



MUSTEL GROUP  
MARKET RESEARCH

# Inventory of Wood-burning Appliance Use in British Columbia

## Report of Findings

March 2012

### Presented to:



British Columbia Ministry of Environment

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# Executive Overview

## Introduction

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The British Columbia Ministry of Environment commissioned Mustel Group to conduct a province-wide survey of British Columbia residents regarding the use of residential wood-burning appliances. The questionnaire is largely based on that used in a similar survey conducted in 2003, and is designed primarily to assist the Ministry in better understanding the incidence of wood-burning appliances across the province and frequency of use.

Key findings are summarized briefly in this executive overview. Further details are presented in the *Detailed Findings* section.

## Summary of Key Survey Findings

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### *Incidence of Wood Burning Appliances*

Among British Columbia households outside of Metro Vancouver the most common main source of domestic heat is natural gas (45%). For about one-third of homes electricity is the main source, while one-in-ten relies on wood or wood pellets.

However, a total of 30% of homes across British Columbia outside of Metro Vancouver currently burn wood or wood pellets in a fireplace, wood stove or other wood burning appliance, with about two-thirds of those located in rural areas (63%).

Regionally the highest incidence of domestic use of wood burning appliances is found in the Cariboo region where almost half of all homes currently burn wood or pellets. Lowest incidence is in the Thompson Okanagan and South Coast regions at less than one-quarter of homes.

Homes that use wood burning appliances use them to generate on average approximately 43% of their domestic heat. This varies across BC from about 36% in the Thompson Okanagan and South Coast Regions to more than 50% in the Kootenay Boundary and Cariboo regions.

The most common wood burning appliance in use is a wood stove (58%), with about four-in-ten using a fireplace or insert (42%). A pellet stove or furnace is used by just 7% as is a wood burning central heating system. The large majority has just one wood stove (92%), or one fireplace or insert (72%).

Among users of fireplaces or inserts 40% are known to be certified low emissions, compared with 64% of wood burning furnaces or boilers, 71% of wood stoves and 89% of pellets stoves.

### *Wood as a Fuel*

On average, users of pellet stoves burn about eighty standard (40 pound) bags of pellets over the course of twelve months. Among those who use a wood burning appliance the median average for the province as a whole is one and a half to two cords of wood over the past twelve months.

Of all wood burned in homes over the past year on average more than half was burned in wood stoves (57%), with about one-third burned in fireplaces. The most common species of wood burned in BC are Douglas Fir (59%) and Pine (40%).

Among those who burn wood the majority gathers it themselves (64%); about one-third buys their wood, mostly pre-bucked and delivered to them by truck.

Those who burn wood at home most commonly gather or purchase their wood during the fall (55%) or summer (40%) months, with about one-third who do so in spring and just 18% in winter. Most will then dry or season the wood for six months or more (65%), storing it outside but covered.

### *Wood Burning Behaviour*

On average, users of wood burning appliances have been burning wood for more than fifteen years (mean average 15.6 years), with pellet stoves used on average for about 10 years. The major reasons for using a wood burning appliance include the reliability of using wood as a heat source in the event of power outages (61% rated as a major reason), that wood supply is readily available (61% also rate this as a major reason) and remains cheaper compared with other types of fuel (59% rate as a major reason).

During winter months those with a wood burning appliance have a fire going an average of 5 days a week compared with about two days per week in spring and fall, and less than one day a week in summer. During winter the majority will burn wood most of the day, with almost half who burn overnight (44%). At other times of the year the mornings and evenings are the most common times for using wood burning equipment.

Of the various materials other than wood that might be burned in a wood burning appliance it is only newspaper and cardboard or other paper products that are burned with any regularity. Just over half of all users burn newspapers at least sometimes in their appliances (58%), with about one-third that burns cardboard and other paper products at least sometimes (32%).

### *Installation of New Appliances*

In all, about one-in-ten users of wood burning appliances has installed new equipment in the past two years, the majority of whom having installed a wood stove (57%). More than three-quarters of those who installed new equipment have found that the new equipment produces less smoke than the equipment it replaced.

About one-quarter of all users expect to install new wood or wood pellet burning equipment, either as replacement or as brand new installation within the next three years; of those almost half expect to install a wood stove (47%), with one-in-five opting for a pellet stove.

The most common reasons for installing new equipment are out of need to replace or upgrade failing older equipment for more fuel efficient new equipment.

### *Incentives, Bylaws and Programs*

About half of all users of wood burning appliances are currently aware of the cash incentives available in many BC communities for upgrading to newer, more efficient, cleaner burning wood or pellet stoves, with awareness highest in the Kootenay Boundary (72%) and Cariboo (62%) regions.

About one-third of users are currently aware of the provincial wood stove exchange program, with just 4% that has actually taken part in the program.

If a \$250 incentive were made available a total of 41% of users of wood burning appliances would feel more likely to upgrade or replace their existing wood or pellet burning equipment, with 14% "very likely".

A total of six-in-ten users are currently aware that most new stoves sold in British Columbia are mandated by law to have low smoke emissions rates.

### *Smoke Emissions*

Chimney smoke is currently a concern for about one-in-five residents across the province (21%), with the main concerns generally being its impact on health, the environment and the smell.

Of the suggested actions to reduce the amount of smoke from wood burning equipment strongest support is expressed for "Provincial Regulations that only allow clean burning wood appliances to be sold in BC" (77% support vs. 13% oppose). This is closely followed by support for "Providing a cash back incentive for removing old wood stoves and wood inserts" (71% support vs. 16% oppose).

Other measures such as restricting burning on poor air quality days, fines for excessive smoke production, required removal of all appliances upon the sale of a property and establishing a bylaw to reduce smoke emissions each receive support from approximately half of all residents, with about one-third opposed.

Currently "Transportation, including vehicles, trains, aircraft and ships" is most commonly rated as a medium to high contributor (55%), followed by Industry in general (40%); households (including wood stoves and backyard burning) and the forestry industry, including land clearing and agricultural burning are each rated medium to high contributors to air pollution by about one-third of residents (36% and 32% respectively).

Overall the large majority of British Columbians outside of Metro Vancouver perceive the air quality in the area in which they live as "almost always good" (57%) or "good most of the time, poor on occasion" (31%).

# Foreword

## Background & Objectives

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The British Columbia Ministry of Environment commissioned Mustel Group to conduct a province-wide survey of British Columbia residents regarding the use of residential wood-burning appliances. The questionnaire is largely based on that used in a similar survey conducted in 2003, and is designed primarily to assist the Ministry better understand the incidence and frequency of use of wood-burning appliances across the province.

More specifically, the objectives of the survey are to enable the Ministry:

- ▶ To determine the number of domestic wood-burning appliances in use in the province,
- ▶ To estimate emissions of air pollutants from wood-burning, and
- ▶ To guide outreach and education campaigns targeting wood-burners.

Currently domestic wood-burning is estimated to account for approximately 15% of total fine particulates matter emissions in BC. While use of wood heating may have changed considerably since 2003, as other sources of air pollutants begin to use cleaner fuels, wood heating may in fact account for a larger proportion of remaining air pollutants than in the past.

## Methodology

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A mixed-mode approach was employed for this survey in order to maximize the number of interviews completed within budget.

The main method of data collection was a random telephone survey, used initially to determine the incidence of wood-burning appliance users across the province. A web survey, which can be a more cost efficient method than a telephone survey to target low incidence respondents, was also used to boost the sub-sample of users.

## Sampling

The approach to sampling was to set disproportionate targets for each region and sub-region, with an approximate ratio of two-thirds users to one-third non users. In order to establish the actual incidence of users, surveys were conducted at random with both users and non-users and proportions of completed surveys were monitored up until the point that the smaller non-user targets were reached. Once the non-user targets were reached those quota cells closed and surveys were only completed with users (an over-sample).

While the incidence of users of wood-burning appliances varies by region, the overall incidence for the province as a whole (excluding Metro Vancouver) is 30%.

The six main regions and twenty-five sub-regions, as defined by the Ministry, were geo-mapped and random samples of households were drawn for each area, using a regularly up-dated database of published, residential telephone listings. Within each household the eligible respondent was identified as the person most knowledgeable about their home heating equipment. Up to six calls were made in attempting to complete an interview with each household/respondent selected, a measure to minimize potential non-response bias.

While the telephone survey was being conducted, a total of 500 surveys were completed among users via a web survey, programmed and hosted by Mustel Group and utilizing a reputable, reliable Canadian panel sample.

About halfway through the fieldwork period additional budget was made available in order to complete a boosted telephone sample of users in two of the existing sub-regions (Bulkley Valley and Cranbrook/Kimberly), along with the creation of a new sub-region (Princeton), in which a target of 70 users and 30 non-users was set.

## Results

In the end a total of 2,527 interviews were completed, 1,765 with users and 762 with non-users. The following disproportionate sampling distribution was achieved by major region:

	<b>Total</b>	MoE*	<b>Users</b>	MoE*	<b>Non-Users</b>	MoE*
<b>Total</b>	<b>2527</b>	<b>+/-1.9</b>	<b>1765</b>	<b>+/-2.3</b>	<b>762</b>	<b>+/-3.6</b>
Northern Region (Omineca, Skeena and Northeast)	459	+/-4.6	343	+/-5.3	116	+/-9.1
Cariboo Region	280	+/-5.9	187	+/-7.2	93	+/-10.2
Thompson/Okanagan Region	481	+/-4.5	334	+/-5.4	147	+/-8.1
Kootenay/Boundary Region	381	+/-5.0	274	+/-5.9	107	+/-9.5
South Coast Region	284	+/-5.8	193	+/-7.1	91	+/-10.3
West Coast Region	642	+/-3.9	434	+/-4.7	208	+/-6.8

\* Margin of Error at the 95% level of confidence

Statistical tolerance limits (or sampling margin of error) are displayed in the table above at the 95% confidence level (or 19 times out of 20, if the study were to be repeated).

At the data processing stage results were weighted back into proportion according to known incidence levels of users versus non-users and according to known estimates from Statistics Canada of the number of households in each region and sub-region. Base sizes shown in graphs and tables of this report reflect the actual (rather than weighted) number of interviews completed.

Following is a more detailed table of completed surveys by sub-region (unweighted vs. weighted):

		Total		Users		Non-Users	
		Actual	Weighted	Actual	Weighted	Actual	Weighted
<b>Total</b>		<b>2546</b>	<b>2546</b>	<b>1765</b>		<b>781</b>	
Northern Region (Omineca, Skeena and Northeast)	Prince George	101	86	67	13	34	73
	Bulkley Valley Lakes District Airshed	235	35	188	19	47	16
	Other Northern Region	126	172	88	66	38	106
Cariboo Region	Quesnel	91	26	60	9	31	16
	Williams Lake	90	22	60	8	30	14
	Other Cariboo Region	100	34	67	21	33	12
Thompson/ Okanagan Region	Kelowna	81	148	54	14	27	133
	Kamloops	80	102	54	8	26	94
	Shuswap	80	30	54	8	26	23
	Princeton	122	6	71	3	51	4
	Other Thompson/ Okanagan Region	128	357	102	117	26	240
Kootenay/ Boundary Region	Grand Forks	81	11	54	4	27	7
	Cranbrook and Kimberley	141	40	112	9	29	31
	Golden	82	10	54	5	28	4
	Other Kootenay/ Boundary Region	81	152	54	56	27	96
South Coast Region	Sea to Sky Corridor	90	62	60	26	30	36
	Fraser Valley Regional District	103	289	72	30	31	260
	Other South Coast Region	91	54	60	26	31	28
West Coast Region	Capital Regional District	91	429	56	140	35	289
	Nanaimo	83	104	56	19	27	85
	Cowichan Valley	97	73	63	26	34	46
	Comox Valley	87	65	54	13	33	51
	Campbell River	81	39	55	8	26	31
	Port Alberni	81	28	54	7	27	21
	Other West Coast Region	123	173	96	113	27	60

# Detailed Findings

## 1. Wood Burning Appliances

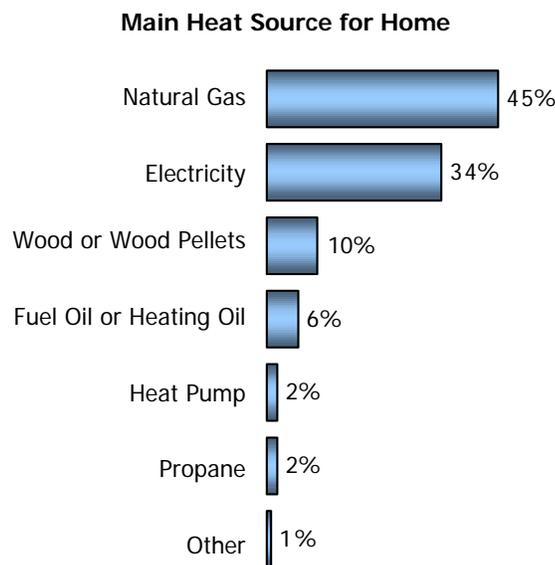
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### 1.1 As a Main Heat Source

Among British Columbia households outside of Metro Vancouver the most common main source of domestic heat, for more than four-in-ten homes, is natural gas (45%). For about one-third of homes electricity is the main source of heat, while one-in-ten relies on wood or wood pellets.

