Catalogue no. 11-526-S

Households and the Environment: Energy Use

2011

Statistics Canada Statistique Canada

Canada

How to obtain more information

For information about this product or the wide range of services and data available from Statistics Canada, visit our website, *www.statcan.gc.ca*.

You can also contact us by

e-mail at *infostats@statcan.gc.ca*

telephone, from Monday to Friday, 8:30 a.m. to 4:30 p.m., at the following toll-free numbers:

- Statistical Information Service 1-800-263-1136
- National telecommunications device for the hearing impaired 1-800-363-7629
- Fax line 1-877-287-4369

Depository Services Program

- Inquiries line 1-800-635-7943
- Fax line 1-800-565-7757

To access this product

This product, Catalogue no. 11-526-S, is available free in electronic format. To obtain a single issue, visit our website, *www.statcan.gc.ca* and browse by “Key resource” > “Publications.”

Standards of service to the public

Statistics Canada is committed to serving its clients in a prompt, reliable and courteous manner. To this end, this agency has developed standards of service that its employees observe. To obtain a copy of these service standards, please contact Statistics Canada toll-free at 1-800-263-1136. The service standards are also published at *www.statcan.gc.ca* under “About us” > “The agency” > “Providing services to Canadians.”

Statistics Canada
Environment Accounts and Statistics Division

Households and the Environment: Energy Use

2011

Published by authority of the Minister responsible for Statistics Canada

September 2013

Catalogue no. 11-526-S

ISSN 1920-7522

Frequency: Biennial

Ottawa

Cette publication est également disponible en français.

Note of appreciation

Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

User information

Symbols

The following standard symbols are used in Statistics Canada publications:

.	not available for any reference period
..	not available for a specific reference period
...	not applicable
0	true zero or a value rounded to zero
0s	value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
p	preliminary
r	revised
x	suppressed to meet the confidentiality requirements of the *Statistics Act*
E	use with caution
F	too unreliable to be published
*	significantly different from reference category ($p < 0.05$)

Acknowledgements

The 2011 Households and the Environment Survey – Energy Use supplement was a cooperative project jointly managed by the Environment Accounts and Statistics Division under the direction of Carolyn Cahill, Director and John Marshall, Chief, Environmental Protection Accounts and Surveys, and Special Surveys Division under the direction of Geoff Bowlby, Director and Denis Poulin, Chief, Education Surveys. Data Collection for the survey was conducted by the Collection Planning and Management Division under the direction of Duncan Wrighte, Director.

The HES 2011 Project team consisted of the following:

Sheri Vermette, project manager
Gordon Dewis, assistant project manager and technical advisor
Serge Legault, survey manager

Thank you to the following people for their contributions in the areas of data collection, data processing, table creation, editing, reviewing, proofreading, dissemination and technical development:

Marc Bodnar
Olena Frolova
François Gagnon
Wayne Griffin
Sara Guay
Dean Huckla
Marc Lavergne
Michele McMillan
Iman Mustapha
Peter van Wesenbeeck
James Wildsmith

The contributions of the respondents, Environment Canada, Natural Resources Canada and provincial environmental departments were critical to the successful completion of the surveys and are gratefully acknowledged.

As well, we would like to acknowledge the vital contribution made to this project by the staff in Statistics Canada's regional offices. This project would not have been possible without their efforts.

Table of contents

Table of contents – continued

Data quality, concepts and methodology

Charts

Text tables

Highlights

Heating equipment and fuel

- Furnaces were the most common type of heating system used by Canadian households (57%), followed by electric baseboards (27%) and boilers (5%).
- Natural gas was the main heating fuel in 50% of Canadian homes.
- Electricity was the second most common fuel source, used by 39% of households across Canada.
- Electric heating was most commonly reported by households in Quebec (85%), Newfoundland and Labrador (71%) and New Brunswick (66%).
- Heating oil was more frequently used by households in Prince Edward Island (76%) and Nova Scotia (54%).

Energy consumption

- Canadian households used 1.4 million terajoules (TJ) of energy in their homes in 2011, up 4% from 2007.
- An average household's energy consumption in 2011 was 105 gigajoules (GJ).
- Households in Prince Edward Island had the highest average energy consumption (142 GJ) followed by Alberta (130 GJ).
- Households in Quebec (95 GJ) and New Brunswick (92 GJ) had the lowest average energy consumption.

Characteristics of households and dwellings

- Average household energy consumption was lower for apartment dwellers (40 GJ) than those in single detached dwellings (134 GJ).
- Households that rented consumed less energy than those who owned their dwelling; 53 GJ compared to 123 GJ. The majority of households that rented lived in apartments.

Energy-saving and retrofitting practices

- In 2011, 82% of households used at least one practice to conserve energy.
- The most widely used energy-saving practices were washing laundry in cold water and turning off computer monitors when not in use; 58% of households used each of these practices.
- At least one Energy Star appliance was used in 71% of households in Canada in 2011.
- Between 2008 and 2011, 37% of households that owned their dwelling made at least one improvement to their dwelling to improve their energy efficiency.

Introduction

Households can have a significant impact on the environment. The *Households and the Environment Survey* (HES) aims to measure the behaviours of Canadian households with respect to the environment. First conducted in 1991, it has since been conducted in 1994, 2006, 2007, 2009 and most recently in 2011.

The Household and the Environment Survey – Energy Use Supplement was a follow-up survey to the HES that asked more detailed information relating to the characteristics and energy use of dwellings.

This report presents the results of the following themes covered by the 2011 HES Energy Use Supplement:

- Heating equipment and heating fuels;
- Energy consumption by household and dwelling characteristics;
- Energy-saving practices and retrofitting practices.

The HES Energy Use Supplement was conducted with the cooperation and support of Natural Resources Canada (NRCan). Further data and analysis from this survey are also available from NRCan's Office of Energy Efficiency.[1]

1. See website: *http://oee.nrcan-rncan.gc.ca*.

Analysis

Energy is essential in almost all facets of Canadian society. Canadian households use energy in their homes to heat, cool and light their homes, heat water, and run appliances such as stoves, refrigerators and other devices such as televisions and computers. The amount of energy used within a home depends on many factors such as climate, fuel prices, the number of people in the household and the age, construction and size of the dwelling.

Air pollutants and greenhouse gas emissions are by-products of energy production and consumption which have an impact on the environment. Households may choose to lessen their environmental impact by reducing their energy use, which may also result in lower energy bills.

There are a number of ways that households can reduce the amount of energy consumed in the home. The use of programmable thermostats, compact fluorescent light bulbs (CFLs) and drying racks all contribute to reducing the amount of energy used in the home. Physical changes to the dwelling, such as switching to more efficient heating and cooling systems, upgrading the dwelling's insulation and caulking leaky windows are other ways to reduce energy consumption.

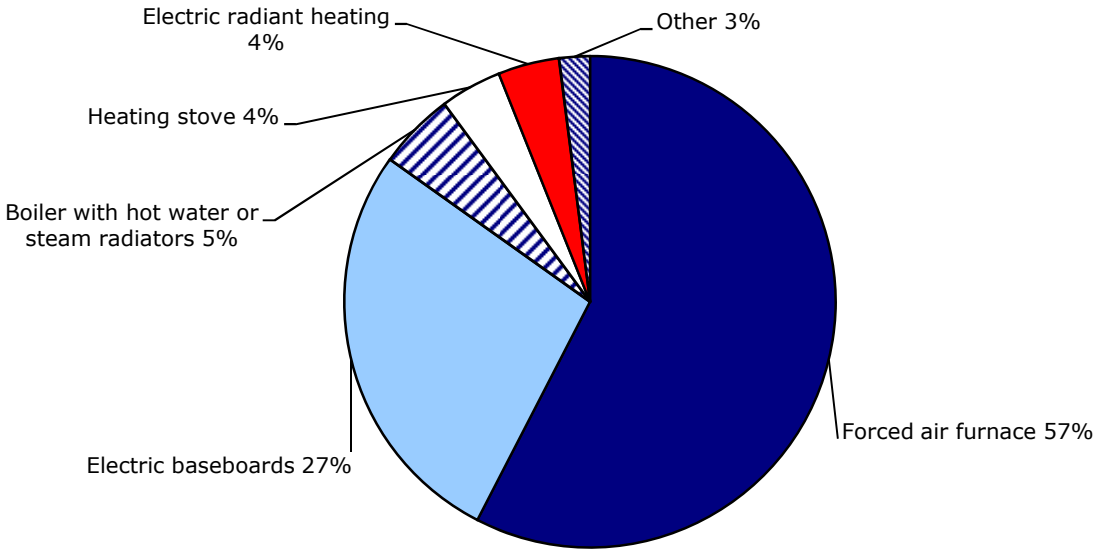
Heating equipment and heating fuel

A furnace was the main type of heating system used by Canadian households in 2011 (57%), followed by electric baseboards (27%) and boilers (5%) (Chart 1).

