

OKANAGAN INDOOR WOOD BURNING APPLIANCE INVENTORY SURVEY

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A Project of the Okanagan Air Quality Technical Steering Committee



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**The Regional District of the Central Okanagan
The Okanagan Similkameen Regional District
The North Okanagan Regional District
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1.0 Introduction

The various local governments in the Okanagan Region wish to establish a reliable information base on the current means of wood burning appliances used by residents in the Okanagan and their usage rates so that they may better understand this source of air quality concerns. The intent of this study was to conduct descriptive research on indoor wood burning and energy usage in each of the various participating regions in the Okanagan (North, Central and Okanagan-Similkameen Regional Districts). This study will enable each of the regions to determine the nature of overall indoor wood burning appliance usage in their region and the Okanagan Valley overall and thus aid in any further strategic planning, guidelines or legislation.

The Okanagan Indoor Wood Burning Inventory Survey will be used for the following purposes:

- to determine the usage and nature of wood burning appliances by households in the Okanagan Region.
- completes a portion of an overall emissions inventory for the Valley. The particulate loading results will be used by Environment Canada in Air Quality Modelling of the Airshed.
- provides a baseline to track emission reduction strategy effectiveness.
- determines the types of wood burning appliances being used in the community. This is also used to track program effectiveness.
- provides us with valuable residential opinions about possible bylaws to protect air quality.
- provides information about the effectiveness of our programs and where they can be improved.
- provides information about the receptivity of households to use/switch to more efficient wood burning appliances.
- provides information about the potential increase or decrease of wood burning appliance use in the near future.

2.0 Project Description

The most reliable methodology chosen for this survey was a proportional study of households surveyed equally by a combined mail survey and a direct intercept cluster study method. For the mail survey each geographic area of the Central, North and Okanagan-Similkameen Regions were identified by their Postal Codes (i.e. Central Okanagan: 9 areas - Peachland – Westbank/Lakeview, Kelowna to Winfield) and each were surveyed proportionally.

Questionnaire design and measurement criteria conforms to the current measurement guidelines that have been established for similar studies to aid cross referencing and support of National efforts in this environmental area. Surveying commenced in May 2001, to ensure proper recall of wood fuel usage in the past winter season.

The City of Kelowna and the Regional District of the Central Okanagan initiated the study to be of a minimum random sample of 400 households in the Central Okanagan area and an additional 400 residents [i.e.200 from South Okanagan and 200 from the North Okanagan] for a representative sample from throughout the Okanagan area. The actual number of surveys received for the Central and North Okanagan were above targeted levels; however, there was some resistance by residents in the Okanagan-Similkameen Region where 169 surveys were received instead of the targeted 200. The table below shows the actual survey sample size for each region.

Actual Survey Sample Size

<u>REGION</u>	<u>NUMBER OF HOUSEHOLDS SURVEYED</u>	<u>NUMBER OF HOUSEHOLDS IN SURVEY AREA (2000 CENSUS)</u>
Central Okanagan	407	62,675
North Okanagan	202	22,949
Okanagan-Similkameen	169	19,543
Total	778	105,167

The final overall sample of the Okanagan area of 778 households provides a sample, which has a confidence level of +/-3.5%, 19 times out of 20.

3.0 Indoor Wood Burning Usage

3.1 Percentage of Okanagan Households that Burn Wood using an Indoor Wood Burning Appliance (Includes Additional Buildings on Property)

Region	Percentage of Households that Burn Wood
Central Okanagan	18.7%
North Okanagan	22.6%
Okanagan-Similkameen	24.3%
OKANAGAN AVERAGE	20.8%
CANADIAN AVERAGE	28%

3.2 Estimated Number of Okanagan Households that Burn Wood using an Indoor Wood Burning Appliance (Includes Additional Buildings on Property)

Region	Number of Households in Study Area (2000 Census)	Number of Households that Burn Wood
Central Okanagan	62,675	11,720
North Okanagan	22,949	5,186
Okanagan-Similkameen	19,543	4,748
OKANAGAN TOTAL	105,167	21,654