Regionally, residents of the west coast are more likely to heat with electricity (51%) or fuel oil (13%) compared on average with other regions, while those in the Cariboo region are more likely than others on average to heat with wood or wood pellets (24%).

When it comes to urban versus rural residents, those in an urban area are more likely to heat with natural gas (55% vs. 28% of rural residents), with those living in rural communities more likely than their urban counterparts to heat with wood or wood pellets (22% and 3% respectively). Use of electricity is the same in both settings (34%).



Base: Total (n=2,546)

Q.8) What is the main source of heat in your home?

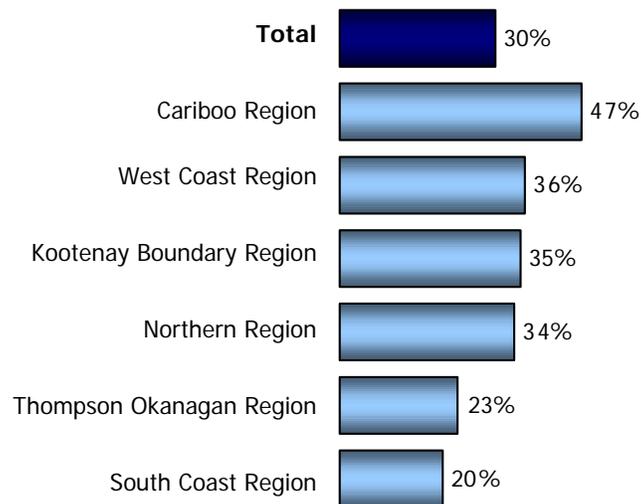
## 1.2 Incidence of Wood Burning Appliances

Across British Columbia, approximately 30% of homes outside of Metro Vancouver currently burn wood or wood pellets in a fireplace, wood stove or other wood burning appliance, and about two-thirds of those are located in rural areas (63%).

Regionally, the incidence is highest in the Cariboo where almost half of all homes currently burn wood (47%); least likely are residents of the Thompson Okanagan and South Coast regions where the incidence falls to less than one quarter.

Households more likely to burn wood or wood pellets include those in a rural setting (49% vs. 18% urban) and those who currently rent (53% vs. 25% of owners).

### Incidence of Burning Wood or Pellets Across British Columbia



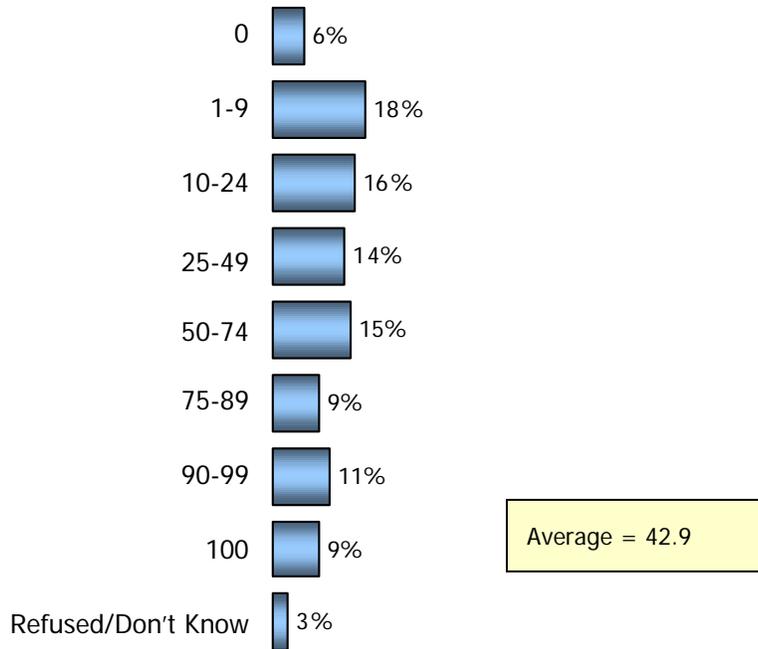
Base: Total (n=2,546)

Q.9) Do you burn wood or wood pellets at all in a fireplace, woodstove or other wood burning appliance?

Among users of wood burning appliances in BC, approximately 43% of heat generated in-home comes from burning wood or pellets. This ranges across BC from about 36% in the Thompson Okanagan and South Coast Regions to more than 50% in the Kootenay Boundary and Cariboo regions.

It also varies according to the type of appliance used from about one-quarter of the home's heat for those with a fireplace or insert (27%), to just over half of the home's heat for those with a wood stove or pellet stove (52-54%), to approximately 71% of those that use a wood burning central heating system.

### Proportion (%) of Household Heat from Burning Wood or Pellets



Base: Users (n=1,765)

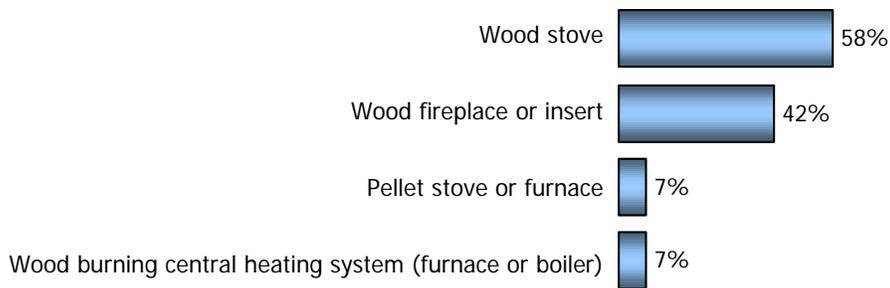
Q.11) Of all the heat used in your home, approximately what percentage comes from burning wood or pellets:

### 1.3 Inventory

When it comes to the type of wood burning appliance most commonly used over the past twelve months, more than half of all users burned wood in a wood stove (58%), with more than four-in-ten using a fireplace or insert. A pellet stove or furnace was used by just 7%, as was a wood burning central heating system.

Wood stoves are more commonly used in rural settings (66% vs. 44% urban homes), while fireplaces or inserts are more likely to be used in urban homes (58% vs. 33% or rural homes).

#### Wood Burning Appliances Used in Past 12 Months



Base: Users (n=1,765)

Q.12) Which of the following types of wood burning fixtures or equipment did you use in your home in the past 12 months?

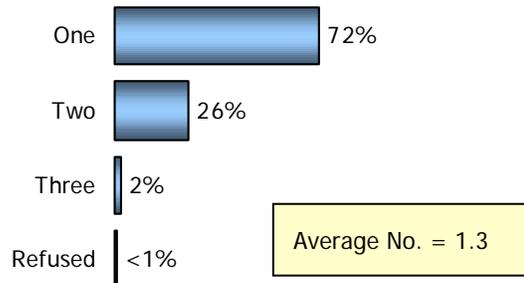
Use of a wood stove is somewhat more common in the West Coast and Kootenay Boundary regions (63-64%), while use of pellet stoves or furnaces are a little more common in the Cariboo and Northern regions, and wood burning central heating systems also more common in the Cariboo.

	Region					
	West Coast (434) %	South Coast (192) %	Kootenay Boundary (274) %	Thompson Okanagan (335) %	Cariboo (187) %	Northern (343) %
Wood stove	63	46	64	53	54	53
Wood fireplace insert	45	53	29	48	25	29
Pellet stove or furnace	5	5	8	7	16	14
Wood burning central heating system	3	6	8	9	19	12

## 1.4 Fireplace or Insert

Of those who currently have a fireplace or insert the majority has just one in their home (72%), with about one-quarter that has two, and 2% with 3 or more.

### Number of Wood Burning Fireplaces or Inserts



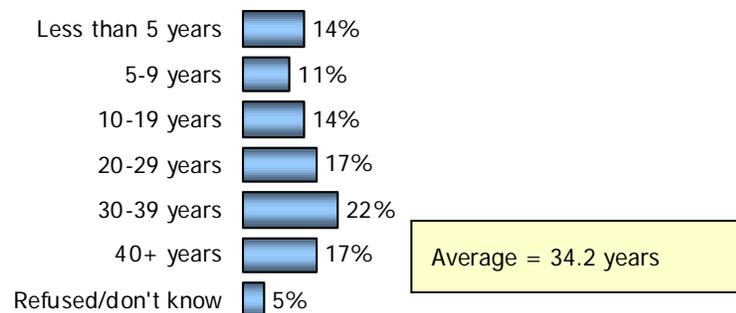
Base: Total have a wood fireplace or insert (n=641)

*Q.13) How many wood burning fireplaces or inserts do you currently have in your home? (This includes fireplaces that have an open hearth [Hearth] and also fireplaces with doors. A fireplace insert is a cast iron or steel device that is inserted into an existing wood burning fireplace and has glass doors that allow the flames of the fire to be viewed while the insulated doors remain closed).*

On average, users of fireplaces or inserts have had them for about thirty years or so (mean average 34 years). About one quarter of users have had their fireplace or insert for less than ten years, with 14% less than 5 years.

Urban homes which are more likely to be older and owned by the residents have, on average older fireplaces or inserts (mean 39 years) compared with homes in rural areas (mean 29 years).

### Approximate Age of Fireplace or Insert



Base: Total have a wood fireplace or insert (n=639)

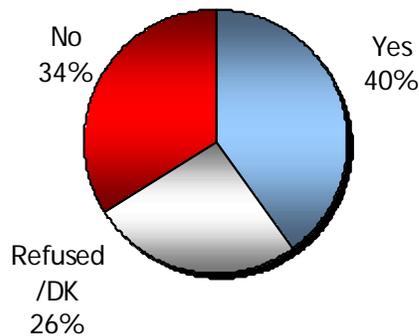
*Q.14) Approximately how old is your fireplace or insert?*

Approximately 40% of fireplaces or inserts are known to be cleaner burning low-emission appliance which are certified, with about one-third that are not, however one-quarter did not know if they were or not.

Regionally, awareness is lowest among residents of the South Coast and Thompson Okanagan (35% and 31% respectively don't know).

More than half of all fireplaces found in rural homes are known to be certified cleaner burning (57% vs. 22% of urban homes), with awareness also considerably higher compared to those living in an urban setting (19% of rural residents answered "don't know" compared with 32% of urban).

#### Certified Low-Emission Appliance



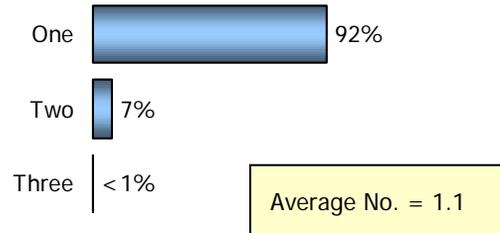
*Base: Total have a wood fireplace or insert (n=639)*

*Q. 15) Is your fireplace or insert a cleaner burning low-emission appliance which is certified? It could be emissions certified with either the United States Environmental Protection Agency (EPA) or the Canadian Standards Association (CSA).*

## 1.5 Wood Stoves

Of those who currently have a wood stove the large majority has just one in their home (92%), with about 7% that has two or more.

### Number of Wood Stoves

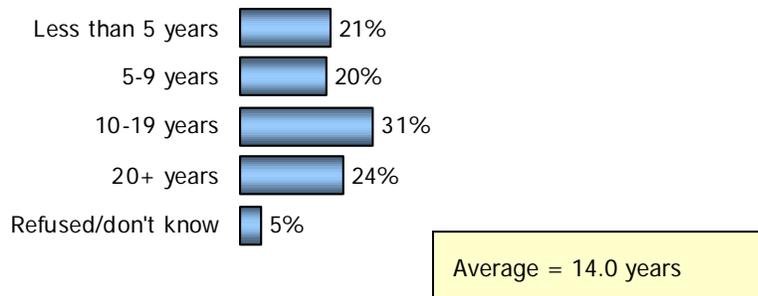


Base: Total have a woodstove (n=1,000)

Q.16) How many wood stoves do you currently have in your home?

On average, users of wood stoves have had them for about fourteen years (mean average 14 years). About four-in-ten users have had their fireplace or insert for less than ten years, with one-in-five less than 5 years.

### Approximate Age of Wood Stove



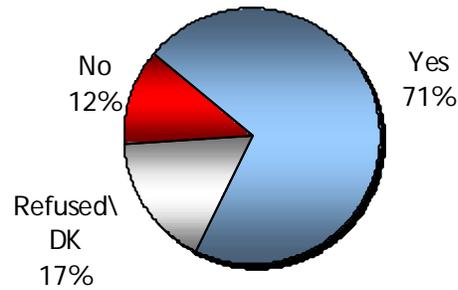
Base: Total have a woodstove (n=998)

Q.17) Approximately how old is your woodstove?

More than two-thirds of wood stoves are known to be certified cleaner burning low-emission appliances (71%), with about one-in-ten that are not (12%); a further 17% did not know if they were or not.

