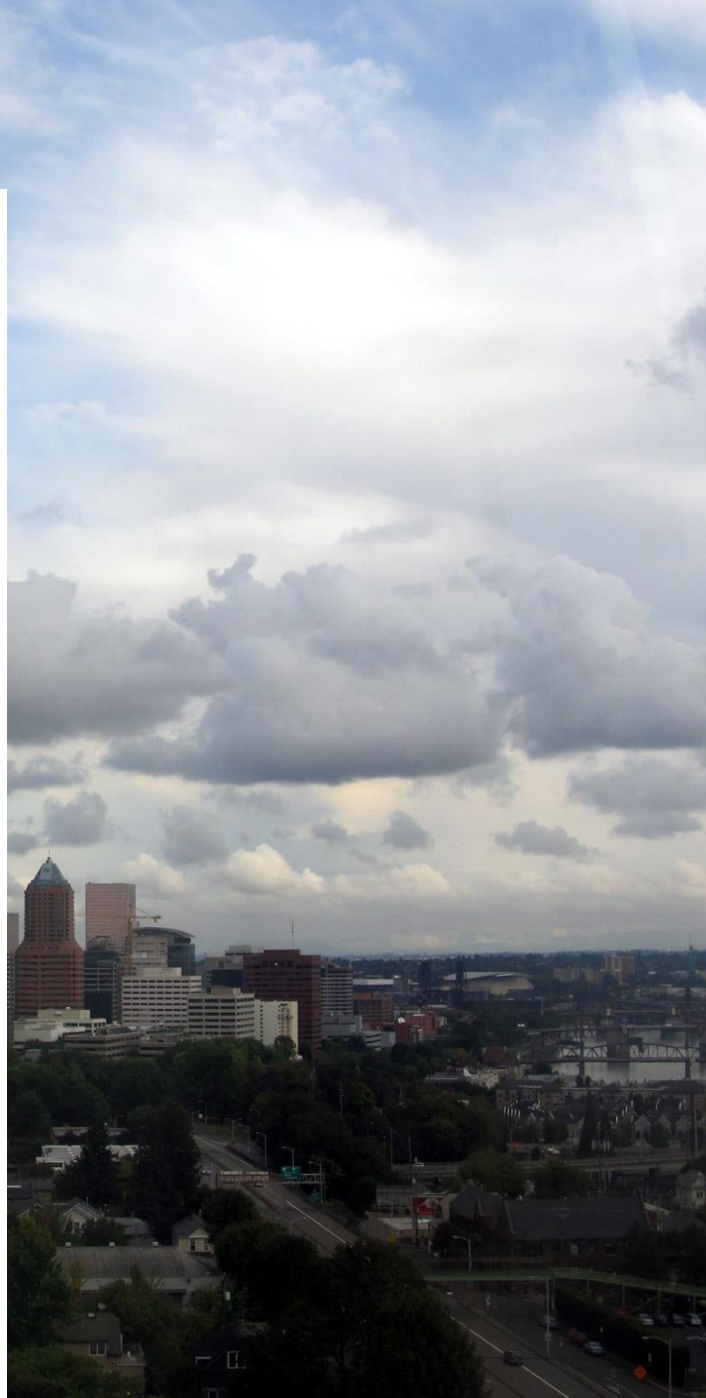


Oregon Residential Wood Combustion Survey

2021

FEBRUARY 27 - FINAL

Center for Marketing & Consumer Insight
Oregon State University



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Overview

Student researchers at Oregon State University Center for Marketing and Consumer Insights (CMCI) collaborated with Oregon Department of Environmental Quality (DEQ) staff to develop and administer an online State-wide Residential Heating Survey. This work builds on prior work in 2014 and 2008 conducted by the Survey Research Lab (SRL) at Portland State University.

The primary purpose identified in the IGA-OSU-DEQ 2021 Agreement were:

- To collect actual residential heating data that DEQ will use to inform climate change policy, set a baseline of understanding around residential heating for future environmental justice policy, and update spatial allocation of emission estimates.
- To generate survey results for the entire State on residential heating, heating options, and opinions, and for homes that use wood, the mass of wood burned, by combustion device, for primary and backup heating.
- To allocate survey sub-regional results to the US Census block-group level within each sub-region, allowing for spatial refinement of heating methods and residential wood combustion sub-region emissions estimates to the block-group level.

The online survey instrument was developed between April and June, and data were gathered from July 24 to October 31, 2021, across multiple data-gathering events. The data from multiple events were combined into a final data set for analysis. The sample size after data cleaning was 2921 completed responses.

This report explains the methodology employed for the survey and presents key findings as summaries of select details from the data set.

Methodology

Survey

CMCI student researchers worked with DEQ research staff to construct a new online survey instrument, maintaining similarities to the 2014 and 2008 surveys when possible since previous surveys were phone surveys. The finalized instrument was programmed into the Qualtrics survey platform for distribution (**Appendix A: 2021 State-wide Residential Heating Survey**).

The State-wide Residential Heating Survey asked Oregon residential home occupants detailed questions via a self-paced online survey about the following:

- How the home is heated (devices) and availability of other heat sources.
- Attitude about alternative heat sources.
- Demographics.

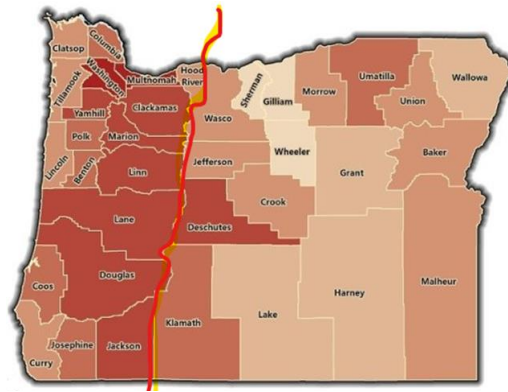
If a participant heated their home with wood, a branching set of questions determined the amount of wood burned and the appliance used (fireplace, wood stove, pellet stove, etc.). This data will be used to inform climate change policy and improve the calculation of emissions from home heating, including wood-burning devices, which lead to PM2.5 and black carbon emissions.

The primary unit of analysis for this survey is homes, with the assumption is that each resident response would represent as single household (HH), which in turn represented a single home. Homes were organized into region and subregion categories defined by two primary factors for analysis:

- Oregon region: West, East
- Residential Area: Urban, Suburban, and Rural

The data for these factors were gathered as part of the screening questions in the survey. The East and West Oregon divisions were based on the following guidance from DEQ (Figure 1).

Figure 1. Westside and Eastside division by Oregon Region/County



Sampling

Convenience sampling was used to recruit a large respondent pool to build a geographically representative sample of Oregon homes. The use of convenience sampling in an unrestricted self-selected survey requires researchers to exercise caution when attempting to generalize results and make inference, but it is useful for modeling purposes.

Recruitment of the survey started in July and continued through to October. Three recruitment methods were employed to increase the overall response number:

- Professional research panels and recruiting (July). Qualtrics LLC was contracted to recruit 1500 respondents that met the following criteria: Age 18+, Oregon residents, homeowners. Qualtrics recruited participants from private research panels and engagement lists, and the 1500 qualified responses constitute the core data set.
- Organizational mailing lists (July – October). The survey link was distributed via DEQ mailing lists; in addition, CMCI students identified and contacted regional community groups, HOAs, neighborhood associations, and events (i.e., county fair organizers) to distribute the survey link.
- Commercial mailing lists (September-October). With funding from Multnomah County, 30,000 Oregon email addresses were purchased. Response to email invitations was approximately 1% (consistent with industry benchmark).

In October, the data were combined into a single dataset. Extensive data screening and cleaning for online surveys are necessary for two reasons. Due to the open access, broad recruitment and distribution, and the self-paced and self-administered nature of the online surveys, automated and manual verification of key screening variables (i.e., being an Oregon resident) is necessary. Further, the open-ended nature of some of the questions (i.e., how much wood do you burn?) also requires manual inspection to improve data quality especially in regards to missing data and entries.

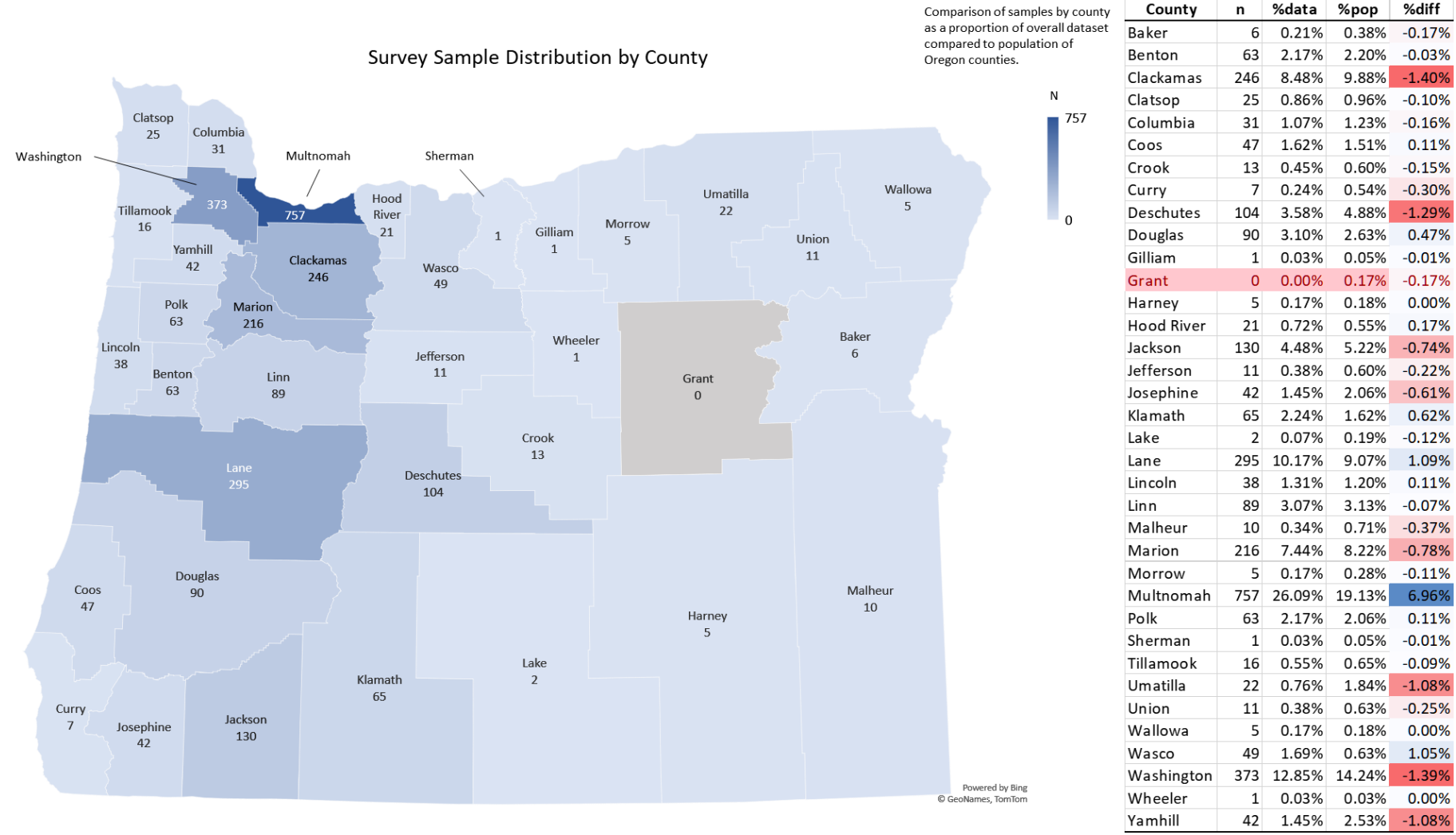
Oregon residence was verified in two ways:

- Self-reported zip code. All self-reported zip codes that did not fall within Oregon zip code ranges (97001-97920) were inspected then removed from the data set.
- Qualtrics GPS coordinates. GPS coordinates of respondents were compared to Oregon boundaries using Google Maps, and any GPS coordinates outside the State of Oregon were manually inspected and removed from the data set if we could not verify the zip code or intersection address.

