

# The State of Energy Efficiency in Canada

Office of Energy Efficiency Report 2003



*it takes teamwork*



Natural Resources  
Canada

Ressources naturelles  
Canada

Canada

This digital mosaic of Canada, produced by Natural Resources Canada (Canada Centre for Remote Sensing), is a composite of individual satellite images. The colours reflect differences in the density of vegetation cover: bright green for dense vegetation in the humid southern regions; yellow for semi-arid and mountainous regions; brown for the far north where vegetation cover is very sparse; and white for the Arctic regions.

*Leading Canadians to Energy Efficiency at Home, at Work and on the Road*

The Office of Energy Efficiency of Natural Resources Canada strengthens and expands Canada's commitment to energy efficiency in order to help address the challenges of climate change.

Cat. No. M92-167/2003  
ISBN 0-662-67841-9

© Her Majesty the Queen in Right of Canada, 2004



Recycled paper

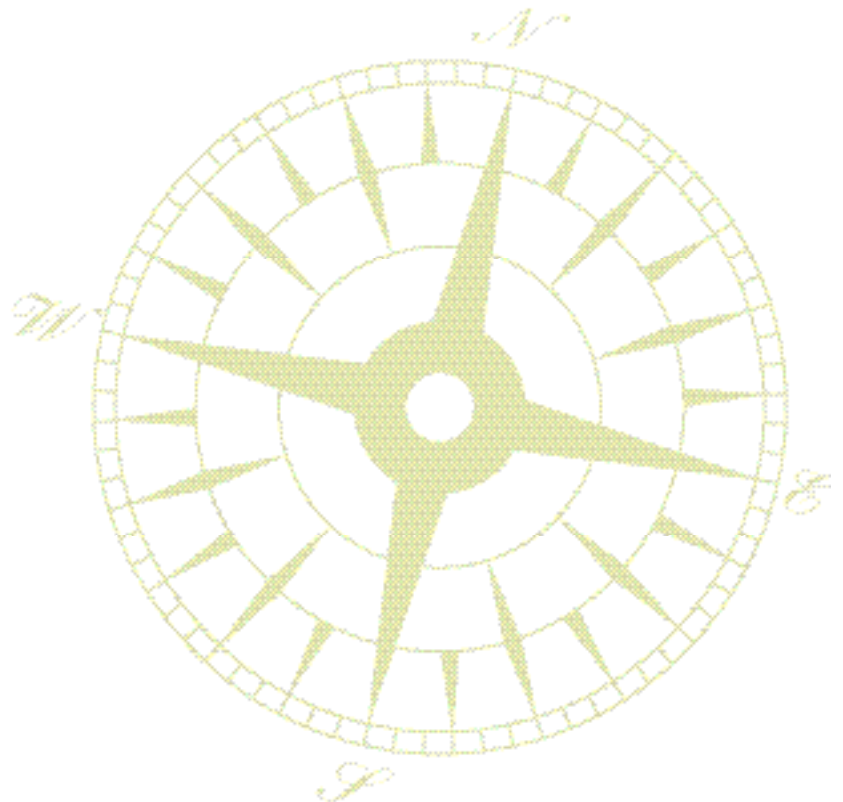
To obtain additional copies of this or other free publications on energy efficiency, please contact

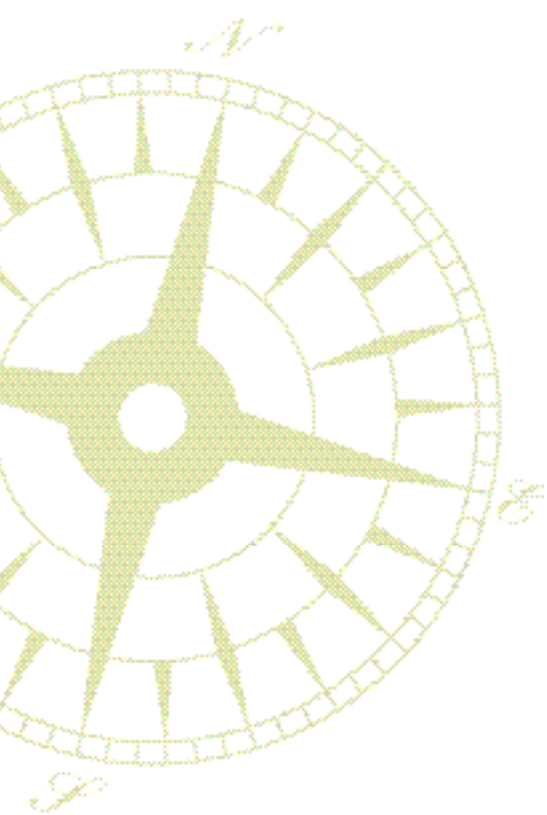
Energy Publications  
Office of Energy Efficiency  
Natural Resources Canada  
c/o S.J.D.S.  
Ottawa ON K1G 6S3  
Tel.: 1 800 387-2000 (toll-free)  
Fax: (819) 779-2833

You can also view or order most Office of Energy Efficiency publications on-line. Visit our Virtual Library at [oee.nrcan.gc.ca/infosource](http://oee.nrcan.gc.ca/infosource). The Office of Energy Efficiency's Web site is at [oee.nrcan.gc.ca](http://oee.nrcan.gc.ca).

# Contents

Message From the Minister	1
Executive Summary	3
The Office of Energy Efficiency	5
Taking Action on Climate Change	7
Energy Use and Greenhouse Gas Emissions	9
The State of Energy Efficiency in Canada	11
Improving Energy Efficiency	13
Equipment	14
Housing	17
Buildings	19
Industry	22
Transportation	25
Government Operations	28
Outreach and Other Information	30
Supporting Municipal Action on Climate Change	33





## Message From the Minister

I am pleased to present the sixth edition of *The State of Energy Efficiency in Canada*. This report describes the progress of Canada's economic sectors in improving energy efficiency and the contribution made by the programs of Natural Resources Canada (NRCan).

Canadians have been making great strides in using energy more wisely. Canada's energy efficiency has improved by 10 percent since 1990. This saves us \$10.7 billion a year in energy costs.

Much of this progress is the result of energy efficiency initiatives that my department has introduced through the Office of Energy Efficiency. These programs encourage innovation and help Canadians reduce their energy use by providing information, training and incentives.

In 2002, the Government of Canada ratified the Kyoto Protocol to the United Nations Framework Convention on Climate Change. As Canada works toward fulfilling its commitment to reducing greenhouse gas (GHG) emissions, NRCan continues to expand and improve the programs that support Canadians in the important area of energy efficiency. Using less energy to meet our daily needs reduces GHG emissions that contribute to climate change.

We all need to take action – governments at all levels, companies of all sizes and individual Canadians. That is why we are proposing the “One-Tonne Challenge” – to encourage every Canadian to set the goal of reducing personal GHG emissions by an average of one tonne a year by 2008–2012. NRCan's programs will continue to help Canadians use energy more wisely at home, at work and on the road.

Together, we can advance the Government of Canada's commitment to the sustainable development of our natural resources – strengthening the foundations of Canadian life, building a 21st-century economy and ensuring our place in the world.



R. John Efford  
Minister of Natural Resources Canada





## Executive Summary

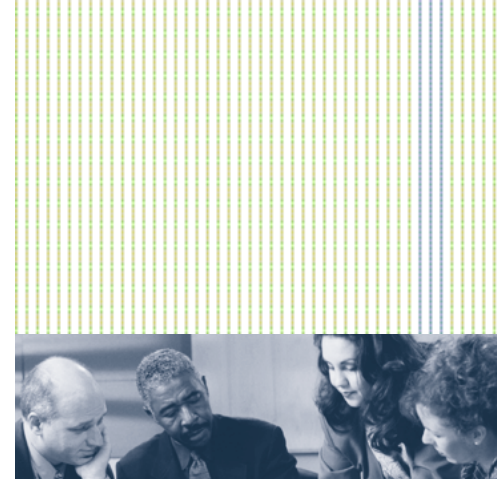
The Office of Energy Efficiency (OEE) of Natural Resources Canada is the country's foremost centre for energy efficiency. It administers key programs that promote energy efficiency in the major energy-using sectors of the economy and collects and analyses energy efficiency data and trends. Clients range 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 10 percent improvement in energy efficiency over 1990–2001.