Awareness of the certification of their wood stove is just somewhat higher amongst rural residents (15% of rural residents answered "don't know" compared with 21% of urban).

### Certified Low-Emission Appliance



*Base: Total have a woodstove (n=998)*

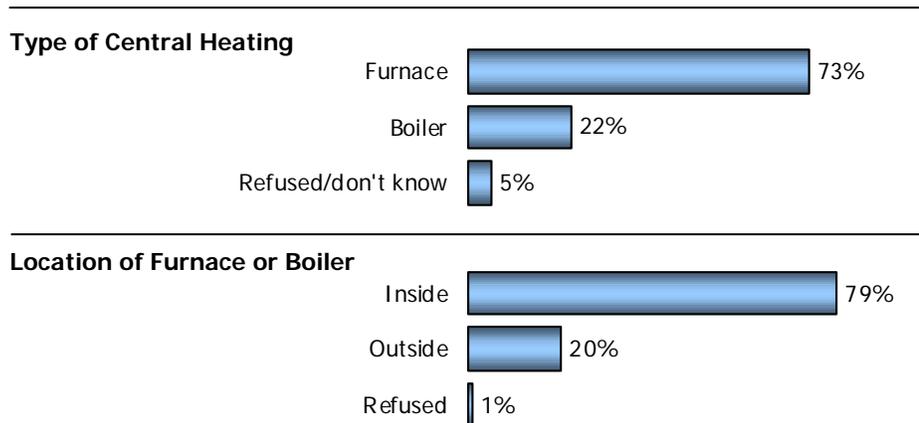
*Q.18) Is your woodstove a cleaner burning low-emission appliance which is certified? It could be emissions certified with either the United States Environmental Protection Agency (EPA) or the Canadian Standards Association (CSA).*

## 1.6 Wood Burning Central Heating

Of those who use a wood burning central heating system the majority currently has a warm air furnace (73%), with about one-in-five that has a boiler (22%).

Most furnaces and boilers are located inside (79%), with one-in-five outside.

**Type of Wood Burning Central Heating Appliance and Location**



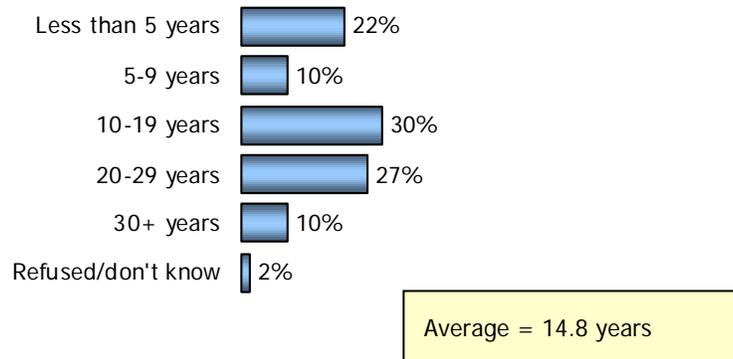
*Base: Total have a wood burning furnace or boiler (n=168)*

*Q.19) Is your wood burning central heating system a warm air furnace or a boiler?*

*Q.20) Is your wood burning furnace or boiler located inside or outside your house?*

On average, users of wood burning furnaces or boilers have had them for about fifteen years (mean average 14.8 years). About four-in-ten users have had their fireplace or insert for less than ten years, with about one-in-five less than 5 years.

**Approximate Age of Wood Burning Furnace or Boiler**

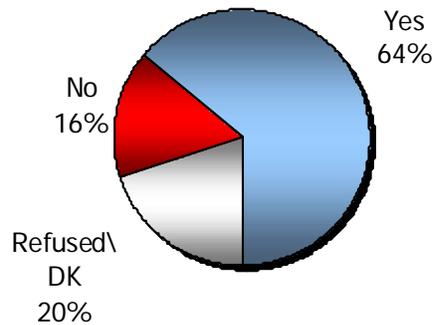


Base: Total have a wood burning furnace or boiler (n=168)

Q.21) Approximately how old is your wood burning furnace or boiler?

Almost two-thirds of wood burning furnaces and boilers are known to be certified cleaner burning low-emission appliances (64%), with about 16% that are not; however, a further 20% did not know if they were or not.

**Certified Low-Emission Appliance**



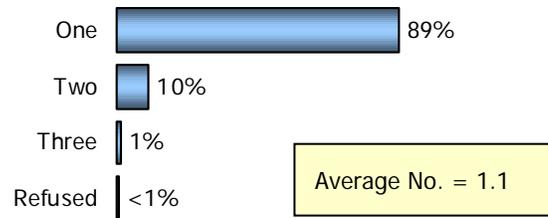
Base: Total have a wood burning furnace or boiler (n=168)

Q.22) Is your furnace or boiler a cleaner burning low-emission appliance which is certified? It could be emissions certified with either the United States Environmental Protection Agency (EPA) or the Canadian Standards Association (CSA).

## 1.7 Pellet Stoves

Of those who currently have a pellet stove the large majority has just one in their home (89%), with about one-in-ten that has two, and just 1% with 3.

### Number of Pellet Stoves

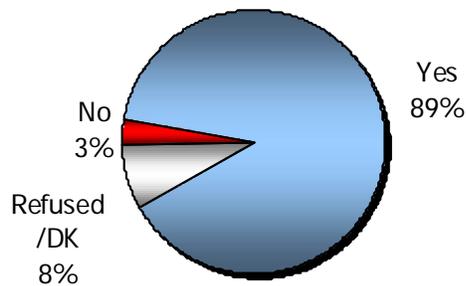


Base: Total have a pellet stove (n=161)

Q.23) How many pellet stoves do you currently have in your home?

Most pellet stoves are known to be certified cleaner burning low-emission appliances (89%), with just 3% that are not; a further 8% did not know if they were or not.

### Certified Low-Emission Appliance



Base: Total have a pellet stove (n=159)

Q.24) Is your pellet stove a cleaner burning low-emission appliance which is certified? It could be certified with either the United States Environmental Protection Agency (EPA) or the Canadian Standards Association (CSA).

## 2. Wood as a Fuel

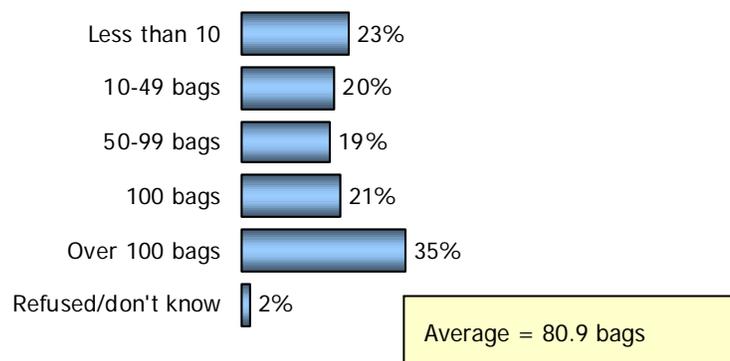
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### 2.1 Volume Burned – Pellet Stoves

On average, users of pellet stoves burn about eighty-one standard (40 pound) bags of pellets over the course of twelve months. More than half of pellet stove users will burn 100 or more standard bags in a year, while about one quarter will burn fewer than ten.

Homes situated in a more rural setting burn considerably more pellets than those in an urban community (approximately 92 vs. 60 standard bags over 12 months), as do home owners versus renters (98 bags vs. 55 respectively).

#### Amount of Pellets Burned Over the Past 12 Months



Base: Total have a pellet stove (n=159)

Q.25) A standard bag of pellets weighs 40 pounds. Approximately how many bags of pellets did you burn over the past 12 months?

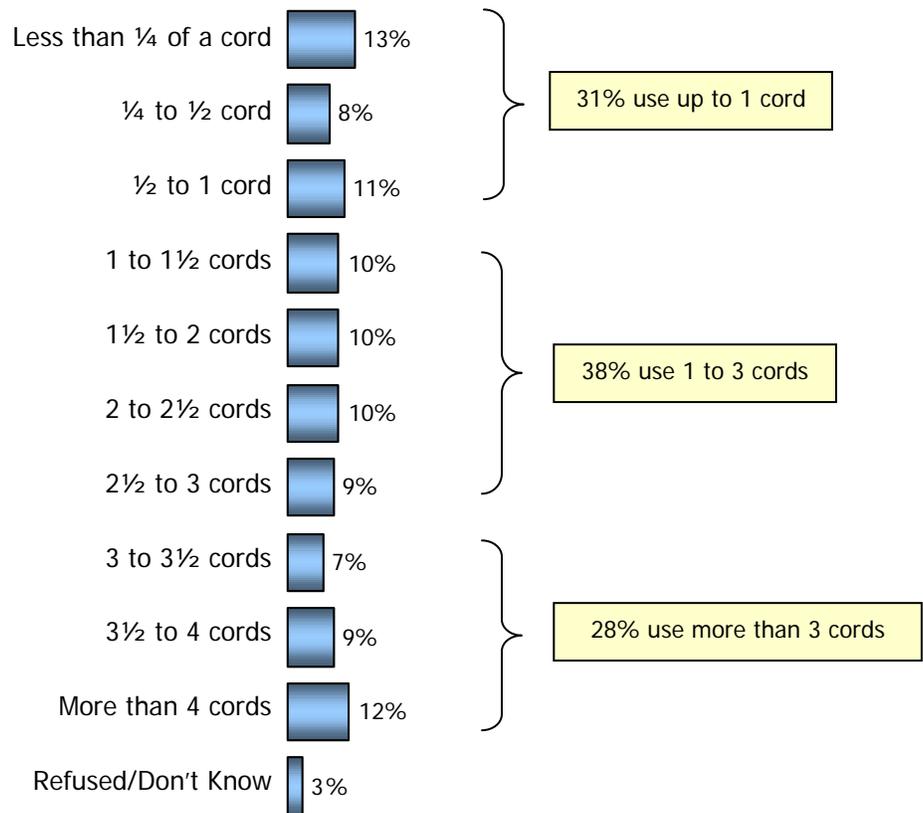
## 2.2 Volume Burned – Other Wood Burning Appliances

About one-third of those who use a wood burning appliance will burn one cord of wood or less over the course of a year (31%), while about four-in-ten will burn between one and three cords (38%); a little more than one-quarter of users burn three or more cords.

The median average for the province as a whole is one and a half to two cords of wood over the past twelve months.

Perhaps not surprisingly those more likely to burn a larger volume of wood, 3 or more cords each year, reside in the Northern (40%), Cariboo (45%) or Kootenay Boundary regions (46%). Homes in rural areas are also likely to burn a larger volume of wood (36% burns 3 or more cords per year compared with 13% of homes in urban areas).

**Cords of Wood Burned in Past 12 Months**



Base: Total wood burners (n=1,640)

Q.27) Approximately how many cords of wood did you burn in your wood-burning equipment over the past 12 months? Please stop me when I have reached your category. Would you say you used?

Of all wood burned in homes over the past year on average more than half was burned in wood stoves (57%), with about one-third burned in fireplaces, with the remaining 6% or so burned in a wood furnace or boiler.

In the Cariboo region, where use of wood burning furnaces or boilers are somewhat more commonplace, wood stoves are still the main appliance used for burning wood (60%), but use of a fireplace and wood furnace or boiler are more evenly divided (proportion of wood burned in these appliances over the year is 22% and 18% respectively).