The main type of heating system used by households varied depending on the province (Table 1). While furnaces were used mainly in Ontario and the Prairie Provinces, electric baseboards were used by the highest percentage of households in Quebec (66%), Newfoundland and Labrador (56%), and New Brunswick (48%). Boilers were used more often to heat homes in Prince Edward Island (42%).

The type of heating fuel used is related to the type of heating equipment used. In 2011, natural gas was used to heat 50% of Canadian homes, followed by electricity (39%) (Table 2). Natural gas was used primarily to heat homes in Ontario, the Prairie Provinces, and British Columbia, while electricity was the predominant energy source for heating in Quebec, Newfoundland and Labrador, and New Brunswick. Heating oil was primarily used in Prince Edward Island and Nova Scotia.

Chart 1
Main heating system, 2011



Note: The data includes households whose main source of heat was supplied by the dwelling unit, who did not use a heat pump, or who used a heat pump that was not the main source of heat for their dwelling.

Source: Statistics Canada, Environment Accounts and Statistics Division.

Units of energy

Energy is measured in units known as Joules (J). Because a Joule is a relatively small amount of energy, energy consumption is often discussed in terms of gigajoules (1 x 10^9 J or 1,000,000,000 J), denoted by GJ, and terajoules (1 x 10^{12} J or 1,000,000,000,000 J), denoted by TJ. To help put things in perspective:

- 4,184 Joules are required to raise the temperature of 1 litre of water by 1 degree Celsius.
- The propane cylinder found on most propane BBQs holds approximately 9 kg of propane, which is roughly 0.45 GJ of energy.
- 1 GJ is equal to slightly more than 2 propane cylinders like the ones used on most gas BBQs.
- The energy content of a 30 litre tank of gasoline is about one gigajoule.
- 1 TJ is equal to slightly more than 2,200 propane cylinders.

Energy use

The amount of energy consumed in the home depends on a number of factors that may change over time and between regions. For example differences in climate will impact the amount of energy required for heating and cooling the home. As such, comparisons between years and regions should be made with caution.

In 2011, Canadian households consumed 1,425,185 terajoules (TJ) of energy in their homes[1], an increase of 56,230 TJ or 4% from 2007[2] (Table 3-1). The largest increases in total energy use occurred in Ontario and Alberta, where energy consumption increased by 26,622 TJ (5% increase) and 18,173 TJ (11% increase) respectively.

Similar to 2007, natural gas (45%) and electricity (38%) were the most commonly used household energy sources for 2011.

Text table 1
Energy Content of various Energy Sources

Energy Source	Energy content [1]
Electricity	3.6 MJ/KWh
Oil	38.2 MJ/litre
Natural Gas	37.5 MJ/m^3
Propane	25.3 MJ/litre
Hardwood	30,600 MJ/cord [2]
Softwood	18,700 MJ/cord [2]
Wood pellets	19,800 MJ/cord [2]

1. 1000 MJ = 1 gigajoule
2. Refers to a full cord measuring 1.2 m x 1.2 m x 2.4 m (4 ft. x 4 ft. x 8 ft.)

Source(s): *Natural Resources Canada*. Office of energy efficiency. <http://oee.nrcan.gc.ca/equipment/heating/3713> (accessed June 17, 2013).

While total energy consumed by Canadian households increased from 2007 to 2011, the amount of energy consumed per household remained relatively the same. In 2011, Canadian households used an average of 105 gigajoules (GJ) of energy per household (Table 3-2) compared to 106 GJ in 2007. Over this period, the number of households in Canada increased by 5%.

At the provincial level, households in Prince Edward Island had the largest increase in energy consumption, using an average of 19 GJ more per household in 2011 than in 2007; an increase of 15%. Prince Edward Island (142 GJ) and Alberta (130 GJ) had the highest average household energy consumption for 2011.

Electricity

Households use electricity for heating, for lighting and to power appliances and electronics. Thirty-eight percent of total energy used by Canadian households was in the form of electricity. A total of 547,096 TJ of electricity was consumed in homes in 2011, up 5% from 2007. However, the average rate remained the same; 40 GJ of electricity were used per household in both 2011 and 2007.

Households in Alberta increased their electricity consumption by 11,226 TJ in 2011 compared to 2007, an increase of 33%. On a per household basis, this equals an increase of 5 GJ per household.

Electricity was the main energy source in Quebec, New Brunswick and Newfoundland and Labrador. Average energy use per household for electricity was highest in Quebec (60 GJ) followed closely by Newfoundland and Labrador (58 GJ).

Natural gas

Natural gas can be used for home and water heating; however, it can also be used to run other large appliances such as stoves, dryers and barbecues. Natural gas was the most widely used source of energy in the home, accounting

1. Includes electricity, natural gas, oil, wood and wood pellets and propane. Gasoline used to fuel motor vehicles or gas-powered devices, such as lawnmowers or snow blowers, and energy from small propane tanks purchased from stores for gas barbecues, camping and similar purposes are excluded. Also excluded is energy from those households with solar panels or windmills that did not purchase energy from an energy supplier.
2. The 2011 reference year is only the second time the Household and Environment Survey – Energy Supplement was conducted. Changes between the two reference years are noted, but are not necessarily an indication of trends.

for 45% of total household energy consumption. Canadian households used a total of 639,203 TJ worth of natural gas in their homes in 2011, up 9% from 2007. Households using natural gas consumed an average of 92 GJ of this fuel per household.

Natural gas was the principal energy source for households in Alberta (72%), Saskatchewan (68%), Ontario (62%), and British Columbia (54%).

Other fuels

Wood is often used for supplementary heating. In 2011, 6% of Canadian households used wood and wood pellets as their main source of home heating (Table 2). Households using this energy source consumed on average 88 GJ per household in 2011, down from 101 GJ per household in 2007.

Heating oil accounted for 62,773 TJ of household energy consumption in 2011, a reduction of 14,000 TJ (18%) from 2007. The reduction in the use of oil as an energy source in the home could be related to cost; average prices of fuel oil in Canada have increased over the last five years by over 30%.[3] While fewer households used heating oil in 2011 compared to 2007, the average consumption rate increased 3 GJ per household.

Propane was used as the primary heating fuel by 1% of households in 2011. Households using propane to heat their homes consumed on average 20 GJ of fuel per household.

Alternative energy sources

Alternative energy sources such as solar and wind power were used by 171,505 households (1.3%) in 2011.

Energy use, by household and dwelling characteristics

The quantity of energy used by a household depends on many factors, such as the type and size of the dwelling, the quality and condition of its insulation, windows and doors and number of people living in it. Households with multiple occupants may use more electricity for heating water (more showers and baths), cooking (more food preparation) and home entertainment (more televisions and other electronic devices).