A total of 4292 responses were received. After data cleaning, a total yield of 2921 completed responses were use in this final analysis, representing a yield of 68.1%.

An important consideration is that the data reflects the population and distribution of Oregon residence. Figure 2 provides a comparison of the distribution of respondents in Oregon counties.

Figure 2. Sample Distribution by County (n = 2921)



Regarding the proportion of sample, when compared by county, the samples obtained does a good job reflecting the distribution of population in Oregon – except for Grant County (underrepresented, 0%) and Multnomah County (overrepresented, +7%). The sample has a bias towards Western Oregon (+3%).

Sample Characteristics

The following tables provide a top-level overview of the data set. Please note the counts (n) vary due to incomplete or missing data – but survey data still had sufficient information to still contribute to the dataset.

Table 1. Sample count by Oregon region and subregion

Response (n=2921)	Urban	Suburban	Rural	Total
West	1156 (39.6%)	888 (30.4%)	557 (19.1%)	2601 (89.3%)
East	89 (3.0%)	91 (3.1%)	130 (4.5%)	310 (10.6%)
Total ¹	1246 (42.7%)	979 (33.5%)	687 (23.5%)	2912 (99.7%)

¹ Missing incomplete specification of East or West (n=9)

Table 2. Housing general characteristics

House Unit Type (n = 2908)	Count	%
Detached single residence	1783	61.3%
Large complex 5 or more units (Condos, Apt, Townhouse)	375	12.9%
Mobile home	325	11.2%
Multiplex 2-4 units (Condos, Apt, Townhouse)	425	14.6%
Own/Rent (n=2912)	Count	%
Own	1944	66.8%
Rent	968	33.2%

Table 3. Decade home was built

Years Built (n=1589)	Count	%
1880-1890	3	0.2%
1891-1900	10	0.6%
1901-1910	45	2.8%
1911-1920	43	2.7%
1921-1930	96	6.0%
1931-1940	37	2.3%
1941-1950	78	4.9%
1951-1960	116	7.3%
1961-1970	147	9.3%
1971-1980	235	14.8%
1981-1990	135	8.5%
1991-2000	237	14.9%
2001-2010	224	14.1%
2011 and above	181	11.4%

Table 4. Residential characteristics by region and subregion

Western Oregon				Easter Oregon			
West	Count	% all HH		East	Count	% all HH	
	2609	89.3%			311	10.6%	
	Count	% western HH	% urban W HH		Count	% eastern HH	%urban E HH
Urban ¹	1156	39.6%		Urban	89	28.6%	
Detached Single Residence	707		61.2%	Detached Single Residence	48		53.9%
Mobile Home	114		9.9%	Mobile Home	10		11.2%
Multiplex	163		14.1%	Multiplex	21		23.6%
Large Complex	165		14.3%	Large Complex	10		11.2%
	Count	% western HH	% suburb W HH		Count	% eastern HH	%suburb E HH
Suburban	888	30.4%		Suburban	91	29.2%	
Detached Single Residence	561		63.2%	Detached Single Residence	62		68.1%
Mobile Home	52		5.9%	Mobile Home	7		7.7%
Multiplex	139		15.7%	Multiplex	18		19.8%
Large Complex	133		15.0%	Large Complex	3		3.3%
	Count	% western HH	% rural W HH		Count	% eastern HH	%rural E HH
Rural	557	19.1%		Rural	130	41.8%	
Detached Single Residence	318		57.1%	Detached Single Residence	78		60.0%
Mobile Home	116		20.8%	Mobile Home	26		20.0%
Multiplex	68		12.2%	Multiplex	16		12.3%
Large Complex	55		9.9%	Large Complex	9		6.9%

¹ Divided by total responses

Demographics

Table 5. Survey participant demographic characteristics

Ethnicity (n=2623)	Count	%
White	2138	81.5%
Hispanic and Latino/a/x	94	3.6%
Asian	45	1.7%
Black or African American	37	1.4%
American Indian and Alaska Native	29	1.1%
Native Hawaiian and Pacific Islander	23	0.9%
Middle Eastern/North African	3	0.1%
Other	15	0.6%
Two or More	199	7.6%
Prefer not to answer	40	1.5%
Income Group (n=2523)	Count	%
\$100 to \$149,999	530	21.0%
\$25 to \$49,999	495	19.6%
\$50 to \$74,999	386	15.3%
\$75 to \$99,999	385	15.3%
Greater than \$150,000	234	9.3%
Less than \$25,000	361	14.3%
Prefer not to answer	132	5.2%
Number of people live in household (n=2490)	Count	%
1 Household Member	420	16.9%
2 Household Members	865	34.7%
3 Household Members	472	19.0%
4 Household Members	374	15.0%
5 Household Members	177	7.1%
6 Household Members	91	3.7%
7 Household Members	39	1.6%
8 Household Members	18	0.7%
9 Household Members	4	0.2%
10 Household Members	5	0.2%
> 10 Household Members	25	1.0%
Number of people living in household older than 65	Count	%
0 people	1853	74.4%
1 people	365	14.7%
2 people	266	10.7%
3 people	2	0.1%
4 people	1	0.0%
> 5 people	3	0.1%

Number of people living in household under 17	Count	%
0 people	1698	68.2%
1 people	380	15.3%
2 people	292	11.7%
3 people	82	3.3%
4 people	25	1.0%
> 5 people	13	0.5%
Language spoken in home (n=2632; multiple selection permitted)	Count	%
English	2603	90.4%
Spanish	133	4.6%
German	18	0.6%
French (Incl. Cajun)	16	0.6%
Other Indo-European Languages	12	0.4%
Other Languages of Asia	12	0.4%
Korean	11	0.4%
Chinese (Incl. Mandarin, Cantonese)	10	0.3%
Japanese	10	0.3%
Russian	9	0.3%
Italian	9	0.3%
Vietnamese	8	0.3%
Hindi	7	0.2%
Amharic, Somali, or Other Afro-Asiatic Languages	5	0.2%
Tagalog (Incl. Filipino)	5	0.2%
Arabic	5	0.2%
Ukrainian or Other Slavic Languages	3	0.1%
Thai, Lao, or Other Tai-Kadai Languages	2	0.1%
Telugu	2	0.1%
Ilocano, Samoan, Hawaiian, or Other Austronesian Languages	1	<0.1%

Findings

Key Tables

Table 6. Wood burning devices in subregion and residence

Detached Single Residence (DSR)				All Others (Mobile and Plexes)			
DSR	Count	% all HH		OTHER	Count	% all HH	
	1783	61.0%			1125	38.5%	1125
			% urban DSR HH with appliance				% urban other HH with appliance
	Count	% DSR			Count	% other	
Urban	756	42.4%		Urban	483	42.9%	
Fireplace	21		2.8%	Fireplace	6		1.2%
Fireplace insert	14		1.9%	Fireplace insert	3		0.6%
Woodstove	15		2.0%	Woodstove	3		0.6%
Pellet stove	1		0.1%	Pellet stove	--		--
Wood furnace	--		--	Wood furnace	--		--
Wood boiler	--		--	Wood boiler	1		0.2%
			% suburb DSR HH with appliance				% suburban other HH with appliance
	Count	% DSR			Count	% other	
Suburban	623	34.9%		Suburban	352	31.3%	
Fireplace	33		5.3%	Fireplace	9		2.6%
Fireplace insert	33		5.3%	Fireplace insert	2		0.6%
Woodstove	32		5.1%	Woodstove	6		1.7%
Pellet stove	2		0.3%	Pellet stove	--		--
Wood furnace	--		--	Wood furnace	--		--
Wood boiler	--		--	Wood boiler	1		0.3%
			% rural DSR HH with appliance				% rural other HH with appliance
	Count	% DSR			Count	% other	
Rural	396	22.2%		Rural	290	25.78%	
Fireplace	12		3.0%	Fireplace	4		1.4%
Fireplace insert	21		5.3%	Fireplace insert	3		1.0%
Woodstove	60		15.2%	Woodstove	15		5.2%
Pellet stove	7		1.8%	Pellet stove	10		3.5%
Wood furnace	--		--	Wood furnace	1		0.3%
Wood boiler	--		--	Wood boiler	--		--

Table 7. Wood burning devices wood use (cords) by subregion

Western Oregon					Eastern Oregon				
West	Count	% all HH			East	Count	% all HH		
	315	10.8%				57	2.0%		
	Count	% western HH	#cords primary heat	#cords aesthetics, back up heat		Count	% eastern HH	#cords primary heat	#cords aesthetics, back up heat
Urban	71	2.7%			Urban	3	1.0%		
Fireplace			3.33	1.94	Fireplace			--	4.33
Fireplace insert			2.75	0.95	Fireplace insert			--	--
Woodstove			3.80	1.67	Woodstove			--	--
Wood Furnace			--	--	Wood Furnace			--	--
Wood Boiler			--	--	Wood Boiler			--	--
	Count	% western HH	#cords primary heat	#cords aesthetics, back up heat		Count	% eastern HH	#cords primary heat	#cords aesthetics, back up heat
Suburban	111	4.3%			Suburban	17	5.5%		
Fireplace			2.00	3.77	Fireplace			4.00	--
Fireplace insert			1.90	2.44	Fireplace insert			4.00	5.00
Woodstove			2.90	2.12	Woodstove			3.33	3.00
Wood Furnace			--	--	Wood Furnace			--	--
Wood Boiler			--	--	Wood Boiler			--	--
	Count	% western HH	#cords primary heat	#cords aesthetics, back up heat		Count	% eastern HH	#cords primary heat	#cords aesthetics, back up heat
Rural	133	5.1%			Rural	37	11.9%		
Fireplace			9.57	2.71	Fireplace			--	--
Fireplace insert			3.29	1.17	Fireplace insert			10.00	1.00
Woodstove			4.09	1.63	Woodstove			4.73	2.44
Wood Furnace			--	--	Wood Furnace			--	--
Wood Boiler			--	--	Wood Boiler			--	--