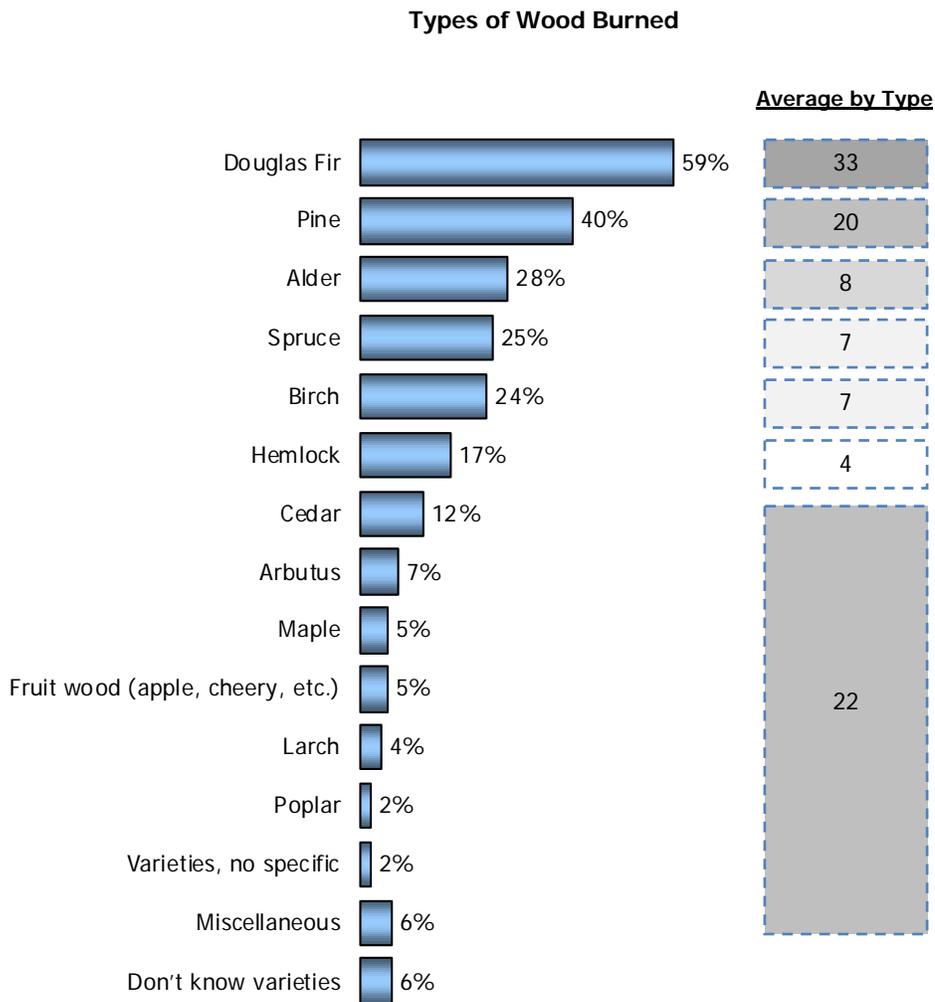
#### Approximate Overall Percentage of Wood Burned – Past Year

	<u>Total</u> (1,651) %	<b>Region by Wood Burners</b>					
		<u>West Coast</u> (416) %	<u>South Coast</u> (187) %	<u>Kootenay Boundary</u> (264) %	<u>Thompson Okanagan</u> (314) %	<u>Cariboo</u> (164) %	<u>Northern</u> (306) %
Wood stove(s)	57	60	44	67	50	60	59
Wood fireplaces (s)	38	38	51	27	44	22	28
Wood furnace or boiler(s)	6	3	5	6	6	18	13
<i>Q.28) Of all the wood burned in your home over the past year, excluding pellets, approximately what percentage did you burn in your:</i>							

### 2.3 Species of Wood Burned

The most common species of wood burned BC are Douglas Fir (59%) and Pine (40%). Next most popular are Alder, Spruce and Birch, each burned by about one quarter of wood burning appliance users; burned somewhat less are Hemlock (17%) and Cedar (12%). Various other woods such as Arbutus, Maple or wood from fruit trees are each burned by 7% or less.

Among those people that burn multiple types of wood the proportions of each type burned generally follow the order of popularity (proportions shown as “Average by Type”).



Base: Total wood burners (n=1,651)

Q.29) Which if any of the following types of wood do you burn?

Q.30) And of those different types of wood that you burn, what percentage would be:

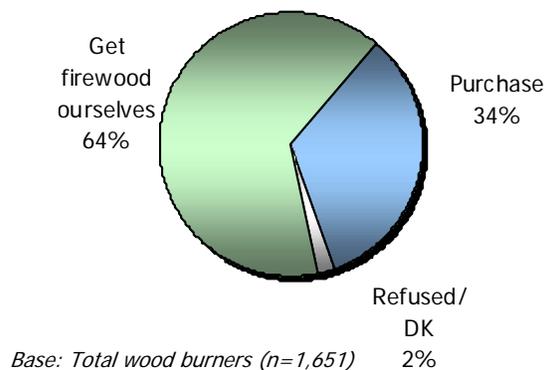
## 2.4 Methods of Collecting Wood

The majority of users of wood burning appliances, about two-thirds, obtain firewood themselves, with one-third that purchases their wood.

Residents in rural areas are more likely to gather their own wood (69%) compared with those in more urban areas (56%). Those in the Cariboo region are least likely to purchase their wood (16%).

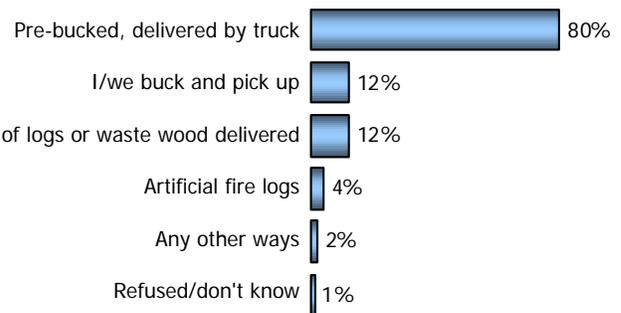
The large majority of those that purchase their wood buy it pre-bucked and have it delivered (80%). About 12% buy logs or waste wood and have it delivered, with the same proportion that pick up and buck their own wood. Just 4% say they use artificial logs. Only 2% say they use any other ways.

### Gather or Purchase Firewood



Q.31) Do you purchase the majority of your firewood or get it yourself?

### Method of Purchase



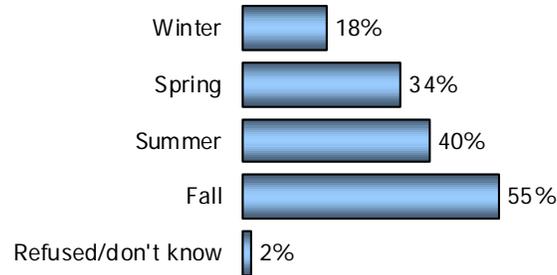
Base: Total wood burners who purchase wood (n=524)

Q.32) How do you purchase wood?

## 2.5 Timing of Wood Collection and Seasoning

More than half of users of wood burning appliances gather or purchase their wood during the Fall (55%) while 40% do so during the Summer and about one-third in the Spring; less than one-in-five will do so during the winter.

### Frequency of Gathering Firewood by Season

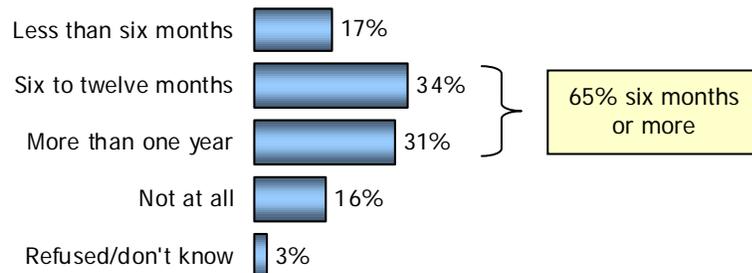


Base: Total wood burners (n=1,651)

Q.33) In what season(s) do you mainly gather or purchase your firewood?

The majority of those who burn wood will typically dry or season the wood for six months or more (65%); while about 17% will dry their wood for less than six months a similar proportion will not bother with this process at all (16%). Urban residents are less likely to dry or season their wood (21% "not at all" vs. 13% of those in rural areas).

### Length of Time to Dry/Season Firewood



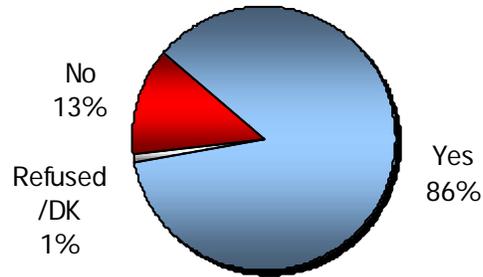
Base: Total wood burners (n=1,651)

Q.34) How long do you typically dry/season your firewood before the heating season?

## 2.6 Splitting and Storage

Most of those who dry or season their wood prior to the burning season will usually have it split before they dry or season it (86%).

### Have Firewood Split Before Drying/Seasoning



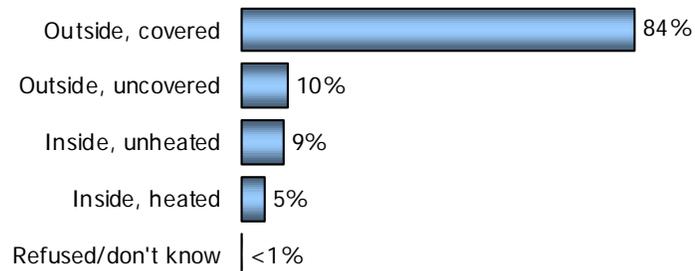
Base: Total wood burners who dry/season wood before burning (n=1,269)

Q.35) Do you usually have your firewood split before drying/seasoning it?

The most common method of storing firewood is to keep it outside but undercover (84%), with just one-in-ten who will keep it outside uncovered. Those in the Okanagan are somewhat more likely than other regions to keep their wood outside uncovered (22%), perhaps due to the relatively drier climate of that region.

In all, a total of 14% keeps their wood inside, either heated or unheated.

### Storage of Wood



Base: Total wood burners (n=1,651)

Q.36) How do you store the majority of your wood? Would it be:

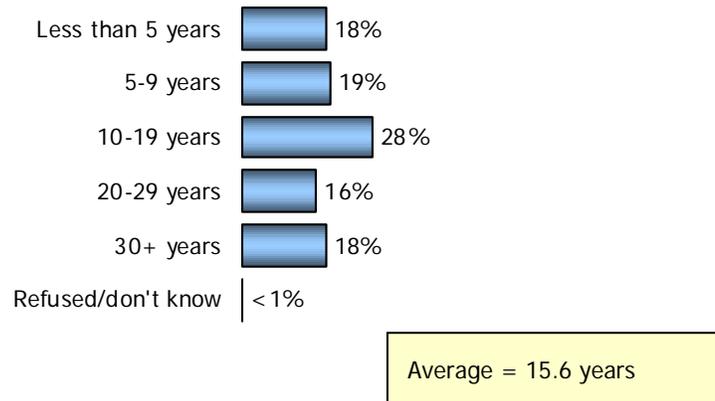
### 3. Wood Burning Behaviour

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#### 3.1 Time Spent Using Wood Burning Appliances

On average, users of wood burning appliances have been burning wood for more than fifteen years (mean average 15.6 years). Users of pellet stoves have been burning pellets for an average of about 11 years (mean average 10.8 years), while those with wood burning central heating systems have been burning wood for closer to 20 years on average (mean average 18.8 years).

**Number of Years Burning Wood or Pellets**



*Base: Total users (n=1,765)*

*Q.37) How many years, in total, have you been burning wood or pellets in your home?*

### 3.2 Reasons for Using Wood Burning Appliances

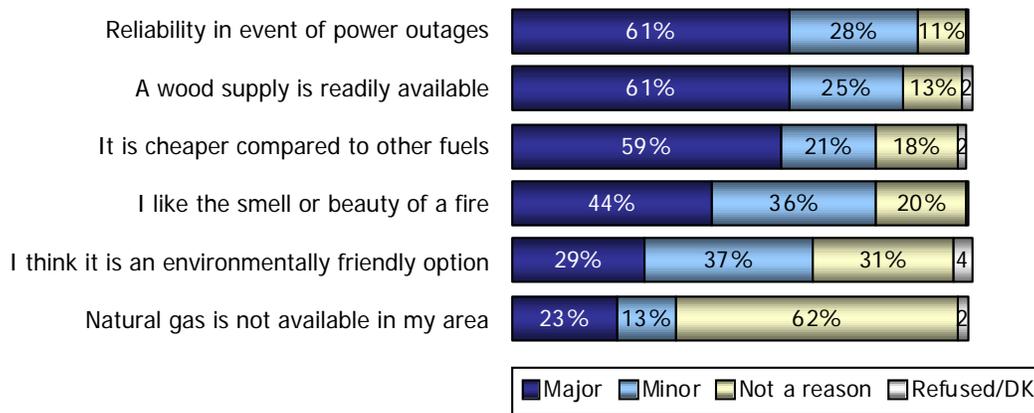
Of the various reasons tested for why people burn wood in their homes, three stand out equally strong, with about six-in-ten people citing them as major reasons for their choice of fuel.

Respondents value the reliability of using wood as a heat source in the event of power outages, they appreciate that wood supply is readily available and remains cheaper compared with other types of fuel.

Just less than half consider the smell or beauty of a fire a major reason for continuing to burn wood in their homes, while for less than one-third a major reason is that they consider it an environmentally friendly option (29%). Finally, for about one-quarter a major reason is that natural gas is simply not available in their area (23%).

Those living in rural communities are more likely than their urban counterparts to rate each of the following a major reason: wood readily available, cheaper than other fuels, environmentally friendly and reliable during power outages, while urban residents are more likely than rural residents to rate the smell or beauty as a major reason.