As a result of this improvement, Canadians saved about \$10.7 billion in energy costs in 2001 alone. Moreover, energy use in Canada increased by only 14 percent between 1990 and 2001 rather than the 25 percent that would have taken place without increases in energy efficiency. In addition, energy-related GHG emissions are more than 44 megatonnes lower than they would otherwise have been. 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.

In 1995, the Government of Canada committed to "getting its own house in order" by reducing GHG emissions from its operations by at least 20 percent from 1990 levels by the year 2005. The Government of Canada's target was later updated to 31 percent below 1990 levels by 2010. As of March 31, 2002, the Government of Canada had reduced its GHG emissions by 24 percent. The OEE has played and will continue to play an important role in helping to achieve this reduction.



As Canada works toward fulfilling its commitment for reducing GHG emissions under the Kyoto Protocol, 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 that contribute to climate change. A dynamic, flexible and proactive organization, the OEE will continue to evolve in response to the climate change challenge and new energy efficiency opportunities throughout society.

Note that this document does not reflect developments occurring after September 2003. The most recent market trends data available are for 2001.

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 [oee.nrcan.gc.ca](http://oee.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). Its mandate is to strengthen and expand Canada's commitment to energy efficiency. The OEE is part of Canada's efforts to address climate change. It 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.

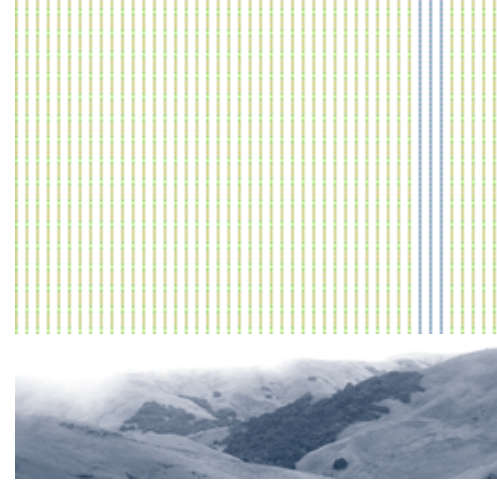
The OEE manages energy efficiency and alternative fuels measures aimed at the residential, commercial/institutional, industrial and transportation sectors.<sup>1</sup> Guided by the OEE's vision statement of "Leading Canadians to Energy Efficiency at Home, at Work and on the Road," programs related to these sectors target all energy consumers and emphasize partnerships 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 energy efficiency information through its publications and Web site at [oeenrcan.gc.ca](http://oeenrcan.gc.ca); and
- managing Canada's Energy Efficiency Awards.

The OEE plays a key role in administering the Public Education and Outreach (PEO) component of the Government of Canada's Climate Change Action Fund (CCAF). The OEE's Director General is the co-lead with Environment Canada in overseeing this component. PEO projects promote public awareness and understanding of climate change and encourage Canadians to take action to reduce GHG emissions and adapt to climate change. OEE staff evaluate project proposals as part of the interdepartmental review process. They also manage energy efficiency projects funded under the CCAF-PEO component. For more information, visit the Web site at [climatechange.gc.ca](http://climatechange.gc.ca).

<sup>1</sup> 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 and all regions of the country.

## 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 coordinates the drafting and publication of two NRCan reports: *Improving Energy Efficiency in Canada – Report to Parliament Under the Energy Efficiency Act* and *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/neud/dpa/policy\\_e/programs.cfm](http://oee.nrcan.gc.ca/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 fourth year, the awards send a positive message that Canada is taking action on climate change.

Awards are given in several categories – equipment and technology, housing, buildings, industry, outreach, media and a student competition – and, as of 2003, are presented annually. For more information, visit the Web site at [oee.nrcan.gc.ca/awards](http://oee.nrcan.gc.ca/awards).

## Taking Action on Climate Change

One of the most pressing environmental challenges is that of 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 increase the earth's surface temperature, change our climate, alter our environment and endanger our health. For more information, visit the Government of Canada Web site at [www.climatechange.gc.ca/english/index.shtml](http://www.climatechange.gc.ca/english/index.shtml).

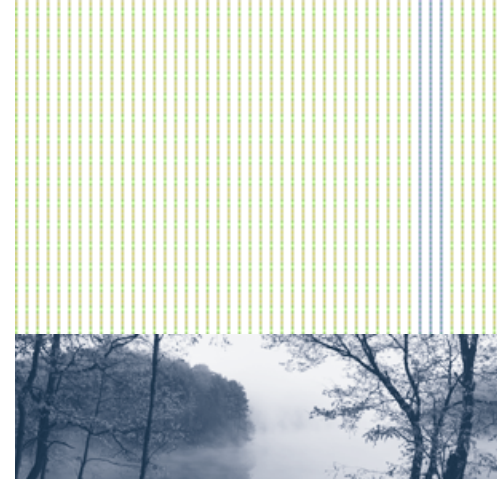
Most human-generated GHG emissions are produced through the combustion of fossil fuels. Although Canada accounts for only about 2 percent of the world's GHG emissions, it needs to be part of the solution. Substantially reducing GHG emissions is a challenge, particularly given Canada's highly industrialized and resource-based economy. Solutions require a multi-faceted, coordinated domestic response and a high level of cooperation among all nations.

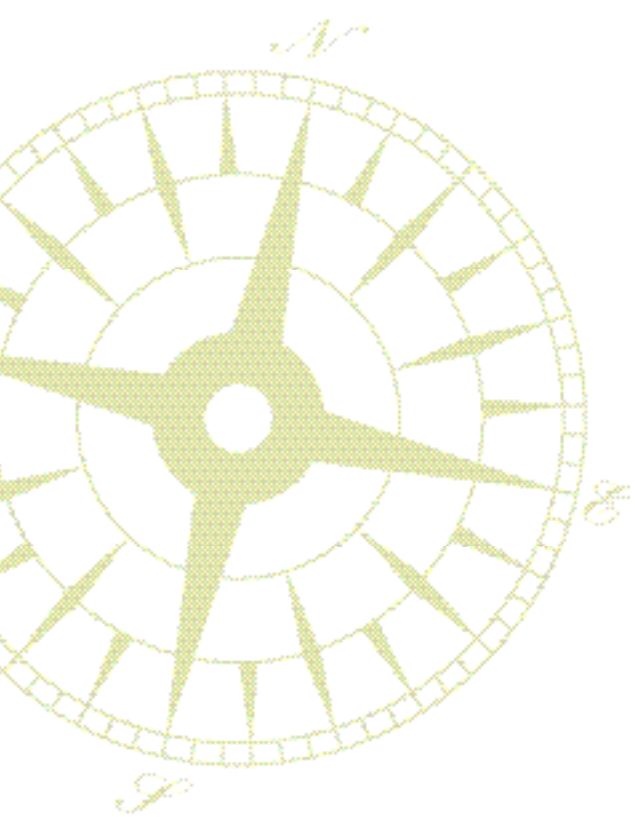
In 1997, Canada and more than 160 other countries met in Kyoto, Japan, and agreed to targets to reduce GHG emissions. Canada's target is to reduce its GHG emissions to 6 percent below 1990 levels by the first commitment period (2008 to 2012).

The Government of Canada ratified the Kyoto Protocol and notified the United Nations of its decision on December 17, 2002. Earlier, in November 2002, the Government of Canada had released the *Climate Change Plan for Canada*, which provides a framework for the way forward on climate change.

The federal budget of February 2003 provided new funding of \$2 billion over five years to support climate change initiatives. This is in addition to the \$1.7 billion in climate change investments announced by the Government of Canada since 1997. The next edition of *The State of Energy Efficiency in Canada* will fully reflect the Office of Energy Efficiency (OEE) measures implemented with this new funding.

The Government of Canada challenges all Canadians to reduce their GHG emissions by one tonne. That is about 20 percent of what individuals produce on average each year. The OEE is helping Canadians to achieve improvements in their energy use.





## Energy Use and Greenhouse Gas 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 (CO<sub>2</sub>) 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.