Table 8. Outdoor wood burning by subregion

Western Oregon					Eastern Oregon					
West	Count	% all HH				East	Count	% all HH		
	2609	89.3%					311	10.6%		
				average						average
	Count	% western HH	% W urban HH	#			% eastern HH	% E urban HH	#	
Urban	1156	39.6%			Urban	89	3.0%			
<i>Outdoor Appliance (Yes)</i>	402		34.8%		<i>Outdoor Appliance (Yes)</i>	36		40.4%		
Cords				7.5	Cords				6.4	
Bundles				12.9	Bundles				29.6	
Waxlog				10.6	Waxlog				6.2	
Pallets				21.2	Pallets				13.9	
Bags of yard waste				35.3	Bags of yard waste				17.8	
Other				25.8	Other				7.3	
				average					average	
	Count	% western HH	% W suburb HH	#			% eastern HH	% E suburb HH	#	
Suburban	888	30.4%			Suburban	91	3.1%			
<i>Outdoor Appliance (Yes)</i>	231		26.0%		<i>Outdoor Appliance (Yes)</i>	28		30.8%		
Cords				3.7	Cords				2.3	
Bundles				9.0	Bundles				7.1	
Waxlog				15.4	Waxlog				48.0	
Pallets				16.6	Pallets				6.0	
Bags of yard waste				6.7	Bags of yard waste				16.5	
Other				5.3	Other				--	
				average					average	
	Count	% western HH	% W rural HH	#			% eastern HH	% E rural HH	#	
Rural	557	19.1%			Rural	130	4.5%			
<i>Outdoor Appliance (Yes)</i>	185		33.2%		<i>Outdoor Appliance (Yes)</i>	31		23.8%		
Cords				2.0	Cords				4.2	
Bundles				6.2	Bundles				73.3	
Waxlog				19.8	Waxlog				503.0	
Pallets				14.7	Pallets				4.2	
Bags of yard waste				10.4	Bags of yard waste				10.5	
Other				55.0	Other				--	

Table 9. Wood Stove certifications and catalysts

Detached Single Residence (DSR)			
	Count	% all HH	
DSR WS	129	4.4%	
	Count	% DSR	% urban DSR HH
Urban	18	14.0%	
WS certified yes	8		44.4%
WS catalyst yes	4		22.2%
	Count	% DSR	% suburb DSR HH
Suburban	39	30.2%	
WS certified yes	19		48.7%
WS catalyst yes	10		25.6%
	Count	% DSR	% rural DSR HH
Rural	72	55.8%	
WS certified yes	42		58.3%
WS catalyst yes	33		45.8%
All Others (Mobile and Plexes)			
	Count	% all HH	
OTHER WS	29	1.0%	
	Count	%other	% urban other HH
Urban	6	20.7%	
WS certified yes	0		--
WS catalyst yes	2		33.3%
	Count	%other	% suburban other HH
Suburban	6	20.7%	
WS certified yes	1		16.7%
WS catalyst yes	0		--
	Count	%other	% rural other HH
Rural	17	58.6%	
WS certified yes	10		58.8%
WS catalyst yes	8		47.1%

Table 10. Fireplace with inserts certifications and catalysts

Detached Single Residence (DSR)			
	Count	% all HH	
DSR FP	83	2.8%	
	Count	% DSR	% urban DSR HH
Urban	17	20.5%	
FP insert certified yes	6		35.3%
FP insert catalyst yes	5		29.4%
	Count	% DSR	% suburb DSR HH
Suburban	41	49.4%	
FP insert certified yes	19		46.3%
FP insert catalyst yes	5		12.2%
	Count	% DSR	% rural DSR HH
Rural	25	30.1%	
FP insert certified yes	19		76.0%
FP insert catalyst yes	8		32.0%
All Others (Mobile and Plexes)			
	Count	% all HH	
OTHER FP	10	0.3%	
	Count	%other	% urban other HH
Urban	3	30.0%	
FP insert certified yes	1		33.3%
FP insert catalyst yes			--
	Count	%other	% suburban other HH
Suburban	2	20.0%	
FP insert certified yes	1		50.0%
FP insert catalyst yes			--
	Count	%other	% rural other HH
Rural	5	50.0%	
FP insert certified yes	1		20.0%
FP insert catalyst yes	1		20.0%

Table 11. Pellet Stoves certifications and catalysts

Detached Single Residence (DSR)			
	Count	% all HH	
DSR PS	19	0.7%	
	Count	% DSR	% urban DSR HH
Urban	2	10.5%	
Pellet stove certified yes	2		100.0%
Pellet stove catalyst yes	1		50.0%
	Count	% DSR	% suburb DSR HH
Suburban	6	31.6%	
Pellet stove certified yes	4		66.7%
Pellet stove catalyst yes	3		50.0%
	Count	% DSR	% rural DSR HH
Rural	11	57.9%	
Pellet stove certified yes	8		72.7%
Pellet stove catalyst yes	1		9.1%
All Others (Mobile and Plexes)			
	Count	% all HH	
OTHER PS	12	0.4%	
	Count	%other	% urban other HH
Urban	1	8.3%	
Pellet stove certified yes	--		--
Pellet stove catalyst yes	--		--
	Count	%other	% suburban other HH
Suburban	--	--	
Pellet stove certified yes	--		--
Pellet stove catalyst yes	--		--
	Count	%other	% rural other HH
Rural	11	91.7%	
Pellet stove certified yes	--		--
Pellet stove catalyst yes	--		--

Table 12. Wood Furnace certifications and catalysts

Detached Single Residence (DSR)			
	Count	% all HH	
DSR Furnace	8	0.3%	
	Count	% DSR	% urban DSR HH
Urban	3	37.5%	
Furnace certified yes	2		66.7%
Furnace catalyst yes	--		--
	Count	% DSR	% suburb DSR HH
Suburban	3	37.5%	
Furnace certified yes	2		66.7%
Furnace catalyst yes	--		--
	Count	% DSR	% rural DSR HH
Rural	2	25.0%	
Furnace certified yes	2		100%
Furnace catalyst yes	--		--
All Others (Mobile and Plexes)			
	Count	% all HH	
OTHER Furnace	3	0.1%	
	Count	%other	% urban other HH
Urban	1	33.3%	
Furnace certified yes	1		--
Furnace catalyst yes	--		--
	Count	%other	% suburban other HH
Suburban	--	--	
Furnace certified yes	--		--
Furnace catalyst yes	--		--
	Count	%other	% rural other HH
Rural	2	66.7%	
Furnace certified yes	2		--
Furnace catalyst yes	--		--

Table 13. Boiler certifications and catalysts

Detached Single Residence (DSR)			
	Count	% all HH	
DSR	5	0.2%	
	Count	% DSR	% urban DSR HH
Urban	5	100.0%	
Boiler certified yes	4		0.8
Boiler catalyst yes	--		--
	Count	% DSR	% suburb DSR HH
Suburban	--	--	
Boiler certified yes	--		--
Boiler catalyst yes	--		--
	Count	% DSR	% rural DSR HH
Rural	--	--	
Boiler certified yes	--		--
Boiler catalyst yes	--		--
All Others (Mobile and Plexes)			
	Count	% all HH	
OTHER Boiler	2	< .01	
	Count	%other	% urban other HH
Urban	1	50.0%	
Boiler certified yes	--		--
Boiler catalyst yes	--		--
	Count	%other	% suburban other HH
Suburban	1	50.0%	
Boiler certified yes	--		--
Boiler catalyst yes	--		--
	Count	%other	% rural other HH
Rural	--	--	
Boiler certified yes	--		--
Boiler catalyst yes	--		--

Heating Opinion and Choices

Table 14. Attitude towards the cost of heating

How would you classify your home heating costs?						
Response (n=2627)			Count	%		
Never too high			342	11.7%		
Rarely too high			804	27.5%		
Sometimes too high			1106	39.9%		
Always too high			375	12.8%		
Region & Subregions	Count	(%HH)	Never	Rarely	Sometimes	Always
All	2627	(100%)	11.7%	27.5%	39.9%	12.8%
West	2361	(89.9%)	13.4%	31.3%	41.2%	14.2%
East	266	(10.1%)	9.8%	24.8%	50.4%	15.0%
Urban	1121	(42.7%)	14.3%	29.4%	39.3%	17.0%
Suburban	903	(34.4%)	11.6%	32.2%	45.8%	10.3%
Rural	599	(22.8%)	12.7%	30.4%	41.9%	15.0%
West Urban	1043	(39.8%)	14.8%	29.4%	38.6%	17.2%
West Suburban	824	(31.4%)	11.7%	32.9%	45.3%	10.2%
West Rural	489	(18.6%)	13.3%	32.3%	39.9%	14.5%
East Urban	77	(2.9%)	7.8%	28.6%	48.1%	15.6%
East Suburban	79	(3.0%)	11.4%	25.3%	51.9%	11.4%
East Rural	110	(4.2%)	10.0%	21.8%	50.9%	17.3%