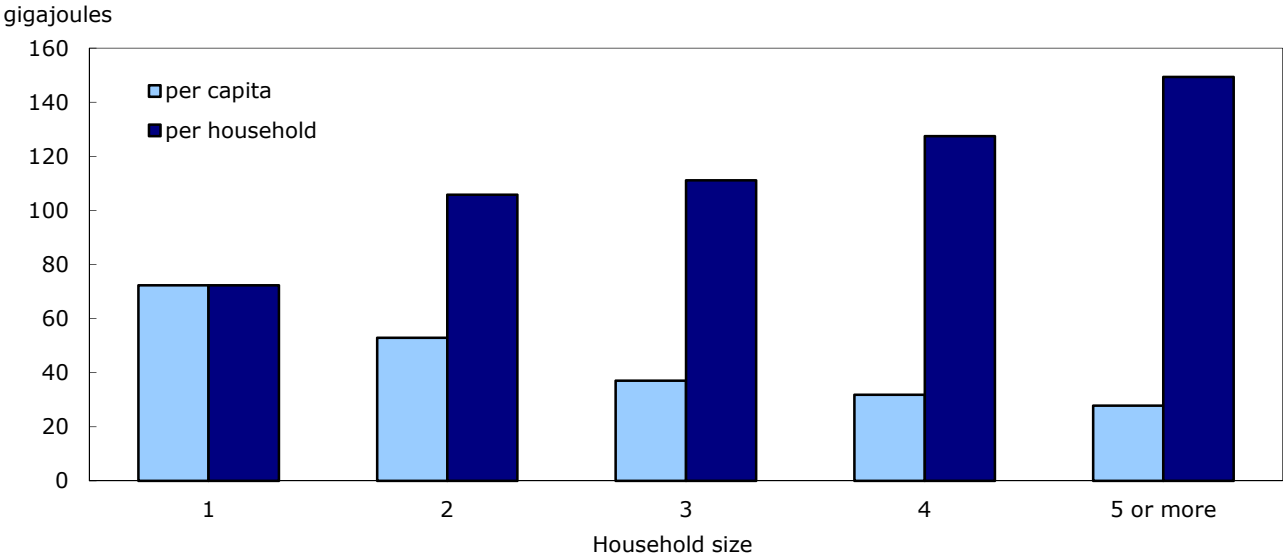
In 2011, a one-person household used an average of 72 GJ of energy in the home compared to 149 GJ for households with 5 or more people (Table 4-1). However, the amount of energy consumed per person was lower in households with multiple occupants than in households with a single occupant. A person living alone used 40 GJ more in 2011 than a person living in a four-person household (Chart 2).

On average, smaller dwellings use less energy than larger dwellings. Dwellings with a heated area[4] of less than 55 m^2 (600 sq. feet) used an average of 52 GJ, compared to 161 GJ for dwellings with a heated area of 231 m^2 (2501 sq. feet) or more (Table 4-2). However, smaller dwellings consumed more energy per square meter than larger dwellings: 1.09 GJ/ m^2 for those under 55 m^2 compared to 0.55 GJ/ m^2 for those with 231 m^2 or more of heated space.

Similar to the 2007 results, apartment dwellers consumed less energy than those living in single detached homes: 40 GJ per household compared to 134 GJ per household (Table 4-3). Households that rented consumed less energy than those who owned - 53 GJ per household compared to 123 GJ per household (Table 4-4). The majority of households that rented lived in apartments (64%).

3. Statistics Canada. CANSIM Table 326-0009. (Accessed June 17, 2013).
4. The calculation for the heated area of a dwelling excludes basements and garages.

Chart 2
Average energy use, 2011



Note: Data is given as a percentage of all households.

Source: Statistics Canada, Environment Accounts and Statistics Division.

Households living in newer dwellings used less energy per m^2 of heated area than those living in older dwellings (Table 4-5). Modern construction practices and changes to building codes - such as the use of improved insulation and more efficient heating and cooling systems - have contributed to newer homes being more energy efficient.

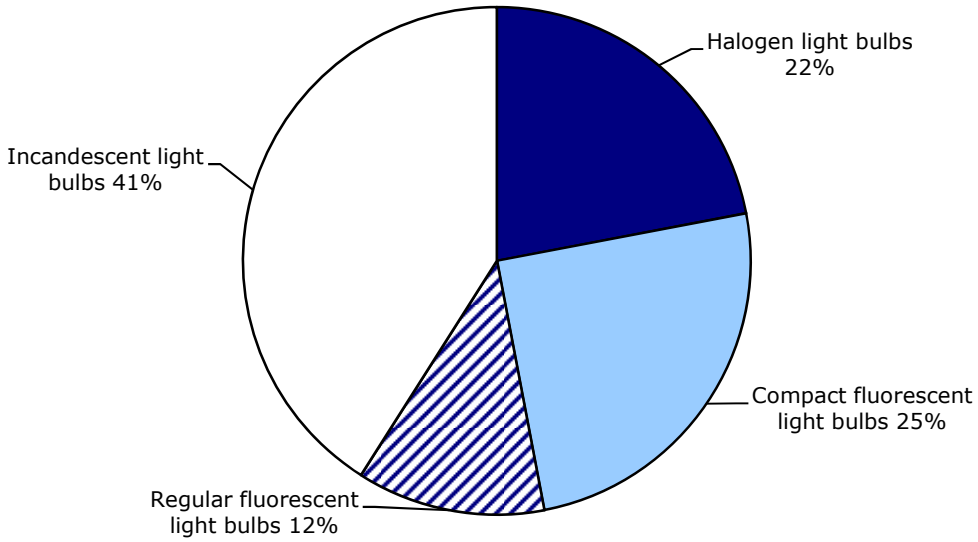
Home energy use increased with income and education level. Households with an annual income of $150,000 and over consumed an average of 141 GJ of energy in 2011, compared to 68 GJ consumed by households with an annual income under $20,000 (Table 4-6). Total energy use was highest in households where at least one member had a university degree (109 GJ) (Table 4-7). However, energy intensity was less for these households (0.75 GJ per m^2) compared to households where the highest education level was only some secondary education but no degree (0.84 GJ per m^2) (Table 4-7).

Household Lighting

There are a variety of light bulb types used by Canadian households. Incandescent light bulbs tend to be less expensive but are also the least efficient; almost 90% of the energy used is lost as heat.[5] Fluorescent and compact fluorescent light bulbs are more efficient, using about a quarter of the energy of a standard incandescent, and less energy is lost as heat. Halogen light bulbs, a type of incandescent light bulb, fall between the standard incandescent and fluorescent bulbs in terms of efficiency.

5. Natural Resources Canada. Office of Energy Efficiency. (*oee.nrcan.gc.ca/energy-efficient-products/lighting/15137*) accessed May 2, 2013.

Chart 3
Type of light bulb use, 2011



Note: The data is represented as a percentage of all light bulbs used by Canadian households.

Source: Statistics Canada, Environment Accounts and Statistics Division.

Incandescent light bulbs were the most popular type of light bulb used by Canadian households in 2011 (Chart 3). Incandescent bulbs accounted for 41%[6] of the total number of light bulbs used, followed by compact fluorescent (25%), halogen (22%) and regular fluorescent (12%).

On average, 25 light bulbs were used per household in 2011 (Table 5). Households in Nova Scotia used the fewest light bulbs with an average of 22 bulbs per household, while those in Alberta used the most (28 bulbs per household).

Energy-saving and retrofitting practices

There are a variety of ways for a household to reduce the energy consumption in a home. These practices range from major renovations such as installing new windows or purchasing more efficient heating equipment, to smaller changes such as installing a programmable thermostat or turning off a computer monitor when it is not in use.

Energy-saving practices

The Household and the Environment Survey and the HES Energy Use Supplement collected information on the following energy saving practices:

- using programmable thermostats;
- using compact fluorescent light bulbs (CFLs);
- washing laundry in cold water;
- turning off computer monitors when they are not in use;

6. Includes the following types of interior and exterior light bulbs; halogen light bulbs, compact fluorescent light bulbs, regular fluorescent light bulbs, and incandescent light bulbs. Excluded are seasonal lights such as Christmas lights, Halloween lights etc.

- turning off gas fireplace pilot lights in summer;
- air drying dishes in the dishwasher.

In 2011, 82% of households used at least one of these practices to conserve energy (Table 6). The most widely used energy-saving practices were washing laundry in cold water and tuning off computer monitors when not in use; each of these practices were used by 58% of households.

Programmable thermostats were used by 47% of households in 2011 (Table 6), up from 36% in 2007. Rebates for the purchase of programmable thermostats were offered by several provincial governments and energy provider programs.

Using cold water for washing and rinsing laundry is a way to significantly cut back on energy use, as energy is required to heat water for warm or hot water washes. More households used cold water to wash laundry in 2011 than in 2007 (58% compared to 47%).

Households in Quebec had the highest participation rate, with 73% of households using cold water to wash their laundry. Households in the Atlantic Provinces were more likely to wash laundry in cold water than those in the Prairie Provinces; Newfoundland and Labrador (68%), Prince Edward Island (70%), Nova Scotia (68%), and New Brunswick (64%), compared to Manitoba (36%), Saskatchewan (42%) and Alberta (41%).