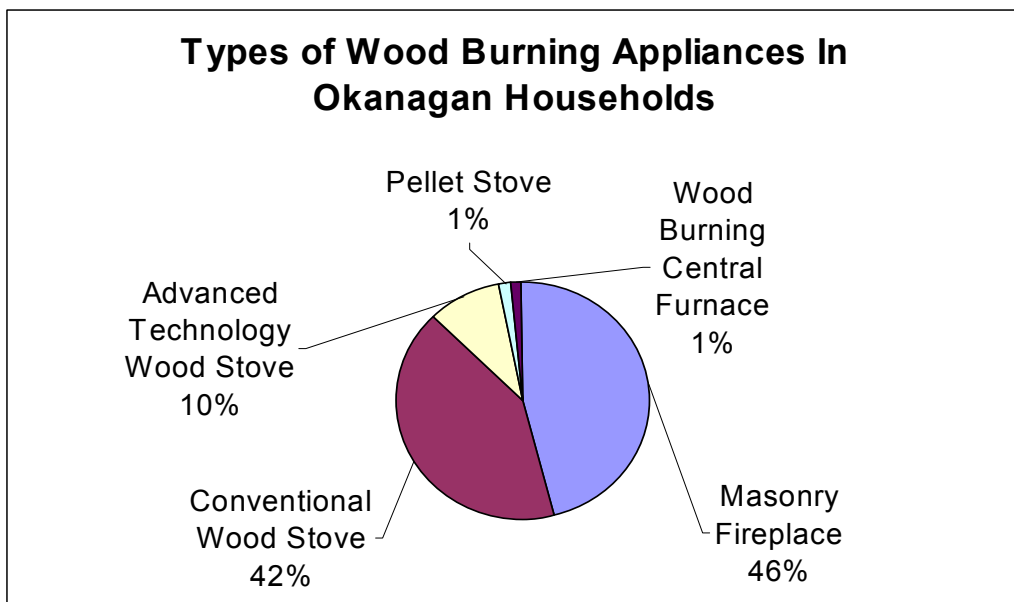
3.3 Percentage of Okanagan Households that Burn Wood to Heat Additional Buildings on their Property (e.g. Workshop or Garage)

Region	Percentage of Households
Central Okanagan	1.7%
North Okanagan	4.3%
Okanagan-Similkameen	1.8%
OKANAGAN AVERAGE	2.3%

3.4 Dwelling types of indoor wood burning households within the Okanagan (Includes the North, Central and Okanagan Similkameen Regional Districts)

	Central Okanagan	North Okanagan	Okanagan Similkameen
Detached House	97%	93%	100%
Duplex, triplex or semi-detached dwelling	3%	2%	0%
Manufactured trailer or mobile home	0%	5%	0%

3.5 Types of Wood Burning Appliances in Okanagan Households (Includes the North, Central and Okanagan Similkameen Regional Districts)



3.6 Average Number of Cords (4x4x8ft.) Burned Per Year in the Okanagan (Includes the North, Central and Okanagan Similkameen Regional Districts)

Region	Average Number of Cords Burned per Household (4ft.x4ft.x8ft.)
Okanagan (Includes the North, Central and Okanagan Similkameen Regional Districts)	2.3
Canada	2.3 (NRCan, 1998)
British Columbia	1.7 (NRCan, 1998)