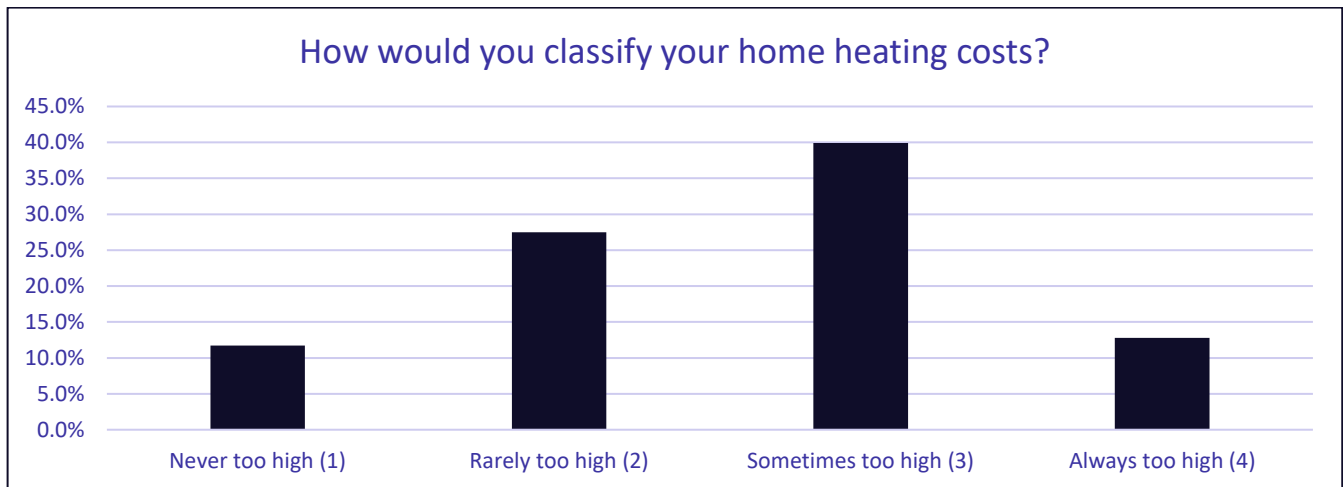


Table 15. Alternative heating options

Does your household have an alternative heating option that you could switch to should the need arise?		
Response	Count	%
Yes	1054	39.3%
No	1628	60.7%

If Yes , what is your alternative heating option?		
Heating Options	Count	%
Electricity	375	35.6%
Fuel Oil/Kerosene	101	9.6%
Natural Gas	201	19.1%
Propane	61	5.8%
Wood	246	23.3%
Other	67	6.4%

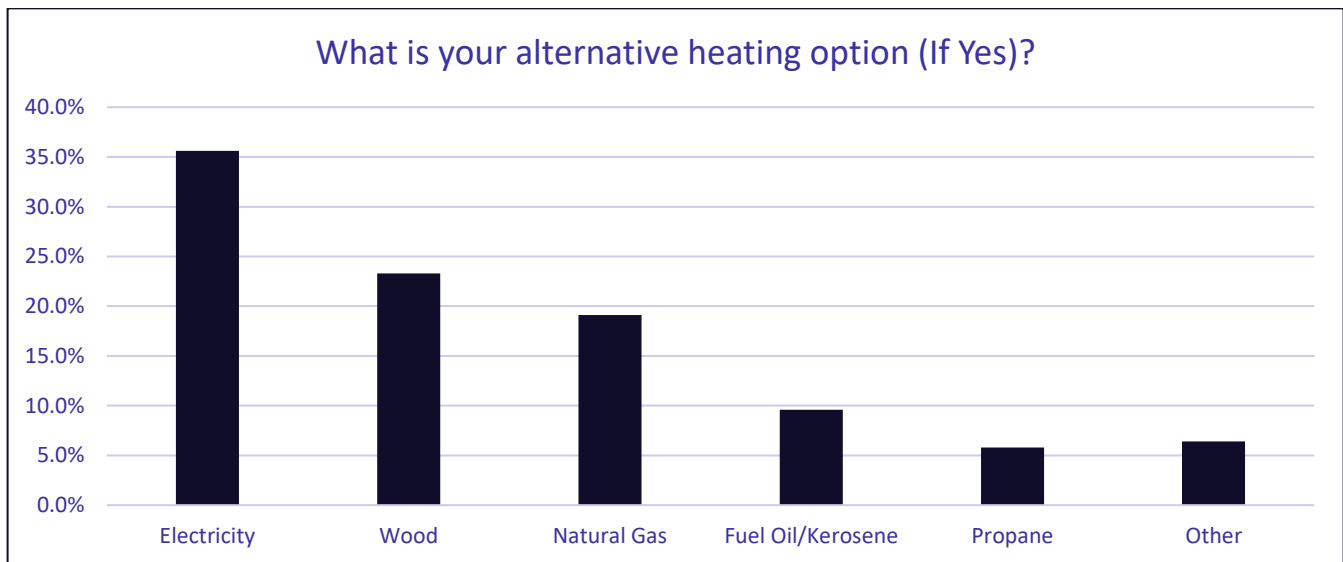


Table 16. Natural gas availability

If you do not use Natural Gas in your home, do you know if it is available in your area?			
Response	Count	%	
Yes	581	68.2%	
No	271	31.8%	
Region & Subregions	Count	(%HH)	Yes (%)
All	852	(100.0%)	68.2%
West	752	(88.3%)	68.8%
East	100	(11.7%)	64.0%
Urban	317	(37.2%)	76.0%
Suburban	235	(27.6%)	77.4%
Rural	299	(35.1%)	52.5%
West Urban	292	(34.3%)	76.4%
West Suburban	212	(24.9%)	76.4%
West Rural	247	(29.0%)	53.0%
East Urban	25	(2.9%)	72.0%
East Suburban	23	(2.7%)	87.0%
East Rural	52	(6.1%)	50.0%

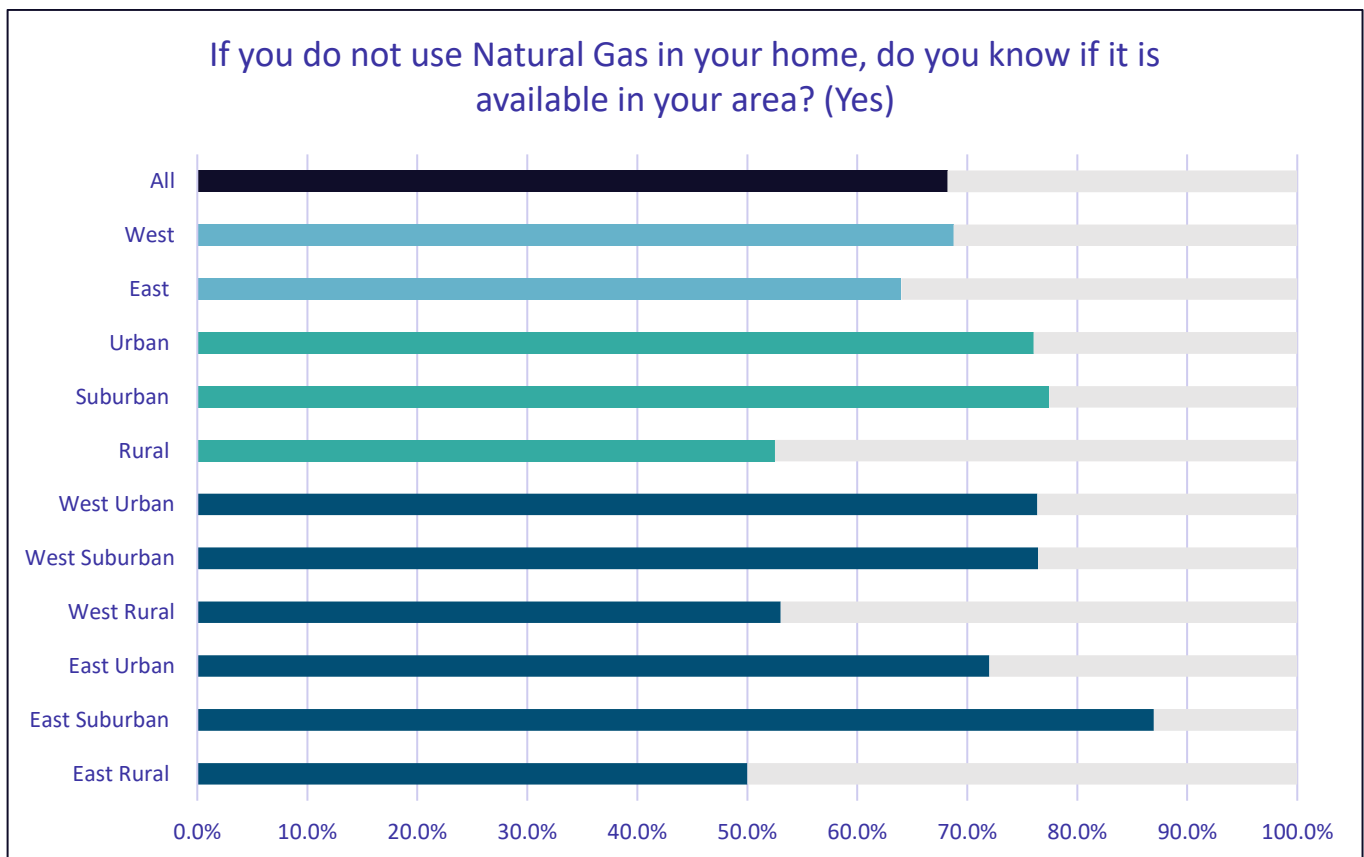


Table 17. Impact of wood-burning bans

If you use wood to heat your home, have wintertime wood-burning bans affected your ability to keep your home heated?			
Response	Count	%	
Yes	74	23.4%	
No	242	76.6%	
Region & Subregions	Count	(%HH)	Yes (%)
All	316	(100.0%)	23.4%
West	271	(85.8%)	24.0%
East	45	(14.2%)	20.0%
Urban	60	(19.0%)	30.0%
Suburban	117	(37.0%)	23.1%
Rural	139	(44.0%)	20.9%
West Urban	58	(18.4%)	31.0%
West Suburban	101	(32.0%)	21.8%
West Rural	112	(35.4%)	22.3%
East Urban	2	(0.6%)	0.0%
East Suburban	16	(5.1%)	31.3%
East Rural	27	(8.5%)	14.8%