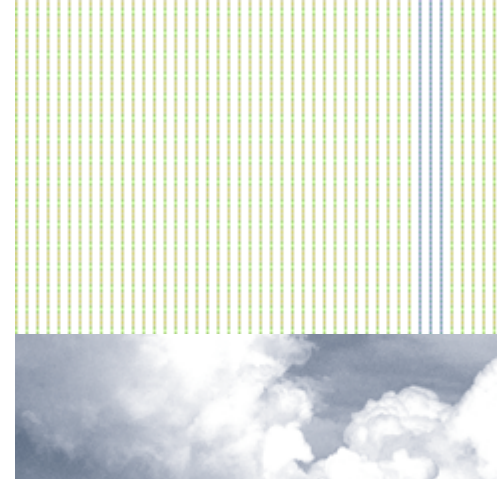
Between 1990 and 2001, the amount of energy that Canadians used to heat and cool their homes and workplaces and to operate their appliances, vehicles and facilities – known as secondary energy use – increased by about 14 percent. GHG emissions associated with this energy use increased by about 16 percent, accounting for 66 percent of all GHG emissions in Canada in 2001.

### Factors That Affect Energy Use

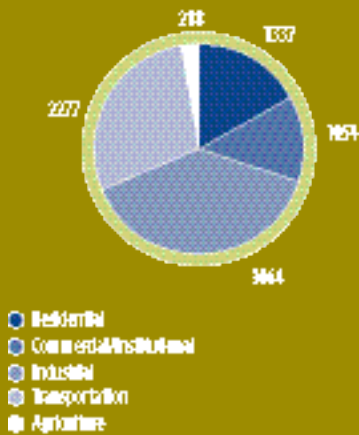
Several factors affect how much energy the Canadian economy uses. These include the level of economic activity in a sector (e.g. production by industry, floor space in the residential or commercial/institutional sector); structure (the mix of activities that consume energy in a sector); the weather; and how efficiently each sector uses energy. By promoting improved energy efficiency, the Office of Energy Efficiency's (OEE's) programs are helping Canada reduce its GHG emissions.

Canada's increased energy use between 1990 and 2001 was primarily due to growth in economic activity in each end-use sector. For example, activity in the industrial sector increased by almost 32 percent during this period. In the residential sector, there was a 22 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 26 percent over 1990–2001. In the transportation sector, there was an 8 percent increase in passenger-kilometres travelled.

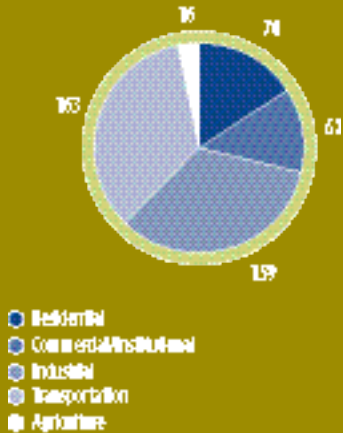
Changes in structure – the mix of activities that consume energy – contributed to decreased energy use between 1990 and 2001. The decrease was mainly due to changes in the industrial sector.



**Figure 1**  
Secondary Energy Use by Sector, 2001  
(petajoules)



**Figure 2**  
Secondary Energy-Related Greenhouse  
Gas Emissions by Sector, 2001  
(megatonnes of CO<sub>2</sub>-equivalent)



The industrial sector accounted for almost 39 percent of total secondary energy use in Canada in 2001 (see Figure 1) and 34 percent of secondary energy-related GHG emissions (see Figure 2).<sup>2</sup> The second largest energy-using sector – transportation – accounted for almost 29 percent of energy use in 2001, but it also accounted for about 34 percent of GHG emissions, more than any other sector. This is because 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 energy use and GHG emissions in Canada’s end-use energy markets, the primary focus of the OEE is energy efficiency. The following chapter takes an in-depth look at the state of energy efficiency in Canada.

<sup>2</sup> 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: 1990-2001*. A copy is available at [www.ec.gc.ca/pdb/ghg/1990\\_01\\_report/foreword\\_e.cfm](http://www.ec.gc.ca/pdb/ghg/1990_01_report/foreword_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, the only one of its kind in Canada.

The OEE Index<sup>3</sup> 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, structure and weather, the resulting estimate of energy efficiency includes some factors not related to efficiency. For example, the estimate of industry energy efficiency will reflect changes in sub-sector mixes of products or in the products themselves.

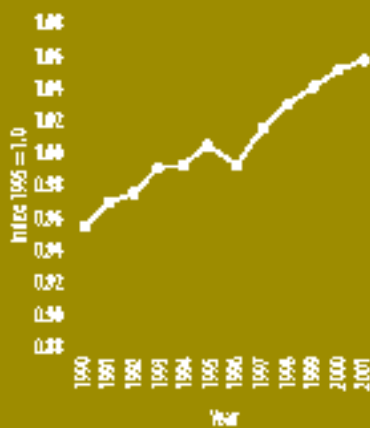
The OEE Index shows that, even with the many barriers to improvement in energy efficiency, strong and measurable progress has been made, due in part to the programs of the OEE. For 1990–2001, the OEE Index shows an increase in value, indicating that energy efficiency improved by 10 percent (see Figure 3). As a result of this improvement, Canadians saved about \$10.7 billion in energy costs in 2001 alone.

Moreover, energy use increased by only 14 percent between 1990 and 2001 rather than the 25 percent that would have taken place without increases in energy efficiency (see Figure 4). As well, energy-related GHG emissions are more than 44 megatonnes lower than they would otherwise have been.

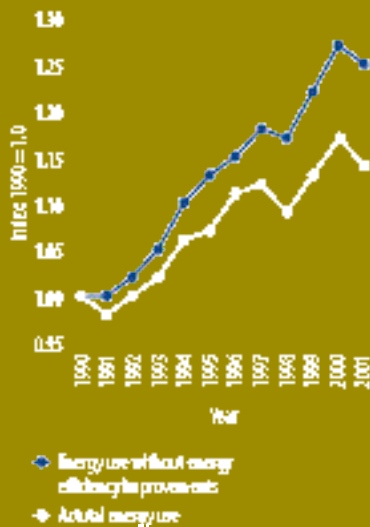
<sup>3</sup> For more information on the OEE Energy Efficiency Index, see *Energy Efficiency Trends in Canada, 1990 to 2001 – June 2003*. The document can be viewed on the OEE Web site at [oee.nrcan.gc.ca/neud/dpa/data\\_e/Trends2003.pdf](http://oee.nrcan.gc.ca/neud/dpa/data_e/Trends2003.pdf).



**Figure 3**  
The OEE Energy Efficiency Index, 1990–2001



**Figure 4**  
Impact of Energy Efficiency Improvements on Energy Use, 1990–2001



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 22 percent increase in activity (which is represented by a mix of households and floor space) and an increase in the average number of major appliances per household were partially offset by the warm winter of 2001 relative to 1990 and a 19 percent improvement in energy efficiency. This kept the increase in residential energy use over the review period to about 4 percent over 1990 levels.
- The almost 4 percent improvement in energy efficiency in the **commercial/institutional** sector over 1990–2001 contributed to reducing GHG emissions by almost two megatonnes.
- Although there was a 22 percent increase in **industrial**<sup>4</sup> activity, much of it occurred in less energy-intensive industries, such as electrical and electronic products. That, along with an almost 8 percent improvement in energy efficiency between 1995 and 2001, restrained the increase in energy use in the industrial sector to 3 percent, which reflects changes in activity, structure and efficiency.
- Passenger **transportation** energy use increased by about 9 percent, and freight transportation energy use increased by almost 43 percent. However, improvements in energy efficiency served to decrease energy use by about 10 percent so that energy use increased by only 21 percent rather than the 31 percent that would otherwise have occurred in the transportation sector.
- Despite a 9 percent increase in weight and a 38 percent increase in horsepower, the energy use of the average new mid-sized car has held steady since 1990; i.e. the average lab-tested fuel economy remained at just under nine litres per 100 kilometres.

<sup>4</sup> Due to data limitations, the industrial sector analysis uses 1995 as a base year.