Energy-saving practices, by household and dwelling characteristics

The use of energy-saving practices varied according to some household and dwelling characteristics. For example, energy-saving practices tended to be used more frequently by single detached dwellings with larger heated areas and higher incomes.

At least one energy-saving practice was used by 93% of households with five or more members compared to 64% of one-person households. Owners were more likely to use an energy-saving practice than renters. However, a higher percentage of renters than owners washed their laundry in cold water (66% compared to 56%) (Table 7-4).

Energy Star appliances

Energy Star is an internationally recognized symbol indicating that the product has been tested and found to meet or exceed higher energy efficient levels without compromising performance. The purchase of energy efficient appliances is another way households can reduce the amount of energy they consume in the home. In 2011, 71% of households in Canada used at least one Energy Star appliance (Table 8). The main refrigerator was the most common Energy Star appliance, found in 50% of households, followed by the washing machine (48% of households).

Retrofitting practices

The HES Energy Use supplement collected information on the type of improvements that were made to dwellings including:

- insulation;
- heating, venting and cooling equipment;
- doors, windows, exterior siding and caulking;
- foundations;
- roof structures and surfaces.

Between 2008 and 2011, 37% of households that owned their dwelling and were not located in apartment buildings made at least one improvement to their dwelling to improve its energy efficiency (Table 9), down from 50% between 2003 and 2007. However, for both periods the most common retrofits were improvements to heating, ventilation or cooling equipment and improvements to doors, windows, exterior siding and caulking.

Provincially, 45% of households in Nova Scotia and Manitoba completed a retrofitting project between 2008 and 2011, followed by 40% of households in Ontario.

Energy efficiency improvements were more common in households built between 1961 and 1977, with 45% of households making improvements to their dwelling, while those built after 1996 were less likely to make such improvements (19%) (Table 10).

Related products

Selected publications from Statistics Canada

11-526-X	Households and the Environment
16-001-M	Environment Accounts and Statistics Analytical and Technical Paper Series
16-201-S	Human Activity and the Environment: Detailed Statistics
16-201-X	Human Activity and the Environment
16-251-X	Canadian Environmental Sustainability Indicators
16-252-X	Canadian Environmental Sustainability Indicators: Highlights
16-253-X	Canadian Environmental Sustainability Indicators: Socio-economic Information
16-254-X	Canadian Environmental Sustainability Indicators: Air Quality Indicators: Data Sources and Methods
16-255-X	Canadian Environmental Sustainability Indicators: Greenhouse Gas Emissions Indicator: Data Sources and Methods
16-256-X	Canadian Environmental Sustainability Indicators: Freshwater Quality Indicator: Data Sources and Methods
16-257-X	Environment Accounts and Statistics Product Catalogue
16-401-X	Industrial Water Use
16-403-X	Survey of Drinking Water Plants
16F0008X	Environment Industry: Business Sector
16M0001X	Households and the Environment Survey: Public Use Microdata File

Selected technical and analytical products from Statistics Canada

16-001-M2010013	Recycling by Canadian Households, 2007

Selected CANSIM tables from Statistics Canada

153-0059	Households and the environment survey, use of energy-saving lights, Canada and provinces, biennial
153-0060	Households and the environment survey, use of thermostats, Canada and provinces, biennial
153-0062	Households and the environment survey, dwelling's main source of water, Canada and provinces, biennial
153-0063	Households and the environment survey, primary type of drinking water consumed, Canada and provinces, biennial
153-0064	Households and the environment survey, use of fertilizer and pesticides, Canada and provinces, biennial
153-0065	Households and the environment survey, awareness of air quality advisories and their influence on behaviours, Canada and provinces, biennial
153-0066	Households and the environment survey, treatment of drinking water, Canada and provinces, biennial
153-0098	Households and the environment survey, knowledge of radon and testing, Canada and provinces, biennial
153-0104	Households and the environment survey, indoor water conservation practices, Canada and provinces, biennial

Selected surveys from Statistics Canada

3881	Households and the Environment Survey

Statistical tables

Table 1
Type of main heating equipment used, by province, 2011

	Furnace	Electric baseboards	Boiler	Heating stove	Electric radiant heating	Gas fireplace	Other
	percent						
Canada	**57**	**27**	**5**	**4**	**4**	**1** [E]	**2** [E]
Newfoundland and Labrador	22 [E]	56	6 [E]	10 [E]	F	F	F
Prince Edward Island	37 [E]	F	42	F	F	F	F
Nova Scotia	33	16 [E]	24	16 [E]	F	F	F
New Brunswick	16	48	6 [E]	15 [E]	5 [E]	F	F
Quebec	14	66	4 [E]	4 [E]	9 [E]	F	F
Ontario	81	7 [E]	5 [E]	2 [E]	F	F	1 [E]
Manitoba	77	17 [E]	F	F	F	F	F
Saskatchewan	94	F	F	F	F	F	F
Alberta	94	F	F	F	F	F	F
British Columbia	52	28 [E]	6 [E]	5 [E]	F	F	F

Note(s): Includes households whose main source of heat was supplied by the dwelling unit, who did not use a heat pump, or who used a heat pump that was not the main source of heat for their dwelling.
Source(s): Statistics Canada, Environmental Accounts and Statistics Division.

Table 2
Type of main heating fuel used, by province, 2011

	Electricity	Natural gas	Oil	Wood and wood pellets	Propane	Other
	percent					
Canada	**39**	**50**	**7**	**6**	**1** [E]	**F**
Newfoundland and Labrador	71	F	21 [E]	22 [E]	F	F
Prince Edward Island	F	F	76	32 [E]	F	F
Nova Scotia	29	F	54	26	F	F
New Brunswick	66	F	13	23	F	F
Quebec	85	3 [E]	8	7 [E]	F	F
Ontario	14	76	5	3 [E]	2 [E]	F
Manitoba	37	61	F	F	F	F
Saskatchewan	11 [E]	87	F	F	F	F
Alberta	9 [E]	91	F	F	F	F
British Columbia	39	55	3 [E]	5 [E]	F	F

Note(s): Includes households whose main source of heat was supplied by the dwelling unit, who did not use a heat pump, or who used a heat pump that was not the main source of heat for their dwelling.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 3-1
Household energy use, by fuel type and by province, 2011 — Total energy use

	Electricity		Natural gas		Oil		Wood and wood pellets		Propane		All fuel types
	terajoules	percent	[1] terajoules	percent	[1] terajoules	percent	[1] terajoules	percent	[1] terajoules	percent	[1] terajoules
Canada	**547,096**	**38**	**639,203**	**45**	**62,773**	**4**	**167,474**	**12**	**8,640**	1	**1,425,185**
Newfoundland and Labrador	12,492	52	F	F	3,591	15	7,435	31	256 [E]	1 [E]	23,869
Prince Edward Island	1,651	20	F	F	3,446	42	2,922 [E]	36 [E]	69 [E]	1 [E]	8,189
Nova Scotia	13,702	34	F	F	14,560	36	10,810	27	265 [E]	1 [E]	39,958
New Brunswick	16,582	58	F	F	2,812	10	8,753	31	101 [E]	0 [E]	28,584
Quebec	202,579	63	17,854 [E]	6 [E]	18,863	6	80,976	25	1,870 [E]	1 [E]	322,142
Ontario	150,462	28	333,391	62	17,023	3	37,247 [E]	7 [E]	3,665 [E]	1 [E]	541,788
Manitoba	22,957	49	21,410	46	F	F	1,937 [E]	4 [E]	F	F	46,465
Saskatchewan	13,235	29	31,223	68	F	F	932 [E]	2 [E]	F	F	45,746
Alberta	44,930	24	136,036	72	F	F	6,171 [E]	3 [E]	F	F	187,973
British Columbia	68,506	38	98,134	54	2,113 [E]	1 [E]	10,292 [E]	6 [E]	1,425 [E]	1 [E]	180,471

1. As a proportion of all fuel types. Figures may not add up to totals due to rounding.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 3-2
Household energy use, by fuel type and by province, 2011 — Average energy use

