distributed (5.6 million) and a 30 percent increase in visits to the Web site (2 million).

- The introduction of the OTC to the Canadian public and potential partners included an advertising campaign noted by over 50 percent of Canadians. As of March 31, 2005, activity levels were high, with over 1.7 million Web site visits and the distribution of 900 000 OTC guides.
- Twenty private-sector partners, representing retail, utilities and manufacturing sectors, are involved in outreach activities to support the One-Tonne Challenge initiative. More than 400 companies have registered on-line to access the One-Tonne Challenge Employee Awareness Toolkit and bring the OTC to their workplace.

Outreach Initiatives

Public information activities increase awareness of the environmental impact of energy use. They also encourage consumers to adopt energy-efficient practices and to switch to alternative forms of energy. Numerous publications are available on-line at oee.nrcan.gc.ca.

The OEE's work in youth and education seeks to create a greater awareness of climate change and the need for energy efficiency among young Canadians. The kindergarten to

Grade 12 stream builds around the annual *Energy and the Environment* calendar, which is produced in cooperation with stakeholders and the education community. An educators' on-line resource site and an information kit for teachers at the elementary and secondary levels are also available. At the post-secondary level, the OEE's Outreach Program builds links using such tools as its Energy Ambassadors competition.

For more information, visit the following Web sites:

oee.nrcan.gc.ca/calendarclub

climatechange.gc.ca/onetonne/english/educators.asp

oee.nrcan.gc.ca/corporate/awards/ambassadors/index.cfm

The One-Tonne Challenge is co-managed with Environment Canada, with input from and coordination with other departments, such as Transport Canada. Canadians are challenged to use less energy, reduce waste and conserve water and other resources. Reduced emissions will protect the climate and result in cleaner air and healthier communities for all Canadians.

For more information, visit the Web site at

climatechange.gc.ca/onetonne.