# Improving Energy Efficiency

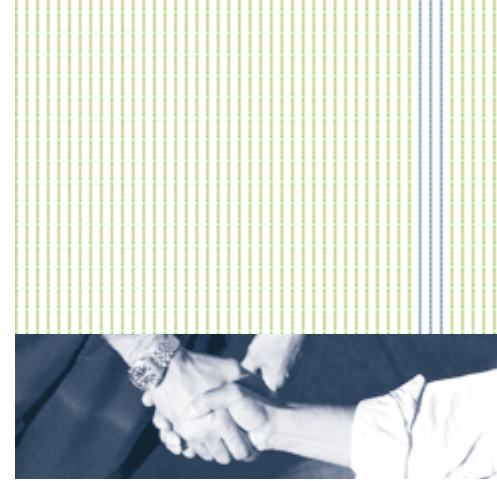
## The Office of Energy Efficiency Approach

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. Improving energy efficiency reduces greenhouse gas (GHG) emissions that contribute to climate change. 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 GHG-intensive energy sources, including renewable energy.

The OEE manages energy efficiency and alternative fuels measures aimed at all sectors of the Canadian end-use energy market. The following chapters 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 2001, 14 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 more than 64 percent of this amount, or 9 percent of the total. Lighting fixtures (including lamps and ballasts) accounted for a significant amount of energy use in the commercial/institutional sector – 15 percent in 2001. Space heating and cooling equipment accounted for about 59 percent of energy use in the residential and commercial/institutional sectors.

Although the stock of the major appliances increased by 29 percent between 1990 and 2001, the energy used by these appliances actually decreased by 10 percent (see Figure 5). The increasing popularity of smaller appliances, for which energy use increased by 52 percent, resulted in an overall increase in energy use of 2 percent in the residential sector.

### Promoting Energy Efficiency

Residential energy-using equipment is an important area for program support because it has a relatively short life (less than 20 years) and is replaced regularly. 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 first *Energy Efficiency Regulations* under the *Energy Efficiency Act* came into force in 1995. Regulations have been established for more than 30 products. They cover products that consume 80 percent of the energy used in the residential sector and 50 percent in the commercial/institutional sector.
- The Regulations also 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 label is used voluntarily by heating, ventilating and air-conditioning (HVAC) manufacturers and suppliers.
- Amendments to the *Energy Efficiency Regulations* have raised the efficiency standard for industrial motors and are expected to reduce carbon dioxide (CO<sub>2</sub>) emissions by more than two megatonnes by 2020 (see Figure 6). More than half of the projected energy savings are expected to come from the industrial sector.

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 or territories. The Act also gives the Government of Canada the authority to collect statistics on energy use and alternative energy.

### The OEE's Equipment Program

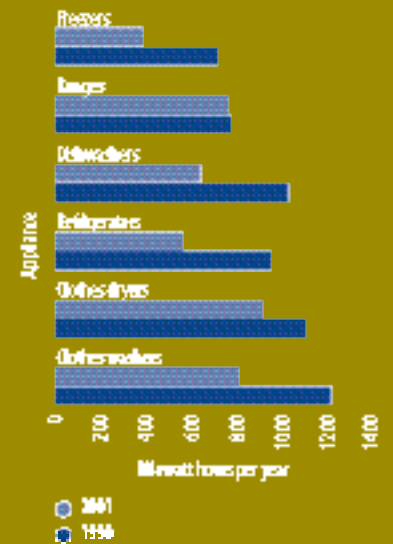
The objective of the OEE's standards setting and conformity assessment under its Equipment Program is to eliminate the less energy-efficient models of energy-using equipment from the market through minimum performance regulations under the *Energy Efficiency Act*.

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](http://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 HVAC and industrial equipment.

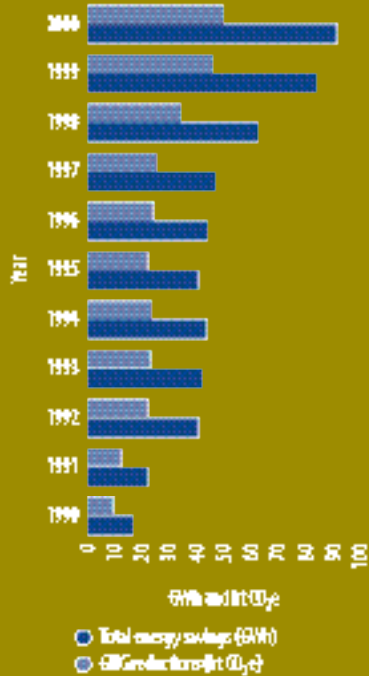
**Figure 5**  
Average Energy Consumption of  
New Appliances, 1990 and 2001 Models



**Figure 6**  
Estimated Reduction in CO<sub>2</sub> Emissions  
From Motor Regulations, 2000–2020



**Figure 7**  
**Total Energy Savings and GHG Emissions**  
**Reductions Attributable to EnerGuide Labeling,**  
**1990–2000**



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 impact of labelling is illustrated in Figure 7.

EnerGuide for Industry promotes and encourages the manufacture, purchase and use of industrial equipment that is more energy efficient. Implemented in 2001, this new 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. The initiative aims ultimately to reduce GHGs related to energy use by improving the efficiency of the stock of energy-using equipment available for industrial applications.

For more information, visit the following Web sites:

- [oee.nrcan.gc.ca/appliances](http://oee.nrcan.gc.ca/appliances)
- [oee.nrcan.gc.ca/equipment](http://oee.nrcan.gc.ca/equipment)
- [oee.nrcan.gc.ca/energystar](http://oee.nrcan.gc.ca/energystar)
- [oee.nrcan.gc.ca/egi](http://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 2001.

Despite significant growth in activity (i.e. more houses and increased floor area), significant energy efficiency improvements and the relatively warmer winter in 2001 restricted the increase in residential energy consumption to about 4 percent above 1990 levels. Without these energy efficiency improvements, residential energy use would have been 19 percent higher in 2001.

GHG emissions from the residential sector increased by about 7 percent between 1990 and 2001. This was principally due to the increase in the carbon intensity of generated electricity.

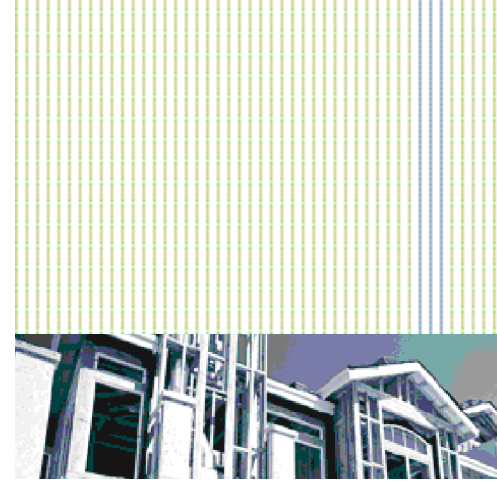
### Promoting Energy Efficiency

It is usually more economical to make energy efficiency improvements during home construction than after a home is built. However, by 2010, energy-efficient houses built after 1995 will represent only about 20 percent of Canadian housing, so energy use in the existing stock of houses also needs to be improved.

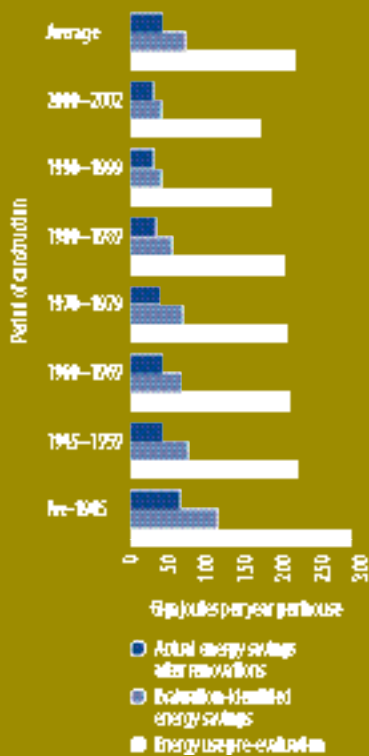
About 80 percent of residential energy is used for space and water heating, and significant potential exists for continued energy efficiency gains in this area. The relatively short life (less than 20 years) and regular replacement of residential energy-using equipment make it an important area for program support.

