



Natural Resources  
Canada

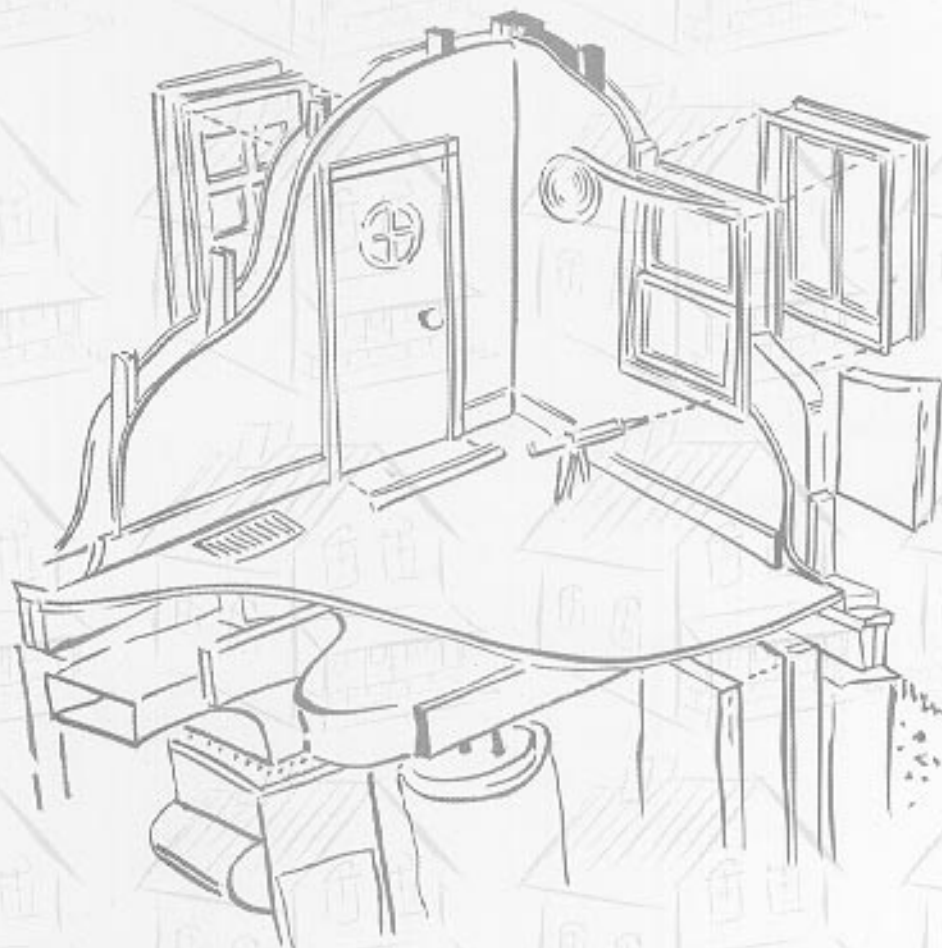
Ressources naturelles  
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# NEUD

*National Energy Use Database*

## The 1994 Home Energy Retrofit Survey

STATISTICAL REPORT



Canada

SEPTEMBER 1997

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Cat. no. M92-135/1994  
ISBN 0-662-62969-8



# **The 1994 Home Energy Retrofit Survey**

**STATISTICAL REPORT**

## FOREWORD

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This report is the sixth in a series aimed at presenting the results of surveys conducted for Natural Resources Canada (NRCan) in the residential sector on energy end-use. These surveys were developed as part of the National Energy Use Database (NEUD) initiative.

In 1993, Statistics Canada conducted the first national survey on household energy use for NRCan. Since then, NRCan has conducted annual surveys or complementary studies. The data collected is used to track trends in energy-consuming appliances and equipment, new residential construction and renovation of existing homes. A list is appended of the statistical reports and analyses produced to date by the NEUD in connection with these surveys.

This report reviews the findings of the *1994 Home Energy Retrofit Survey*. This survey is a supplement to the Statistics Canada *Homeowner Repair and Renovation Survey*. It has made it possible to provide data on upgrades and additions made to the thermal envelope.

This statistical report was prepared with the collaboration of Victor Tremblay of the firm STATPLUS.

The entire project was supervised by Maryse Courchesne of Natural Resources Canada. The following individuals contributed to the project: Vadim Belotserkovski, Michel Francoeur, Skip Hayden, Cristobal Miller, Jean-Pierre Moisan and Mark Pearson.

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## IMPORTANT FACTS

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- In 1994, approximately one in twenty homeowner households undertook major energy efficiency work such as improvements to insulation (4.9%), windows (6.7%) or doors (5.9%).
- In the case of insulation added in 1994, this work focused on exterior walls (1.6%), basement walls (1.5%) or attics (1.4%).
- Almost half a million Canadian households (6.7%) improved the windows in their homes in 1994.
- In most instances, these improvements consisted in replacing some windows: single-pane glass with double-pane (2.4%), the same type of panes (2.0%) or, less frequently, double-pane with triple-pane (0.6%).
- Slightly more than 400 000 Canadian homeowners household (5.9%) made improvements to the exterior doors of their homes. This work involved replacing wood doors with metal doors (2.9%), improving the caulking or weatherstripping (1.5%) and adding a storm door (1.1%).
- In the area of home heating, only a small proportion of households undertook upgrades, additions or replacements to systems (2.0%) or conversions of systems (1.0%) or energy sources (1.2%).
- In 1994, 1.6% of homeowners added a fireplace to their dwelling; other homeowners (0.9%) upgraded existing fireplaces.
- The principal reason for homeowners to make improvements to insulation, doors or windows was to save energy: 70.8% of households gave this reason. Comfort (44.3%), maintenance (37.0%), appearance (29.3%) and the resale value of the house (13.5%) were the other reasons given most often.
- In the case of changes, additions and upgrades to heating or ventilation equipment, energy saving was the reason given most often (61.0%). Equal importance was given to maintenance (31.3%) and to comfort (30.9%).

- The age of the building played an important role in the decision to undertake energy-saving work. Systematically, there was an increase in the frequency of activities to upgrade insulation, windows or doors in relation to the age of the home. The replacement or upgrading of heating equipment followed the same trend.
- In 1994, approximately one in five (19.0%) homeowner households installed various devices to reduce energy consumption in their homes. The activities undertaken most frequently were the installation of low-flow shower heads (10.0%), replacement of incandescent bulbs with fluorescent bulbs (7.0%), installation of aerators on hot water faucets (3.7%), insulation of hot water pipes (3.4%) and installation of programmable thermostats (3.4%).
- The installation of energy-saving equipment rises with total household income and decreases as the age of the head of the household increases.

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## INTRODUCTION

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The *Home Energy Retrofit Survey*, an initiative of Natural Resources Canada (NRCan), expands the scope of the *1994 Homeowner Repair and Renovation Survey* (HRRS). The latter survey was conducted as a supplement to the *Labour Force Survey* (LFS) of March 1995.

NRCan and the Canada Mortgage and Housing Corporation (CMHC) provided the funding for the *Home Energy Retrofit Survey* and the 1994 HRRS.

The purpose of the *Home Energy Retrofit Survey* is to measure energy retrofit activities in Canadian homes.

The first chapter provides a general overview of the activities undertaken by homeowners to make their homes more energy-efficient. The second chapter provides details on each of the activities. The appendix contains a general description of the methodology used by Statistics Canada.

# 1. HOMEOWNER HOUSEHOLDS THAT CARRIED OUT ENERGY SAVING IMPROVEMENTS

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In 1994, approximately one in twenty homeowner households undertook major work aimed at improved energy efficiency: improved insulation (4.9%), improvements to windows (6.7%) or to doors (5.9%).

Upgrades, additions or replacements to home heating systems were made by only 1% to 2% of homeowner households. These retrofits involved adding a fireplace or upgrading an existing fireplace (2.4%), upgrading or replacing of heating equipment (2.0%) or converting the system (1.0%) or the source (1.2%).

In 1994, approximately one in five households (19.0%) added various devices to reduce energy consumption in the home, such as the installation of low-flow shower heads (10%) or the replacement of incandescent bulbs with fluorescent bulbs (7.0%).

These national trends were relatively consistent in all provinces, but there were a few differences. For example, the addition of energy-saving devices occurred less frequently (between 12% and 15% of households) among the Prairie provinces and in Newfoundland. However, in the latter province, there was slightly more emphasis than elsewhere in Canada on upgrading insulation (7.2%) or making improvements to windows (9.1%) or doors (10.4%).

Of course the age of the building played an important part in the decision to carry out work to reduce energy consumption. A systematic trend was observed (see the graph) between the increase in the frequency of activities to upgrade insulation, doors and windows and the age of the residence. The replacement or upgrade of heating equipment followed the same trend.

Lastly, the age of the head of the household and total household income also had an impact on the proportion of households carrying out energy efficiency work. This was especially true of the addition of energy-saving devices: the percentage of retrofit work climbed from 13.3% when income was below \$30,000 to 23.1% when income exceeded \$80,000. This percentage was 25.3% for households where the head of the household was younger than 35 years of age compared to 11.1% in households where the head of the household was 65 years or older.