**Reasons for Burning Wood or Pellets**

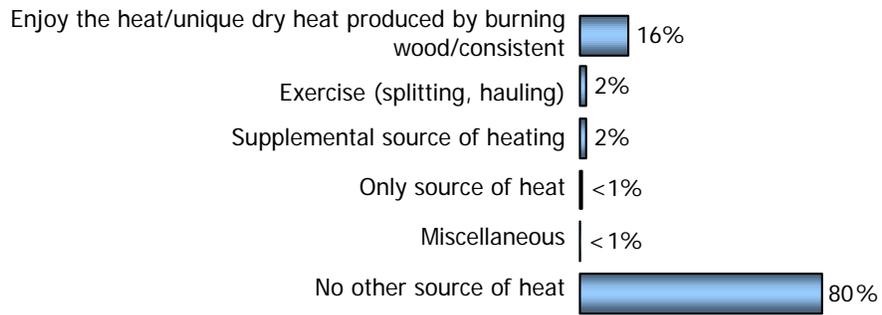


Base: Total users (n=1,765)

Q.38) People have mentioned to us several reasons for burning wood or pellets in their home. As I read each reason, please tell me if this is NOT A REASON, A MINOR REASON OR A MAJOR REASON for burning wood in your home.

The only other reason of note mentioned by those that burn wood is the uniqueness of the heat produced by a real fire (16%).

#### Other Reasons for Burning Wood or Pellets



*Base: Total users (n=1,765)*

*Q.38) Any other reasons?*

### 3.3 Frequency of Using Wood Burning Appliances – Time of Year

Throughout the past year those with wood burning appliances in their home would have a fire burning an average of five days per week during the winter months, and about half as much during the fall (2.5 days per week on average) and spring (2.2 days per week on average), with little or no use during the summer months.

Those living in a rural setting are more likely to keep their fires going longer on average than those in urban areas, 2.9 days in fall compared with 1.8 days for urban residents, 5.6 days during winter versus 4.0 for urban residents in winter, and 2.6 versus 1.4 days in spring.

**Average # Days Per Week Burning a Fire - by Season**



*Base: Total users (n=1,765)*

*Q.39) Thinking back over the seasons in the past year, approximately how many days per week would you have had a fire going in your wood burning equipment (at least one of your wood or pellet burning appliances):*

### 3.4 Frequency of Using Wood Burning Appliances – Time of Day

The majority of users of wood burning appliances tend to have a fire going throughout the day during the winter months, about six-in-ten doing so morning and afternoon, increasing to 90% in the evening and 44% keeping the fire going overnight.

Fire use lessens in both fall and spring, though the majority still has them in the evening they are used almost half as much during the afternoons and overnight. While also less, use of fires in the morning does not drop as much, likely as it is used to warm the dwelling after the colder overnight temperatures.

While fires are rarely used in the summer months, those that do tend to burn them either in the evening or first thing in the morning.

Those living in rural areas are more likely than those in urban areas to burn fires in the morning and overnight during the winter, spring and fall.

	Time of Day for Fire			
	Fall season (1,293) %	Winter season (1,688) %	Spring season (1,215) %	Summer season (112) %
Morning	37	59	41	36
Afternoon	29	59	24	9
Evening	79	90	68	41
Overnight	28	44	22	8
Refused/don't know	1	<1	1	12

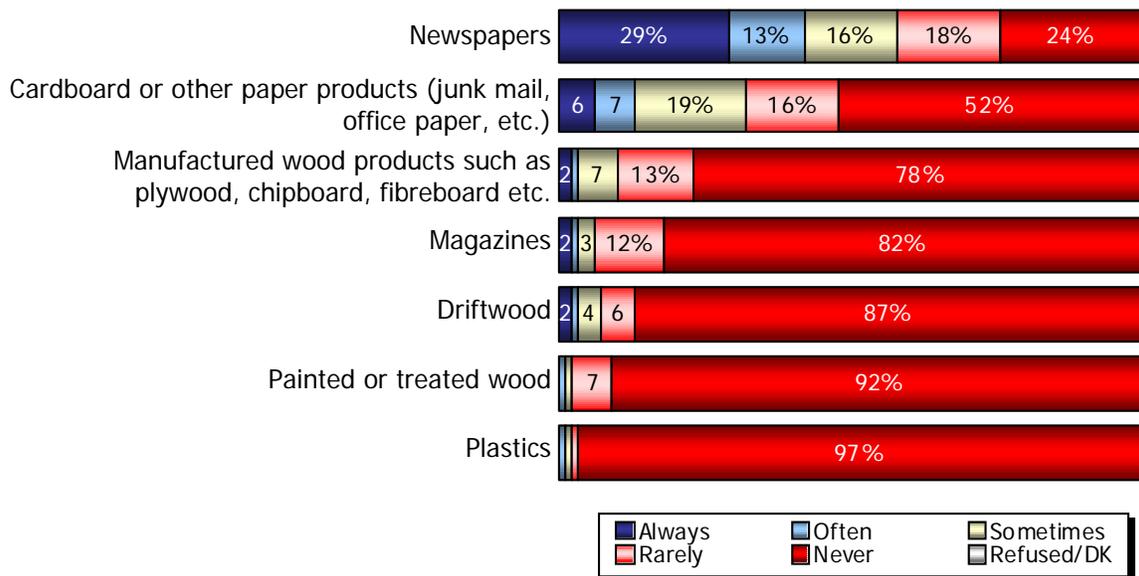
*Q.40) And in the seasons when you used your wood burning equipment, generally what times of day would you have had a fire going, beginning with:*

### 3.5 Other Types of Material Burned

Of the various other materials that might be burned in a wood burning appliance it is only newspaper and cardboard or other paper products that are burned with any regularity. The large majority of users claim never to burn other materials such as magazines, manufactured, painted or treated wood or plastics. Very few burn driftwood in their appliances either; even on the coast about 85% of the South and West coast regions say they never burn driftwood.

Those burning manufactured wood products are somewhat more likely to live in urban communities (12% do so at least sometimes or more often vs. 8% of rural residents).

**Frequency of Burning Various Types of Materials**



Base: Total users (n=1,765)

Q.41) Next I'm going to read a list of materials and for each one I'd like you to tell me if you burn them always, often, sometimes, rarely or never in your wood or wood pellet burning equipment.

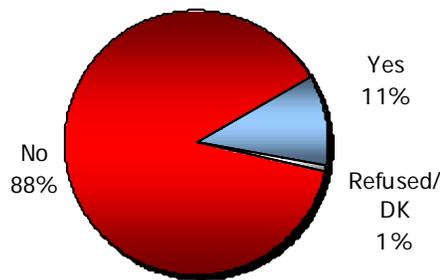
## 4. Installation of New Appliances

### 4.1 Past Two Years Behaviour

In all, a total of 11% of users have installed new wood or wood pellet burning appliances in the past two years. Rural residents are somewhat more likely to have done so than urban (14% rural versus 7% urban).

Among those who have installed new equipment in the past two years the most popular equipment is, by far, a wood stove (57%), with about one-in-ten installing a fireplace insert, pellet stove or wood fireplace.

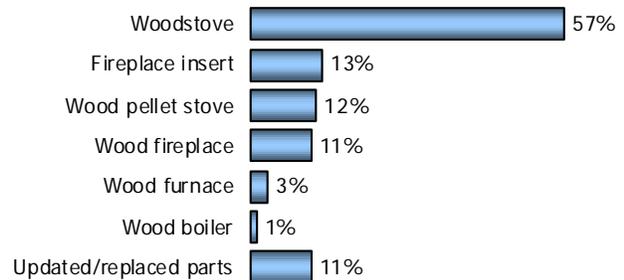
#### Installation of New Equipment – Past 2 Years



Base: Total users (n=1,765)

Q.42) In the past two years, have you installed any new wood or wood pellet burning equipment – either as a replacement for old equipment or as a brand new installation?

#### Types of Equipment



Base: Total who have installed new equipment (n=232)

Q.43) Which, if any of the following types of equipment did you install:

In the majority of cases, where residents are aware of the status of their appliance, most are EPA certified low emissions. Wood stoves and inserts tend to include baffles rather than catalysts in the fireboxes to burn smoke. However, due to the low base sizes in most of these questions results should be interpreted with caution.

Low Emissions Certification Status	
<b>Wood Fireplace</b>	<u>Base</u> (19*) %
EPA Certified	95
Refused/don't know	5
<b>Wood Stove</b>	<u>Base</u> (124) %
EPA Certified with baffles	64
EPA Certified with catalysts	11
Neither	1
Refused/don't know	25
<b>Fireplace Insert</b>	<u>Base</u> (35*) %
EPA Certified with baffles	58
EPA Certified with catalysts	9
Neither	2
Refused/don't know	31
<b>Wood Furnace</b>	<u>Base</u> (9*) %
Conventional wood furnace	15
EPA Certified furnace	38
Refused/don't know	46
<b>Wood Boiler</b>	<u>Base</u> (7*) %
Outside the house	100
White Tag – Low emissions	25
Orange Tag – Low emissions	4
Neither	11
Refused/don't know	61
<b>Pellet Stove</b>	<u>Base</u> (34*) %
EPA Certified	100
<i>*Caution: Very low base sizes</i>	

## 4.2 Reasons for Installing New Equipment

The most common reasons for installing new equipment revolve around the need to replace older failing equipment, to upgrade to more fuel efficient new equipment; cost savings through improved efficiency and concerns for the environment tend to be more secondary considerations.

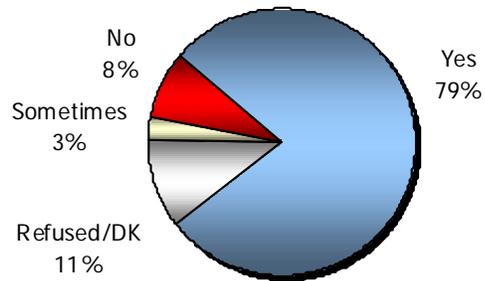
Reasons for Installing New Equipment		
	Total who have installed new equipment	
	<u>First Mention</u> (232) %	<u>Total Mentions</u> (232) %
Fuel efficiency – old equipment	28	41
Failure of old equipment	17	19
Cost savings	13	20
Age of old equipment	11	17
Environmental/air quality concerns	5	10
High prices for electricity	5	5
Home insurance purposes	4	5
Inconvenient to use old equipment	2	3
Appearance	2	3
Electricity supply unreliable	2	3
Health or safety reasons	2	4
Enjoy burning wood	1	3
Gas is not available in my area	1	1
Other	1	1
Refused/don't know	6	6

*Q.44/45) What was the single most important reason you installed this new equipment? Any other reasons?*

### 4.3 Smoke Production

More than three-quarters of those who installed new equipment have found that the new equipment produces less smoke than the equipment it replaced.

**New Equipment Found to Produce Less Smoke**



*Base: Total who have installed new equipment (n=232)*

*Q.46) Does your new wood burning appliance produce less smoke than your older wood burning equipment?*

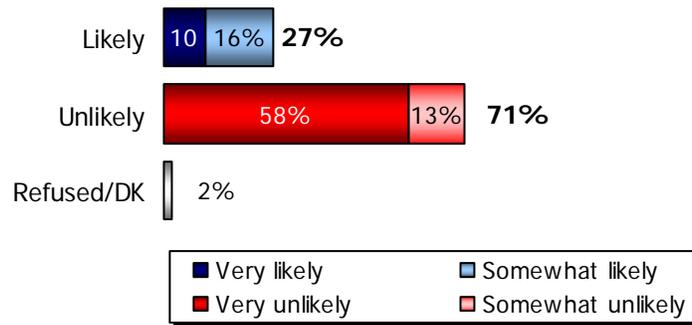
#### 4.4 Intentions to Install New Equipment

Currently more than one-quarter of all users expect to install new wood or wood pellet burning equipment, either as replacement or as brand new installation within the next three years (27%), with one-in-ten that says they are “very likely” to do so.

Regionally those living in the Kootenay Boundary (33%), Thompson Okanagan (33%) and Northern (39%) regions are more likely to be considering new equipment in the next 3 years, compared with those living on the West Coast (20%), South Coast (23%) or Cariboo (24%).

Those living in more rural communities are also somewhat more likely than those in urban areas (30% likely vs. 21% respectively).

##### Likelihood of Installing New Equipment – Next 3 Years



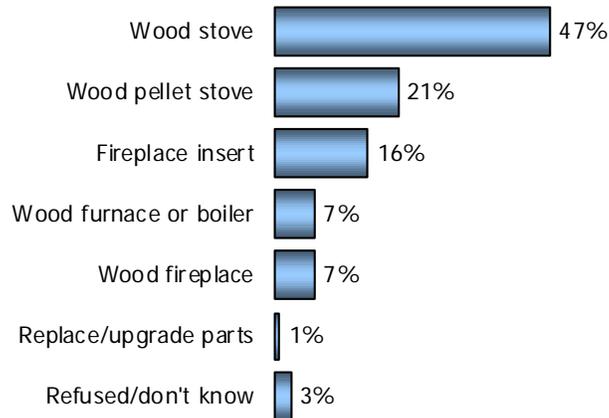
Base: Total users (n=1,765)

Q.47) How likely do you think you will be to install any new wood or wood pellet burning equipment – either as a replacement for old equipment or as a brand new installation – over the next three years? Will you be very likely, somewhat likely, somewhat unlikely or very unlikely?

Among those likely to purchase and install new equipment over the next three years almost half will most likely choose a wood stove (47%), with about one-in-five opting for a pellet stove (21%), and 16% a fireplace insert.