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

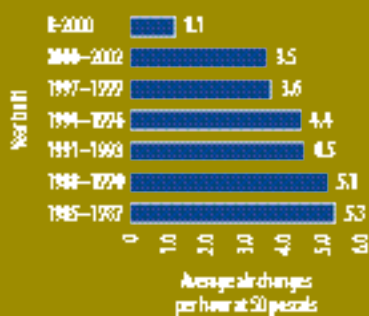
- use regulations and information programs to gradually exclude the least efficient equipment from the market and to influence consumers to select – and manufacturers to produce – energy-efficient products that outperform the minimum standards (discussed previously in the chapter on equipment in this report);
- 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.



**Figure 8**  
Residential Energy Use and Energy Savings per Household



**Figure 9**  
National Trends in Air Leakage in Houses (R-2000 and EnerGuide for Houses), 1985-2002



## Selected Progress Indicators in Housing

- EnerGuide for Houses encourages Canadians to improve the energy efficiency of their homes, especially when undertaking home renovation and maintenance projects. It raises consumer awareness of the benefits of energy efficiency, such as cost savings, improved comfort and indoor air quality, durability and the resale value of a house. On average, 75 percent of the Canadian homeowners who retrofitted their homes as EnerGuide for Houses participants implemented half of the recommended energy efficiency improvements. As of December 2002, participating homeowners achieved an estimated annual energy savings of 18 percent (see Figure 8).
- 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. R-2000 practices and technologies are increasingly being adopted in mainstream construction (see Figure 9). Examples include greater use of heat recovery ventilators, high-performance windows and high-efficiency gas furnaces.

### 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.

For more information, visit the Web site at [oee.nrcan.gc.ca/r-2000](http://oee.nrcan.gc.ca/r-2000).

EnerGuide for Houses is an energy performance evaluation and rating initiative. It provides homeowners with the facts they need to make informed decisions about energy efficiency when they are buying a house or improving their existing home.

The EnerGuide for Houses Retrofit Incentive was launched in October 2003 to encourage homeowners to retrofit their houses to make them more energy efficient.

For more information, visit the Web site at [oee.nrcan.gc.ca/houses](http://oee.nrcan.gc.ca/houses).

## Buildings

### Market Trends

The commercial/institutional sector of the economy accounted for 13 percent of Canada's secondary energy use and 13 percent of the related greenhouse gas (GHG) emissions in 2001.

Improved energy efficiency somewhat offset the effect of increased commercial activity between 1990 and 2001. This limited the growth in the sector's energy use to about 22 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 25 percent.

GHG emissions from the commercial/institutional sector increased by 29 percent during 1990–2001. Part of the increase was due to a shift toward the use of more GHG-intensive fuels to generate electricity during that period.

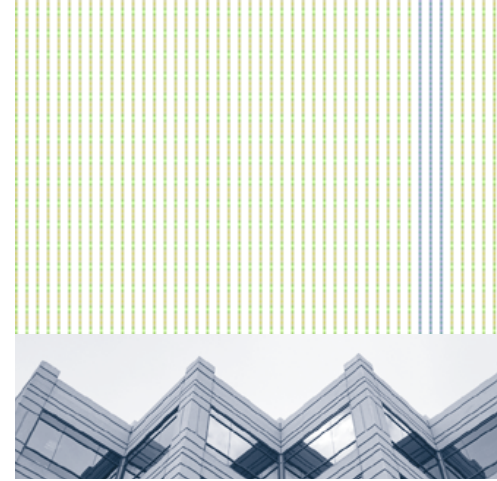
### Promoting Energy Efficiency

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 together account for about 34 percent of commercial energy use. Energy efficiency improvements are also possible in these areas.

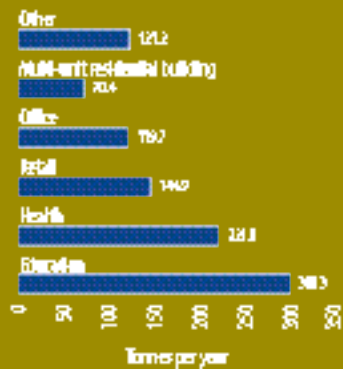
As is the case in the residential sector, it is generally more economical to make energy efficiency improvements during the construction of a building rather than afterward. However, given the slow turnover of the building stock in this sector and the opportunities for energy-efficient retrofits, the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

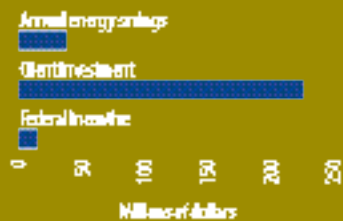
- use regulations and information to gradually exclude the least efficient equipment from the market and to influence consumers to select – and manufacturers to produce – energy-efficient products that outperform the minimum standards (discussed previously in the chapter on equipment in this report); 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,



**Figure 10**  
Estimated Average GHG Reductions by Institution Under CBIP, 2002–2003



**Figure 11**  
Energy Innovators Initiative – Incentive Projects From 2001 to 2003



- providing incentives for designing more energy-efficient buildings, and
- encouraging investments in energy-efficient building retrofits to lower costs and reduce GHG emissions by forming partnerships with key associations, emphasizing corporate energy management planning and providing incentives for implementing energy-efficient retrofits.

## Selected Progress Indicators for Buildings

- Through the Commercial Building Incentive Program (CBIP), 79 projects aimed at improving the energy efficiency of new commercial, institutional and multi-unit residential buildings were supported in fiscal year 2002–2003. CBIP contributed \$3.9 million toward the design stage of these projects. On average, buildings that qualify for assistance are designed to achieve energy performance that is 34 percent better than that required by the *Model National Energy Code for Buildings* (MNECB) (see Figure 10).
- The Energy Innovators Initiative (EII) encourages commercial businesses and public institutions to become more energy efficient and reduce their GHG emissions. Since 1992, the EII has recruited more than 1000 organizations that represent about 27 percent of the floor space in these sectors.
- In the 2002–2003 fiscal year, 59 commercial businesses, public institutions and multi-unit residential buildings received more than \$8.8 million in financial incentives for energy retrofit projects from the EII. The total investment of these projects is more than \$150 million, representing a significant contribution to energy efficiency retrofits by the commercial/institutional sector (see Figure 11). When completed, these projects are expected to reduce total energy bills by more than \$23 million annually and reduce average annual energy consumption by 1.8 million gigajoules, or about 20 percent. In addition, over 100 organizations qualified to receive almost \$1.3 million for retrofit planning funding assistance. Through this assistance, organizations will be able to overcome barriers associated with implementing an energy-saving retrofit.



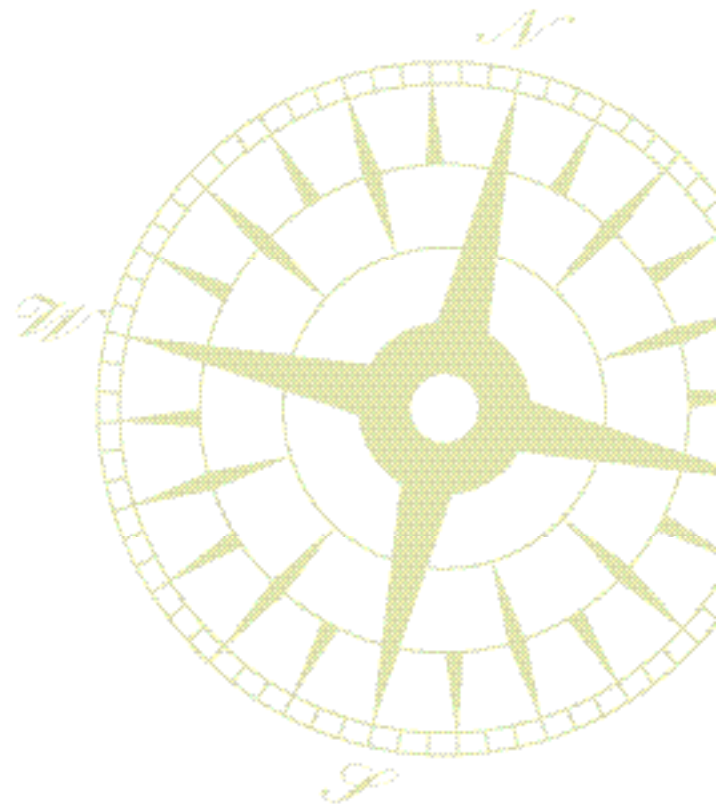
## The OEE's Buildings Program

The Commercial Building Incentive Program, part of the OEE's Buildings 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 [oee.nrcan.gc.ca/newbuildings](http://oee.nrcan.gc.ca/newbuildings).