**Table 1.1**  
**Number and percentage of homeowner households**  
**that made energy-saving improvements**

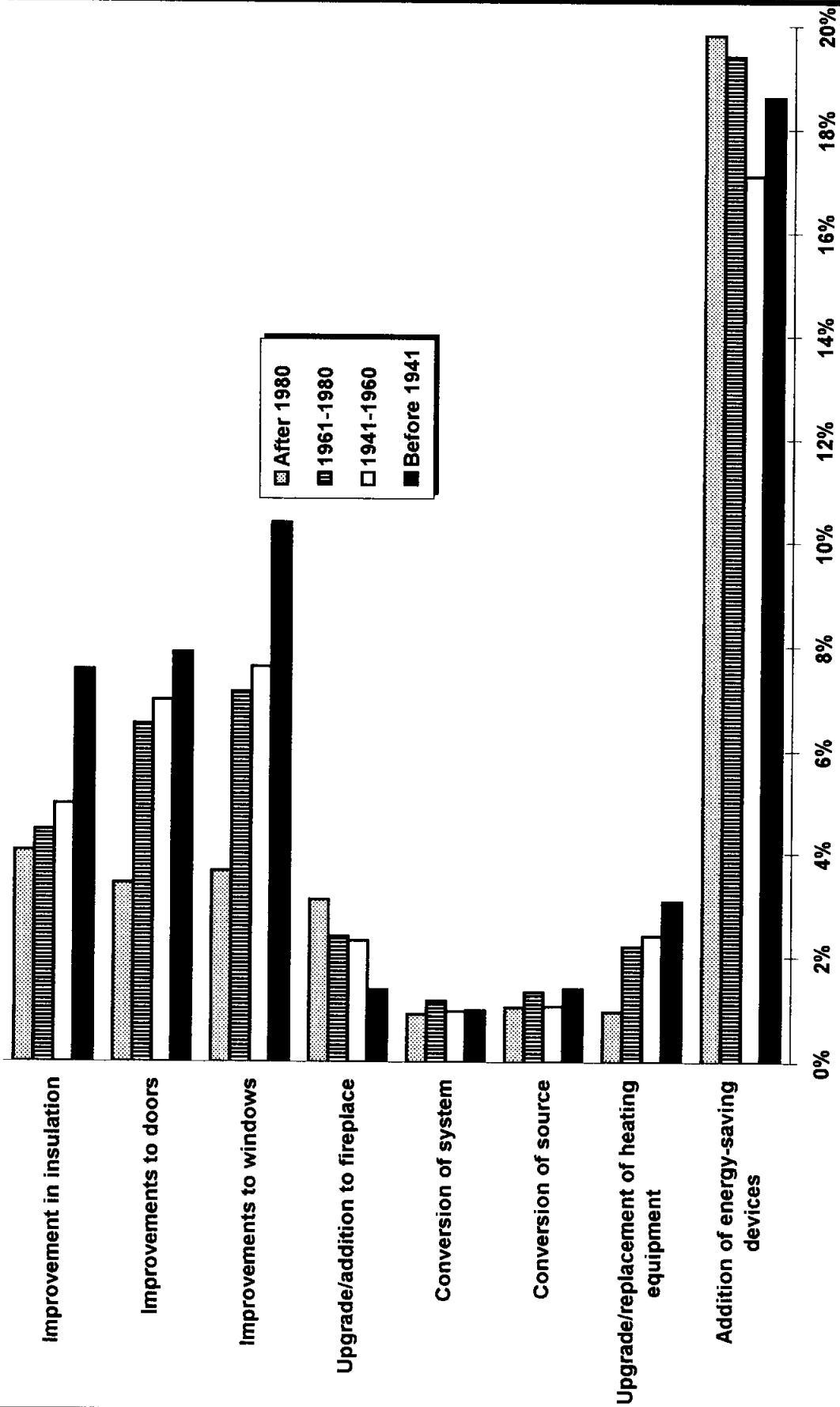
***Canada and provinces***

	Canada	Newfound- land	Prince Edward Island	Nova Scotia
<b>Number of homeowners ('000)</b>	<b>7 121</b>	<b>149</b>	<b>36</b>	<b>245</b>
<b>Type of work</b>				
Improvement in insulation	347	11	1	14
Improvements to doors	421	15	2	17
Improvements to windows	476	14	2	19
Upgrade/addition to fireplace	173	2	0	6
Heating of dwelling:				
conversion of system	73	3	0	5
conversion of source	86	3	0	6
upgrade/replacement of equipment	144	3	1	11
Addition of energy-saving devices	1 353	19	7	43
<b>Total of homeowners</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Type of work</b>				
Improvement in insulation	4.9%	7.2%	3.7%	5.9%
Improvements to doors	5.9%	10.4%	5.5%	7.1%
Improvements to windows	6.7%	9.1%	6.0%	7.7%
Upgrade/addition to fireplace	2.4%	1.6%	1.3%	2.3%
Heating of dwelling:				
conversion of system	1.0%	1.8%	0.6%	2.2%
conversion of source	1.2%	1.9%	0.6%	2.3%
upgrade/replacement of equipment	2.0%	2.2%	2.9%	4.6%
Addition of energy-saving devices	19.0%	12.6%	18.8%	17.7%

Table 1.1 (continued)

New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
<b>207</b>	<b>1 654</b>	<b>2 646</b>	<b>290</b>	<b>268</b>	<b>687</b>	<b>939</b>
11	86	129	14	9	27	40
12	104	151	20	15	40	41
14	103	205	20	16	42	39
3	32	63	4	3	18	41
2	14	35	2	1	2	8
2	13	45	2	1	2	14
6	28	57	4	4	10	19
34	335	568	43	35	96	172
100%	100%	100%	100%	100%	100%	100%
5.5%	5.2%	4.9%	4.8%	3.5%	3.9%	4.2%
5.7%	6.3%	5.7%	6.9%	5.7%	5.8%	4.3%
6.8%	6.2%	7.7%	7.1%	5.9%	6.1%	4.1%
1.7%	1.9%	2.4%	1.5%	0.9%	2.6%	4.4%
1.2%	0.8%	1.3%	0.6%	0.4%	0.3%	0.8%
0.8%	0.8%	1.7%	0.5%	0.4%	0.4%	1.5%
2.9%	1.7%	2.1%	1.3%	1.6%	1.4%	2.0%
16.4%	20.3%	21.5%	14.8%	13.2%	13.9%	18.3%

**Graph 1.1 : Improvements by period of construction**





**Table 1.2.1**  
**Homeowner households that made**  
**energy-saving improvements**  
**by period of construction and type of dwelling**

**Canada**

<b>Period of construction of dwelling</b>	<b>Total</b>	<b>Before 1941</b>	<b>1941-1960</b>	<b>1961-1980</b>	<b>After 1980</b>
<b>Number of owners ('000)</b>	7 121	1 031	1 315	2 732	2 043
Improvement in insulation	4.9%	7.6%	5.0%	4.5%	4.1%
Improvements to doors	5.9%	7.9%	7.0%	6.5%	3.4%
Improvements to windows	6.7%	10.4%	7.6%	7.1%	3.7%
Upgrade/addition to fireplace	2.4%	1.4%	2.3%	2.4%	3.1%
Heating of dwelling					
conversion of system	1.0%	1.0%	1.0%	1.2%	0.9%
conversion of source	1.2%	1.4%	1.1%	1.3%	1.0%
upgrade/replacement of equipment	2.0%	3.1%	2.4%	2.2%	1.0%
Addition of energy-saving devices	19.0%	18.6%	17.1%	19.4%	19.8%
<b>Type of dwelling</b>	<b>Total</b>	<b>Detached house</b>	<b>Attached house*</b>	<b>Duplex*</b>	<b>Apartment*</b>
<b>Number of owners ('000)</b>	7 121	5 949	630	134	408
Improvement in insulation	4.9%	5.1%	3.9%	6.1%	3.4%
Improvements to doors	5.9%	6.2%	5.1%	6.2%	3.4%
Improvements to windows	6.7%	6.9%	6.5%	7.0%	4.0%
Upgrade/addition to fireplace	2.4%	2.6%	2.0%	1.4%	1.2%
Heating of dwelling					
conversion of system	1.0%	1.1%	0.5%	0.7%	0.3%
conversion of source	1.2%	1.3%	1.5%	0.4%	0.4%
upgrade/replacement of equipment	2.0%	2.1%	2.2%	1.8%	0.8%
Addition of energy-saving devices	19.0%	19.4%	19.8%	12.9%	14.4%

\*For these categories, estimates below 2% have a high coefficient of variation (C.V.) and should be used with caution.

**Table 1.2.2**  
**Homeowner households that made**  
**energy-saving improvements according to the age**  
**of the head of the household and household income**

**Canada**

<b>Age of head of household</b>	<b>Total</b>	<b>Younger than 35 years</b>	<b>35 - 49 years</b>	<b>50 - 64 years</b>	<b>65 years and older</b>
<b>Number of owners ('000)</b>	7 121	1 189	2 653	1 798	1 481
Improvement in insulation	4.9%	9.3%	5.7%	3.5%	1.6%
Improvements to doors	5.9%	6.8%	7.2%	5.3%	3.6%
Improvements to windows	6.7%	7.4%	7.3%	6.4%	5.3%
Upgrade/addition to fireplace	2.4%	2.7%	3.0%	2.1%	1.8%
Heating of dwelling:					
conversion of system	1.0%	1.1%	1.2%	0.9%	0.8%
conversion of source	1.2%	1.6%	1.4%	0.9%	0.8%
upgrade/replacement of equipment	2.0%	2.3%	2.2%	1.7%	1.8%
Addition of energy-saving devices	19.0%	25.3%	22.0%	17.0%	11.1%
<b>Household income</b>	<b>Total</b>	<b>Less than \$30 000</b>	<b>\$30 000 to \$50 000</b>	<b>\$50 000 to \$80 000</b>	<b>\$80 000 and higher</b>
<b>Number of owners ('000)</b>	7 121	1 801	1 873	2 119	1 328
Improvement in insulation	4.9%	3.7%	4.9%	5.8%	5.8%
Improvements to doors	5.9%	5.3%	6.1%	6.5%	6.4%
Improvements to windows	6.7%	6.2%	6.5%	7.2%	7.5%
Upgrade/addition to fireplace	2.4%	1.3%	2.3%	2.7%	3.7%
Heating of dwelling:					
conversion of system	1.0%	1.1%	1.0%	1.0%	1.0%
conversion of source	1.2%	1.1%	1.0%	1.6%	1.1%
upgrade/replacement of equipment	2.0%	2.1%	1.5%	2.5%	1.8%
Addition of energy-saving devices	19.0%	13.3%	19.4%	21.8%	23.1%

## 2. DETAILS ON WORK DONE BY HOMEOWNERS

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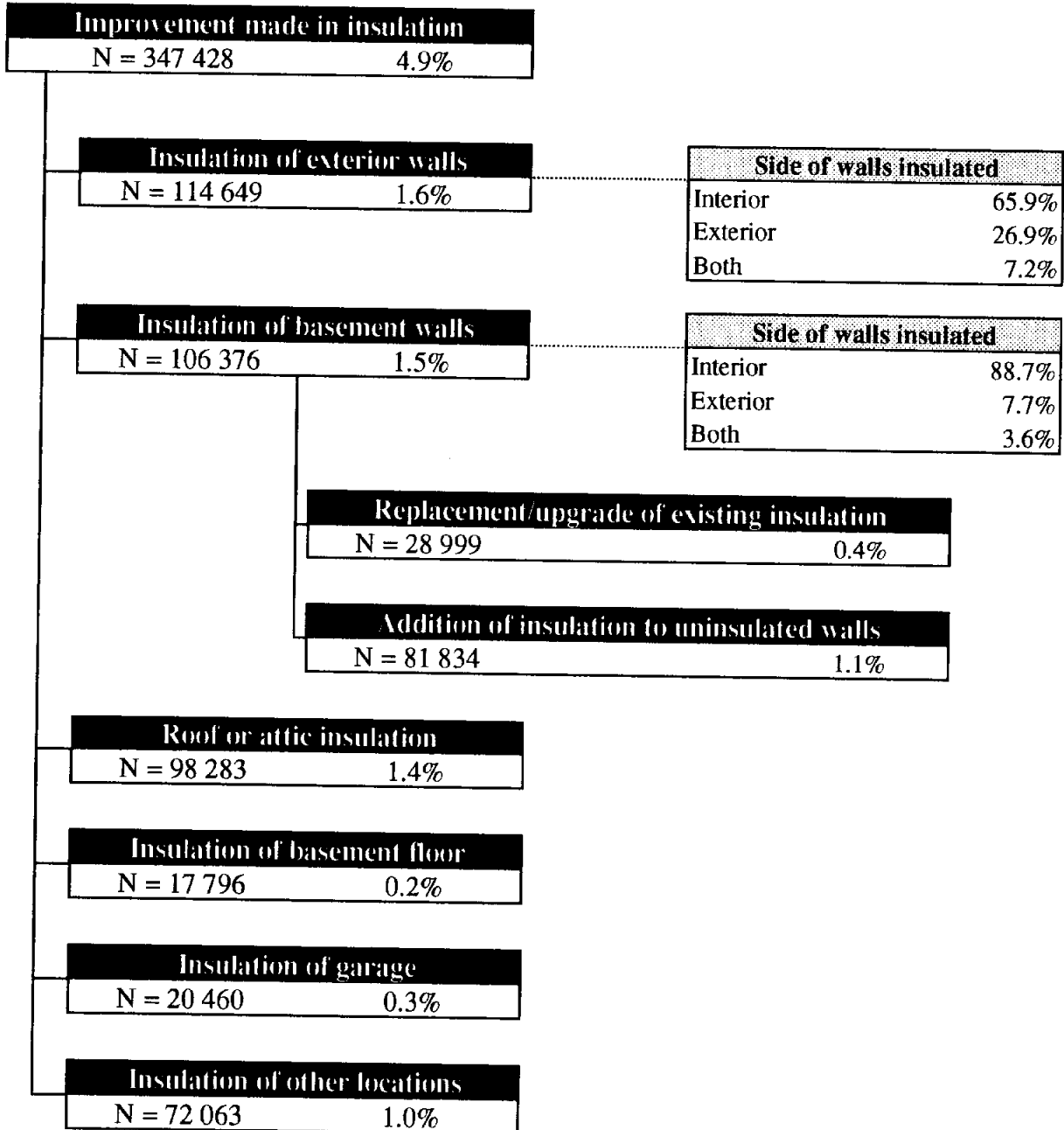
### 2.1 Improvement in insulation

Among the 350 000 households (4.9%) which installed insulation in 1994, the proportion which insulated exterior walls (1.6%), basement walls (1.5%) or the roof or attic (1.4%) was almost equal.