In many of these cases the choice corresponds with the equipment they already have, and so likely anticipation of renewing or replacing the same type of existing appliance.

#### Appliance Most Likely to Install – Next 3 Years



*Base: Total users who are likely to purchase new equipment over the next three years (n=470)*

*Q.48) Which ONE of the following types of equipment do you think you would most seriously consider installing in the next 3 years? Would it be a:*

As anticipated, the main reason for considering installing the new equipment is due to the age of current, older equipment and improved fuel efficiency of the replacement equipment.

Other reasons include health or safety concerns regarding the aging equipment, the benefit to the environment of upgrading to newer, more fuel efficient equipment and cost savings resulting from the improved efficiency.

Reasons for Installing New Equipment Over Next Three Years		
	Total likely to purchase new equipment over the next three years	
	<u>First Mention</u> (470) %	<u>Total Mentions</u> (470) %
Fuel efficiency – old equipment	31	42
Age of old equipment	31	33
Cost savings	7	10
Health or safety reasons	7	11
Failure of old equipment	6	7
Environmental/air quality concerns	5	11
Inconvenient to use old equipment	2	4
Enjoy burning wood	2	5
Appearance	2	4
High prices for electricity	1	5
Electricity supply unreliable	1	1
Home insurance purposes	<1	<1
Gas is not available in my area	<1	<1
Other	3	3
Refused/don't know	3	3

*Q.49/50) What was the single most important reason you installed this new equipment? Any other reasons?*

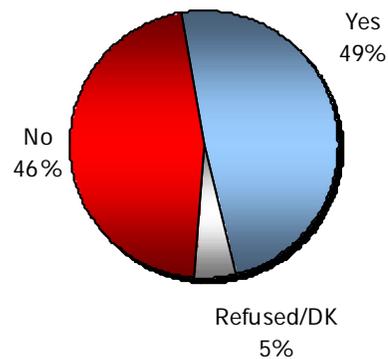
## 5. Incentives, Programs and Bylaws

### 5.1 Cash Incentives

About half of all users of wood burning appliances are currently aware of the cash incentives available in many BC communities for upgrading to newer, more efficient, cleaner burning wood or pellet stoves.

Awareness is somewhat higher in the Kootenay Boundary (72%) and Cariboo (62%) regions.

**Awareness of Cash Incentives**



Base: Total users (n=1,765)

Q.51) Are you aware that there are cash incentives in many BC communities for upgrading to newer, more efficient, cleaner burning wood or pellet stoves?

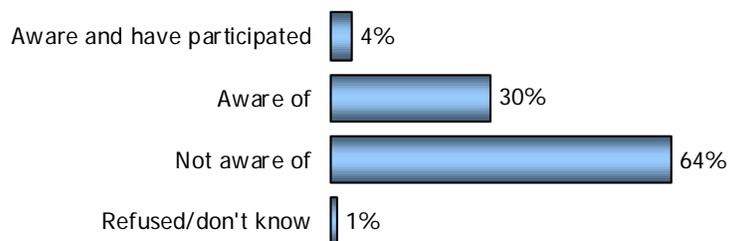
	Region					
	West Coast (434) %	South Coast (192) %	Kootenay Boundary (274) %	Thompson Okanagan (335) %	Cariboo (187) %	Northern (343) %
Yes	46	36	72	49	62	51
No	51	59	25	41	38	43
Refused/don't know	4	5	3	10	<1	6

## 5.2 Provincial Wood Stove Exchange Program

About one-third of users are currently aware of the provincial wood stove exchange program, with just 4% that has actually taken part in the program.

Participation in the program is somewhat higher in the Kootenay Boundary (10%) and Cariboo (10%) regions.

### Aware of/Participated in Provincial Wood Stove Exchange Program



Base: Total users (n=1,765)

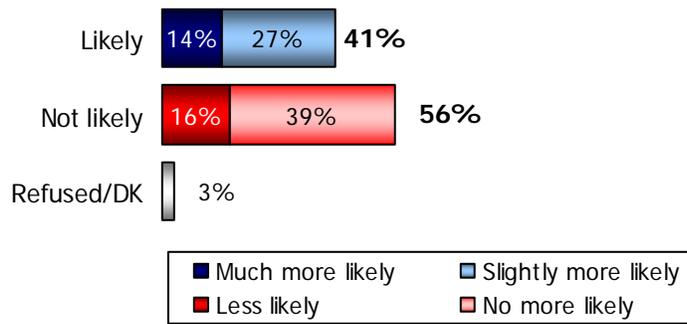
Q.52) Are you aware of or have you participated in the Provincial Wood Stove Exchange Program?

	Region					
	West Coast (434) %	South Coast (192) %	Kootenay Boundary (274) %	Thompson Okanagan (335) %	Cariboo (187) %	Northern (343) %
Aware and have participated	3	3	10	3	10	4
Aware of	26	19	48	31	39	36
Not aware of	70	77	41	64	51	56
Refused/don't know	1	2	1	2	<1	4

### 5.3 Upgrade Incentive

If a \$250 incentive were made available a total of 41% of users of wood burning appliances would feel more likely to upgrade or replace their existing wood or pellet burning equipment, with 14% “very likely”.

#### Likelihood to Upgrade/Replace with \$250 Incentive



Base: Total users (n=1,765)

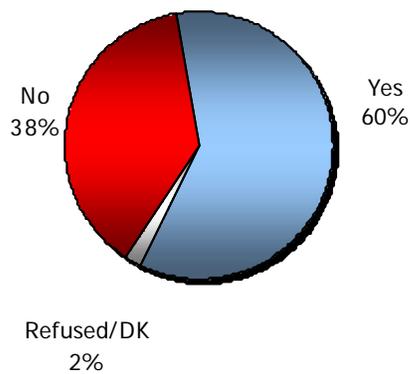
Q.53) Assuming there was a \$250 incentive available in your community how would this affect your decision to upgrade or replace your existing wood or pellet burning equipment?

## 5.4 Smoke Emission Bylaw

In all, six-in-ten users are aware that most new stoves sold in British Columbia are mandated by law to have low smoke emissions rates, with awareness somewhat higher in the Kootenay Boundary (72%), Cariboo (72%) and Northern (66%) regions.

Those living in rural areas are also more likely to be aware of this bylaw (63% vs. 55% of urbanites), as are home owners compared with renters (62% and 55% respectively).

### Awareness of Mandated Low Smoke Emission Rates for Wood Stoves in BC



*Base: Total users (n=1,765)*

*Q.54) Were you aware that most new stoves sold in British Columbia are mandated by law to have low smoke emissions rates?*

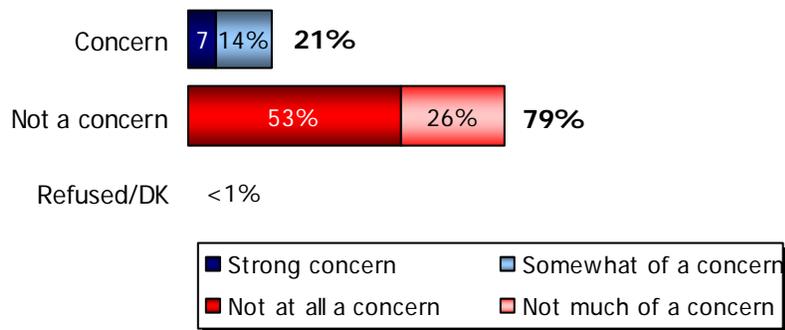
## 6. Smoke Emissions

### 6.1 Chimney Smoke

Chimney smoke is currently a concern for about one-in-five residents across the province, while more than three-quarters states it is either not much of a concern (26%) or not a concern at all (53%).

Those living in urban areas are just somewhat more likely to express a concern about chimney smoke in their community than those living in a more rural setting (23% concerned vs. 18% of those in rural areas).

#### Level of Concern Regarding Chimney Smoke

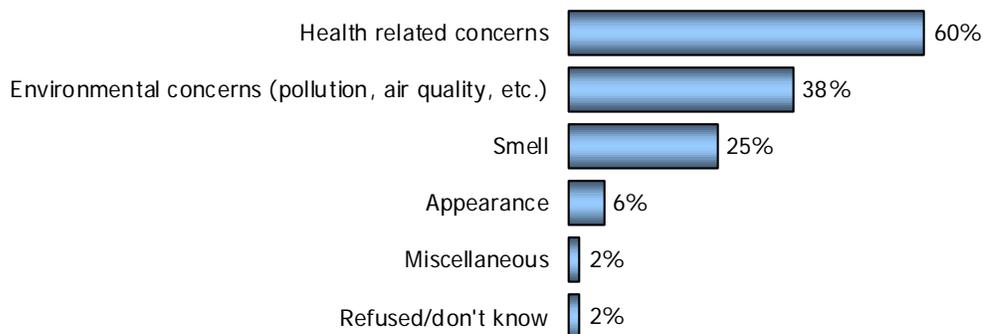


Base: Total (n=2,546)

Q.55) To what extent is chimney smoke in your local area a concern to you and your family?

The three most common concerns regarding chimney smoke are health concerns (60%) particularly expressed by those living in the West Coast region (72%), concern for the impact on the environment (38%) and finally the smell from the smoke (25%).

#### Concerns Regarding Chimney Smoke



Base: Total respondents who are concerned about chimney smoke (n=602)

Q.56) Why is chimney smoke a concern to you?

Of the suggested actions to reduce the amount of smoke from wood burning equipment strongest support is expressed for “Provincial Regulations that only allow clean burning wood appliances to be sold in BC” (77% support, 50% strongly and 27% somewhat). This is closely followed by support for “Providing a cash back incentive for removing old wood stoves and wood inserts” (71% support, 42% strongly and 29% somewhat).

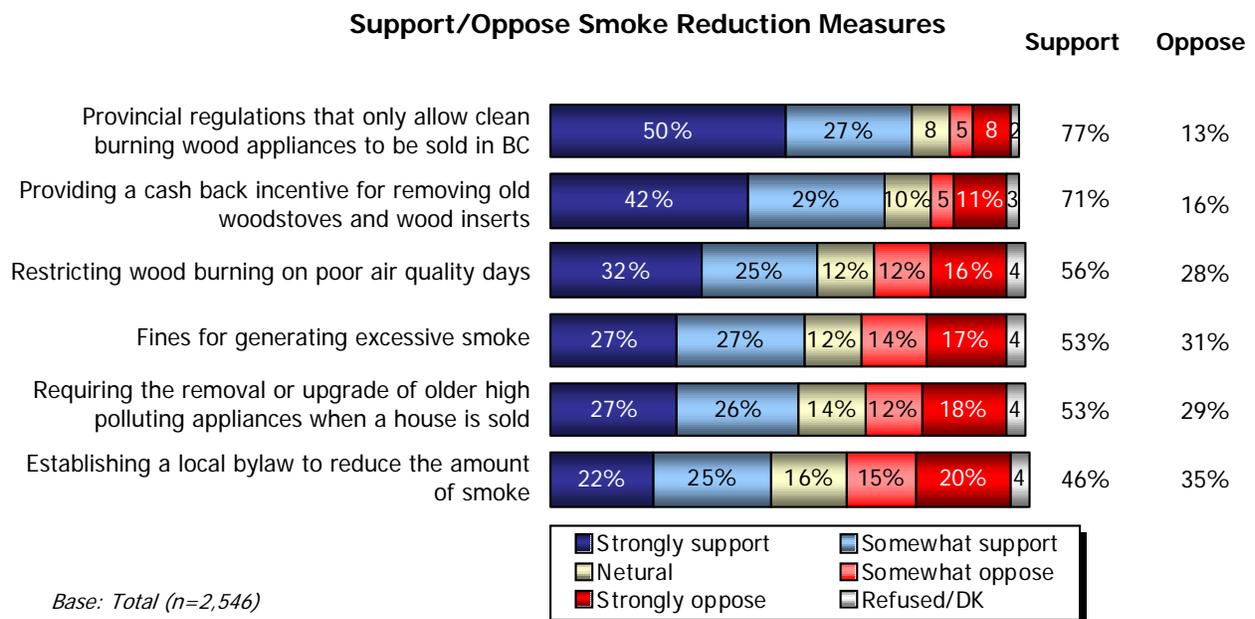
A little more than half of all respondents then expresses support for three of the other suggested actions, “Restricting wood burning on poor air quality days” (56% support), “Requiring the removal or upgrade of older high polluting appliances when a house is sold” and “Fines for generating excessive smoke” (each supported by 53%).

There is a little less support for “Establishing a local bylaw to reduce the amount of smoke” (46% support versus 35% opposed).

Support for the idea of fines for those producing excessive smoke is highest amongst residents of the South Coast region (64%), while residents of the Cariboo are more divided, with 41% that supports the measure versus 46% opposed to it.

A similar pattern exists when it comes to support for establishing the local bylaw, with support strongest on the South Coast (54%) while more divided in the Cariboo (38% support vs. 47% opposed) and Northern region (44% support vs. 42% opposed).