The Energy Innovators Initiative encourages owners and operators of existing commercial businesses and public institutions to reduce operating costs and become more energy efficient through a variety of tools and services, including information, training, advice and financial incentives. Organizations can receive up to 50 percent of approved costs to a maximum of \$25,000 for activities related to planning and developing an energy retrofit. Eligible measures include audits, feasibility studies, energy management plans and other facilitation services. Financial incentives are also available for qualifying energy retrofit projects. Organizations may qualify for up to 25 percent of eligible costs – up to \$250,000 (based on projected energy savings) – for the implementation of energy-saving measures.

For more information, visit the Web site at [oee.nrcan.gc.ca/eii](http://oee.nrcan.gc.ca/eii).



### Market Trends

For the purposes of this report, the industrial sector of the economy includes forestry, construction, mining and manufacturing. In 2001, this sector accounted for about 39 percent of secondary energy use in Canada and 34 percent of related greenhouse gas (GHG) emissions.

Due to data limitations as Statistics Canada converts to a new industrial classification system, the analysis of factors affecting energy use was done using 1995 rather than 1990 as the base year. Industrial energy use between 1995 and 2001 increased by only 3 percent, compared with a 22 percent increase in activity. This is the result of structural changes, specifically, a relative increase in the activity share of less energy-intensive industries and improvements in energy efficiency in this sector. Improved efficiency was achieved by rationalizing operations, installing equipment that is more efficient and making other efforts.

GHG emissions from the industrial sector increased by 11 percent between 1995 and 2001. 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

- implement more stringent minimum efficiency standards for electric motors and for fluorescent and incandescent lamps (discussed previously in the chapter on equipment in this report); and
- encourage and make voluntary action easier, both industry-wide and at the company level, to improve energy efficiency.

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

- By the end of March 2003, 382 industrial companies had been recruited as Energy Innovators, and more than 240 of them had prepared and submitted actions plans that describe their efficiency projects.
- The Canadian Industry Program for Energy Conservation (CIPEC) has a network of more than 43 trade associations that represent more than 5000 companies. CIPEC reports on approximately 95 percent of total secondary industrial energy demand through its task forces. CIPEC targets all of industry, including mining, manufacturing, construction, forestry, upstream oil and gas, and electricity generation. The number of CIPEC task forces that have established energy efficiency improvement targets continues to rise. The level of participation in various elements of CIPEC is shown in Figure 12.
- CIPEC's new Energy Managers Network held a successful first conference, Energy 2003, in Ottawa on March 26, 2003. Participants focused on the need for the involvement of managerial, technical and financial staff in the successful implementation of energy efficiency efforts. Energy 2003 also marked the official launch of a new energy benchmarking and monitoring Web site, at [strategis.gc.ca](http://strategis.gc.ca), created by Industry Canada in partnership with CIPEC.
- The aggregate CIPEC target is a 1 percent overall improvement in industrial energy intensity per year through to 2005. As of 2001, it had exceeded that target: from 1990 to 2000, industrial energy intensity improved on average by close to 2 percent per year. CIPEC participants have been shown to have lower increases in energy use than non-participants (see Figure 13).
- In fiscal year 2002–2003, the Industrial Building Incentive Program (IBIP) contributed \$415,000 toward the design stage of eight projects.

Figure 12

Level of Participation in Elements of CIPEC

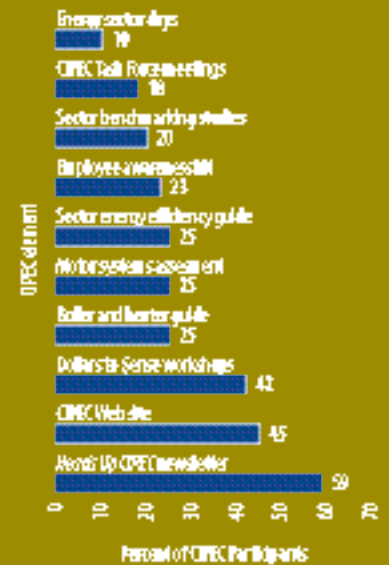


Figure 13

Mean Five-Year Increase in Energy Consumption, CIPEC Participants vs. Non-Participants





## The OEE's Industry Program

The Canadian Industry Program for Energy Conservation and 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 [oeenrcan.gc.ca/cipec](http://oeenrcan.gc.ca/cipec).

The Industrial Building Incentive Program, another part of the OEE's Industry Program, is a measure that aims to increase the energy efficiency of newly constructed buildings meant to house manufacturing and other industrial activities. IBIP 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](http://oeenrcan.gc.ca/newbuildings).

# Transportation

## Market Trends

In 2001, the transportation sector accounted for about 29 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 21 percent between 1990 and 2001. Without these improvements, transportation energy use would have increased by about 31 percent over the period. The increase in energy use is due to many factors. Three of the most important are the growth in vehicle activity, the rising preference of Canadians for minivans and sport utility vehicles and an increase in the amount of freight shipped by truck, which is more energy-intensive than some other forms of transport.

GHG emissions from the transportation sector increased by 21 percent from 1990 to 2001, consistent with the increase in energy use. The change in GHG intensity of transportation energy use was negligible because the fuel mix continues to be based almost entirely on fossil fuels.

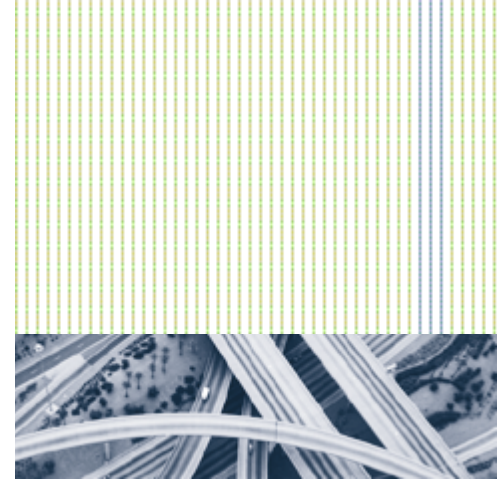
The transportation sector consists of three sub-sectors: passenger, freight and off-road. The passenger sub-sector comprises three modes (road, rail and air), as does the freight sub-sector (road, rail and marine). Road transport uses the most energy, accounting for almost 78 percent of total transportation energy use. Of this, 62 percent was for passenger transportation; 38 percent was for freight transportation.

## 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 driving and maintenance practices that save fuel. In addition, there are opportunities for passenger and freight users to employ more energy-efficient modes of transportation.

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

- improve the energy efficiency of the vehicle stock 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 energy sources such as natural gas, ethanol, bio-diesel and fuel cells.

### Selected Progress Indicators in Transportation

- The Motor Vehicle Fuel Efficiency Initiative is aimed at improving the average fuel consumption of the entire new vehicle fleet by 2010. The indicator used to measure annual progress in new vehicle fuel consumption is company average fuel consumption (CAFC), expressed in litres per 100 kilometres (L/100 km). Between 1990 and 2002, the CAFC of new passenger cars and light-duty trucks sold in Canada remained fairly flat at about 8 L/100 km and 11 L/100 km, respectively (see Figure 14). The light-duty truck segment includes pickups, vans and sport utility vehicles. When passenger cars and light-duty trucks are combined, the average CAFC over the period grew slightly. Part of the growth was due to a shift in consumer demand from passenger cars to light-duty trucks, but increasing vehicle weight and power also affected fuel consumption (see Figure 15).
- For personal vehicles, the Transportation Program is aimed at improving the energy efficiency practices of private motorists by influencing car purchase decisions, on-road driving practices and vehicle maintenance practices through the use of driver information. Figure 16 illustrates the awareness levels of Canadians with respect to Transportation Program activities. In 2002, 150 new-driver educators were using the Auto\$mart Student Driving Kit. More than 800 000 novice drivers had been exposed to fuel-efficient driving as of March 2003.
- The Program's Idle-Free Awareness Campaign was successfully implemented in two cities and is now being extended to eight others (visit the Web site at [oee.nrcan.gc.ca/idling/home.cfm](http://oee.nrcan.gc.ca/idling/home.cfm)).
- For fleet vehicles, the Transportation Program is aimed at improving the fuel efficiency and use of alternative fuels in non-federal vehicle fleets. It provides information materials, workshops, technical demonstrations and driver training programs to help fleet operators assess and pursue opportunities to increase energy efficiency in their operations. As of March 2003, the initiative had registered over 2800 members, representing more than 409 000 fleet vehicles.