In the case of exterior walls, two out of three (65.9%) homeowners insulated on the inside; insulation on the outside (26.9%) or to both sides of the partition (7.2%) remained a relatively frequent choice.

In the case of basement walls, the work involved mostly the addition of insulation to uninsulated walls (1.1%) rather than the replacement of existing insulation (0.4%). Nine times out of ten, the insulation of basement walls was done on the inside (88.7%).

**Diagram 2.1**  
**Homeowner households that**  
**improved insulation**  
**- Canada -**



## 2.2 Windows

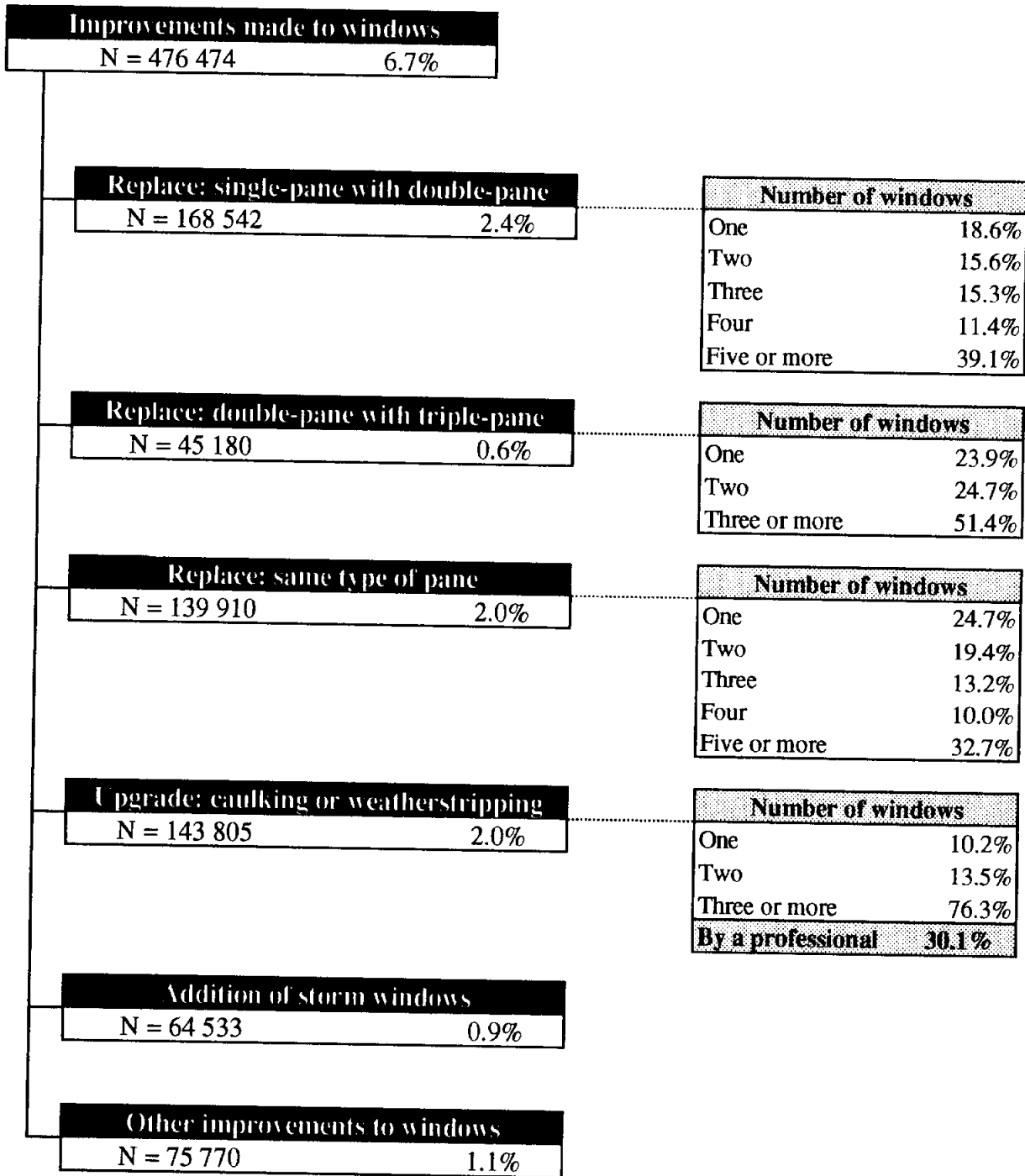
Almost half a million Canadian households (6.7%) upgraded the windows in their homes in 1994.

In most instances, the work involved replacing certain windows: single-pane by double-pane (2.4%), same type of pane (2.0%) or, less frequently, double-pane by triple-pane (0.6%).

Frequently the replacement of windows involved only a few units: for example, among homeowners who replaced windows with the same pane, the work involved a maximum of four windows in 67.3% of the cases. When single-pane with double-pane, the percentage was 60.9%.

Other projects carried out by owners included caulking and weatherstripping (2.0%), adding storm windows to single-pane windows (0.9%) and other types of upgrades not specified in the survey (1.1%).

**Diagram 2.2**  
**Homeowner households that made**  
**improvements to windows**  
**- Canada -**



## 2.3 Exterior doors

Slightly more than 400 000 Canadian households (5.9%) made improvements to the exterior doors of their homes.

This work involved replacing wood doors with metal doors (2.9%), upgrading caulking or weatherstripping (1.5%), adding a storm door (1.1%); or other types of improvements not specified in the survey (1.1%).

In a majority of cases, only one exterior door was affected when the work involved replacing a wood door (63.4%) or adding a storm door (71.7%).

**Diagram 2.3**  
**Homeowner households that made**  
**improvements to exterior doors**  
**- Canada -**

<b>Improvements to exterior doors</b>	
N = 420 526	5.9%

<b>Replace: wood doors with metal</b>	
N = 207 507	2.9%

<b>Number of doors</b>	
One	63.4%
Two	30.7%
Three or more	5.9%

<b>Upgrade: caulking or weatherstripping</b>	
N = 108 579	1.5%

<b>Number of doors</b>	
One	43.0%
Two or more	57.0%
<b>By a professional</b>	<b>25.8%</b>

<b>Addition of storm doors</b>	
N = 75 911	1.1%

<b>Number of doors</b>	
One	71.7%
Two or more	28.3%

<b>Other improvements to doors</b>	
N = 81 434	1.1%



## 2.4 Principal heating or ventilation system

One in fifty homeowner households (2.0%) upgraded or replaced the heating system in 1994. The breakdown by energy source of the existing systems is as follows: oil systems (0.7%), natural gas systems (0.9%) and electric systems (0.4%).

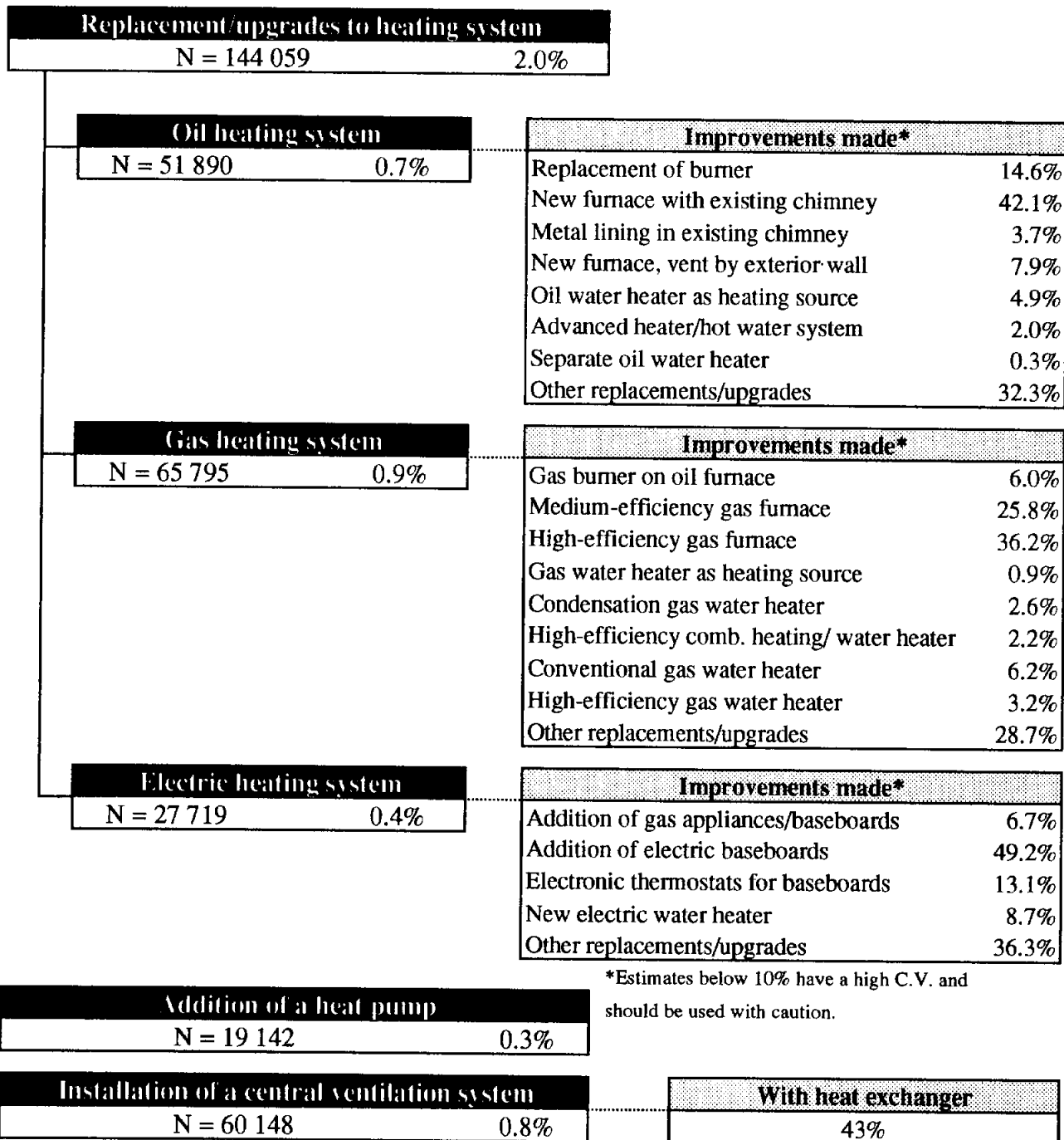
The most frequent improvement with oil or gas systems was the installation of a new furnace. In 42.1% of cases involving changes to oil systems, a new oil furnace or boiler that used the existing chimney was installed. With natural gas systems, a new medium-efficiency (25.8%) or high-efficiency (36.2%) natural gas furnace or boiler was purchased. With electric heating systems, the most frequent action was the addition of baseboards (49.2%). Heat pumps were rarely installed only (0.3%).