	Electricity	Natural gas	Oil	Wood and wood pellets	Propane	All fuel types
	gigajoules per household					
Canada	**40**	**92**	**62**	**88**	**20**	**105**
Newfoundland and Labrador	58	F	64	110	10	111
Prince Edward Island	29	F	71	135	9 [E]	142
Nova Scotia	35	F	62	75	11 [E]	101
New Brunswick	53	F	59	96	7 [E]	92
Quebec	60	72	57	117	13	95
Ontario	30	93	70	77	26	107
Manitoba	48	78	F	57 [E]	F	98
Saskatchewan	32	88	F	31 [E]	F	110
Alberta	31	105	F	36 [E]	F	130
British Columbia	37	84	50	58	22 [E]	99

Note(s): Average household energy use for households using the specified type of fuel.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 4-1
Average household energy use, by household and dwelling characteristics, 2011 — Household size

	Household members					All households
	One	Two	Three	Four	Five or more	
	gigajoules per household					
Canada	**72**	**106**	**111**	**127**	**149**	**105**
Newfoundland and Labrador	91	113	129	112	F	111
Prince Edward Island	92	130	150 E	168	F	142
Nova Scotia	80	109	109	103	F	101
New Brunswick	65	97	104 E	96	127	92
Quebec	61	103	106	120	136	95
Ontario	72	104	103	137	155	107
Manitoba	65	95	113	129	135	98
Saskatchewan	78	115	124	130	154	110
Alberta	98	125	147	148	164	130
British Columbia	78	98	111	108	141	99

	Household members					All households
	One	Two	Three	Four	Five or more	
	gigajoules per m^2 of heated area					
Canada	**0.68**	**0.83**	**0.81**	**0.78**	**0.84**	**0.79**
Newfoundland and Labrador	0.77	0.84	0.85	0.68	F	0.80
Prince Edward Island	0.79 E	0.71 E	0.94 E	1.00	F	0.87
Nova Scotia	0.66	0.86	0.71	0.66	F	0.74
New Brunswick	0.57	0.74	0.79	0.76	0.78	0.72
Quebec	0.60	0.94	0.92	0.85	0.98	0.84
Ontario	0.68	0.76	0.70	0.75	0.77	0.74
Manitoba	0.74	0.90	0.93	0.97	0.92	0.89
Saskatchewan	0.77	0.97	0.91 E	1.16	1.09	0.95
Alberta	0.96	0.99	1.10	0.96	1.02	1.00
British Columbia	0.65	0.68	0.79	0.62	0.71	0.67

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 4-2
Average household energy use, by household and dwelling characteristics, 2011 — Size of heated area

	55 square metres or less and 600 square feet or less	56 to 95 square metres and 601 to 1,000 square feet	96 to 140 square metres and 1,001 to 1,500 square feet	141 to 185 square metres and 1,501 to 2,000 square feet	186 to 230 square metres and 2,001 to 2,500 square feet	231 square metres or more and 2,501 square feet or more	All households
	gigajoules per household						
Canada	**52**	**70**	**108**	**122**	**147**	**161**	**105**
Newfoundland and Labrador	F	84	108	116	125	188	111
Prince Edward Island	F	90	116	172 E	F	F	142
Nova Scotia	F	82	100	109	156	124	101
New Brunswick	64 E	72	84	110	126	151	92
Quebec	57	74	105	133	127	129	95
Ontario	39	59	103	117	156	171	107
Manitoba	45 E	70	119	128	138	F	98
Saskatchewan	F	91	118	131	119 E	F	110
Alberta	75	88	129	158	164	204	130
British Columbia	F	64	109	102	134	136	99

	55 square metres or less and 600 square feet or less	56 to 95 square metres and 601 to 1,000 square feet	96 to 140 square metres and 1,001 to 1,500 square feet	141 to 185 square metres and 1,501 to 2,000 square feet	186 to 230 square metres and 2,001 to 2,500 square feet	231 square metres or more and 2,501 square feet or more	All households
	gigajoules per m^2 of heated area						
Canada	**1.09**	**0.86**	**0.94**	**0.75**	**0.69**	**0.55**	**0.79**
Newfoundland and Labrador	F	1.02	0.94	0.69	0.60	0.67	0.80
Prince Edward Island	F	1.07	0.97	1.03	F	F	0.87
Nova Scotia	F	0.96	0.88	0.65	0.73	0.41	0.74
New Brunswick	1.40 E	0.88	0.70	0.67	0.59	0.53	0.72
Quebec	1.25	0.90	0.93	0.83	0.62	0.41	0.84
Ontario	0.78	0.74	0.88	0.72	0.72	0.59	0.74
Manitoba	1.03 E	0.85	1.05	0.77	0.68	F	0.89
Saskatchewan	F	1.05	1.04	0.81	0.58 E	F	0.95
Alberta	1.83	1.07	1.13	0.97	0.78	0.74	1.00
British Columbia	F	0.79	0.90	0.62	0.62	0.46	0.67

Note(s): The heated area of a dwelling excludes basements and garages.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 4-3
Average household energy use, by household and dwelling characteristics, 2011 — Dwelling type

	Apartment	Multi-unit [1]	Single-detached dwelling	All other	All households
	gigajoules per household				
Canada	**40**	**84**	**134**	**108**	**105**
Newfoundland and Labrador	F	101 E	121	F	111
Prince Edward Island	F	F	153	F	142
Nova Scotia	75	77	114	F	101
New Brunswick	34	65 E	117	F	92
Quebec	41	70	132	F	95
Ontario	33	94	136	F	107
Manitoba	38 E	85	126	F	98
Saskatchewan	51 E	91	133	F	110
Alberta	50 E	102	151	101	130
British Columbia	46 E	76	125	F	99

	Apartment	Multi-unit [1]	Single-detached dwelling	All other	All households
	gigajoules per m^2 of heated area				
Canada	**0.45**	**0.70**	**0.87**	**1.03**	**0.79**
Newfoundland and Labrador	F	0.81	0.83	F	0.80
Prince Edward Island	F	F	0.88	F	0.87
Nova Scotia	0.54 E	0.67	0.79	F	0.74
New Brunswick	0.36 E	0.56	0.82	F	0.72
Quebec	0.44	0.69	1.03	F	0.84
Ontario	0.39	0.68	0.80	F	0.74
Manitoba	0.51 E	0.98	0.99	F	0.89
Saskatchewan	0.52 E	0.86	1.08	F	0.95
Alberta	0.63 E	0.92	1.05	0.91	1.00
British Columbia	0.55	0.60	0.70	F	0.67

1. Includes doubles, duplexes and row or terrace homes.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 4-4

Average household energy use, by household and dwelling characteristics, 2011 — Dwelling tenure

	Owned	Rented	All households
	gigajoules per household		
Canada	**123**	**53**	**105**
Newfoundland and Labrador	122	68	111
Prince Edward Island	158	F	142
Nova Scotia	112	72	101
New Brunswick	110	39	92
Quebec	121	51	95
Ontario	125	47	107
Manitoba	120	37	98
Saskatchewan	125	69	110
Alberta	142	76	130
British Columbia	108	60	99

	Owned	Rented	All households
	gigajoules per m^2 of heated area		
Canada	**0.84**	**0.57**	**0.79**
Newfoundland and Labrador	0.84	0.59	0.80
Prince Edward Island	0.90	F	0.87
Nova Scotia	0.80	0.58	0.74
New Brunswick	0.79	0.42	0.72
Quebec	0.95	0.57	0.84
Ontario	0.77	0.52	0.74
Manitoba	0.98	0.49	0.89
Saskatchewan	1.02	0.71	0.95
Alberta	1.02	0.90	1.00
British Columbia	0.70	0.53 E	0.67

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 4-5

Average household energy use, by household and dwelling characteristics, 2011 — Dwelling construction period

	Before 1946	Between 1946 and 1960	Between 1961 and 1977	Between 1978 and 1995	1996 or later	Not stated	All households
	gigajoules per household						
Canada	**118**	**104**	**106**	**106**	**111**	**54**	**105**
Newfoundland and Labrador	F	126 E	124	108	113	F	111
Prince Edward Island	166	F	134 E	126	127	F	142
Nova Scotia	129	83 E	94	96	100	F	101
New Brunswick	112	107	93	98	76 E	F	92
Quebec	96	89	103	97	102	47	95
Ontario	128	100	108	105	119	47	107
Manitoba	118	115	95	98	113	39 E	98
Saskatchewan	106	121	114	107	119	F	110
Alberta	145	149	128	133	130	76	130
British Columbia	108	114	92	104	94	81	99