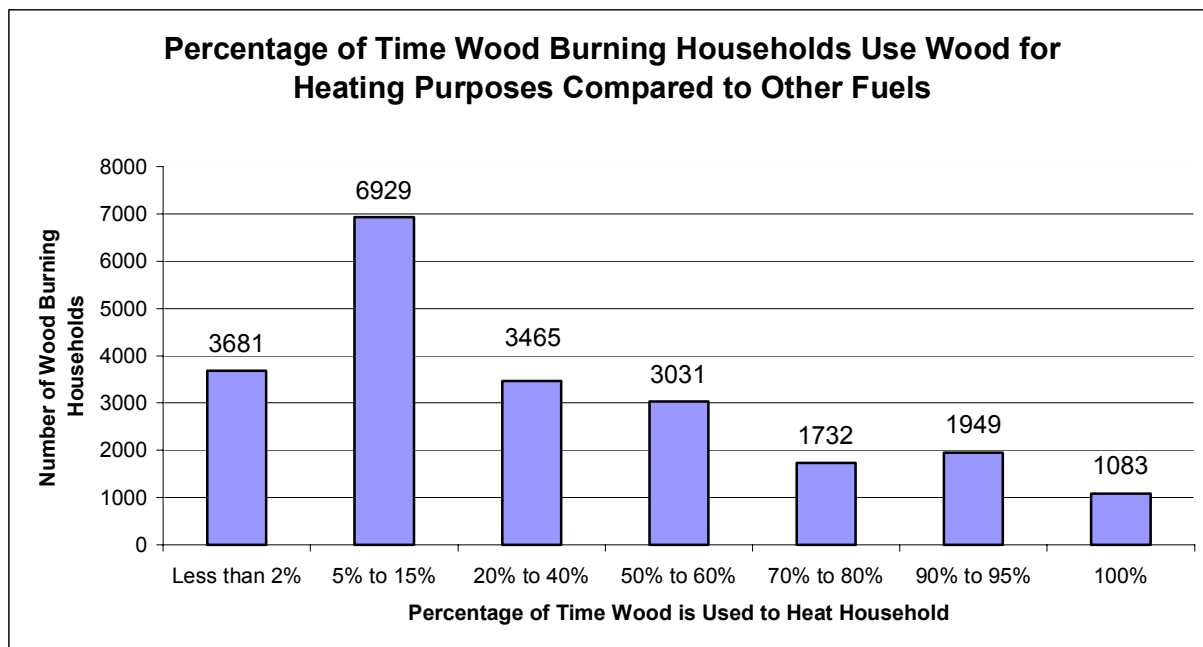
3.7 Average annual consumption of fuel wood per Okanagan household within the main wood burning system categories (Includes the North, Central and Okanagan Similkameen Regional Districts)

Type of Appliance	Cords Burned Annually (4ft. by 4ft. by 8ft.)
Advanced Technology Stove	2.2
Conventional Stove	2.7
Masonry Fireplace	1.2
Pellet Stove	0.5
Central Furnace	7

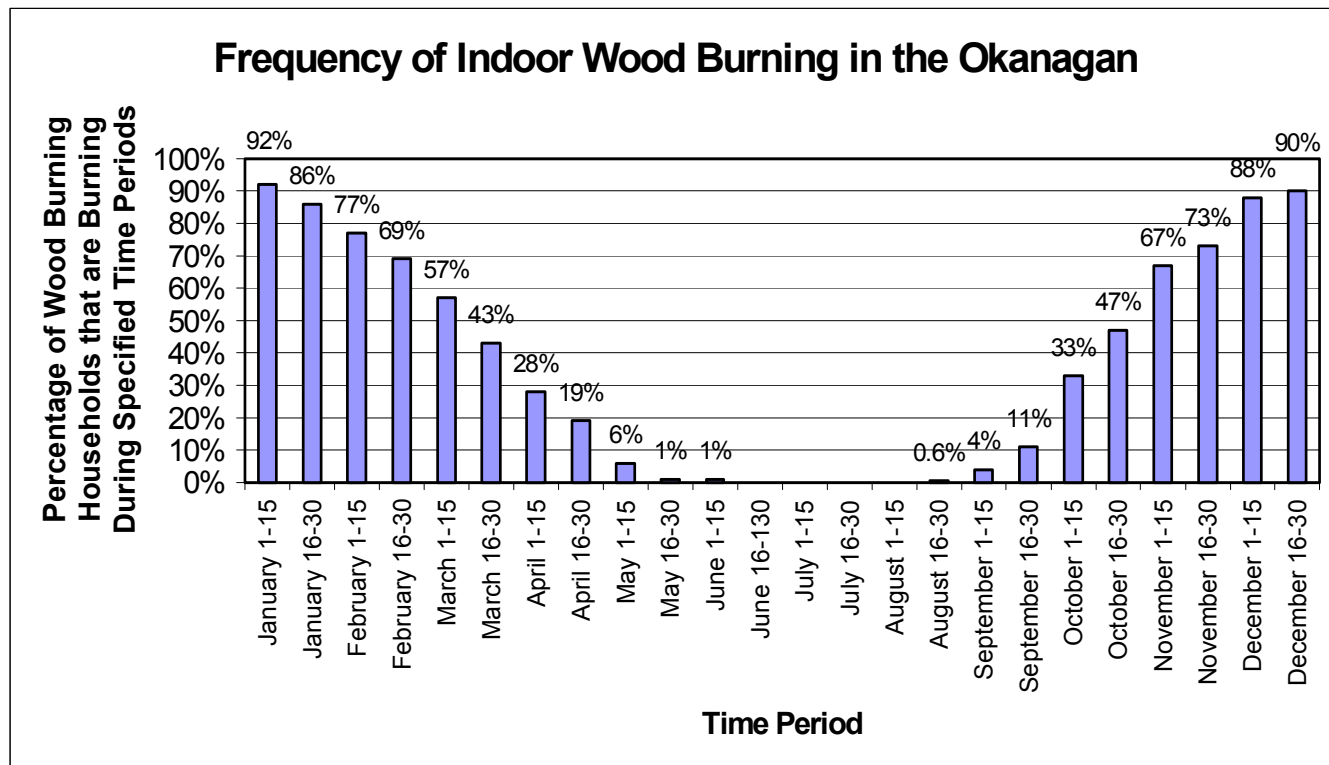
3.8 Type of wood burned by Okanagan households (Includes the North, Central and Okanagan Similkameen Regional Districts)