Conversion of the energy source of the principal system occurred in 1.2% of homeowner households in 1994. The original energy source was most often oil (39.3%) or electricity (38.8%). In households which changed fuel or energy source, 47.2% opted for natural gas, while 18.7% chose wood and 15.2% chose electricity to heat their homes. Among former oil users who changed energy source, two-thirds (66.6%) opted for natural gas.

An equivalent proportion of dwellings, 1.0%, changed the principal heating system. Most frequently, the old system consisted of electric baseboards (38.3%) or a central hot air system (33.5%). Two-thirds of the households that converted selected a compressed hot-air furnace for their new system. This was the system chosen by four out of five former users of electric baseboards (80.2%) or wood stoves (77.6%). Lastly, 0.8% of homeowner households installed a central air conditioning system. In 43% of the cases, this system included a heat exchanger.

## Diagram 2.4.1

### Homeowner households that replaced or upgraded the principal heating or ventilation system - Canada -



\*Estimates below 10% have a high C.V. and should be used with caution.

**Table 2.4.2**  
**Conversion of the heating energy source**

**Canada**

	Current principal energy source				
	Total	Electricity	Gas	Oil	Others
<b>Number of owners ('000)</b>	7 094	1 996	3 492	1 106	500
<b>Change of energy source in 1994</b>					
Yes	1.2%	0.7%	1.2%	1.5%	3.3%
No	98.8%	99.3%	98.8%	98.5%	96.7%
<b>Dwellings that changed energy source ('000)</b>	86	13	41	16	16
<b>Former energy source*</b>					
Electricity	38.8%	15.8%	33.6%	60.4%	49.1%
Natural gas	2.5%	4.8%	1.9%	0.0%	4.4%
Oil	39.3%	57.6%	55.5%	2.1%	21.1%
Wood	12.8%	17.4%	4.1%	27.1%	16.9%
Others	6.5%	4.4%	4.9%	10.4%	8.6%

	Former principal energy source				
	Total	Electricity	Wood	Oil	Others
<b>Number of owners ('000)</b>	7 094	2 017	398	1 124	3 555
<b>Change of energy source in 1994</b>					
Yes	1.2%	1.7%	2.8%	3.0%	0.2%
No	98.8%	98.3%	97.2%	97.0%	99.8%
<b>Dwellings that changed energy source ('000)</b>	86	33	11	34	8
<b>New energy source*</b>					
Electricity	15.2%	6.2%	20.6%	22.2%	15.6%
Natural gas	47.2%	40.9%	15.0%	66.6%	35.5%
Oil	18.7%	29.1%	39.5%	1.0%	21.6%
Wood	9.9%	17.6%	1.8%	6.4%	3.0%
Others	9.0%	6.2%	23.1%	3.7%	24.3%

\*For these conversions, estimates below 10% have a high coefficient of variation (C.V.) and should be used with caution.

**Table 2.4.3**  
**Conversion of the principal heating system**

**Canada**

	<b>Current principal system</b>				
	Total	Electricity	Hot air	Hot water	Others
<b>Number of owners ('000)</b>	7 094	1 673	4 603	514	304
<b>Change in system in 1994</b>					
Yes	1.0%	0.6%	1.1%	0.7%	3.3%
No	99.0%	99.4%	98.9%	99.3%	96.7%
<b>Dwellings that changed systems ('000)</b>					
	73	10	49	4	10
<b>Former principal system*</b>					
Hot water	3.9%	9.7%	3.6%	0.0%	1.3%
Hot air	33.5%	56.7%	26.6%	66.6%	32.1%
Stove (including wood)	13.6%	13.3%	15.7%	13.6%	3.8%
Electric baseboards	38.3%	0.0%	45.5%	15.4%	50.1%
Others	10.6%	20.3%	8.6%	4.4%	12.7%

	<b>Former principal system</b>				
	Total	Electricity	Hot air	Stove	Others
<b>Number of owners ('000)</b>	7 094	1 690	4 578	274	552
<b>Change in system in 1994</b>					
Yes	1.0%	1.6%	0.5%	3.6%	1.9%
No	99.0%	98.4%	99.5%	96.4%	98.1%
<b>Dwellings that changed systems ('000)</b>					
	73	28	24	10	11
<b>Current principal system*</b>					
Hot water	4.8%	1.9%	9.5%	4.8%	1.5%
Hot air	67.4%	80.2%	53.5%	77.6%	56.3%
Stove (including wood)	10.9%	14.2%	10.8%	1.0%	12.0%
Electric baseboards	14.1%	0.0%	23.9%	13.8%	29.0%
Others	2.8%	3.8%	2.3%	2.8%	1.2%

\*For these conversions, estimates below 10% have a high coefficient of variation (C.V.) and should be used with caution.

## 2.5 Alterations to fireplaces

A fireplace was added to 1.6% of Canadian households occupied by their owners in 1994. The new fireplace used either wood (0.8%) or natural gas or propane (0.7%).

Sixty percent of the wood fireplaces added were of masonry construction. High-efficiency models were installed infrequently (19.2%), and even glass doors were not a frequent feature (32.9%).

New natural gas or propane fireplaces had energy efficiency features more frequently: 29.9% had natural draught with glass doors, 11.7% had forced draught with glass doors, and 35.9% were high-efficiency direct venting.

Other homeowners (0.9%) upgraded or made additions to their existing fireplaces. Among these owners, 26.7% converted their old wood fireplace to a gas fireplace, 24.4% inserted a built-in element in their wood fireplace and 19.0% installed glass doors on their wood fireplace.

**Diagram 2.5**  
**Homeowner households that made**  
**changes to fireplaces**  
**- Canada -**

Addition of a fireplace	
N = 111 712	1.6%

Wood fireplace	
N = 58 960	0.8%

Characteristics	
Masonry	60.0%
Prefabricated of metal	24.5%
With glass doors	32.9%
High-efficiency model	19.2%

Propane or natural gas fireplace	
N = 52 354	0.7%

Characteristics	
With built-in imitation logs	24.9%
Natural draught with glass doors	29.9%
Forced draught with glass doors	11.7%
Direct venting (high-efficiency)	35.9%

Upgrade or addition to fireplace	
N = 65 259	0.9%

Description	
Built-in element in wood fireplace	24.4%
Glass doors on wood fireplace	19.0%
Conversion: from wood to gas	26.7%
Other improvements or additions	35.4%

## 2.6 Addition of energy-saving devices

One in five homeowner households (19.0%) acquired equipment designed to reduce energy consumption.

Some of the most frequent activities included installation of low-flow shower heads (10.0%), replacement of conventional light bulbs with fluorescent bulbs (7.0%), installation of aerators on hot water faucets (3.7%), installation of insulation around hot water pipes (3.4%) or installation of programmable thermostats (3.4%).

Such devices were added less frequently (between 12% and 15% of households) in the Prairie provinces and Newfoundland than in the other provinces. Low-flow shower heads (12.6%) and aerators on faucets (5.7%) were installed most frequently in Quebec; the highest percentage of households (8.9%) that replaced incandescent bulbs with fluorescent was in Ontario.

Both the age of the head of the household and total household income had an impact on the proportion of households that acquired energy-saving devices: The percentage of households installing energy-saving devices rose from 13.3% when household income was less than \$30,000 to 23.1% when household income exceeded \$80,000. As well, 25.3% of households in which the head was less than 35 years old acquired at least one device, while only 11.1% of households in which the head was 65 years or older did so. Both of these trends applied to all seven of the energy-saving devices studied in this part of the survey.

**Table 2.6.1**  
**Number and percentage of homeowner households**  
**that added energy-saving devices**

***Canada and provinces***

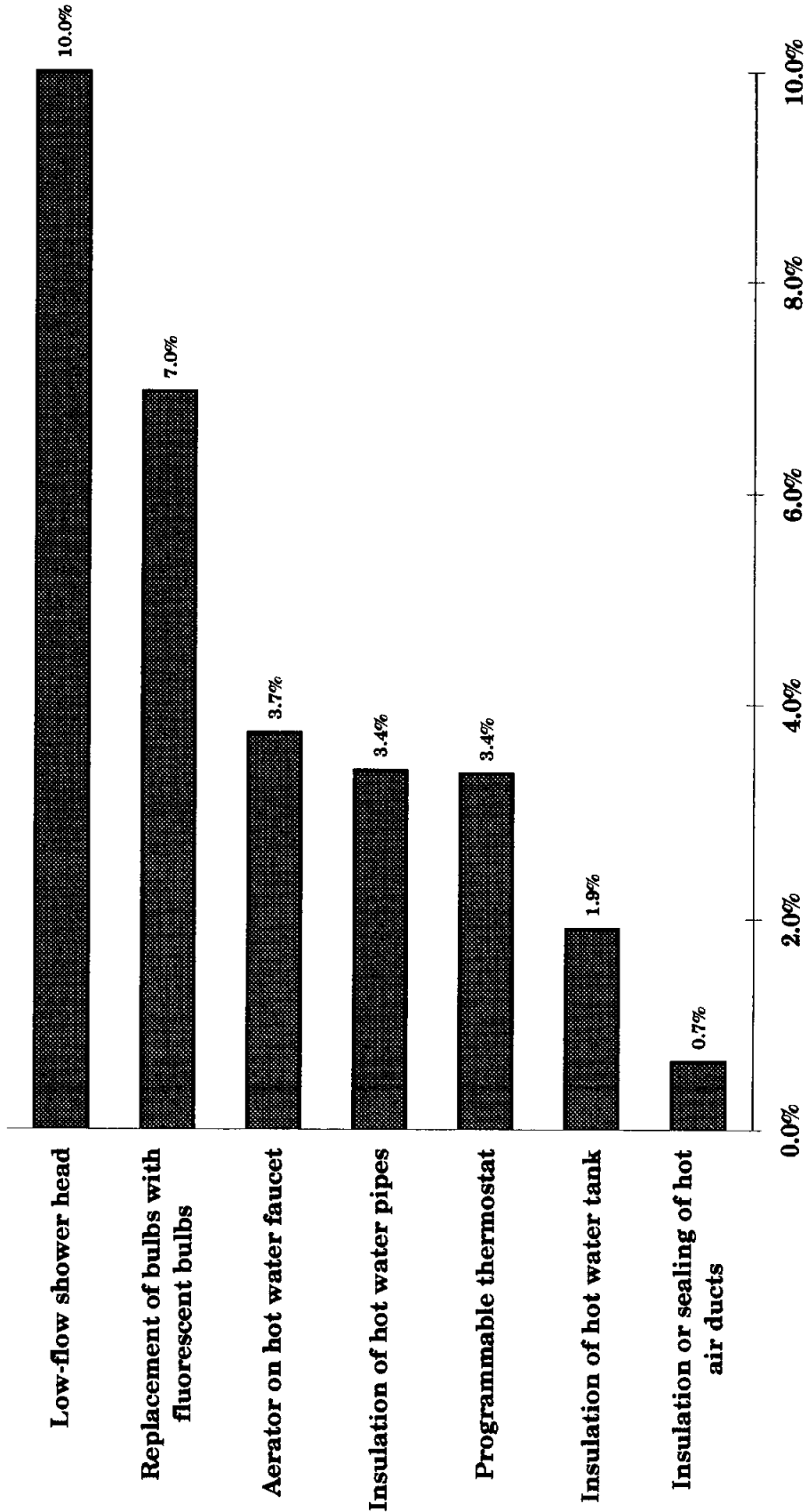
	Canada	Newfound- land	Prince Edward Island	Nova Scotia
<b>Number of owners ('000)</b>	<b>7 121</b>	<b>149</b>	<b>36</b>	<b>245</b>
<b>Energy-saving devices</b>				
Low-flow shower head	713	8	3	24
Replace bulbs with fluorescent	496	5	3	11
Aerator on hot water faucet	266	2	1	6
Insulation around hot water pipes	241	7	1	10
Programmable thermostat	239	3	0	3
Insulation around water heater	136	3	0	7
Insulation/sealing of hot air ducts	47	2	0	1
Addition of at least one device	1353	19	7	43
<b>Total of owners</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Energy-saving devices</b>				
Low-flow shower head	10.0%	5.6%	7.9%	9.9%
Replace bulbs with fluorescent	7.0%	3.2%	8.9%	4.6%
Aerator on hot water faucet	3.7%	1.4%	3.4%	2.4%
Insulation around hot water pipes	3.4%	5.0%	3.5%	3.9%
Programmable thermostat	3.4%	1.9%	1.2%	1.0%
Insulation around water heater	1.9%	1.8%	1.1%	2.8%
Insulation/sealing of hot air ducts	0.7%	1.0%	1.0%	0.4%
Addition of at least one device	19.0%	12.6%	18.8%	17.7%