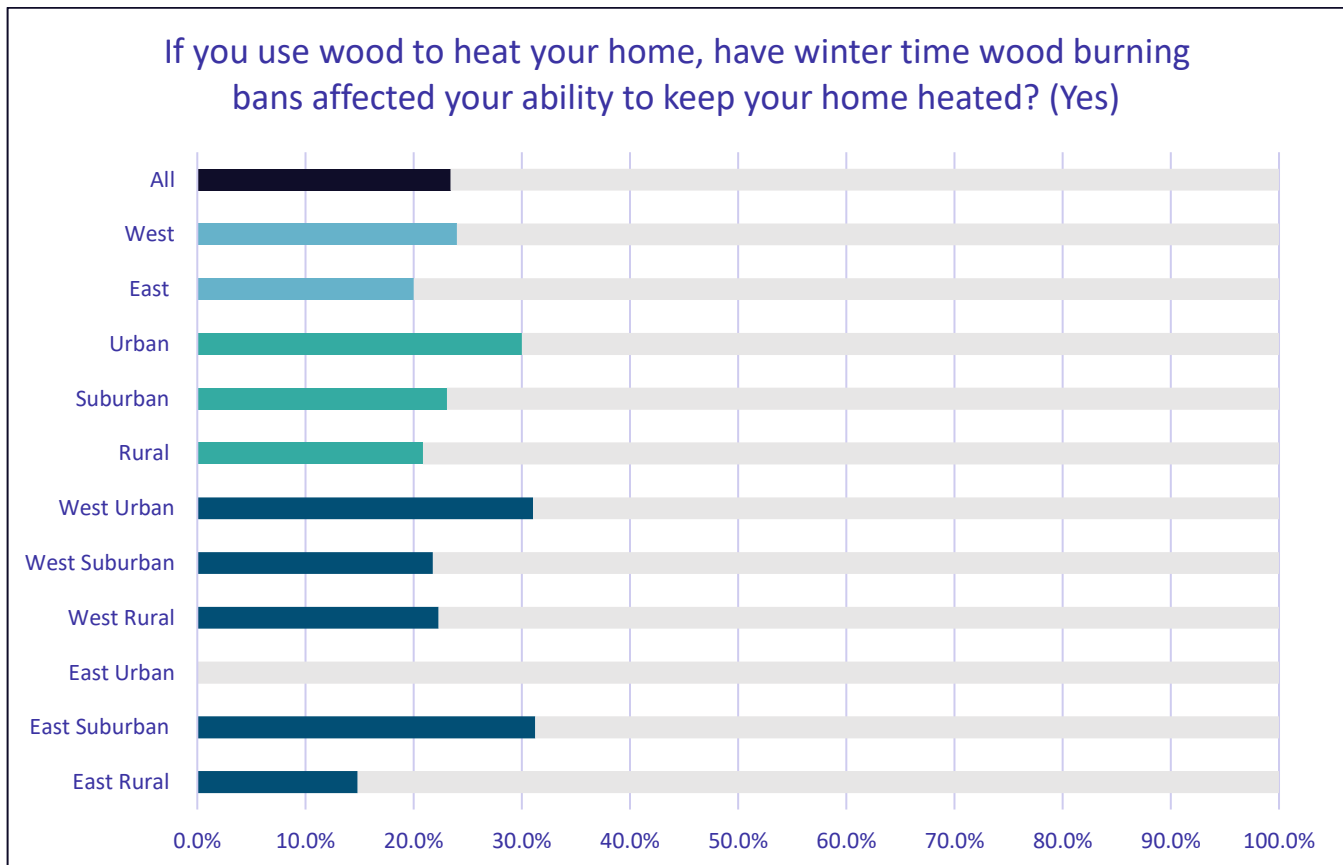


Table 18. Compliance with burning bans

Woodsmoke can build up during certain fall and winter weather conditions. When local jurisdictions issue wood burning alerts, warnings or bans, do you:						
Response (n = 321)	Count	%				
Always follow the suggestions or bans	201	62.6%				
Sometimes follow the suggestions or bans	51	15.9%				
Never follow the suggestions or bans	9	2.8%				
I am unaware of the suggestions or bans	60	18.7%				
Region & Subregions	Count	(%HH)	Always	Sometimes	Never	Unaware
All	321	(100.0%)	63%	16%	3%	19%
West	276	(86.0%)	63%	16%	3%	19%
East	45	(14.0%)	62%	16%	4%	18%
Urban	61	(19.0%)	61%	15%	3%	21%
Suburban	121	(37.7%)	74%	12%	3%	12%
Rural	139	(43.3%)	54%	20%	2%	24%
West Urban	59	(18.4%)	63%	14%	3%	20%
West Suburban	105	(32.7%)	76%	11%	2%	10%
West Rural	112	(34.9%)	50%	21%	3%	26%
East Urban	2	(0.6%)	0%	50%	0%	50%
East Suburban	16	(5.0%)	56%	13%	13%	19%
East Rural	27	(8.4%)	70%	15%	0%	15%

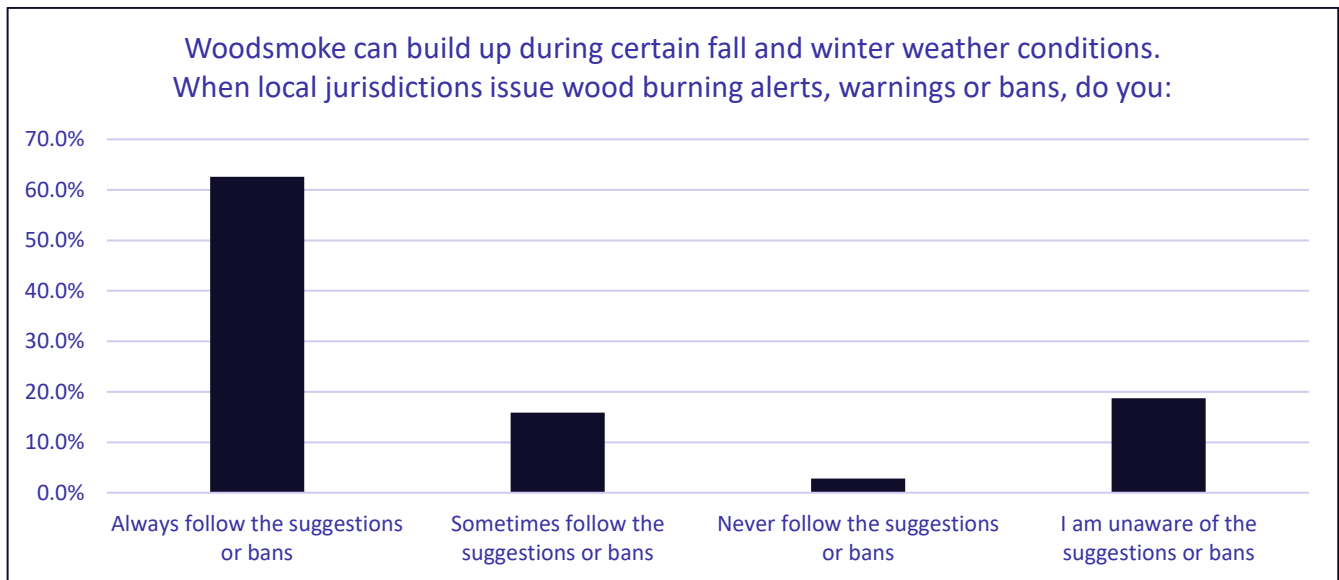


Table 19. Interest in heat pumps

Would you consider switching to a heat pump if it were free or low cost to you? (A heat pump is powered by electricity and transfer heat using refrigerant to provide both cooling and heating; homeowners may not need to install separate systems to heat their homes. Heat pumps do not burn fossil fuel like many furnaces do, making them more environmentally friendly. Heat Pumps also improve indoor air quality by replacing combustion and filtering the air. Below is a picture example of a heat pump.)

Response (n=2670)		Count			%		
Yes		1198			44.9%		
No		247			9.3%		
Maybe		595			22.3%		
I don't know enough about heat pumps		416			15.6%		
Other		214			8.0%		
Regions & Subregions	Count	(%HH)	Yes	No	Maybe	Don't know enough	Other
All	2670	(100.0%)	44.9%	9.3%	22.3%	15.6%	8.0%
West	2402	(90.0%)	44.7%	9.5%	22.0%	15.7%	8.1%
East	268	(10.0%)	46.3%	7.1%	25.0%	14.2%	7.5%
Urban	1144	(42.8%)	49.1%	8.4%	19.9%	16.3%	6.3%
Suburban	917	(34.3%)	43.0%	8.6%	23.7%	15.9%	8.8%
Rural	605	(22.7%)	39.5%	11.9%	24.6%	13.9%	10.1%
West Urban	1065	(39.9%)	48.9%	8.4%	19.8%	16.5%	6.4%
West Suburban	838	(31.4%)	41.9%	8.8%	24.0%	16.3%	8.9%
West Rural	494	(18.5%)	40.3%	13.2%	23.3%	13.0%	10.3%
East Urban	78	(2.9%)	52.6%	9.0%	21.8%	11.5%	5.1%
East Suburban	79	(3.0%)	54.4%	6.3%	20.3%	11.4%	7.6%
East Rural	111	(4.2%)	36.0%	6.3%	30.6%	18.0%	9.0%

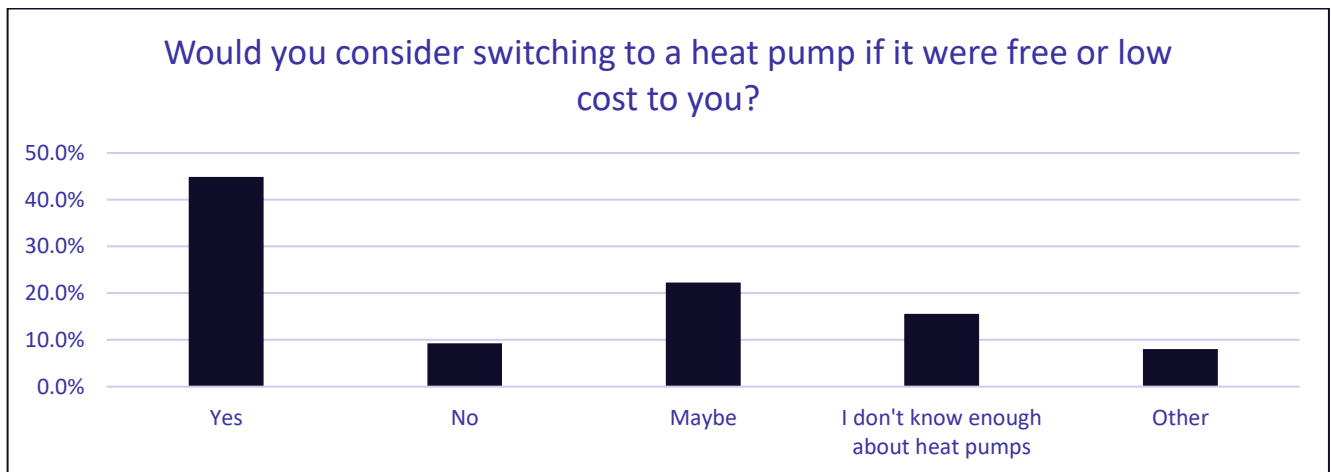


Table 20. Interest in solar panels

If adding solar panels to my home was affordable, I would have them installed:					
Response (n=2649)			Count	%	
Already have them			161	6.1%	
Yes			1978	74.7%	
No			510	19.3%	
Region & Subregions	Count	(%HH)	Already have them		
			Yes	No	
All	2649	(100.0%)	6.1%	74.7%	19.3%
West	2383	(90.0%)	6.0%	74.7%	19.3%
East	266	(10.0%)	6.8%	74.8%	18.4%
Urban	1133	(42.8%)	8.9%	72.6%	18.4%
Suburban	912	(34.4%)	4.6%	77.3%	18.1%
Rural	600	(22.7%)	3.0%	74.5%	22.5%
West Urban	1055	(39.8%)	9.1%	72.3%	18.6%
West Suburban	833	(31.4%)	3.8%	77.7%	18.5%
West Rural	490	(18.5%)	3.1%	74.5%	22.4%
East Urban	77	(2.9%)	6.5%	76.6%	16.9%
East Suburban	79	(3.0%)	12.7%	73.4%	13.9%
East Rural	110	(4.2%)	2.7%	74.5%	22.7%