	Before 1946	Between 1946 and 1960	Between 1961 and 1977	Between 1978 and 1995	1996 or later	Not stated	All households
	gigajoules per m^2 of heated area						
Canada	**0.90**	**0.86**	**0.87**	**0.76**	**0.72**	**0.57**	**0.79**
Newfoundland and Labrador	F	0.92	0.84	0.84	0.73	F	0.80
Prince Edward Island	0.77 E	F	1.00 E	0.88	0.75	F	0.87
Nova Scotia	0.93	0.60 E	0.82	0.69	0.70	F	0.74
New Brunswick	0.83	0.80	0.82	0.73	0.54 E	F	0.72
Quebec	0.83	0.76	0.95	0.85	0.78	0.58	0.84
Ontario	0.89	0.83	0.82	0.68	0.67	0.47	0.74
Manitoba	1.16	1.06	0.97	0.80	0.76	0.56 E	0.89
Saskatchewan	0.98	1.13	0.91	0.94	0.97	F	0.95
Alberta	1.11	1.26	1.09	0.96	0.91	0.82 E	1.00
British Columbia	0.84	0.89	0.67	0.66	0.62	0.65 E	0.67

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 4-6

Average household energy use, by household and dwelling characteristics, 2011 — Household income

	Less than $20,000	$20,000 to less than $40,000	$40,000 to less than $60,000	$60,000 to less than $80,000	$80,000 to less than $100,000	$100,000 to less than $150,000	$150,000 and over	Not stated	All households
	gigajoules per household								
Canada	**68**	**81**	**94**	**108**	**109**	**129**	**141**	**104**	**105**
Newfoundland and Labrador	148	92	111 E	119	106	102	121	103	111
Prince Edward Island	F	122	F	168 E	F	F	F	120	142
Nova Scotia	81	81	108	112	108	103	F	114	101
New Brunswick	73	76	84	96	118	108	119	102 E	92
Quebec	61	78	94	111	112	121	129	77	95
Ontario	61	76	100	108	114	128	141	104	107
Manitoba	52 E	90	74	97	118	142	146	92	98
Saskatchewan	98	88	105	131	104	128	139	100	110
Alberta	99 E	113	97	118	136	159	155	119	130
British Columbia	57 E	78	79	93	89	125	141	120	99

	Less than $20,000	$20,000 to less than $40,000	$40,000 to less than $60,000	$60,000 to less than $80,000	$80,000 to less than $100,000	$100,000 to less than $150,000	$150,000 and over	Not stated	All households
	gigajoules per m^2 of heated area								
Canada	**0.65**	**0.75**	**0.82**	**0.85**	**0.79**	**0.86**	**0.75**	**0.76**	**0.79**
Newfoundland and Labrador	1.15	0.80	0.85	0.83	0.73	0.67	0.68	0.69	0.80
Prince Edward Island	F	1.05	F	0.78 E	F	F	F	0.75	0.87
Nova Scotia	0.68 E	0.79	0.89	0.73	0.66	0.63 E	F	0.77	0.74
New Brunswick	0.60	0.75	0.70	0.71	0.84	0.68	0.71	0.77	0.72
Quebec	0.63	0.75	0.93	1.00	0.96	0.90	0.74	0.70	0.84
Ontario	0.61	0.68	0.75	0.80	0.74	0.81	0.67	0.72	0.74
Manitoba	0.61 E	0.97	0.77	0.87	0.99	1.11	0.84	0.85	0.89
Saskatchewan	0.95	0.86	0.98	1.10	0.90	1.03	1.07	0.81	0.95
Alberta	1.08 E	1.10	0.93	0.95	0.96	1.07	1.02	0.96	1.00
British Columbia	F	0.60	0.70	0.65	0.64	0.79	0.61	0.74	0.67

Source(s): Statistics Canada, Environment Accounts and Statistices Division.

Table 4-7

Average household energy use, by household and dwelling characteristics, 2011 — Education level

	0 to 8 years or some secondary	Grade 11 to 13, graduate	Some post secondary, or post secondary certificate	University	Not stated	All households
	gigajoules per household					
Canada	**87**	**98**	**106**	**109**	**105**	**105**
Newfoundland and Labrador	136	113	114	93	F	111
Prince Edward Island	F	F	145	143	F	142
Nova Scotia	84	106	98	108	F	101
New Brunswick	75	91	91	97	F	92
Quebec	98	81	101	94	86 E	95
Ontario	70 E	101	100	116	84 E	107
Manitoba	71	77	113	105	F	98
Saskatchewan	102	109	123	106	F	110
Alberta	91	130	136	130	F	130
British Columbia	89	96	106	96	F	99

	0 to 8 years or some secondary	Grade 11 to 13, graduate	Some post secondary, or post secondary certificate	University	Not stated	All households
	gigajoules per m^2 of heated area					
Canada	**0.85**	**0.82**	**0.84**	**0.75**	**0.76**	**0.79**
Newfoundland and Labrador	1.04	0.97	0.82	0.62	F	0.80
Prince Edward Island	F	F	0.78 E	0.87	F	0.87
Nova Scotia	0.67	0.71	0.82	0.73	F	0.74
New Brunswick	0.63	0.78	0.72	0.70	F	0.72
Quebec	1.02	0.77	0.93	0.75	0.72	0.84
Ontario	0.70	0.82	0.75	0.72	0.55 E	0.74
Manitoba	0.74	0.89	1.01	0.84	F	0.89
Saskatchewan	1.01	0.97	1.10	0.87	F	0.95
Alberta	0.95	1.04	1.06	0.99	F	1.00
British Columbia	0.75	0.69	0.65	0.67	F	0.67

Note(s): Education level refers to the highest level completed by any member of the household.
Source(s): Statistics Canada, Environment Accounts and Statisitcs Division.

Table 5
Number and type of light bulb use, by province, 2011

	Halogen	Compact fluorescent	Regular fluorescent	Incandescent	Total
	number of light bulbs per household				
Canada	**10**	**11**	**6**	**14**	**25**
Newfoundland and Labrador	8	14	7	14	24
Prince Edward Island	8 E	14	6 E	14 E	24
Nova Scotia	7	13	5	12	22
New Brunswick	10 E	13	5	17	23
Quebec	10	8	5	13	23
Ontario	11	12	5	14	27
Manitoba	7	9	6	14	24
Saskatchewan	8	11	6	15	24
Alberta	9	12	7	16	28
British Columbia	9	12	7	15	26

Note(s): Average number of light bulbs for households using the specified type of light bulb.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 6
Energy-saving practice use, by province, 2011

	Used a programmable thermostat [1]	Used 5 or more CFLs	Washed and rinsed laundry in cold water [2]	Turned computer monitor off when not in use [3]	Turned off fireplace pilot in summer [4]	Air dried dishes in dishwasher (door open) [5]	Proportion of households that used at least one energy-saving practice
	percent						
Canada	**47**	**33**	**58**	**58**	**44**	**14**	**82**
Newfoundland and Labrador	22	35	68	52	48 E	F	81
Prince Edward Island	22 E	33	70	67	F	F	85
Nova Scotia	25	35	68	48	F	12 E	82
New Brunswick	17	34	64	51	38 E	17 E	81
Quebec	47	27	73	60	38	15	86
Ontario	56	36	54	61	39	12	82
Manitoba	39	39	36	38	41 E	F	73
Saskatchewan	44	27	42	52	29 E	10 E	75
Alberta	42	37	41	58	42	11 E	84
British Columbia	40	34	54	59	61	22 E	79

1. As a proportion of households that had at least one thermostat in their dwelling.
2. As a proportion of households that used a washer in their dwelling.
3. As a proportion of households that had a desktop computer in their dwelling.
4. As a proportion of households that had a gas-burning fireplace in their dwelling.
5. As a proportion of households that had a dishwasher in their dwelling.