Type of Wood	Percentage Burned
Pine	33.5%
Douglas Fir	20.9%
Apple	13.2%
Birch	10.6%
Spruce	9.6%
Don't Know	6.9%
Other	5.4%
TOTAL	100%

3.9 Percentage of time Okanagan wood burning households use wood for heating purposes compared to other fuels (Includes the North, Central and Okanagan Similkameen Regional Districts)



3.10 Frequency of Indoor Wood Burning in the Okanagan (Includes the North, Central and Okanagan Similkameen Regional Districts)



3.11 How wood is used as a source of energy in the Okanagan

	Central Okanagan	North Okanagan	Okanagan Similkameen
Frequency of Wood Heating	Percentage of Wood Burning Households	Percentage of Wood Burning Households	Percentage of Wood Burning Households
Occasional Leisure Heating	48%	32%	43%
Secondary Heating	29%	38%	34%
Main Heating	23%	30%	17%
Other			6%

4.0 Influences on Indoor Wood Burning

- 4.1 How did the sharp increase in natural gas prices affect the amount of time Okanagan residents burned wood during the 2000/2001 winter burning season? (Includes the North, Central and Okanagan Similkameen Regional Districts)

% of Okanagan households that increased burning due to increased natural gas prices	% of Okanagan households that did not increase burning due to increased natural gas prices	% of Okanagan wood burning households not hooked up to natural gas
41.3%	42.0%	16.7%
<i>The average increase in burning for these households was 42.5%</i>		

5.0 Future Heating Plans

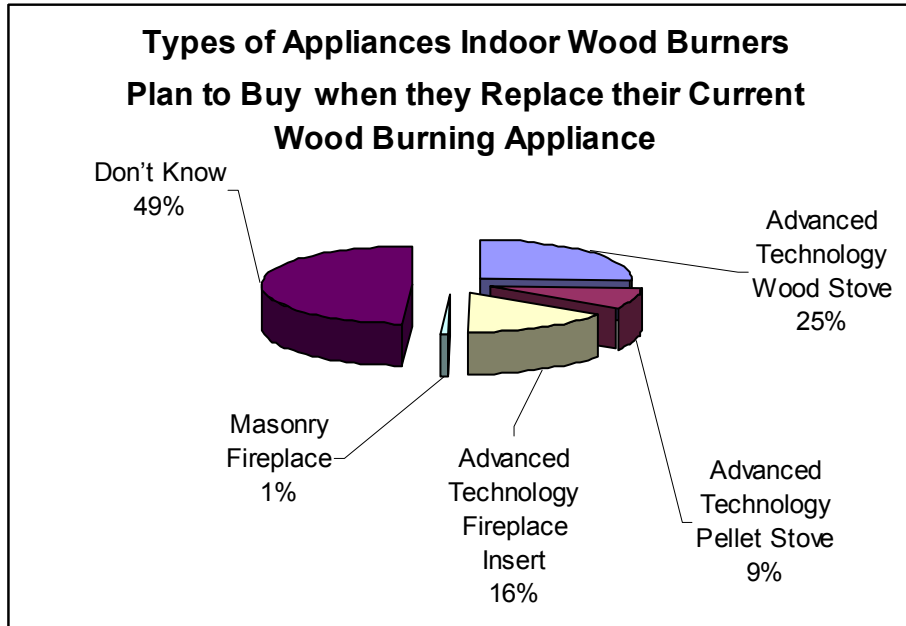
- 5.1 Percentage of non-wood burning households intending to add a wood burning appliance within the next 2 years