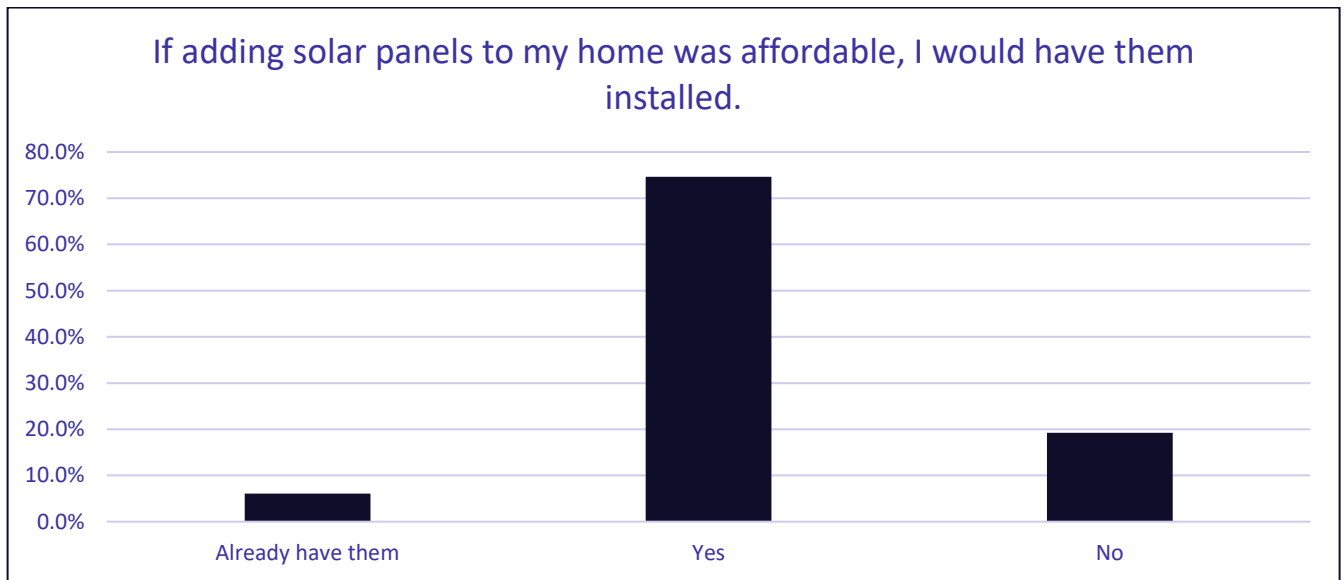


Table 21. Interest in biofuels

If available, I'd use a bio-fuel in my home's fuel oil/kerosene furnace:						
Response (n=2661)	Count	%				
I already do	87	3.3%				
Yes	617	23.2%				
No	635	23.9%				
Don't have a fuel oil/kerosene furnace	1322	49.7%				
Region & Subregions	Count	(%HH)	I already do	Yes	No	Don't have a fuel oil/kerosene furnace
All	2661	(100.0%)	3.3%	23.2%	23.9%	49.7%
West	2393	(89.9%)	3.2%	22.6%	24.1%	50.1%
East	268	(10.1%)	3.7%	28.4%	22.0%	45.9%
Urban	1142	(42.9%)	6.2%	26.9%	25.0%	41.9%
Suburban	913	(34.3%)	1.1%	19.7%	21.0%	58.2%
Rural	602	(22.6%)	1.0%	21.4%	26.2%	51.3%
West Urban	1063	(39.9%)	6.0%	25.8%	25.0%	43.2%
West Suburban	834	(31.3%)	1.0%	18.5%	21.3%	59.2%
West Rural	491	(18.5%)	1.0%	22.6%	26.9%	49.5%
East Urban	78	(2.9%)	9.0%	41.0%	24.4%	25.6%
East Suburban	79	(3.0%)	2.5%	32.9%	17.7%	46.8%
East Rural	111	(4.2%)	0.9%	16.2%	23.4%	59.5%

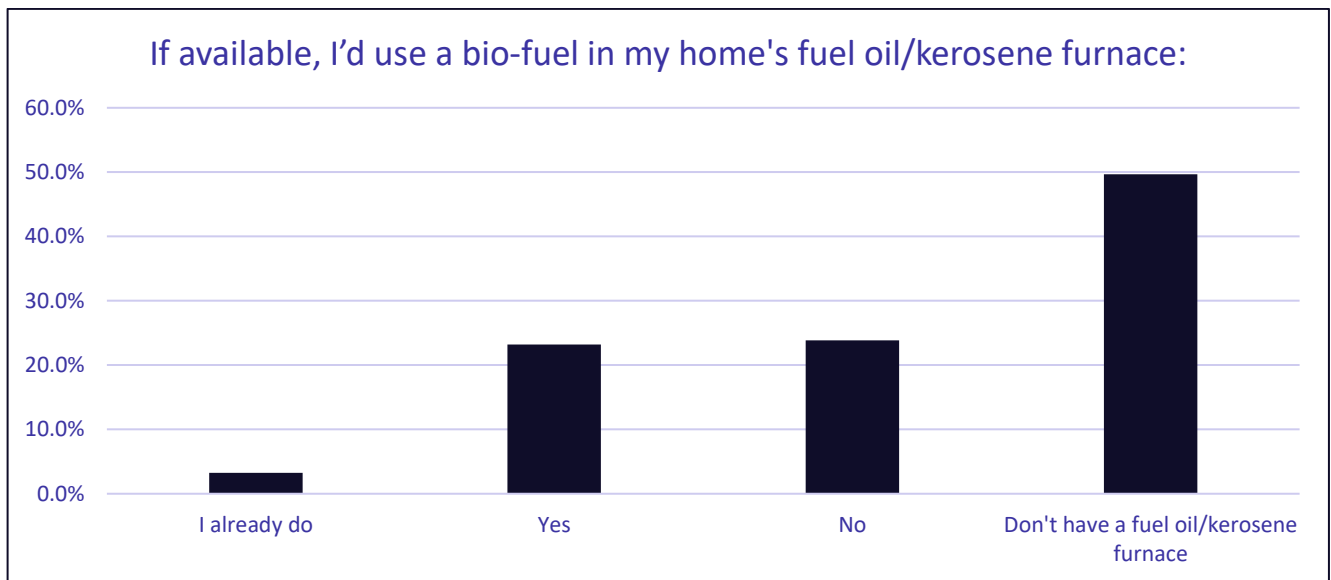


Table 22. Interest in renewable diesel

If available, I'd fuel my diesel vehicle with renewable diesel:						
Response (n=2661)			Count	%		
I already do			89	3.3%		
Yes			703	26.4%		
No			318	12.0%		
Don't have a diesel vehicle			1551	58.3%		
Region & Subregions	Count	(%HH)	I already do	Yes	No	Don't have a diesel vehicle
All	2661	(100.0%)	3.3%	26.4%	12.0%	58.3%
West	2393	(89.9%)	3.3%	25.8%	12.0%	59.0%
East	268	(10.1%)	4.1%	32.1%	11.6%	52.2%
Urban	1141	(42.9%)	5.8%	31.0%	11.7%	51.5%
Suburban	915	(34.4%)	1.3%	22.1%	9.7%	66.9%
Rural	601	(22.6%)	1.8%	24.5%	16.0%	57.7%
West Urban	1062	(39.9%)	5.6%	30.4%	11.5%	52.5%
West Suburban	836	(31.4%)	1.2%	20.7%	10.2%	67.9%
West Rural	490	(18.4%)	1.8%	24.5%	16.3%	57.3%
East Urban	78	(2.9%)	9.0%	38.5%	14.1%	38.5%
East Suburban	79	(3.0%)	2.5%	36.7%	5.1%	55.7%
East Rural	111	(4.2%)	1.8%	24.3%	14.4%	59.5%