Table 2.6.1 (continued)

New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
<b>207</b>	<b>1 654</b>	<b>2 646</b>	<b>290</b>	<b>268</b>	<b>687</b>	<b>939</b>
20	209	273	22	17	42	94
12	93	234	13	13	39	71
6	94	99	6	5	15	31
9	72	102	7	5	8	22
4	39	122	9	4	19	37
3	39	55	2	1	2	24
2	8	22	1	1	3	5
34	335	568	43	35	96	172
100%	100%	100%	100%	100%	100%	100%
9.8%	12.6%	10.3%	7.6%	6.3%	6.1%	10.0%
5.8%	5.6%	8.9%	4.7%	5.0%	5.6%	7.6%
3.0%	5.7%	3.8%	2.2%	1.9%	2.2%	3.3%
4.1%	4.3%	3.9%	2.4%	1.8%	1.1%	2.3%
2.1%	2.4%	4.6%	3.0%	1.6%	2.8%	3.9%
1.5%	2.4%	2.1%	0.6%	0.5%	0.3%	2.6%
1.0%	0.5%	0.8%	0.4%	0.5%	0.5%	0.6%
16.4%	20.3%	21.5%	14.8%	13.2%	13.9%	18.3%

**Graph 2.6 Proportion of homeowner households that added energy-saving devices**



**Table 2.6.2.1**  
**Homeowner households that added energy-saving devices**  
**by period of construction and type of dwelling**

**Canada**

<b>Period of construction of dwelling</b>	<b>Total</b>	<b>Before 1941</b>	<b>1941 - 1960</b>	<b>1961 - 1980</b>	<b>After 1980</b>
<b>Number of owners ('000)</b>	7 121	1 031	1 315	2 732	2 043
Low-flow shower head	10.0%	9.0%	7.9%	10.8%	10.8%
Replace bulbs with fluorescent	7.0%	6.7%	6.6%	6.8%	7.5%
Aerator on hot water faucet	3.7%	3.3%	3.2%	4.0%	3.9%
Insulation on hot water pipes	3.4%	4.1%	2.8%	3.3%	3.6%
Programmable thermostat	3.4%	3.2%	3.2%	3.4%	3.4%
Insulation on water heater	1.9%	2.2%	1.9%	2.0%	1.7%
Insulation/sealing of hot air ducts	0.7%	0.5%	0.4%	0.6%	0.9%
Addition of at least one device	19.0%	18.6%	17.1%	19.4%	19.8%
<b>Type of dwelling</b>	<b>Total</b>	<b>Detached house</b>	<b>Attached house</b>	<b>Duplex</b>	<b>Apartment</b>
<b>Number of owners ('000)</b>	7 121	5 949	630	134	408
Low-flow shower head	10.0%	10.1%	11.3%	6.8%	7.3%
Replace bulbs with fluorescent	7.0%	7.0%	7.6%	4.0%	6.2%
Aerator on hot water faucet	3.7%	3.7%	4.3%	3.6%	3.4%
Insulation on hot water pipes	3.4%	3.7%	2.5%	2.1%	1.2%
Programmable thermostat	3.4%	3.5%	3.4%	1.1%	2.4%
Insulation on water heater	1.9%	1.9%	2.0%	1.5%	1.5%
Insulation/sealing of hot air ducts	0.7%	0.7%	0.5%	0.2%	0.1%
Addition of at least one device	19.0%	19.4%	19.8%	12.9%	14.4%

**Table 2.6.2.2**  
**Homeowner households that added energy-saving devices**  
**by age of the head of the household and household income**

**Canada**

<b>Age of head of household</b>	<b>Total</b>	<b>Younger than 35 years</b>	<b>35 - 49 years</b>	<b>50 - 64 years</b>	<b>65 years and older</b>
<b>Number of owners ('000)</b>	7 121	1 189	2 653	1 798	1 481
Low-flow shower head	10.0%	13.9%	11.9%	8.8%	5.0%
Replace bulbs with fluorescent	7.0%	8.6%	8.7%	5.8%	3.9%
Aerator on hot water faucet	3.7%	4.1%	4.8%	3.5%	1.9%
Insulation on hot water pipes	3.4%	5.1%	4.0%	2.9%	1.5%
Programmable thermostat	3.4%	4.9%	3.8%	3.0%	1.7%
Insulation on water heater	1.9%	2.5%	2.3%	1.6%	1.1%
Insulation/sealing of hot air ducts	0.7%	0.9%	0.8%	0.5%	0.4%
Addition of at least one device	19.0%	25.3%	22.0%	17.0%	11.1%
<b>Household income</b>	<b>Total</b>	<b>Less than \$30 000</b>	<b>\$30 000 to \$50 000</b>	<b>\$50 000 to \$80 000</b>	<b>\$80 000 and higher</b>
<b>Number of owners ('000)</b>	7 121	1 801	1 873	2 119	1 328
Low-flow shower head	10.0%	6.7%	10.4%	12.0%	11.7%
Replace bulbs with fluorescent	7.0%	4.5%	7.1%	8.0%	8.7%
Aerator on hot water tap	3.7%	3.0%	3.7%	4.2%	4.4%
Insulation on hot water pipes	3.4%	2.6%	3.5%	4.3%	3.1%
Programmable thermostat	3.4%	1.7%	2.7%	4.4%	5.2%
Insulation on water heater	1.9%	1.5%	1.8%	2.3%	1.9%
Insulation/sealing of hot air ducts	0.7%	0.4%	0.4%	0.9%	0.9%
Addition of at least one device	19.0%	13.3%	19.4%	21.8%	23.1%

## 2.7 Motivation of homeowner households to make improvements or changes

The main reason homeowner households improved insulation or made improvements to doors or windows was to save energy: 70.8% of households gave this reason. Comfort (44.3%), maintenance (37.0%), appearance (29.3%) and resale value of the house (13.5%) followed in order of decreasing importance. Concern for the environment (6.5%) and the addition of living space (5.3%) remained secondary considerations. The same trend was observed in all provinces. At most, there was a less pronounced gap between energy saving and comfort in Alberta (55.7% vs. 51.3%) and Prince Edward Island (57.1% vs. 49.2%) and less frequent mention of comfort as a reason in Manitoba (29.8%).

There was little significant variation in the reasons given from one segment to another based on period of construction of the building, type of dwelling, age of the head of the household or household income. In the case of changes, additions and upgrades to heating or ventilation equipment, energy-saving was again the reason given most often (61.0%). Equal importance was given to maintenance (31.3%) and comfort (30.9%). Concern for the environment (10.0%), resale value of the house (6.8%) or the addition of living space (3.2%) were given as reasons less frequently.

This overall trend was observed in each of the provinces, with a few slight variations. For example, energy saving was less important in Alberta (47.8%) and Prince Edward Island (47.2%). Further, while equal importance was attributed to comfort and maintenance nationally, the breakdown revealed different priorities in certain provinces: maintenance was cited more frequently in Nova Scotia (37.4%) and Manitoba (41.7%), while comfort ranked higher in Newfoundland (44.1%) and British Columbia (36.7%).

In terms of the motivation for changes, additions and upgrades to heating or ventilation equipment, maintenance was mentioned more often by owners of homes dating before 1941 (39.2%) than those whose residences were built after 1980 (24.2%).

**Table 2.7.1**  
**Motivation of homeowner households**  
**to make improvements to insulation, doors or windows**  
**or to make changes, additions and upgrades**  
**to heating and ventilation equipment**

***Canada and provinces***

	Canada	Newfound- land	Prince Edward Island	Nova Scotia
<b><i>(A) Improvements to insulation, doors or windows</i></b>				
<b>Number of owners ('000)</b>	<b>952</b>	<b>29</b>	<b>5</b>	<b>39</b>
Energy saving	70.8%	70.7%	57.1%	68.4%
Comfort	44.3%	49.3%	49.2%	46.0%
Maintenance	37.0%	49.3%	43.2%	40.3%
Appearance	29.3%	22.7%	34.4%	21.3%
Resale value of house	13.5%	11.0%	14.6%	6.9%
Concern for the environment	6.5%	5.2%	1.5%	6.0%
Addition to living space	5.3%	6.2%	1.4%	6.6%
<b><i>(B) Changes, additions and upgrades to heating or ventilation equipment</i></b>				
<b>Number of owners ('000)</b>	<b>1 466</b>	<b>24</b>	<b>7</b>	<b>53</b>
Energy saving	61.0%	52.6%	47.2%	57.4%
Maintenance	31.3%	29.3%	36.1%	37.4%
Comfort	30.9%	44.1%	35.6%	26.2%
Concern for the environment	10.0%	6.7%	3.5%	5.1%
Resale value of house	6.8%	4.9%	3.7%	2.6%
Addition of living space	3.2%	6.8%	1.9%	2.9%

Note: Provincial estimates below 10% have a high coefficient of variation (C.V.) and should be used with caution.

Table 2.7.1 (continued)

New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
<b>29</b>	<b>213</b>	<b>380</b>	<b>42</b>	<b>32</b>	<b>92</b>	<b>91</b>
76.1%	74.9%	71.9%	64.0%	70.7%	55.7%	77.2%
45.7%	40.9%	43.2%	29.8%	39.8%	51.3%	55.1%
38.2%	28.7%	42.1%	46.1%	39.4%	36.4%	26.8%
31.5%	24.0%	34.0%	29.7%	23.6%	27.8%	29.7%
15.9%	11.7%	14.5%	8.9%	7.8%	12.0%	22.3%
7.7%	3.6%	7.9%	4.8%	3.6%	4.1%	11.5%
6.7%	5.0%	6.0%	3.2%	2.8%	3.8%	5.0%
<b>37</b>	<b>349</b>	<b>612</b>	<b>45</b>	<b>39</b>	<b>102</b>	<b>198</b>
63.1%	59.5%	65.5%	52.9%	55.7%	47.8%	63.3%
31.7%	27.1%	31.4%	41.7%	41.0%	37.8%	28.2%
28.1%	29.1%	30.5%	21.6%	17.9%	36.3%	36.7%
10.5%	6.2%	11.7%	8.8%	5.3%	12.3%	13.4%
8.2%	3.9%	7.3%	6.2%	6.7%	6.9%	12.1%
3.2%	2.1%	3.0%	3.3%	3.5%	5.1%	2.8%

Note: Provincial estimates below 10% have a high coefficient of variation (C.V.) and should be used with caution.