	% of Households adding wood burning appliance	% of Households not adding wood burning appliance	Uncertain
Central Okanagan	6.1%	74.0%	19.9%
North Okanagan	5.3%	79.5%	15.2%
Okanagan-Similkameen	7.2%	77.8%	15.0%

- 5.2 Indoor wood burning households considering exchanging their current wood burning appliance for a new one in the next 2 to 3 years

	% of households considering exchanging current wood appliance for a new one	% of households that would consider exchanging current wood appliance if rebate program offered again	% of households that need more information before considering exchanging current wood appliance for a new one	% of households not considering exchanging current wood appliance
Central Okanagan	22.5%	15.5%	10.3%	51.7%
North Okanagan	16.6%	5.6%	2.8%	75.0%
Okanagan-Similkameen	8.6%	22.9%	11.4%	54.3%

5.3 Types of appliances indoor wood burners plan to buy when they replace their current wood burning appliance (Includes the North, Central and Okanagan Similkameen Regional Districts)



6.0 Wood Stove Change out Incentive Program

6.1 Percentage of indoor wood burners aware of the “2001 Great Okanagan Wood Stove Exchange” rebate program

	Aware of the Great Okanagan Wood Stove Exchange Program	Unaware of the Great Okanagan Wood Stove Exchange Program
Central Okanagan Wood Users	45.5%	54.5%
North Okanagan Wood Users	59.5%	40.5%
Okanagan-Similkameen Wood Users	48.6%	51.4%

6.2 Reasons considered important for replacing existing wood burning appliance

	Environmental Concerns	Inefficiency	Age of Equipment	Messy	Safety Reasons	Aesthetic Reasons	Other
Central Okanagan Wood Users	41%	27.7%	10.8%	12.0%	3.6%	4.8%	0%
North Okanagan Wood Users	46.2%	26.9%	11.5%	3.8%	7.7%	0%	3.8%
Okanagan-Similkameen Wood Users	25.5%	29.1%	14.5%	5.5%	18.2%	3.6%	3.6%

7.0 Indoor Wood Burning Practices

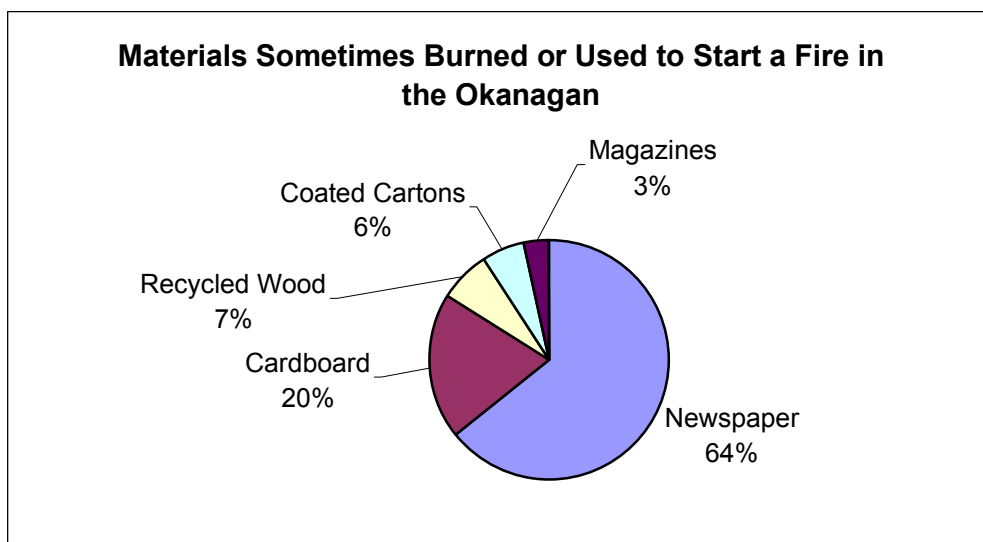
7.1 Length of time Okanagan residents dry their firewood (Includes the North, Central and Okanagan Similkameen Regional Districts)