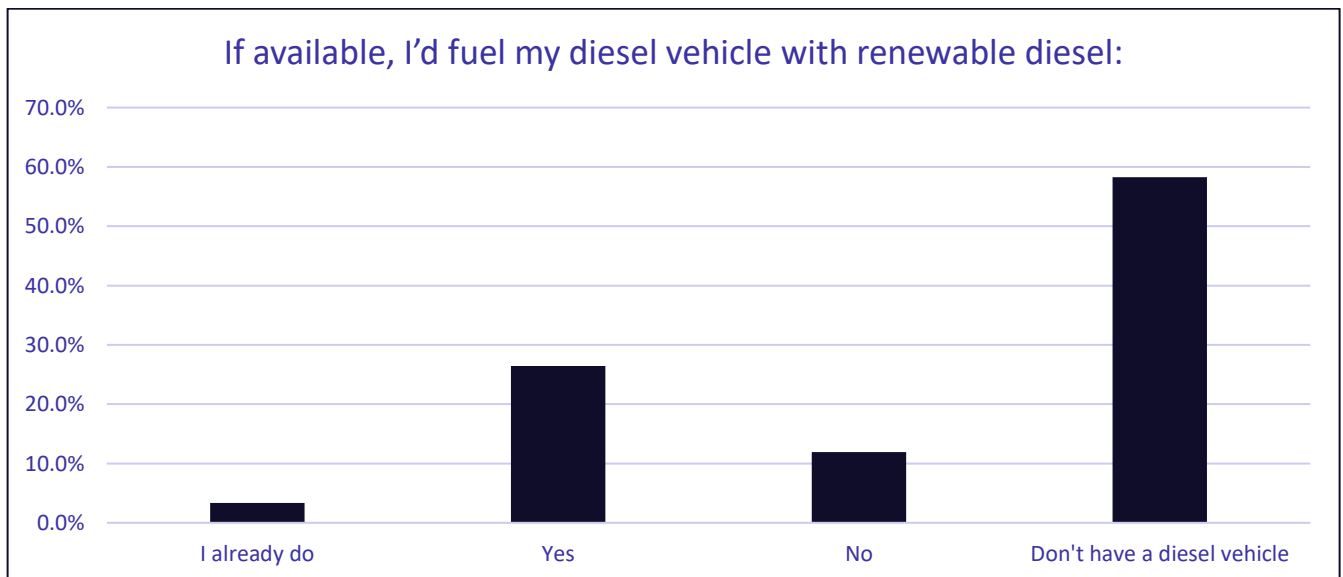
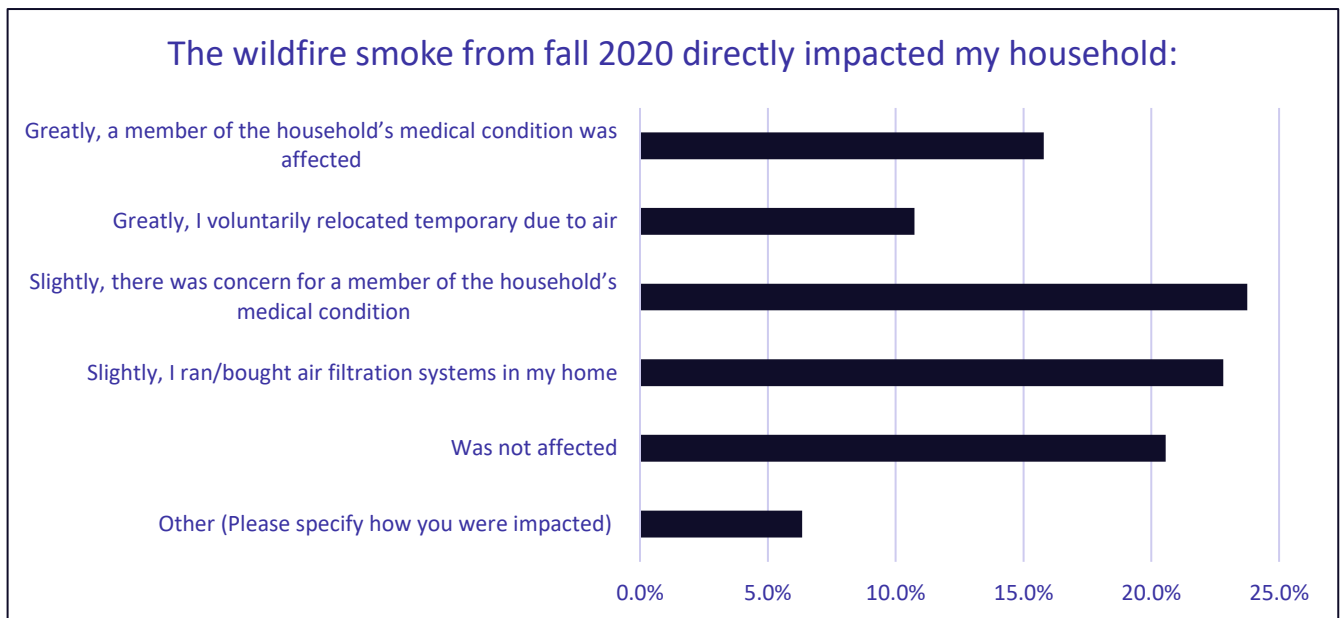


Table 23. Household impact of 2020 wildfire

The wildfire smoke from fall 2020 directly impacted my household:								
Response (n=2665)			Count			%		
Greatly, a member of the household’s medical condition was affected			421			15.8%		
Greatly, I voluntarily relocated temporary due to air			286			10.7%		
Slightly, there was concern for a member of the household’s medical condition			633			23.8%		
Slightly, I ran/bought air filtration systems in my home			608			22.8%		
Was not affected			548			20.6%		
Other (Please specify how you were impacted)			169			6.3%		
Region & Subregions	Count	(%HH)	Greatly (medical)	Greatly (relocate)	Slightly (concern)	Slightly (bought filtration)	Was not affected	Other
All	2665	(100.0%)	15.8%	10.7%	23.8%	22.8%	20.6%	6.3%
West	2397	(89.9%)	15.8%	11.1%	23.5%	22.9%	20.3%	6.4%
East	268	(10.1%)	15.7%	7.5%	25.7%	22.4%	22.8%	6.0%
Urban	1144	(42.9%)	19.9%	11.9%	21.7%	23.4%	17.7%	5.3%
Suburban	915	(34.3%)	11.6%	9.5%	24.8%	26.0%	20.7%	7.4%
Rural	602	(22.6%)	14.3%	10.5%	26.1%	16.8%	25.9%	6.5%
West Urban	1065	(40.0%)	19.7%	11.8%	21.7%	23.6%	17.7%	5.4%
West Suburban	836	(31.4%)	12.0%	9.6%	25.0%	26.0%	20.6%	6.9%
West Rural	491	(18.4%)	13.8%	12.2%	25.1%	15.9%	25.7%	7.3%
East Urban	78	(2.9%)	23.1%	12.8%	21.8%	20.5%	17.9%	3.8%
East Suburban	79	(3.0%)	7.6%	8.9%	22.8%	26.6%	21.5%	12.7%
East Rural	111	(4.2%)	16.2%	2.7%	30.6%	20.7%	27.0%	2.7%



Supplementary Tables

Table 24. Attitude towards the cost of heating (Other, Open-ended Responses)

Response (n=53)	Count	%
No Opinion/Don't Know	20	37.7%
Heating Paid (Rent, HOA, Landlord)	18	34.0%
Manageable	14	26.4%
High	5	9.4%
Non-response/NA	14	26.4%

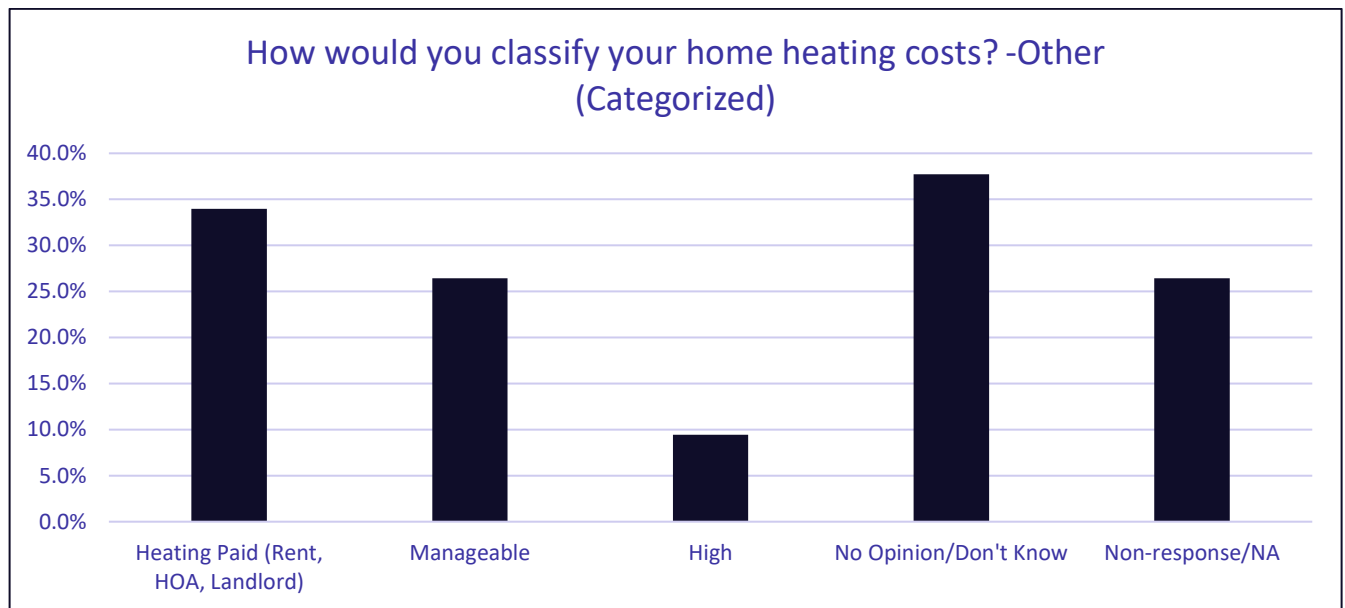
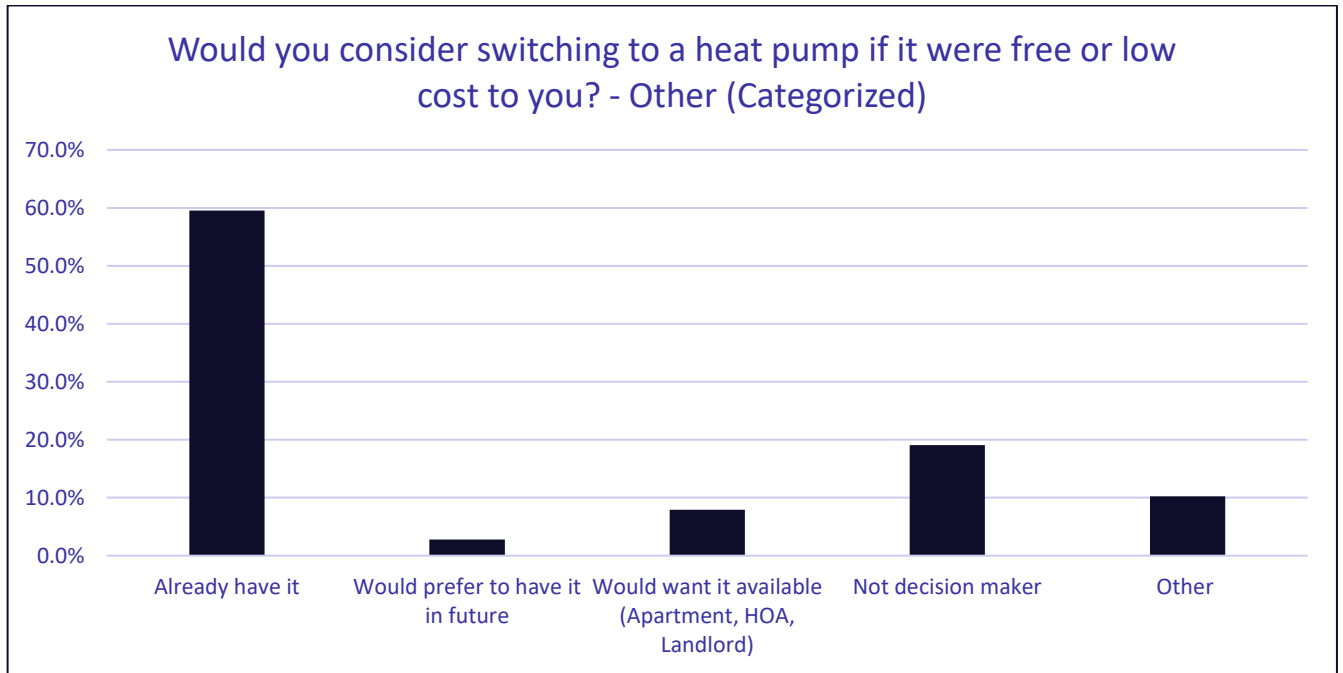


Table 25. Consideration to Switch to Heat Pump (Other, Open-ended Responses)

Response (n=215)	Count	%
Already have it	128	59.5%
Would prefer to have it in future	6	2.8%
Would want it if available (Apartment, HOA, Landlord)	17	7.9%
Not decision maker	41	19.1%
Other Options	22	10.2%



Of the total number of responses, approximately 4.8% (n=128) of respondents indicated they already had heat pumps.