**Table 2.7.2.1**  
**Motivation of homeowner households**  
**to make improvements to insulation, doors or windows**  
**by period of construction and type of dwelling**

**Canada**

<b>Period of construction of dwelling</b>	<b>Total</b>	<b>Before 1941</b>	<b>1941 - 1960</b>	<b>1961 - 1980</b>	<b>After 1980</b>
<b>Number of owners ('000)</b>	952	187	198	382	185
Energy saving	70.8%	72.0%	70.8%	69.7%	72.2%
Comfort	44.3%	47.7%	43.1%	43.7%	43.7%
Maintenance	37.0%	39.0%	37.5%	40.0%	28.6%
Appearance	29.3%	29.5%	33.4%	31.0%	21.1%
Resale value of house	13.5%	14.2%	12.7%	14.9%	10.8%
Concern for the environment	6.5%	7.3%	4.8%	6.9%	6.2%
Addition of living space	5.3%	4.9%	5.4%	4.1%	8.5%

<b>Type of dwelling</b>	<b>Total</b>	<b>Detached house</b>	<b>Attached house*</b>	<b>Duplex*</b>	<b>Apartment*</b>
<b>Number of owners ('000)</b>	952	821	77	20	34
Energy saving	70.8%	71.0%	67.3%	80.8%	67.8%
Comfort	44.3%	44.1%	49.6%	43.3%	39.9%
Maintenance	37.0%	36.9%	36.2%	40.6%	38.8%
Appearance	29.3%	29.9%	30.9%	19.9%	15.3%
Resale value of house	13.5%	13.6%	12.8%	10.7%	13.0%
Concern for the environment	6.5%	6.4%	7.4%	11.8%	3.7%
Addition of living space	5.3%	5.5%	3.8%	6.9%	4.1%

\*For these categories, estimates below 10% have a high coefficient of variation (C.V.) and should be used with caution.



**Table 2.7.2.2.**  
**Motivation of homeowner households to make improvements to insulation, doors or windows according to the age of the head of the household and household income**

**Canada**

<b>Age of head of household</b>	<b>Total</b>	<b>Younger than 35 years</b>	<b>35 - 49 years</b>	<b>50 - 64 years</b>	<b>65 years and older</b>
<b>Number of owners ('000)</b>	952	206	396	217	133
Energy saving	70.8%	73.4%	71.2%	71.7%	64.4%
Comfort	44.3%	46.5%	43.6%	43.8%	44.2%
Maintenance	37.0%	34.1%	36.6%	36.2%	44.0%
Appearance	29.3%	27.4%	29.1%	31.6%	28.9%
Resale value of house	13.5%	15.3%	14.6%	11.8%	10.2%
Concern for the environment	6.5%	6.8%	7.8%	6.0%	2.7%
Addition of living space	5.3%	9.2%	5.6%	3.8%	1.2%
<b>Household income</b>	<b>Total</b>	<b>Less than \$30 000</b>	<b>\$30 000 to \$50 000</b>	<b>\$50 000 to \$80 000</b>	<b>\$80 000 and higher</b>
<b>Number of owners ('000)</b>	952	204	231	315	202
Energy saving	70.8%	67.6%	72.2%	74.0%	68.1%
Comfort	44.3%	42.7%	43.3%	46.8%	44.6%
Maintenance	37.0%	36.9%	35.8%	38.9%	35.2%
Appearance	29.3%	24.5%	27.4%	33.0%	30.4%
Resale value of house	13.5%	10.3%	13.9%	16.3%	13.0%
Concern for the environment	6.5%	4.8%	4.8%	8.6%	6.8%
Addition of living space	5.3%	3.1%	5.7%	6.3%	5.6%

**Table 2.7.3.1**  
**Motivation of homeowner households**  
**to make changes, additions and upgrades**  
**to heating and ventilation equipment**  
**by period of construction and type of dwelling**

**Canada**

<b>Period of construction of dwelling</b>	<b>Total</b>	<b>Before 1941</b>	<b>1941 - 1960</b>	<b>1961 - 1980</b>	<b>After 1980</b>
<b>Number of owners ('000)</b>	1 466	210	254	570	432
Energy saving	61.0%	55.2%	63.7%	59.9%	64.0%
Maintenance	31.3%	39.2%	32.5%	33.6%	24.2%
Comfort	30.9%	32.2%	31.2%	27.6%	34.2%
Concern for the environment	10.0%	8.7%	7.2%	9.1%	13.2%
Resale value of house	6.8%	7.3%	5.0%	7.5%	6.5%
Addition of living space	3.2%	4.2%	3.1%	2.9%	3.0%
<b>Type of dwelling</b>	<b>Total</b>	<b>Detached house</b>	<b>Attached house*</b>	<b>Duplex*</b>	<b>Apartment*</b>
<b>Number of owners ('000)</b>	1 466	1 256	132	19	59
Energy saving	61.0%	61.5%	59.3%	61.0%	54.7%
Maintenance	31.3%	30.7%	33.8%	38.8%	36.3%
Comfort	30.9%	31.7%	27.0%	21.5%	23.5%
Concern for the environment	10.0%	9.4%	16.3%	11.4%	9.8%
Resale value of house	6.8%	6.7%	8.9%	8.9%	4.0%
Addition of living space	3.2%	3.5%	1.4%	2.9%	0.0%

\*For these categories, estimates below 10% have a high coefficient of variation (C.V.) and should be used with caution.

**Table 2.7.3.2**  
**Motivation of homeowner households**  
**to make changes, additions and upgrades**  
**to heating and ventilation equipment according to**  
**the age of the head of the household and household income**

**Canada**

<b>Age of head of household</b>	Total	Younger than 35 years	35 - 49 years	50 - 64 years	65 years and older
<b>Number of owners ('000)</b>	1 466	318	629	332	187
Energy saving	61.0%	62.9%	63.0%	58.8%	55.2%
Maintenance	31.3%	29.4%	30.2%	32.0%	37.1%
Comfort	30.9%	29.1%	32.9%	29.5%	29.3%
Concern for the environment	10.0%	12.8%	9.7%	9.2%	8.0%
Resale value of house	6.8%	8.7%	6.9%	5.3%	6.1%
Addition of living space	3.2%	4.6%	3.3%	2.7%	1.1%
<b>Household income</b>	Total	Less than \$30 000	\$30 000 to \$50 000	\$50 000 to \$80 000	\$80 000 and higher
<b>Number of owners ('000)</b>	1 466	277	364	498	323
Energy saving	61.0%	57.0%	60.0%	63.9%	62.1%
Maintenance	31.3%	33.4%	33.3%	30.3%	29.3%
Comfort	30.9%	29.4%	28.7%	30.9%	33.4%
Concern for the environment	10.0%	7.9%	9.2%	11.1%	10.6%
Resale value of house	6.8%	5.5%	6.6%	7.8%	5.6%
Addition of living space	3.2%	3.2%	2.8%	3.0%	3.9%

**APPENDIX 1**

**SUMMARY OF METHODOLOGY**

## METHODOLOGY

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The *Home Energy Retrofit Survey* expands the scope of the Statistics Canada 1994 *Homeowner Repair and Renovation Survey* (HRRS), which was conducted as a supplement to the *Labour Force Survey* (LFS) of March 1995.

The HRRS sample initially consisted of four of the six rotating groups of the LFS. Among these households, only those identified as homeowner households in the LFS of March 1995 were invited to participate in the HRRS and ultimately responded to the series of questions dealing specifically with the survey of home energy retrofit activities.

The results presented in this document are based on the responses of 21,153 households. The sample breaks down as follows:

Newfoundland	947
Prince Edward Island	540
Nova Scotia	1 376
New Brunswick	1 266
Quebec	3 903
Ontario	5 856
Manitoba	1 748
Saskatchewan	1 545
Alberta	1 931
British Columbia	2 041

For more information on this survey, the reader is invited to consult the Statistics Canada publication, *Homeowner Repair and Renovation Expenditure in Canada, 1994* (Cat. No. 62-201-XPB).

## **APPENDIX 2**

### **LIST OF REPORTS PRODUCED BY THE NATIONAL ENERGY USE DATABASE**

## LIST OF REPORTS PRODUCED BY THE NATIONAL ENERGY USE DATABASE

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- *1993 Survey of Household Energy Use - National Results*; Catalogue no. M92-85/1994F; ISBN 0-662-99579-1.
- *1993 Survey of Household Energy Use - Provincial Results*; Catalogue no. M92-96/1995; ISBN 0-662-61978-1.
- *Household Equipment of Canadians - Features of the 1993 Stock and the 1994 and 1995 Purchases*; Catalogue no. M92-131/1997; ISBN 0-662-62806-3.
- *Survey of new household equipment purchases in Canada, 1994 and 1995*; Catalogue no. M92-133/1997; ISBN 0-662-62902-7.
- *Survey of residential construction in Canada in 1994*; Catalogue no. M92-136/1994; ISBN 0-662-62970-1.
- *1994 Home Energy Retrofit Survey*; Catalogue no. M92-135/1994; ISBN 0-662-62969-8.

**APPENDIX 3**

**QUESTIONNAIRE**



1995 Home Energy Retrofit Survey Specs, February 9th, 1996

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HECS-C1 IF HRRS-Q1 =12 GO TO HECS-I1 OTHERWISE GO TO END-I2

---

HECS-I1 THE FOLLOWING QUESTIONS HAVE BEEN SPONSORED BY NATURAL RESOURCES CANADA TO STUDY THE CHANGE OF ENERGY CHARACTERISTICS OF CANADIAN HOMES.

*Default Next Question: HECS-I2*

---

HECS-I2 THESE QUESTIONS ARE ASKED REGARDLESS OF EXPENDITURES BECAUSE WORK MAY HAVE BEEN CONDUCTED AT NO COST (EXAMPLE: THE MATERIALS USED WERE BOUGHT BEFORE %YR%, A FRIEND HELPED YOU AT NO COST, ETC.)

*Default Next Question: HECS-Q1*

---

HECS-Q1 IN %YR%, WERE ANY IMPROVEMENTS MADE TO THE INSULATION OF YOUR DWELLING?

- 1 Yes *go to HECS-Q2*
- 2 No
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q5*

---

HECS-Q2 WERE ANY IMPROVEMENTS MADE TO THE INSULATION OF...

(Read list and mark all that apply)

- 1 WALLS (EXCLUDE BASEMENT)?
- 2 BASEMENT WALLS?
- 3 THE ROOF OR ATTIC?
- 4 BASEMENT FLOORS? (EXCLUDE CARPETING)
- 5 THE GARAGE?
- 6 OTHER AREAS?
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C2*

---

HECS-C2 IF HECS-Q2 = 1 GO TO HECS-Q3 OTHERWISE GO TO HECS-C3

---

HECS-Q3 WAS THE WALL INSULATION (EXCLUDING BASEMENT) ADDED TO THE OUTSIDE (DEFINED AS THE EXTERIOR OF FRAME BEFORE SIDING) OR PUT INSIDE THE WALLS ?

(Read list and mark one only)

- 1 OUTSIDE
- 2 INSIDE
- 3 BOTH
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C3*

---

HECS-C3 IF HECS-Q2 = 2 GO TO HECS-Q4 OTHERWISE GO TO HECS-C4a

---

HECS-Q4 WAS THE BASEMENT WALL INSULATION ADDED TO THE OUTSIDE OR PUT

## INSIDE THE WALLS?

(Read list and mark one only)

- 1 OUTSIDE
- 2 INSIDE
- 3 BOTH
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C4*

HECS-C4 IF HECS-Q4 = 2 OR HECS-Q4 = 3 GO TO HECS-Q4a OTHERWISE GO TO HECS-C4a

HECS-Q4a DID THE IMPROVEMENT OF BASEMENT WALL INSULATION INVOLVE...