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 7-1
Energy-saving use, by household and dwelling characteristics, 2011 — Household size

	Household members					All households
	One	Two	Three	Four	Five or more	
	percent					
Used a programmable thermostat [1]	26	44	56	67	56	47
Used 5 or more CFLs	18	36	39	42	41	33
Washed and rinsed laundry in cold water [2]	56	58	61	56	55	58
Turned computer monitor off when not in use [3]	59	62	59	51	52	58
Turned off fireplace pilot in summer [4]	30	43	44	57	46	44
Air dried dishes in dishwasher (door open) [5]	16	14	14	13 E	12 E	14
Proportion of households that used at least one energy-saving practice	64	86	90	90	93	82

1. As a proportion of households that had one or more thermostats in their dwelling.
2. As a proportion of households that used a washer in their dwelling.
3. As a proportion of households that had a desktop computer in their dwelling.
4. As a proportion of households that had a gas-burning fireplace in their dwelling.
5. As a proportion of households that had a dishwasher in their dwelling.

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 7-2
Energy-saving use, by household and dwelling characteristics, 2011 — Size of heated area

	55 square metres or less and 600 square feet or less	56 to 95 square metres and 601 to 1,000 square feet	96 to 140 square metres and 1,001 to 1,500 square feet	141 to 185 square metres and 1,501 to 2,000 square feet	186 to 230 square metres and 2,001 to 2,500 square feet	231 square metres or more and 2,501 square feet or more	All households
	percent						
Used a programmable thermostat [1]	27 E	34	47	54	62	60	47
Used 5 or more CFLs	19 E	26	35	43	38	39	33
Washed and rinsed laundry in cold water [2]	64	67	56	57	52	43	58
Turned computer monitor off when not in use [3]	40 E	65	59	62	56	45	58
Turned off fireplace pilot in summer [4]	F	25 E	45	52	52	44	44
Air dried dishes in dishwasher (door open) [5]	F	17 E	14	16 E	12 E	10 E	14
Proportion of households that used at least one energy-saving practice	57	75	86	90	91	87	82

1. As a proportion of households that had one or more thermostats in their dwelling.
2. As a proportion of households that used a washer in their dwelling.
3. As a proportion of households that had a desktop computer in their dwelling.
4. As a proportion of households that had a gas-burning fireplace in their dwelling.
5. As a proportion of households that had a dishwasher in their dwelling.

Note(s): The heated area of a dwelling excludes basements and garages.

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 7-3
Energy-saving use, by household and dwelling characteristics, 2011 — Dwelling type

	Apartment	Multi-unit [1]	Single-detached dwelling	All other	All households
	percent				
Used a programmable thermostat [2]	24	50	54	26 [E]	47
Used 5 or more CFLs	15	33	40	30 [E]	33
Washed and rinsed laundry in cold water [3]	58	62	58	52 [E]	58
Turned computer monitor off when not in use [4]	61	61	57	F	58
Turned off fireplace pilot in summer [5]	19 [E]	50	48	F	44
Air dried dishes in dishwasher (door open) [6]	20 [E]	20 [E]	12	F	14
Proportion of households that used at least one energy-saving practice	59	88	91	88	82

1. Includes doubles, duplexes and row or terrace homes.
2. As a proportion of households that had one or more thermostats in their dwelling.
3. As a proportion of households that used a washer in their dwelling.
4. As a proportion of households that had a desktop computer in their dwelling.
5. As a proportion of households that had a gas-burning fireplace in their dwelling.
6. As a proportion of households that had a dishwasher in their dwelling.

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 7-4
Energy-saving use, by household and dwelling characteristics, 2011 — Dwelling tenure

	Owned	Rented	All households
	percent		
Used a programmable thermostat [1]	52	28	47
Used 5 or more CFLs	38	19	33
Washed and rinsed laundry in cold water [2]	56	66	58
Turned computer monitor off when not in use [3]	58	57	58
Turned off fireplace pilot in summer [4]	46	21 [E]	44
Air dried dishes in dishwasher (door open) [5]	14	16 [E]	14
Proportion of households that used at least one energy-saving practice	89	63	82

1. As a proportion of households that had one or more thermostats in their dwelling.
2. As a proportion of households that used a washer in their dwelling.
3. As a proportion of households that had a desktop computer in their dwelling.
4. As a proportion of households that had a gas-burning fireplace in their dwelling.
5. As a proportion of households that had a dishwasher in their dwelling.

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 8
Energy Star appliance use, by province, 2011

	Main refrigerator	Second refrigerator	Freezer (stand alone)	Dishwasher	Washing machine	Used at least one Energy Star appliance
	percent					
Canada	**50**	**11**	**22**	**37**	**48**	**71**
Newfoundland and Labrador	43	12 E	22	30	45	65
Prince Edward Island	57	F	23 E	37	52	77
Nova Scotia	46	5 E	24	28	45	67
New Brunswick	44	7 E	24	33	49	68
Quebec	53	8	21	34	50	72
Ontario	50	14	22	37	48	73
Manitoba	42	9 E	18	30	39	59
Saskatchewan	51	8 E	20	32	44	69
Alberta	49	10 E	23	42	50	73
British Columbia	49	14 E	19 E	44	45	70

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 9
Retrofitting practices, by province, 2008 to 2011

	Had made at least one improvement	Insulation	Heating, ventilation or cooling equipment	Doors, windows, exterior siding and caulking	Foundation	Roof structure or surface
	percent					
Canada	**37**	**9**	**21**	**18**	**2** E	**12**
Newfoundland and Labrador	39	6 E	18	25	F	10 E
Prince Edward Island	27 E	F	F	18 E	F	F
Nova Scotia	45	16 E	24 E	24	F	22 E
New Brunswick	38	8 E	17	17	F	17
Quebec	32	5	19	14	F	10
Ontario	40	11	24	21	2 E	13
Manitoba	45	12 E	21	25	F	15 E
Saskatchewan	32	6 E	18	21	F	8 E
Alberta	29	10 E	15 E	14	F	11 E
British Columbia	38	F	20 E	14 E	F	12 E

Note(s): Only includes households that own their own dwelling and that are not located in an apartment building.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 10
Retrofitting practices, by dwelling construction period, 2008 to 2011

	Before 1946	Between 1946 and 1960	Between 1961 and 1977	Between 1978 and 1995	After 1995	Not stated	All households
	percent						
Had made at least one improvement	38	42	44	41	19	28 E	37
Insulation	13 E	13 E	11	10	1 E	F	9
Heating, ventilation or cooling equipment	22	23	21	23	15 E	F	21
Doors, windows, exterior siding and caulking	23	19	23	24	3 E	F	18
Foundation	F	F	F	F	F	F	2 E
Roof structure or surface	14	13	15	15	3 E	F	12

Note(s): Only includes households that own their own dwelling and that are not located in an apartment building.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Methodology and data quality

Introduction

This section provides an overview of the underlying methodology of the Households and the Environment Survey (HES) Energy Use supplement, as well as key aspects of the data quality. It will also provide an understanding of the strengths and limitations of the data. The information may be of particular relevance when making comparisons with data from other surveys or sources of information and when drawing conclusions about the data.

Reference period

The reference period of the HES Energy Use supplement is the 2011 calendar year and collection was conducted between the months of January and March 2012. Some questions asked the respondent to respond with respect to “winter”, “summer”, “heating season” or “past 12 months”, while some others asked with respect to 2011.

Energy consumption data were collected for the fourteen months prior when the survey was completed by a household and was processed to reflect the 2011 calendar year.

Target population

The target population consisted of households in Canada excluding households located in Yukon, Northwest Territories and Nunavut, households located on Indian reserves or Crown lands, and households consisting entirely of full-time members of the Canadian Armed Forces. Institutions and households of certain remote regions were also excluded.

Variables measured

The objectives of the Energy Use Supplement were to collect data on the energy use characteristics and energy consumption for occupied dwellings in Canada. The energy use information, coupled with energy consumption data obtained from respondents’ energy bills or obtained directly from energy suppliers can be used to assess the effectiveness of energy efficiency programs. The survey content also covers the following themes:

- dwelling characteristics;
- household appliances;
- electrical devices; and
- heating and air conditioning.

Instrument design

Working with Natural Resources Canada, the questionnaire was designed by Statistics Canada in accordance with standard practices. Content was developed considering the data needs of both the project and the larger research and policy communities.