## The OEE's Transportation Program

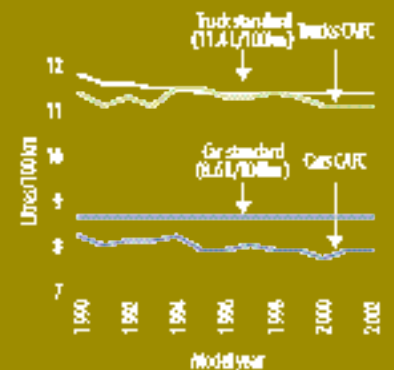
The vehicle efficiency component of the OEE's Transportation Program encourages manufacturers to produce vehicles that meet voluntary average fuel consumption targets for new cars, vans and light-duty trucks. For more information, visit the Web site at [oee.nrcan.gc.ca/english/programs/motorvehicles.cfm](http://oee.nrcan.gc.ca/english/programs/motorvehicles.cfm).

For personal vehicles, information and tools have been developed to encourage motorists to buy, drive and maintain their vehicles in ways that reduce fuel consumption, save money and help protect 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 [oee.nrcan.gc.ca/vehicles](http://oee.nrcan.gc.ca/vehicles).

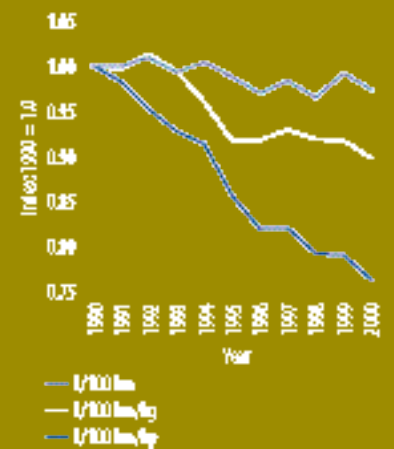
The OEE's activities regarding fleet vehicles provide private-sector fleet managers with information, workshops, technical demonstrations and training programs on fuel-efficient practices for fleet vehicles. For more information, visit the Web site at [fleetsmart.nrcan.gc.ca](http://fleetsmart.nrcan.gc.ca).

The OEE's work in vehicle 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 associations and research and other organizations in transportation, industry and energy. That way, the OEE follows and promotes new developments on alternative fuels, including further improvements in their environmental and economic performance. Alternative transportation fuels include propane, natural gas, alcohols, electricity and hydrogen; conventional fuels include gasoline and diesel. The OEE's Market Development Incentive Payments fund supports natural gas vehicle and station development in parts of Canada that are supplied with Alberta natural gas. Other areas (principally British Columbia) have received support for specific initiatives as funding became available. For further information, consult the Web site at [oee.nrcan.gc.ca/vehiclefuels](http://oee.nrcan.gc.ca/vehiclefuels).

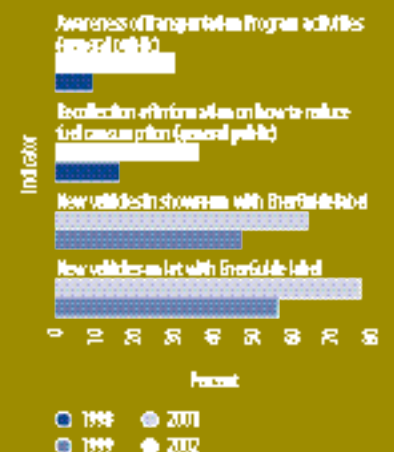
**Figure 14**  
Company Average Fuel Consumption (CAFC) vs. Canadian Voluntary Standards



**Figure 15**  
New-Car Fuel Efficiency, Normalized for Weight and Power, 1990–2000



**Figure 16**  
Vehicle Fuel Efficiency Awareness






## Government Operations

In 1995, the Government of Canada committed to “getting its own house in order” by reducing greenhouse gas (GHG) emissions from its operations by at least 20 percent from 1990 levels by 2005. This commitment and an action plan were registered with Canada’s Climate Change Voluntary Challenge and Registry Inc. (VCR Inc.). Refer to the Web site at [www.vcr-mvr.ca](http://www.vcr-mvr.ca) for further information on VCR Inc.

The *Government of Canada Action Plan 2000 on Climate Change* strengthened the Government of Canada’s leadership role by updating its target to 31 percent below 1990 levels by 2010. This goal will be achieved by making energy efficiency improvements in buildings, putting the “federal garage in order,” switching to cleaner fuels and buying more renewable energy.

As of March 31, 2002, the Government of Canada had reduced its GHG emissions by 24 percent (see Figure 17). The Office of Energy Efficiency (OEE) has played and will continue to play an important role in helping to achieve this reduction. It offers two initiatives in this area – one for federal buildings and one for federal vehicles. It also contributed to the development and implementation of the Federal House in Order initiative. This initiative formally centralizes the Government of Canada’s efforts to monitor, track and reduce its own GHG emissions. For more information, see the Federal House in Order Web site at [fhio.gc.ca](http://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 contracts with private-sector energy management services companies have financed retrofits in thousands of Government of Canada buildings, resulting in millions of dollars in energy savings and significant reductions in GHG emissions. The initiative’s approach is being replicated by some provinces and municipalities in Canada. For more information, visit the Web site at [oee.nrcan.gc.ca/fbi](http://oee.nrcan.gc.ca/fbi).



The Federal Vehicles Initiative assists Government of Canada departments and agencies to reduce their operating costs by increasing the energy efficiency of their motor vehicle fleets and making greater use of alternative transportation fuels (see Figure 18). 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 2002–2003, over 200 vehicles used E-85 (fuel consisting of 85 percent ethanol) daily, and over 130 hybrid gasoline-electric vehicles operated in the federal vehicle fleet. For more information, visit the Web site at [oee.nrcan.gc.ca/greening](http://oee.nrcan.gc.ca/greening).

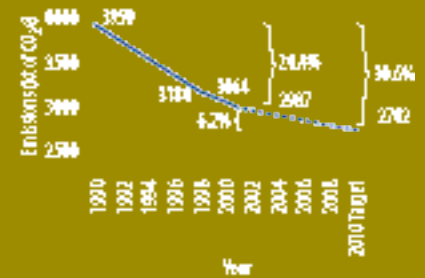


## The OEE's Government Operations Program

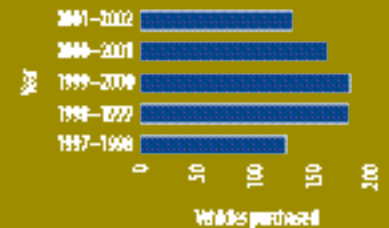
Federal House in Order – The OEE, with Environment Canada, plays an important role in helping departments meet the Government of Canada's GHG emissions reduction target.

- Eleven key departments are responsible for 95 percent of Government of Canada GHG emissions. They will commit to individual energy reduction targets, thus sharing the responsibility for achieving the overall federal emissions target of 31 percent below 1990 emissions levels by 2010.
- The Federal Buildings Initiative provides project facilitation, planning advice and contracting help to secure energy management services for projects.
- The Federal Vehicles Initiative promotes life-cycle costing, best-in-class vehicle identification and continued use of alternative fuels. It also supports increased penetration of ethanol-blended fuels in the federal fleet.
- The Leadership Challenge encourages all Government of Canada departments and agencies to participate in emissions reduction efforts. Best-practices information will be provided in employee awareness, staff training, solid-waste management and GHG-responsible procurement practices. Public transit and "green" commuting will be supported.
- A central GHG Inventory is used to track progress and report annually to VCR Inc.