(Read list and mark all that apply)

- 1 A REPLACEMENT (REPLACED OR UPGRADED EXISTING INSULATION)
- 2 A NEW INSTALLATION (TO WALL SPACE NOT PREVIOUSLY INSULATED)
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C4a*

HECS-C4a IF HECS-Q2 = 2 OR HECS-Q2=4 GO TO HECS-Q5a OTHERWISE GO TO HECS-Q5

HECS-Q5 IN %YR%, DID YOU HAVE A BASEMENT?

- 1 Yes *go to HECS-Q5a*
- 2 No
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q7*

HECS-Q5a WAS YOUR BASEMENT HEATED (PARTIALLY OR COMPLETELY)?

- 1 Yes
- 2 No
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q5b*

HECS-Q5b IN %YR% , WAS YOUR BASEMENT A NEW (PARTIALLY OF COMPLETELY) HEATED SPACE?

- 1 Yes
- 2 No
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q6*

HECS-Q6 HOW WOULD YOU CURRENTLY DESCRIBE THE INSULATION IN YOUR INTERIOR BASEMENT WALLS?

(Read list and Mark all that apply)

- 1 VERY LITTLE OR NO INSULATION IN WALLS
- 2 INSULATION ON TOP HALF OF WALLS ONLY
- 3 INSULATION FROM CEILING TO FLOOR
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q7*

---

HECS-Q7 IN %YR%, WERE ANY IMPROVEMENTS MADE TO YOUR WINDOWS?

- 1 Yes *go to HECS-Q7a*
- 2 No
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q8*

---

HECS-Q7a WERE THEY...

(Read list and mark all that apply)

- 1 UPGRADES FROM SINGLE PANE TO DOUBLE PANE?
- 2 UPGRADES FROM DOUBLE PANE TO TRIPLE PANE?
- 3 UPGRADES WITH THE SAME NUMBER OF PANES AS BEFORE?
- 4 IMPROVED CAULKING OR WEATHERSTRIPPING?
- 5 AN ADDITION OF NEW STORM WINDOWS TO SINGLE PANE WINDOWS?
- 6 OTHER TYPES OF IMPROVEMENTS?
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C7a*

---

HECS-C7a IF HECS-Q7a = 1 GO TO HECS-Q7b OTHERWISE GO TO HECS-C7b

---

HECS-Q7b HOW MANY OF YOUR WINDOWS WERE UPGRADED FROM SINGLE PANE TO DOUBLE PANE?

(Read list and mark one only)

- 1 ALL
- 2 MOST
- 3 HALF
- 4 LESS THAN HALF
- 5 ONE
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C7b*

---

HECS-C7b IF HECS-Q7a = 2 GO TO HECS-Q7c OTHERWISE GO TO HECS-C7c

---

HECS-Q7c HOW MANY OF YOUR WINDOWS WERE UPGRADED FROM DOUBLE PANE TO TRIPLE PANE?

(Read list and mark one only)

- 1 ALL
- 2 MOST
- 3 HALF
- 4 LESS THAN HALF
- 5 ONE

- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C7c*

HECS-C7c IF HECS-Q7a = 3 GO TO HECS-Q7d OTHERWISE GO TO HECS-C7d

HECS-Q7d HOW MANY OF YOUR WINDOWS WERE UPGRADED WITH THE SAME NUMBER OF PANES AS BEFORE?

(Read list and mark one only)

- 1 ALL
- 2 MOST
- 3 HALF
- 4 LESS THAN HALF
- 5 ONE

- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C7d*

HECS-C7d IF HECS-Q7a = 4 GO TO HECS-Q7e OTHERWISE GO TO HECS-C7e

HECS-Q7e TO HOW MANY OF YOUR WINDOWS DID YOU IMPROVE THE CAULKING OR WEATHERSTRIPPING?

(Read list and mark one only)

- 1 ALL
- 2 MOST
- 3 HALF
- 4 LESS THAN HALF
- 5 ONE

- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C7e*

HECS-C7e IF HECS-Q7a = 5 GO TO HECS-Q7f OTHERWISE GO TO HECS-Q8

HECS-Q7f TO HOW MANY OF YOUR SINGLE PANE WINDOWS DID YOU ADD STORM WINDOWS?

(Read list and mark one only)

- 1 ALL
- 2 MOST
- 3 HALF
- 4 LESS THAN HALF
- 5 ONE

- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q8*

---

HECS-Q8 IN %YR%, WERE ANY IMPROVEMENTS MADE TO THE EXTERIOR DOORS OF YOUR DWELLING?

- 1 Yes *go to HECS-Q8a*  
 2 No  
 -2 Don't Know  
 -1 Refusal

*Default Next Question: HECS-Q9*

---

HECS-Q8a WERE THEY...

(Read list and mark all that apply)

- 1 UPGRADES FROM WOOD DOOR TO A METAL DOOR?  
 2 UPGRADES FROM/TO ANY OTHER TYPE OF DOOR?  
 3 AN ADDITION OF NEW STORM DOORS?  
 4 IMPROVED CAULKING OR WEATHERSTRIPPING?  
 5 OTHER TYPES OF IMPROVEMENTS?  
 -2 Don't Know  
 -1 Refusal

*Default Next Question: HECS-C8a*

---

HECS-C8a IF HECS-Q8a = 1 GO TO HECS-Q8b OTHERWISE GO TO HECS-C8b

---

HECS-Q8b HOW MANY OF YOUR DOORS WERE UPGRADED FROM WOOD TO METAL?

(Read list and mark one only)

- 1 ALL  
 2 ONE  
 3 OTHER (Please SPECIFY)  
 -2 Don't Know  
 -1 Refusal

*Default Next Question: HECS-C8b*

---

HECS-C8b IF HECS-Q8a = 3 GO TO HECS-Q8c OTHERWISE GO TO HECS-C8c

---

HECS-Q8c TO HOW MANY OF YOUR DOORS DID YOU ADD STORM DOORS?

(Read list and mark one only)

- 1 ALL  
 2 ONE  
 3 OTHER (Please SPECIFY)  
 -2 Don't Know  
 -1 Refusal

*Default Next Question: HECS-C8c*

---

HECS-C8c IF HECS-Q8a = 4 GO TO HECS-Q8d OTHERWISE GO TO HECS-Q9

---

HECS-Q8d TO HOW MANY OF YOUR DOORS DID YOU IMPROVE THE CAULKING OR WEATHERSTRIPPING?

(Read list and mark one only)

- 1 ALL
- 2 ONE
- 3 OTHER (Please SPECIFY)
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q9*

---

HECS-Q9 IN %YR%, WERE ANY MECHANICAL VENTILATION SYSTEMS INSTALLED OR UPGRADED IN YOUR DWELLING? (THIS REFERS ONLY TO SYSTEMS THAT BRING FRESH AIR TO THE HOUSE AND/OR EXHAUST STALE AIR)

- 1 Yes *go to HECS-Q9a*
- 2 No
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C9b*

---

HECS-Q9a DID YOU ...

(Read list and mark all that apply)

- 1 INSTALL A CENTRAL VENTILATION SYSTEM  
(AIR EXCHANGER) *go to HECS-Q9b*
- 2 INSTALL EXHAUST FAN(S)  
(SUCH AS BATHROOM FANS)
- 3 UPGRADED OR FIXED EXISTING EXHAUST FAN(S)
- 4 OTHER (please SPECIFY)
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C9b*

---

HECS-Q9b DOES THIS SYSTEM HAVE HEAT RECOVERY?

- 1 Yes
- 2 No
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C9b*

---

HECS-C9b IF ROTATION = 5 GO TO HECS-Q10 OTHERWISE GO TO HECS-Q10a

---

HECS-Q10 WHAT TYPE OF PRINCIPAL HEATING EQUIPMENT DO YOU CURRENTLY USE IN YOUR DWELLING?

(Read list and mark <sup>1</sup>one only)

- 1 STEAM OR HOT WATER BOILER (FURNACE)
- 2 FORCED HOT AIR FURNACE
- 3 OTHER TYPE OF HOT AIR FURNACE
- 4 ELECTRIC BASEBOARD OR HEAT PUMPS
- 5 COOKSTOVE OR HEATING STOVE
- 6 OTHER (SPECIFY IN NOTES)
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q10a*

---

HECS-Q10a IN %YR%, WAS THE PRINCIPAL HEATING EQUIPMENT IN YOUR DWELLING CHANGED?

- 1 Yes *go to HECS-Q10b*
- 2 No
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C10b*

---

HECS-Q10b WHAT TYPE OF PRINCIPAL HEATING EQUIPMENT DID YOU PREVIOUSLY USE IN YOUR DWELLING BEFORE THE CHANGE IN %YR%?

(Read list and mark one only)

- 1 STEAM OR HOT WATER BOILER (FURNACE)
- 2 FORCED HOT AIR FURNACE
- 3 OTHER TYPE OF HOT AIR FURNACE
- 4 ELECTRIC BASEBOARD OR HEAT PUMPS
- 5 COOKSTOVE OR HEATING STOVE
- 6 OTHER (SPECIFY IN NOTES)
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C10b*

---

HECS-C10b IF ROTATION = 5 GO TO HECS-Q11 OTHERWISE GO TO HECS-Q11a

---

HECS-Q11 WHICH FUEL OR ENERGY SOURCE DOES YOUR PRINCIPAL HEATING SYSTEM CURRENTLY USE?

(Read list and mark all that apply)

- 1 ELECTRICITY
- 2 COAL
- 3 WOOD
- 4 PROPANE
- 5 NATURAL GAS
- 6 OIL
- 7 OTHER
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q11a*

---

HECS-C11 IF MORE THAN 1 MARKED GO TO HECS-Q11a OTHERWISE GO TO HECS-Q11b

---

HECS-Q11a IS THIS A BI-ENERGY SYSTEM?

- 1 Yes
- 2 No
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q11b*

---

HECS-Q11b IN %YR%, DID YOU CHANGE THE HEATING FUEL OR ENERGY SOURCE OF

## YOUR PRINCIPAL HEATING SYSTEM?

- 1 Yes
- 2 No
- 2 Don't Know
- 1 Refusal

go to HECS-Q11c

*Default Next Question: HECS-Q12*

HECS-Q11c WHICH FUEL OR ENERGY SOURCE DID YOUR PRINCIPAL HEATING SYSTEM USE BEFORE THE CHANGE IN %YR%?

(Read list and mark all that apply)

- 1 ELECTRICITY
- 2 COAL
- 3 WOOD
- 4 PROPANE
- 5 NATURAL GAS
- 6 OIL
- 7 OTHER
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C11c*

HECS-C11c IF MORE THAN 1 ANSWER MARKED GO TO HECS-Q11d OTHERWISE GO TO HECS-Q12

HECS-Q11d WAS THIS A BI-ENERGY SYSTEM?

- 1 Yes
- 2 No
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q12*

HECS-Q12 IN %YR%, WERE ANY REPLACEMENTS OR UPGRADES MADE TO THE HEATING EQUIPMENT THAT WAS USED AS YOUR PRINCIPAL HEATING SYSTEM?

- 1 Yes
- 2 No
- 2 Don't Know
- 1 Refusal

go to HECS-Q12a

*Default Next Question: HECS-C12a*

HECS-Q12a WERE THEY...

(Read list and mark all that apply)

- 1 REPLACEMENT OF BURNER
- 2 INSTALLATION OF A NEW FURNACE OR BOILER
- 3 ADDITION (NOT REPLACEMENT) OF ELECTRIC  
BASEBOARD HEATERS
- 4 OTHER UPGRADES OR REPLACEMENTS
- 2 Don't Know

go to HECS-Q12b



-1 Refusal

*Default Next Question: HECS-Q13*

---

HECS-Q12b WAS THIS A MID OR HIGH-EFFICIENCY GAS FURNACE OR BOILER?