Sampling

The Households and the Environment Survey - Energy Use is a supplement to the Households and the Environment Survey (HES). The HES was administered from October to November 2011 to a sub-sample of the dwellings that were part of the Canadian Community Health Survey (CCHS) Cycle 4.1 between January 1st and June 30th, 2011. Therefore the HES sample design is closely tied to that of the CCHS. All HES respondents were sent a paper questionnaire for the Energy Use supplemental survey.

The following table shows the number of responding dwellings for the 2011 HES – Energy Use supplement.

Table A
Responding dwellings for the 2011 Household and the Environment – Energy Use supplement

	Responding dwellings
	number
Canada	**8,467**
Newfoundland and Labrador	342
Prince Edward Island	140
Nova Scotia	425
New Brunswick	507
Quebec	1,462
Ontario	2,962
Manitoba	593
Saskatchewan	441
Alberta	704
British Columbia	891

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Data collection

Respondents were first contacted between the months of January and June 2011 and asked to complete the Canadian Community Health Survey, Cycle 4.1. They were then surveyed for the telephone portion of the HES between the months of October and November 2011. Finally, households responding to the telephone portion of the HES were asked to complete a paper questionnaire on energy use. Data collection for the HES - Energy Use supplement was carried out between January and March 2012.

The last step of the survey was to establish contact with the energy suppliers. Residential energy consumption for 2011 was collected directly from the suppliers in cases where the account holder had given their consent to do so.

Data processing

The data were captured using imaging and automated data entry technology. A small proportion of questionnaires, those that could not be read by the optical scanners, were captured using heads-down keying by experienced operators. Questionable zones method with standard quality control measures were used to verify the error rate of the capture operations. For the HES, based on the quality control sample that was selected, it was determined that the overall data capture error rate did not exceed 0.1%.

Editing

The first type of error treated was related to the flow of the questionnaire, where questions which did not apply to the respondent (and should therefore not have been answered) were found to contain answers. In this case a computer edit automatically eliminated superfluous data by following the flow of the questionnaire implied by answers to previous, and in some cases, subsequent questions.

The second type of error treated involved a lack of information in questions which should have been answered. For this type of error, a non-response or “not-stated” code was assigned to the item.

The third type of error treated involved the identification of incoherent entries based on logical relationship between certain questions.

Coding of open-ended questions

A few data items on the questionnaire were reported in an open-ended format. These questions required coding for inclusion on the data file. The open-ended questions related to responses to “other” categories throughout the questionnaire.

Imputation

Imputation is the process that supplies valid values for those variables that have been identified for a change either because of invalid information or because of missing information. The new values are supplied in such a way as to preserve the underlying structure of the data and to ensure that the resulting records will pass all required edits. In other words, the objective is not to reproduce the true microdata values, but rather to establish internally consistent data records that yield good aggregate estimates.

There are three types of non-response. Complete non-response is when the respondent does not provide the minimum set of answers. These records are dropped and accounted for in the weighting process. Item non-response is when the respondent does not provide an answer to one question, but goes on to the next question. These are usually handled using the “not stated” code or are imputed. Finally, partial non-response is when the respondent provides the minimum set of answers but does not finish the interview. These records can be handled as either complete non-response or multiple item non-response.

In the case of the HES - Energy Use supplement, donor imputation was used to fill in missing data for some item non-response and partial non-response.

Weighting and estimation

The principle behind estimation in a probability sample is that each unit in the sample “represents”, besides itself, several other units not in the sample.

The weighting phase is a step which calculates, for each record, what this number is. This weight appears on the microdata file, and must be used to derive meaningful estimates from the survey.

The initial sampling weight was provided to the Households and the Environment Survey by the CCHS and incorporated the probability of selecting the unit in their sample, as well as other adjustments such as the treatment of non-response to the CCHS.

In order to produce the HES Energy Use supplement weights, adjustments to the HES weights were made to account for non-response to the HES Energy Use supplement.

The accuracy of the estimates was assessed using the ratio of the standard error of the survey estimate to the average value of the estimate itself. This measure is called coefficient of variation (CV). This relative measure of sampling error is usually expressed as a percentage (10% instead of 0.1).

Given the complexity of the HES multi-stage survey design and calibration, there is no simple formula that can be used to calculate variance estimates. Therefore, an approximate method was needed. The bootstrap method is used because the sample design and calibration needs to be taken into account when calculating variance estimates.

Quality evaluation

Data were compared to similar HES or Survey of Household Energy Use (SHEU) data from previous surveys to ensure consistency. Household energy use data was also compared to residential energy use data from Manufacturing and Energy Division.[1]

Subject-matter experts confronted the data using other sources as well as by identifying and researching any values that were not consistent with others in the same domain.

Disclosure control

Statistics Canada is prohibited by law from releasing any data that would divulge information obtained under the *Statistics Act* that relates to any identifiable person, business or organization without the prior knowledge or the consent in writing of that person, business or organization. Various confidentiality rules are applied to all data that are released or published to prevent the publication or disclosure of any information deemed confidential. If necessary, data are suppressed to prevent direct or residual disclosure of identifiable data.

Coverage

The coverage error of the CCHS, of which the HES is a subsample, is estimated at less than 2%.

Response rates and sampling error

The response rate for this survey was 57.0%.[2] Provincial response rates ranged from 48.1% to 64.8%.

The results estimated from the HES Energy Use Supplement are based on a sample of households in Canada. The results obtained from asking the same questions to all Canadian households would differ to some known extent.

The extent of this sampling error is quantified by the coefficient of variation (CV) with the following guidelines:

- 16.5% and below: acceptable estimate;
- more than 16.5% to 33.3%: marginal estimate requiring cautionary note to users; and
- more than 33.3%: unacceptable estimate.

Estimates that do not meet an acceptable level of quality are either flagged for caution or suppressed. CV tables are prepared by Statistics Canada and made available to help users understand the quality of individual estimates.

For example, CVs for the estimates of the proportion of households that had a forced air furnace in 2011 for Canada and the provinces are as follows:

1. For more information on this comparison, please contact the Information officer from the Environment and Account Statistics Division.
2. As a percentage of the number of HES Energy Use Supplement selected households.

Table B
Coefficients of variation for the estimates *Proportion of households that had a forced air furnace in 2011*

	Proportion of households that had a forced air furnace in 2011
	percent
Canada	**2.12**
Newfoundland and Labrador	19.90
Prince Edward Island	19.49
Nova Scotia	11.82
New Brunswick	14.45
Quebec	11.94
Ontario	2.16
Manitoba	6.15
Saskatchewan	1.43
Alberta	2.03
British Columbia	11.03

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Data comparability to the Households and the Environment Survey

Some data that were collected through the Households and the Environment Survey were included in the Energy Use supplement and are included in this report. However, a household's response was only included in this report if it had also completed the HES Energy Use supplement. For this reason, the HES had a larger sample than the HES Energy Use supplement. Estimates may therefore differ slightly.

Data presented in this report on some energy-saving practices (for example, programmable thermostat use) collected during the HES Energy Use supplement may differ slightly from data presented in the *2011 Households and the Environment* report, 11-526-X, released in March, 2013.

Data comparability to Natural Resource Canada's Survey of Household Energy Use

Natural Resource Canada's Survey of Household Energy Use is based on those respondents to the HES Energy Use Supplement who agreed to share their responses with Natural Resource Canada. As not all respondents agreed to share their responses, there may be some differences between the results of the HES Energy Use supplement and the Survey of Household Energy Use.

Data comparability to The Report on Energy Supply and Demand

Statistics Canada's Manufacturing and Energy Division also produces estimates of Canada's residential energy use in the Report on Energy Supply and Demand in Canada. These estimates are produced using data from a number of supply-side surveys for different fuels and then balancing the supply and demand using a complex accounting framework. The surveys depend on the respondents' ability to allocate fuel sales to specific customers (e.g. industry, government, households, etc.).[1]

While both the Household Environment Survey Energy Use supplement and the Report on Energy Supply and Demand gather energy consumption data for a similar group, given the use of different methodologies there will be a certain amount of difference between the estimates produced and comparisons between the two should be made with caution.

1. Statistics Canada. Report on Energy Supply and Demand in Canada, 2011 preliminary, Catalogue no. 57-003-X.