**Figure 17**  
GHG Emissions Reductions  
From Federal Operations



**Figure 18**  
Annual Purchases of Alternative Transportation  
Fuel Vehicles for the Federal Fleet, 1997–1998  
to 2001–2002





## Outreach and Other Information

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

- The OEE's Outreach Program offers public information in the form of numerous publications and provides promotional products and marketing support, including exhibits, for all OEE initiatives. The program's youth and education component specifically targets young Canadians and often works with the education community.
- The National Energy Use Database (NEUD) initiative is a reliable and comprehensive source of information on end-use energy consumption in all sectors of the Canadian economy (residential, commercial/institutional, industrial, agriculture and transportation sectors).

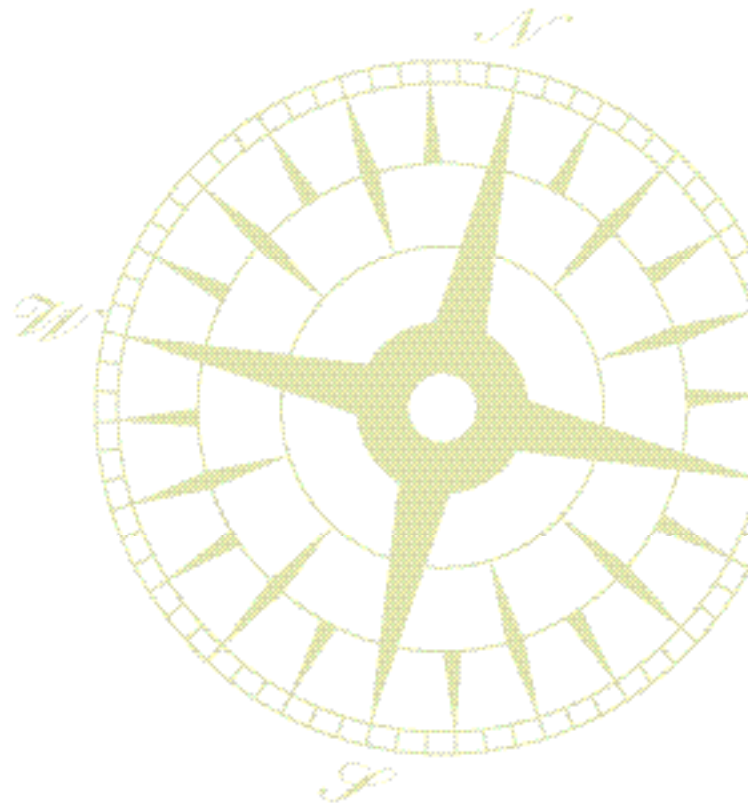
Public information activities increase awareness of the environmental impact of energy use. They also encourage consumers to adopt energy-efficient practices and to switch to alternative forms of energy. Numerous publications are available on-line at [oee.nrcan.gc.ca](http://oee.nrcan.gc.ca).

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. At the post-secondary level, the OEE's Outreach Program builds links using tools such as its Energy Ambassadors competition. For more information, visit the Web sites at [oee.nrcan.gc.ca/calendarclub](http://oee.nrcan.gc.ca/calendarclub) and [oee.nrcan.gc.ca/ambassadors](http://oee.nrcan.gc.ca/ambassadors).

The National Energy Use Database (NEUD) supports the development of Canadian energy end-use data, knowledge and analytical capabilities. Through the NEUD, data is 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/dpa](http://oee.nrcan.gc.ca/dpa).

## Selected Progress Indicators

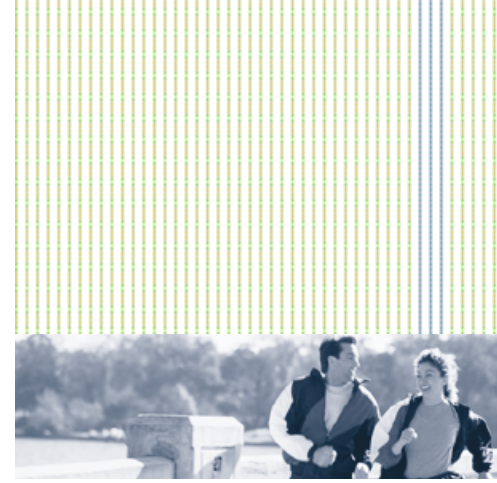
- Each year the OEE distributes about 2 million copies of more than 300 energy efficiency and alternative energy publications to individuals and program partners. More than 75 percent of these publications are available on-line.
- In 2002–2003, the NEUD negotiated with all 13 Canadian jurisdictions for access to their respective vehicle registration files in order to conduct a continuous survey of on-road fuel consumption by all vehicles. The survey, to be conducted by Statistics Canada, is scheduled to start January 1, 2004. Also in 2002–2003, the NEUD began preparation with Statistics Canada to conduct the Survey of Household Energy Use in early 2004. This survey will enable the OEE to analyse changing characteristics in residential energy consumption.





# Supporting Municipal Action on Climate Change

Municipal governments across Canada are taking action to reduce greenhouse gas (GHG) emissions and increase energy efficiency in their own operations and communities. Their activities include encouraging alternative transportation fuels and modes, curbing urban sprawl, using renewable forms of energy and advancing energy efficiency in new construction and existing buildings. Office of Energy Efficiency (OEE) initiatives are supporting many of these activities, directly through municipal participation in OEE programs and pilot projects and indirectly through general agreements of cooperation. Examples are outlined in the following:



## Residential Sector

- The Toronto Community Housing Corporation, in Ontario, is implementing a procurement initiative in Toronto social-housing units – using the savings from the installations of energy-efficient appliances to finance it. The OEE is supporting monitoring activities to validate the savings to assess the potential for implementing similar projects.
- Several municipal governments in Canada are partnering with local delivery agents for EnerGuide for Houses to promote energy efficiency and reduce GHG emissions in their communities.

## Commercial/Institutional Sector

- In partnership with the City of Winnipeg and Manitoba Hydro, the OEE is supporting the installation of ENERGY STAR® qualified light-emitting diode (LED) traffic signals at 15 intersections. LED traffic signals use 90 percent less energy and require less maintenance than conventional signals. Results from monitoring will inform Winnipeg's decision to convert all signals to LED technology. The OEE will use the results to promote the transformation of all traffic signals in Canada to this technology.
- A number of municipalities received financial incentive contributions in 2002–2003 under the Commercial Building Incentive Program. For example, the City of Richmond, British Columbia, received an incentive to support energy-efficient construction in its new city hall.

## Transportation Sector

- The OEE's Idle-Free Awareness Campaign was successfully implemented in Mississauga and Sudbury, Ontario, in 2002–2003. Based on these successes, the campaign is currently being extended to eight other Canadian cities.
- The OEE is working with the City of Edmonton, Alberta, to create a national program for urban transit drivers. It is based on Edmonton's FuelSense Program, which teaches municipal fleet and urban transit drivers how to reduce fuel consumption at home and at work.

## Outreach and Communications

- *City of Ottawa Energy Efficiency Fair.* The OEE supported the City of Ottawa's Energy Efficiency Fair, which featured information booths, seminars and contests aimed at promoting energy efficiency in the community.
- *Canada's Energy Efficiency Awards.* In the Outreach Category of Canada's Energy Efficiency Awards, the City of Calgary Fire Department received an award for its Energy Challenge program. The program aims to conserve energy, save money and reduce the environmental impact of the heating, lighting, cooling and refrigeration activities within its 30 fire stations.
- *Program Directory.* The OEE coordinates an electronic Directory of Energy Efficiency and Alternative Energy Programs in Canada. It provides an overview of programs administered by the Government of Canada and by provincial and territorial governments, major municipalities and major utilities and companies in Canada.



## **Green Municipal Funds**

The Government of Canada established the Green Municipal Funds (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 September 2003, the GMF had provided \$36 million to support 226 feasibility studies and projects. An additional investment of \$134 million had been provided by municipal governments and their partners.