- 1 Yes
- 2 No

-2 Don't Know  
-1 Refusal

*Default Next Question: HECS-Q13*

---

HECS-Q13 WHAT TYPE OF PRINCIPAL TAP WATER HEATING SYSTEM DO YOU CURRENTLY USE?

(Read list and mark one only)

- 1 STANDARD WATER HEATER
- 2 HIGH-EFFICIENCY WATER HEATER
- 3 COMBINED WATER HEATING SYSTEM
- 4 OIL-FIRED WATER HEATER
- 5 ELECTRIC WATER HEATER
- 6 OTHER (SPECIFY IN NOTES)

-2 Don't Know  
-1 Refusal

*Default Next Question: HECS-Q13a*

---

HECS-Q13a IN %YR%, WAS THE PRINCIPAL  WATER HEATING SYSTEM IN YOUR DWELLING CHANGED?

- 1 Yes
- 2 No

*go to HECS-Q13b*

-2 Don't Know  
-1 Refusal

*Default Next Question: HECS-Q14*

---

HECS-Q13b WHAT TYPE OF PRINCIPAL WATER HEATING SYSTEM DID YOU PREVIOUSLY USE BEFORE THE CHANGE IN %YR%?

(Read list and mark one only)

- 1 STANDARD WATER HEATER
- 2 HIGH-EFFICIENCY WATER HEATER
- 3 COMBINED WATER HEATING SYSTEM
- 4 OIL-FIRED WATER HEATER
- 5 ELECTRIC WATER HEATER
- 6 OTHER (SPECIFY IN NOTES)

-2 Don't Know  
-1 Refusal

*Default Next Question: HECS-Q14*

---

HECS-Q14 DID YOU ADD A HEAT PUMP IN %YR%?

- 1 Yes
- 2 No

*go to HECS-Q14a*

- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q15*

---

HECS-Q14a IS THE HEAT PUMP AIR SOURCE OR GROUND SOURCE (WATER SOURCE)?

(Read list and mark one only)

- 1 AIR SOURCE
- 2 GROUND SOURCE

- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q15*

---

HECS-Q15 WHICH OF THE FOLLOWING ENERGY SAVING FEATURES WERE ADDED TO YOUR DWELLING IN %YR% TO REDUCE ENERGY CONSUMPTION?

(Read list and mark all that apply)

- 1 PROGRAMMABLE THERMOSTAT
- 2 INSULATION BLANKET AROUND OUTSIDE OF HOT WATER TANK
- 3 INSULATION AROUND HOT WATER SYSTEM PIPES
- 4 INSULATION AROUND THE HOT AIR DUCTS FROM THE FURNACE AND/OR SEALING OF LEAKY DUCTWORK
- 5 LOW FLOW SHOWER HEADS
- 6 ATTACHMENT TO HOT WATER FAUCETS TO REDUCE WATER FLOW (COMMONLY CALLED AN AERATOR)
- 7 FLUORESCENT LIGHTS TO REPLACE CONVENTIONAL LIGHT BULBS
- 8 OTHER (SPECIFY IN NOTES)
- 9 NONE

- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C15*

---

HECS-C15 IF HECS-Q15 =9 AND HECS-Q15 = 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 DISPLAY EDIT MESSAGE "PLEASE VERIFY QUESTION HECS-Q15 BECAUSE "NONE" IS NOT COMPATIBLE WITH OTHER RESPONSES" OTHERWISE GO TO HECS-Q16

---

HECS-Q16 APPROXIMATELY, WHAT IS THE TOTAL HEATED LIVING AREA OF YOUR DWELLING? (EXCLUDE GARAGES AND BEDROOMS OR LIVING ROOMS IN BASEMENT)

|\_|\_|\_|\_|

- 2 Don't Know
- 1 Refusal

Range:            Minimum: 0001            Soft Minimum: 0001  
                          Maximum: 9999            Soft Maximum: 5000

*Default Next Question: HECS-Q16b*

---

HECS-Q16b Was this...

(Mark one only)

- 1 in square feet
  - 2 in square metres
  - 3 the total number of heated rooms
  - 4 in other units (please comment)
- 2 Don't Know
  - 1 Refusal

*Default Next Question: HECS-Q17*

---

HECS-Q17 IN %YR%, WERE THERE ANY STRUCTURAL EXTENSIONS OR RENOVATIONS MADE TO YOUR DWELLING WHICH ADDED TO THE HEATED FLOOR SPACE? (EXAMPLE: EXPANSION OF EXTERIOR WALLS TO ENLARGE FLOOR SPACE, ADDITION OF HEATED ROOMS, SOLARIUMS AND SUNROOMS)

- 1 Yes go to HECS-Q17a
  - 2 No
- 2 Don't Know
  - 1 Refusal

*Default Next Question: HECS-Q18*

---

HECS-Q17a WHAT IS THE SIZE OF THE FLOOR SPACE WHICH WAS ADDED?

|\_|\_|\_|\_|

- 2 Don't Know
- 1 Refusal

Range:            Minimum: 0001            Soft Minimum: 0001  
                          Maximum: 9999            Soft Maximum: 3000

*Default Next Question: HECS-Q17b*

---

HECS-Q17b Was this...

(Mark one only)

- 1 in square feet
  - 2 in square metres
  - 3 the total number of heated rooms
  - 4 in other units (please comment)
- 2 Don't Know
  - 1 Refusal

*Default Next Question: HECS-Q18*

---

HECS-Q18 DID YOU ADD A FIREPLACE IN YOUR DWELLING IN %YR%?

- 1 Yes go to HECS-Q18a
  - 2 No
- 2 Don't Know
  - 1 Refusal

*Default Next Question: HECS-Q18d*

---

HECS-Q18a IS IT WOOD BURNING OR GAS BURNING?

(Read list and mark one only)

- 1 WOOD

2 NATURAL GAS

-2 Don't Know

-1 Refusal

*Default Next Question: HECS-C18a*

HECS-C18a IF HECS-Q18a = 1 GO TO HECS-Q18b OTHERWISE GO TO HECS-C18b

HECS-Q18b IS YOUR WOOD BURNING FIREPLACE?

(Read list and mark all that apply)

1 A MASONRY (BRICK) FIREPLACE

2 A PREFAB METAL FIREPLACE

3 EQUIPPED WITH GLASS DOORS

4 AN ADVANCED COMBUSTION, HIGH EFFICIENCY FIREPLACE

-2 Don't Know

-1 Refusal

*Default Next Question: HECS-C18b*

HECS-C18b IF HECS-Q18a = 2 GO TO HECS-Q18c OTHERWISE GO TO HECS-Q18d

HECS-Q18c IS YOUR NATURAL GAS OR PROPANE BURNING FIREPLACE?

(Read list and mark all that apply)

1 A GAS LOG SET IN EXISTING  
FIREPLACE

2 NATURAL DRAFT GAS FIREPLACE WITH GLASS DOORS

3 POWER VENTED GAS FIREPLACE WITH GLASS DOORS

4 DIRECT VENT GAS FIREPLACE ( HIGH EFFICIENCY )

-2 Don't Know

-1 Refusal

*Default Next Question: HECS-Q18d*

HECS-Q18d IN %YR%, WERE THERE ANY UPGRADES OR ADDITIONS MADE TO YOUR  
FIREPLACE?

1 Yes

*go to HECS-Q18e*

2 No

-2 Don't Know

-1 Refusal

*Default Next Question: HECS-C18e*

HECS-Q18e WERE THEY...

(Read list and mark all that apply)

1 ADDITION OF A FIREPLACE INSERT TO THE EXISTING WOOD  
FIREPLACE

2 ADDITION OF GLASS DOORS TO THE EXISTING WOOD FIREPLACE

3 NEW INSTALLATION OF A WOOD FIREPLACE WITHOUT FIREPLACE  
INSERT

4 NEW INSTALLATION OF A WOOD FIREPLACE WITH  
FIREPLACE INSERT

5 CONVERSION OF THE EXISTING WOOD FIREPLACE TO A GAS FIREPLACE

6 OTHER TYPES OF UPGRADES OR ADDITIONS

- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C18e*

---

HECS-C18e IF HECS-Q1 = 1 OR HECS-Q7=1 OR HECS-Q8=1 GO TO HECS-Q19 OTHERWISE GO TO HECS-C19b

---

HECS-Q19 FOR THE WORK PERFORMED ON THE INSULATION, WINDOWS OR DOORS WHICH OF THE FOLLOWING REASONS MOTIVATED YOU TO DO IT?

(Do not read list and mark all that apply)

- 1 Maintenance
- 2 Appearance
- 3 Comfort
- 4 Energy savings
- 5 Addition of living space
- 6 Resale value of your home
- 7 Concern about the environment
- 8 Included in a renovation project
- 9 Indoor air quality/health
- 10 Other (SPECIFY in notes)

- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q19a*

---

HECS-Q19a FOR THE WORK PERFORMED ON THE INSULATION, WINDOWS OR DOORS WAS THE WORK DONE BY A CERTIFIED GENERAL CONTRACTOR?

- 1 Yes
- 2 No

- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q19b*

---

HECS-Q19b FOR THE WORK PERFORMED ON THE INSULATION, WINDOWS OR DOORS WHERE DID YOU GET THE INFORMATION THAT INFLUENCED YOUR CHOICE OF MATERIAL?

(Do not read list and mark all that apply)

- 1 Retail stores/home centers
- 2 Magazines/newspapers
- 3 Friends/relatives
- 4 Personal knowledge
- 5 Contractor
- 6 Other (SPECIFY in notes)

- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C19b*

---

HECS-C19b IF HECS-Q9=1 OR HECS-Q10a=1 OR HECS-Q11b=1 GO TO HECS-Q20 OTHERWISE GO TO HECS-C20

---

HECS-Q20 FOR THE CHANGES, ADDITIONS OR IMPROVEMENTS TO YOUR HEATING AND VENTILATION EQUIPMENT, WHICH OF THE FOLLOWING REASONS MOTIVATED YOU TO DO IT?

(Do not read list and mark all that apply)

- 1 Maintenance
- 2 Comfort
- 3 Energy savings
- 4 Addition of living space
- 5 Resale value of your home
- 6 Concern about the environment
- 7 Included in a renovation project
- 8 Indoor air quality health
- 9 Other (SPECIFY in notes)
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-C20*

---

HECS-C20 IF ROTATION = 5 GO TO HECS-Q21 OTHERWISE GO TO END-I2

---

HECS-Q21 WHEN WAS THIS DWELLING ORIGINALLY BUILT?

(Read list and mark one only)

- 1 BEFORE 1941
- 2 1941 - 1950
- 3 1951 - 1960
- 4 1961 - 1970
- 5 1971 - 1980
- 6 1981 - 1990
- 7 1991 - 1994
- 2 Don't Know
- 1 Refusal

*Default Next Question: HECS-Q22*

---

HECS-Q22 WHAT IS YOUR TOTAL HOUSEHOLD INCOME?

(Read list and mark one only)

- 1 LESS THAN \$10,000
- 2 \$10,000 TO \$14,999
- 3 \$15,000 TO \$19,999
- 4 \$20,000 TO \$24,999
- 5 \$25,000 TO \$29,999
- 6 \$30,000 TO \$34,999
- 7 \$35,000 TO \$39,999
- 8 \$40,000 TO \$49,999
- 9 \$50,000 TO \$59,999
- 10 \$60,000 TO \$79,999
- 11 \$80,000 OR MORE
- 2 Don't Know
- 1 Refusal

*Default Next Question: END-I2*

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END-I2 Interviewer: Thank respondent and end.

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