Residents of the Cariboo region are also less supportive than other regions when it comes to restricting wood burning on poor air quality days (43% support vs. 44% opposed), and requiring removal of older appliances when a house is sold (45% support vs. 40% opposed).



Q.57) There are a number of actions that can be taken to reduce the amount of smoke from wood burning equipment. Please tell me if you would support or oppose the following measures:

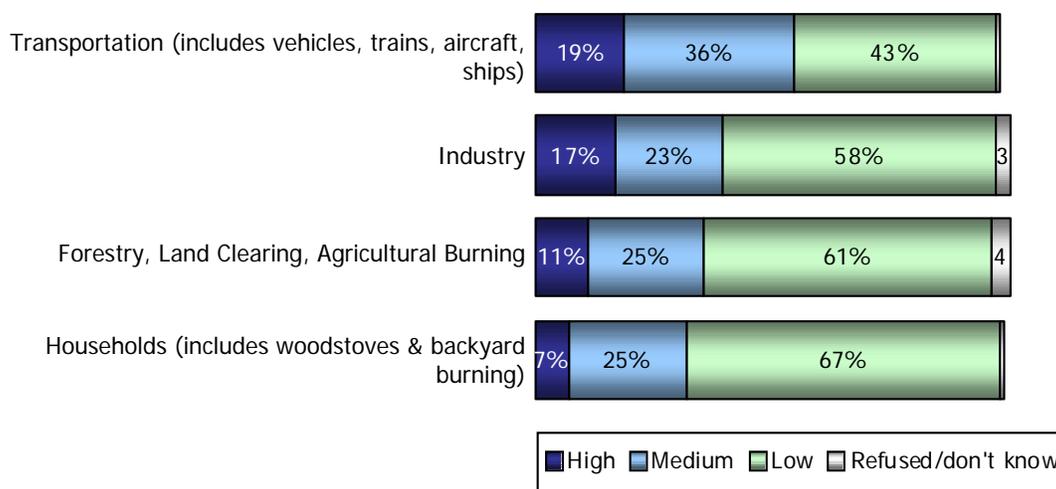
## 6.2 Sources of Air Pollution

Asked to rate the perceived level of pollution from each of four potential contributors, more than half rate “Transportation” (including vehicles, trains, aircraft and ships) as a medium to high contributor. Next, “Industry” (in general) is rated medium to high by 40%, while about one-third rates “Forestry” (including land clearing and agricultural burning, 36%), and “Households” (32%) as medium to high contributors.

Residents of the Cariboo and Northern regions are more likely than others to rate industry as a “high” contributor to air pollution (34% each), while those living on the West Coast are most likely to rate industry as a “low” contributor (66%).

Residents of the South Coast (which excludes Metro Vancouver) are more likely than other regions to rate transportation as a “high” contributor (36%), while those in the Cariboo and Kootenay Boundary regions are more likely to rate it as “low” (54% each). Also, those living in urban communities are more likely to consider transportation a “medium to high” contributor compared with those living more rurally (63% versus 45% respectively).

### Rating of Sources of Air Pollution



Base: Total (n=2,546)

Q.58) How would you rate the following sources – Low, Medium or High – for their contribution to air pollution in your area?

### 6.3 General Attitudes to Air Quality

Almost nine-in-ten residents across the province describes the air quality in the area in which they live as good, including 57% that rate it as “almost always good” and 31% as “good most of the time, poor on occasion”.

Attitudes do vary somewhat by region, with perception of air quality particularly positive on the West Coast (98% good, including 72% almost always good), while it is least positive among residents of the South Coast (though excluding Metro Vancouver), where 67% rate their air quality as good, including just 28% almost always good and 39% good most of the time.

Perhaps not surprisingly, those living in rural areas are more positive about their air quality than those living in a more urban setting, with 68% of rural residents describing their air quality as “almost always good” and 26% as “good most of the time, poor on occasion”. This is compared with 51% of urban residents describing their air quality as “almost always good” and 34% as “good most of the time, poor on occasion”.



Base: Total (n=2,546)

Q.59) Which of the following statements best describes how you feel about the air quality in the area where you live? The air quality in the area where I live is:

## 7. Demographic Profiles

Demographic Profile			
	Total (2,546) %	Users (1,765) %	Non-Users (781) %
<b>Rural Area</b>			
Yes	39	63	29
No	60	36	70
Refused/don't know	1	1	1
<b>Type of Residence</b>			
Detached house	81	92	77
Manufactured trailer or mobile home	6	5	7
Apartment building	4	<1	5
Condominium	4	1	5
Duplex, triplex or semi-detached	3	1	4
Rowhouse or townhouse	2	1	2
Refused/don't know	<1	<1	<1
<b>Home Tenure</b>			
Own	79	64	85
Rent	20	36	14
Refused/don't know	1	1	1
<b>Square Footage of Residence</b>			
Less than 1,000 sq ft	11	9	13
1,000 to 1,500 sq ft	28	27	28
1,500 to 2,500 sq ft	36	39	35
More than 2,500 sq ft	21	23	20
Refused/don't know	4	2	5
<b>Year Residence Built</b>			
Since 2010	1	2	1
2000-2009	12	10	13
1990-1999	18	13	20
1980-1989	18	22	16
1970-1979	24	24	23
1960-1969	10	12	9
1940-1959	11	10	11
1920-1939	3	2	3
Before 1920	2	2	2
Refused/don't know	3	3	2

*Continued*



Demographic Profile (cont'd)			
	<u>Total</u> (2,546) %	<u>Users</u> (1,765) %	<u>Non-Users</u> (781) %
<b>Main Source of Heat</b>			
Natural gas	45	25	54
Electricity	34	30	35
Wood or wood pellets	10	34	-
Fuel oil or heating oil	6	7	5
Heat pump	2	2	2
Propane	2	2	2
Other	1	1	2
Refused/don't know	<1	<1	<1
<b>Burn Wood or Pellets</b>			
Yes	30	100	-
No	70	-	100
<b>Unused Wood Burning Appliances</b>			
Yes	20	n/a	20
No	80	n/a	80

# Appendix

## Questionnaire



## British Columbia Woodstove and Residential Heating Survey

Good afternoon/evening, my name is NAME, and I am calling from company name on behalf of the British Columbia Ministry of Environment. May I please speak to the person in your household who is most knowledgeable about your home heating equipment? Please be assured that we are not selling or soliciting anything.

### **IF NECESSARY, REINTRODUCE SELF, THEN READ:**

We are conducting a province-wide survey to gather information on wood heating equipment use. This information will assist in the design of programs and services to help residents use their equipment more efficiently, save money on fuel costs and keep our air clean. All participants in this survey will remain anonymous.

**IF ASKED:** The survey takes between 10 and 20 minutes to complete, depending on the type and number of wood burning appliances you use in your home.

- 1) To ensure that we are representing all areas of the province, may I please have your postal code?
- 2) N/A
- 3) Please note that the questions I am going to be asking you refer to the residence you are in right now. Is the residence you are in right now in a rural area, that is, in a country setting?  
1 Yes                      2 No                      9 Don't know
- 4) Is your residence a home, an apartment, condominium, something else?  
READ IF NECESSARY, CHECK ONE ONLY  
1 Detached house  
2 Duplex, triplex or semi-detached  
3 Apartment building  
4 Rowhouse or townhouse  
5 Condominium  
6 Manufactured trailer or mobile home  
99 Don't know
- 5) Do you own or rent this residence?  
1 Rent                      2 Own                      9 Don't know
- 6) Approximately how large is your residence (in square feet)?  
1 Less than 1000 square feet  
2 1000 to 1500 square feet  
3 1500 to 2500 square feet  
4 More than 2500 square feet  
9 Don't know

7) In approximately what decade or year was your residence built?

- |              |               |
|--------------|---------------|
| 1 Since 2010 | 6 1960-1969   |
| 2 2000-2009  | 7 1940-1959   |
| 3 1990-1999  | 8 1920-1939   |
| 4 1980-1989  | 9 Before 1920 |
| 5 1970-1979  | 99 Don't Know |

8) What is the main source of heat in your home? **(READ LIST) [ACCEPT 1 MENTION] [RANDOMIZE]**

- 1 Electricity
- 2 Natural gas
- 3 Fuel oil or heating oil
- 4 Wood or wood pellets
- 5 Propane
- 6 Heat Pump
- 96 Other [specify] **[ALWAYS LAST]**
- 99 Don't Know

**If Wood or Wood Pellets is main source go to question 11 otherwise continue**

9) Do you ever burn wood or wood pellets in a fireplace, woodstove or other wood burning appliance?

- 1 Yes                      2 No                      9 Don't know

**IF YES TO WOOD or PELLETS go to question 11**

**IF NO (or DK) TO WOOD or PELLETS continue**

10) You indicated that you do not heat with wood or pellets at all. Does your home have any wood burning appliances, such as fireplaces, woodstoves, that you don't use?

- 1 Yes                      2 No                      9 Don't know

**Go to question 55**

11) Of all the heat used in your home, approximately what percentage comes from burning wood or pellets:

Percentage \_\_\_\_\_%

999 Don't know

*You indicated that you heat your home at least partly with wood or pellets. I am now going to ask you some questions about the types of wood burning equipment you have in your home.*

12) Which of the following types of wood burning fixtures or equipment did you use in your home in the past 12 months? **READ, CHECK ALL THAT APPLY**

- |   |                  |             |                     |
|---|------------------|-------------|---------------------|
| Wood fireplace or insert                                | <b>1 YES</b>     | <b>2 NO</b> | <b>9 Don't know</b> |
| Wood stove  | <b>1 YES</b>     | <b>2 NO</b> | <b>9 Don't know</b> |
| Wood burning central heating system (furnace or boiler) | <b>1 YES</b>     | <b>2 NO</b> | <b>9 Don't know</b> |
| Pellet stove or furnace                                 | <b>1 YES</b>     | <b>2 NO</b> | <b>9 Don't know</b> |
| Other wood burning appliance                            | <b>1 Specify</b> | <b>2 NO</b> | <b>9 Don't know</b> |



**If YES to pellet stove in 12 ask questions 23-25, otherwise skip.**

23) How many pellet stoves do you currently have in your home?

Record number \_\_\_\_\_

24) Is your pellet stove a cleaner burning low-emission appliance which is certified? It could be certified with either the United States Environmental Protection Agency (EPA) or the Canadian Standards Association (CSA).

1 Yes                      2 No                      9 Don't know

25) A standard bag of pellets weighs 40 pounds. Approximately how many bags of pellets did you burn over the past 12 months?

ENTER NUMBER OF BAGS OF PELLETS: \_\_\_\_\_ 998 Don't know

**Repeat question 24 and 25 if the respondent indicated more than one pellet stove.**

**AMOUNT OF WOOD BURNED**

**(ASK IF ANY WOOD BURNING EQUIPMENT OTHER THAN A PELLETT STOVE IDENTIFIED IN QUESTION 12. If a pellet stove is the only appliance then go to Number 37):**

*I am now going to ask you a few questions about the wood you burn in your home*

26) First I would like to know how much fire wood, in total, you burned in your wood burning equipment(s) over the past 12 months. In answering this question, I would like you to express the amount of wood in 'cords', which is the standard measure of firewood volume. As you may know, one full cord is a stack of firewood that measures 4 feet in width, 8 feet in length, and 4 feet in height.

A) Is the amount of wood in one full cord clear to you?

1 YES (**GO TO QUESTION 27**)      2 NO or 9 Don't know (**Continue**)

B) Okay, forgetting about "cords", can you tell me in your own words approximately how much wood you burned in your wood-burning equipment over the past 12 months?

96 MISCELLANEOUS                      97 NO, CAN'T EXPLAIN                      98 Don't know

**Skip to question 28**

27) Approximately how many cords of wood did you burn in your wood-burning equipment over the past 12 months? Please stop me when I have reached your category. Would you say you used?

1) less than ¼ of a cord    2) ¼ to ½ cord                      3) ½ to 1 cord                      4) 1 to 1 ½ cords  
5) 1 ½ to 2 cords                      6) 2 to 2 ½ cords                      7) 2 ½ to 3 cords                      8) 3 to 3 ½ cords  
9) 3 ½ to 4 cords                      96) More than 4 cords    98 Don't know

28) Of all the wood burned in your home over the past year, excluding pellets, approximately what percentage did you burn in your: **ASK ONLY THOSE THAT APPLY FROM QUESTION 12**

A Wood fireplace(s)                      \_\_\_%

B Wood stove(s)                      \_\_\_%

C Wood furnace or boiler(s)                      \_\_\_%

D Other appliance (named in 12)                      \_\_\_%

998 Don't know

29) Which if any of the following types of wood do you burn? **(READ)**

- |               |                                      |
|---------------|--------------------------------------|
| 1 Pine        | 10. Cedar                            |
| 2 Spruce      | 11. Larch                            |
| 3 Douglas fir | 12. Maple                            |
| 4 Birch       | 13. Poplar                           |
| 5 Alder       | 14. Arbutus                          |
| 6 Hemlock     | 15. Fruit wood (apple, cherry, etc.) |
|               | 95. Varies, no specific              |
|               | 96. Miscellaneous species            |
|               | 98. Don't know varieties             |

30) And of those different types of wood that you burn, what percentage would be: THOSE MENTIONED IN Q29 **(READ)**

- |                |       |   |
|----------------|-------|---|
| A Pine         | _____ | % |
| B Spruce       | _____ | % |
| C Douglas fir  | _____ | % |
| D Birch        | _____ | % |
| E Alder        | _____ | % |
| F Hemlock      | _____ | % |
| G Other 1      | _____ | % |
| H Other 2      | _____ | % |
| 998 DON'T KNOW |       |   |

31) Do you purchase the majority of your firewood or get it yourself?