Length of Drying	Percentage of Woodburning Households
Not at all	3.5%
1-2 months	10.0%
3-4 months	5.0%
5-6 months	5.7%
7-8 months	7.1%
1 year or longer	68.7%
TOTAL	100%

7.2 Percentage of Okanagan residents that split their firewood before drying it (Includes the North, Central and Okanagan Similkameen Regional Districts)

Frequency	Percentage of Woodburning Households
Most of the time	81.7%
Half the time	8.5%
One quarter of the time	2.8%
Rarely to none	7.0%
TOTAL	100%

7.3 Materials sometimes burned or used to start a fire in the Okanagan (Includes the North, Central and Okanagan Similkameen Regional Districts)



7.4 Amount of smoke Okanagan wood users see coming from their chimney (Includes the North, Central and Okanagan Similkameen Regional Districts)

Can't see any smoke	See only a small amount of smoke	See a moderate amount of smoke	See a large amount of smoke	Don't Know
18.8%	46.8%	24.1%	0%	10.3%

7.5 Percentage of households that are aware that you can burn wood within an indoor wood burning appliance without causing smoke (Includes the North, Central and Okanagan Similkameen Regional Districts)

Aware that you can burn wood without causing smoke.	Unaware that you can burn wood without causing smoke.
55.2%	44.8%

8.0 Opinions

8.1 Percentage of households that consider fireplace or wood stove smoke a health concern in their neighbourhood

	Smoke is a Health Concern	Not a Health Concern
Central Okanagan	33.5%	66.5%
North Okanagan	36.8%	63.2%
Okanagan-Similkameen	30.6%	69.4%

8.2 Support for a bylaw to control nuisance amounts of smoke from wood burning appliances

	Yes	No
Central Okanagan	73.2%	26.8%
North Okanagan	59.4%	40.6%
Okanagan-Similkameen	75.5%	24.5%

8.3 Should indoor wood burning be suspended during poor air quality conditions?

	Yes	No
Central Okanagan	75.7%	24.3%
North Okanagan	62.4%	37.6%
Okanagan-Similkameen	79.6%	20.4%

9.0 Summary

This study provides a profile of indoor wood burning usage and practices in 2001 as well as offers insight into future heating plans of residents in the Okanagan. Information was also compiled on residents' opinions on indoor wood burning bylaws, health effects of wood smoke and the Okanagan's wood stove change out incentive program. The final overall sample of the Okanagan area of 778 households provides a sample, which has a confidence level of +/-3.5%, 19 times out of 20.

The following are information highlights compiled from the survey:

- ◆ The percentage of Okanagan households that burn wood using an indoor wood burning appliance is approximately 21% or 21,654 households (Includes the North, Central and Okanagan Similkameen Regional Districts). The Canadian average is 28% of households (Canadian Facts Survey, 1997).
- ◆ An average of 2.3 cords (4ft. by 4ft. by 8ft.) of wood are burned per year in each Okanagan indoor wood burning household. The Canadian average is 2.3 cords per year while the British Columbia average is 1.7 cords (NRCan, 1998).
- ◆ Only 11% of wood burning appliances are considered advanced technology or EPA emission approved in the Okanagan.
- ◆ It is projected there will be a 5-7% increase in the number of wood burning appliances being used in the next 2 years within the Okanagan.
- ◆ Okanagan residents generally have good burning habits, but there is room for improvement through education.
- ◆ Only 55% of Okanagan indoor wood burning households were aware that you could burn wood without causing smoke.
- ◆ A large portion of wood burning residents are considering exchanging their old wood burning appliance for a new clean burn technology appliance in the next 2-3 years. The exchange program will boost these numbers.
- ◆ Environmental / health concerns rate as the highest reason for replacing old wood burning appliances for advanced technology appliances.
- ◆ The percentage of households that consider fireplace or wood stove smoke a health concern in their neighbourhood is 34% in the Central Okanagan, 37% in the North Okanagan and 31% in the Okanagan Similkameen.
- ◆ A majority of households in the Okanagan would support a bylaw to control nuisance amounts of smoke from indoor wood burning appliances (73% in the Central Okanagan, 76% in the Okanagan Similkameen and 59% in the North Okanagan).
- ◆ A majority of households in the Okanagan believe indoor wood burning should be suspended during poor air quality conditions (76% in the Central Okanagan, 80% in the Okanagan Similkameen and 62% in the North Okanagan).

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