- 1 PURCHASE
- 2 GET FIREWOOD OURSELVES
- 9 Don't Know

**ASK QUESTION 32 TO PARTICIPANTS WHO ANSWERED "PURCHASE" TO QUESTION 31 OTHERWISE CONTINUE TO 33**

32) How do you purchase wood? **(READ)**

- 1 PRE-BUCKED, DELIVERED BY TRUCK
- 2 I/WE BUCK AND PICK UP
- 3 PURCHASE LOAD OF LOGS OR WASTE WOOD DELIVERED
- 4 ARTIFICIAL FIRELOGS
- 96 OTHER \_\_\_\_\_
- 98 DON'T KNOW

33) In what season(s) do you mainly gather or purchase your firewood?

- 1 WINTER
- 2 SPRING
- 3 SUMMER
- 4 FALL
- 9 Don't Know

- 34) How long do you typically dry/season your firewood before the heating season? **DO NOT READ, ONE ANSWER ONLY**
- 1 NOT AT ALL
  - 2 LESS THAN SIX MONTHS
  - 3 SIX TO TWELVE MONTHS
  - 4 MORE THAN ONE YEAR
  - 9 Don't know

- 35) Do you usually have your firewood split before drying/seasoning it?
- 1 Yes
  - 2 No
  - 9 Don't know

- 36) How do you store the majority of your wood? Would it be:
- READ, CHECK ALL THAT APPLY**
- 1 Outside, covered
  - 2 Outside, uncovered
  - 3 Inside, heated
  - 4 Inside, unheated
  - 9 Don't know

*I am now going to ask you a few questions on wood burning practices*

- 37) How many years, in total, have you been burning wood or pellets in your home?
- ENTER NUMBER OF YEARS: \_\_\_\_\_ 998 Don't know

- 38) People have mentioned to us several reasons for burning wood or pellets in their home. As I read each reason, please tell me if this is NOT A REASON, A MINOR REASON OR A MAJOR REASON for burning wood in your home. First...**READ**

- a) A wood supply is readily available
- b) It is cheaper compared to other fuels
- c) I like the smell or beauty of a fire
- d) I think it is an environmentally friendly option
- e) Natural gas is not available in my area
- f) Reliability in event of power outages

1 NOT A REASON                      2 MINOR                      3 MAJOR                      9 NOT SURE

- g) Any other reasons?

- 1. Enjoy the heat/unique dry heat produced by burning wood/ consistent
- 2. Supplemental source of heating
- 3. Exercise (i.e. splitting, hauling)
- 4. Only source of heat
- 96. MISCELLANEOUS REASONS
- 97. NO OTHER REASONS

39) Thinking back over the seasons in the past year, approximately how many days per week would you have had a fire going in your wood burning equipment (at least one of your wood or pellet burning appliances): **READ, ONE ANSWER ONLY FOR EACH SEASON**

	NUMBER OF DAYS PER WEEK
A Fall Season (September through October)	0 1 2 3 4 5 6 7 (9 DK)
B Winter Season (November through February)	0 1 2 3 4 5 6 7 (9 DK)
C Spring Season (March through May)	0 1 2 3 4 5 6 7 (9 DK)
D Summer Season (June through August)	0 1 2 3 4 5 6 7 (9 DK)

40) And in the seasons when you used your wood burning equipment, generally what times of day would you have had a fire going, beginning with: **READ, RECORD TIMES FOR EACH SEASON IN WHICH EQUIPMENT WAS USED (FROM QUESTION 39)**

- A Fall Season (September through October):
- B Winter Season (November through February)
- C Spring Season (March through May)
- D Summer Season (June through August)

FOR EACH SEASON SELECT ALL THAT APPLY:

- 1 Morning
- 2 Afternoon
- 3 Evening
- 4 Overnight
- 9 Don't know

41) Next I'm going to read a list of materials and for each one I'd like you to tell me if you burn them always, often, sometimes, rarely or never in your wood or wood pellet burning equipment. Starting with... **READ**

1 Always   2 Often        3 Sometimes        4 Rarely        5 Never        9 Don't know

- a) Newspapers
- b) Magazines
- c) Cardboard or other paper products (junk mail, office paper, etc.)
- d) Manufactured wood products such as plywood, chipboard, fibreboard, etc.
- e) Painted or treated wood
- f) Plastics
- g) Driftwood

42) In the past two years, have you installed any new wood or wood pellet burning equipment – either as a replacement for old equipment or as a brand new installation?

- 1 Yes **CONTINUE**
- 2 No **GO TO QUESTION 47**
- 9 Don't know **GO TO QUESTION 47**

- 43) Which, if any of the following types of equipment did you install: **READ, CHECK AS MANY AS APPLY**
- a. Wood fireplace
  - b. Woodstove
  - c. Fireplace insert 1. YES
  - d. Wood furnace 2. NO
  - e. Wood boiler 9. REFUSED
  - f. Wood pellet stove
  - g. UPDATED/REPLACED PARTS (PIPES, BAFFLES, ETC)

IF Q43a=1: Was the wood fireplace EPA certified?  
1 YES 2 NO 9 Don't know

IF Q43b=1: Was the Woodstove:  
1 EPA certified with baffles inside the firebox to burn the smoke  
2 EPA certified with catalyts inside the firebox that burn off the smoke  
3 NEITHER  
9 Don't know

IF Q43c=1: Was the Fireplace insert:  
1 EPA certified with baffles inside the firebox to burn the smoke  
2 EPA certified with catalyts inside the firebox that burn off the smoke  
3 NEITHER  
9 Don't know

IF Q43d=1: Was the Wood furnace:  
1 A Conventional Wood Furnace  
2 An EPA Certified Furnace  
9 Don't know

IF Q43e=1: Was the Wood boiler:  
1 Inside  
2 Outside  
9 Don't know

IF Q43e=1: And was the Wood boiler:  
1 White Tag – Low Emissions Boiler  
2 Orange Tag – Low Emissions Boiler  
3 NEITHER  
9 Don't know

IF Q43f=1: Was the Wood pellet stove EPA certified?  
1 YES 2 NO 9 Don't know

44) What was the single most important reason you installed this new equipment? (**Do Not Read, Check One Only**)

45) Any other reasons? (**DO NOT READ, CHECK AS MANY AS APPLY. PROBE**)

- 01 APPEARANCE
- 02 AGE OF OLD EQUIPMENT
- 03 ELECTRICITY SUPPLY UNRELIABLE
- 04 ENVIRONMENTAL/AIR QUALITY CONCERNS
- 05 FAILURE OF OLD EQUIPMENT
- 06 GAS ISN'T AVAILABLE IN MY AREA
- 07 HIGH PRICES FOR ELECTRICITY, GAS OR OTHER FUEL
- 08 HOME INSURANCE PURPOSES
- 09 INCONVENIENT TO USE OLD EQUIPMENT
- 10 ENJOY BURNING WOOD
- 11 HEALTH OR SAFETY REASON S
- 12 FUEL EFFICIENCY - OLD EQUIPMENT USES TOO MUCH FUEL
- 13 COST SAVINGS
- 96 MISCELLANEOUS
- 98 Don't know

46) Does your new wood burning appliance produce less smoke than your older wood burning equipment?

- 1 Yes                      2 No                      3 Sometimes                      9 Don't know

47) How likely do you think you will be to install any new wood or wood pellet burning equipment – either as a replacement for old equipment or as a brand new installation – over the next three years? Will you be very likely, somewhat likely, somewhat unlikely or very unlikely?

- 1 VERY LIKELY CONTINUE
- 2 SOMEWHAT LIKELY CONTINUE
- 3 SOMEWHAT UNLIKELY GO TO QUESTION 51
- 4 VERY UNLIKELY GO TO QUESTION 51
- 9 DON'T KNOW GO TO QUESTION 51

48) Which ONE of the following types of equipment do you think you would most seriously consider installing in the next 3 years? Would it be a: **READ, CHECK ONE ANSWER ONLY**

- 1 Wood fireplace
- 2 Woodstove
- 3 Fireplace insert
- 4 Wood furnace or boiler
- 5 Wood pellet stove
- 96 Replace/Upgrade parts
- 98 DON'T KNOW

49) What would be the single most important reason why you would install new equipment? (**Do Not Read, Check One Only**)

50) Any other reasons? **DO NOT READ, CHECK AS MANY AS APPLY. PROBE**

- 01 APPEARANCE
- 02 AGE OF OLD EQUIPMENT
- 03 ELECTRICITY SUPPLY UNRELIABLE
- 04 ENVIRONMENTAL/AIR QUALITY CONCERNS
- 05 FAILURE OF OLD EQUIPMENT
- 06 GAS ISN'T AVAILABLE IN MY AREA
- 07 HIGH PRICES FOR ELECTRICITY, GAS OR OTHER FUEL
- 08 HOME INSURANCE PURPOSES
- 09 INCONVENIENT TO USE OLD EQUIPMENT
- 10 ENJOY BURNING WOOD
- 11 HEALTH OR SAFETY REASONS
- 12 FUEL EFFICIENCY - OLD EQUIPMENT USES TOO MUCH FUEL
- 13 COST SAVINGS
- 96 MISCELLANEOUS
- 98 Don't know

51) Are you aware that there are cash incentives in many BC communities for upgrading to newer, more efficient, cleaner burning wood or pellet stoves?

- 1 Yes
- 2 No
- 9 Don't know

52) Are you aware of or have you participated in the Provincial Wood Stove Exchange Program?

- 1 Aware and have participated
- 2 Aware of
- 3 Not aware of
- 9 Don't know

53) Assuming there was a \$250 incentive available in your community how would this affect your decision to upgrade or replace your existing wood or pellet burning equipment?

- 1 Much more likely to replace
- 2 Slightly more likely to replace
- 3 No more likely to replace
- 4 Less likely to replace
- 9 Don't know

54) Were you aware that most new stoves sold in British Columbia are mandated by law to have low smoke emissions rates?

- 1 YES, AWARE
- 2 NO, NOT AWARE
- 9 Don't Know

**Opinion – ASK EVERYONE**

55) To what extent is chimney smoke in your local area a concern to you and your family? Is it...

**READ**

- |                         |                          |
|-------------------------|--------------------------|
| 1 A strong concern      | <b>CONTINUE</b>          |
| 2 Somewhat of a concern | <b>CONTINUE</b>          |
| 3 Not much of a concern | <b>GO TO QUESTION 57</b> |
| 4 Not at all a concern  | <b>GO TO QUESTION 57</b> |
| 9 DON'T KNOW            | <b>GO TO QUESTION 57</b> |

56) Why is chimney smoke a concern to you? **DO NOT READ, CHECK AS MANY AS APPLY. PROBE**

- 1 HEALTH-RELATED CONCERNS

2 APPEARANCE

3 SMELL

4 ENVIRONMENTAL CONCERNS (POLLUTION, AIR QUALITY, ETC.)

96 MISCELLANEOUS

98 DON'T KNOW

57) There are a number of actions that can be taken to reduce the amount of smoke from wood burning equipment. Please tell me if you would support or oppose the following measures:

**READ**

1 Strongly support            2 Somewhat support    3) Neutral            4 Somewhat oppose

5 Strongly oppose

a) Establishing a local bylaw to reduce the amount of smoke.

b) Providing a cash back incentive for removing old woodstoves and wood inserts.

c) Provincial regulations that only allow clean burning wood appliances to be sold in BC

d) Fines for generating excessive smoke

e) Restricting wood burning on poor air quality days

f) Requiring the removal or upgrade of older high polluting appliances when a house is sold

58) How would you rank the following sources – Low, Medium or High – for their contribution to air pollution in your area?

a) Industry

b) Transportation (includes vehicles, trains, aircraft, ships)

c) Households (includes woodstoves & backyard burning)

d) Forestry, Land Clearing, Agricultural Burning

1 LOW

2 MEDIUM

3 HIGH

9 DON'T KNOW

59) Which of the following statements best describes how you feel about the air quality in the area where you live? The air quality in the area where I live is: **READ AND ROTATE, ONE**

**ANSWER ONLY**

1 Almost always good

2 Good most of the time, poor on occasion

3 Good about half of the time, poor the other half

4 Poor most of the time, good on occasion

5 Almost always poor

9 DON'T KNOW