Table 26. Alternative heating options (Other, Open-ended Responses)

Response (n=68)	Count	%
Wood resources (Pellets, Fireplaces, etc)	14	20.6%
Electrical resources	19	27.9%
Gas resources	11	16.2%
Generator (Fuel Unknown)	6	8.8%
Solar resources	3	4.4%
Geothermal	1	1.5%

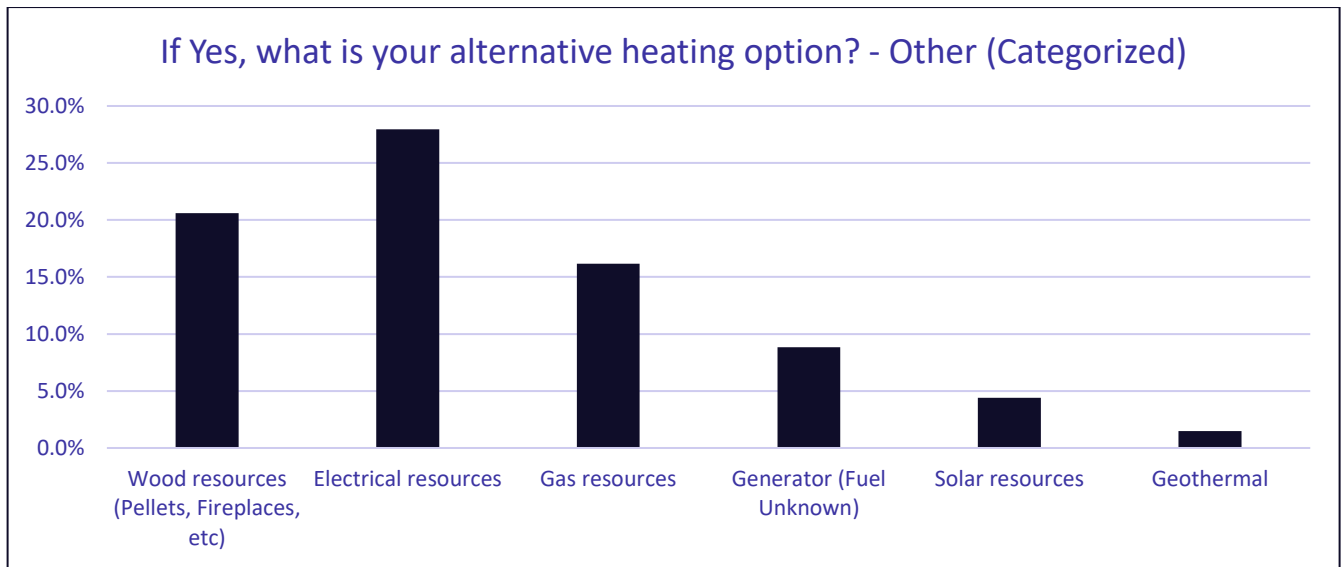
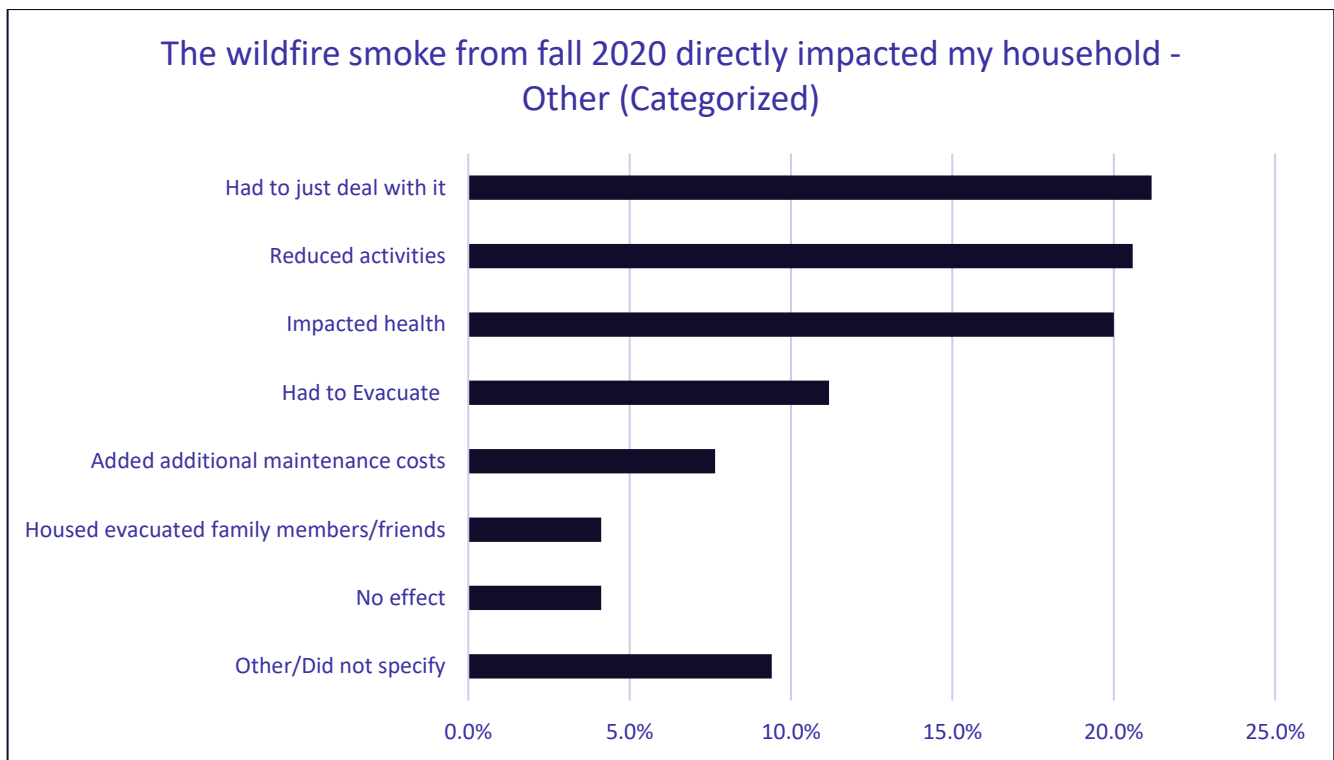


Table 27. Household impact of 2020 wildfire (Other, Open-ended Responses)

Response (n=167)	Count	%
Reduced activities	35	20.6%
Had to Evacuate	19	11.2%
No affect	7	4.1%
Impacted health	34	20.0%
Added additional maintenance costs	13	7.6%
Had to just deal with it	36	21.2%
Housed evacuated family members/friends	7	4.1%
Other impacts	16	9.4%



Appendix A: Survey Instrument

ORDEQ Survey 2021_FOR DEQ

Start of Block: Introduction

The Center for Marketing and Consumer Insights (CMCI) at Oregon State University is partnering with the Air Quality Division of the Oregon Department of Environmental Quality to better understand air quality in communities.

We invite you to participate in this survey to share information about how you, a residential home occupant, heats your home. Questions focus on heating sources, availability and attitude towards alternative heating sources. The responses collected will help OSU students better understand how home heating emissions affects air quality.

Activities: First, you will be asked about your primary and secondary heating sources. Next, you will be asked about your home heating opinions and choices. Finally, you will be asked questions regarding your demographics.

Time: The entire survey will take approximately 10-15 minutes.

Voluntary: This survey is optional. You can decide now to start the survey and change your mind later.

Confidentiality: Your participation and responses to the survey are confidential and no identifiable information will be shared or published.

Survey issues or questions: If you have questions about this survey or have problems accessing this survey, please send an email to cmci.projectair@oregonstate.edu

For your Time: If you'd like the opportunity to win a \$50 Amazon gift card please provide your email after completion. (Email will not be stored with your responses

for confidentiality and please only one survey per household.) One card will be randomly given away for every 100 completed surveys. (Only one survey per household.)

Thank you for your time and participation!

End of Block: Introduction

Start of Block: SCREENER

Before the survey begins we would like to first ask you a few simple questions and find out more about your residence and understand your living environment.

What type of housing unit best describes your home?

- Detached single residence
 - Mobile home
 - Multiplex 2-4 units (Condos, Apt, Townhouse)
 - Large complex 5 or more units (Condos, Apt, Townhouse)
-

In what year was your home originally built?

- Year: _____
 - I don't know
-

What is the zip code where your home is located?

What is the nearest intersection?

Do you live in a rural, urban, or suburban area?

- Rural
- Urban
- Suburban

Do you own or rent your home?

- Own
- Rent

End of Block: SCREENER

Start of Block: Residential Heating

The goal of this section is to understand how you heat your primary residence.

What is the primary way you heat your home?

- Natural Gas
 - Electricity
 - Fuel Oil/Kerosene
 - Propane
 - Wood
 - Other _____
 - None
-

Which natural gas form do you use to heat your home?

- Central Furnace
 - Natural gas fireplace
 - Natural gas wood stove
-

Which electricity form do you use to heat your home?

- Central Furnace
 - Heat pump
 - Floorboard (radiant wall)
 - Wall Heaters
 - Portable
 - Steam or hot water system
-

Which fuel oil/ kerosene form do you use to heat your home?

- Central furnace
 - Portable
 - Steam or hot water system
-

Which propane form do you use to heat your home?

- Central furnace
 - Portable
 - Steam or hot water system
-

In the last 12-months, did you use a secondary or backup source to heat your home?

- Natural Gas
 - Electricity
 - Fuel Oil/Kerosene
 - Propane
 - Wood
 - Other _____
 - None
-

Which natural gas form do you use as a secondary method to heat your home?

- Central Furnace
 - Natural gas fireplace
 - Natural gas wood stove
-

Which electricity form do you use as a secondary method to heat your home?

- Central Furnace
 - Heat pump
 - Floorboard (radiant wall)
 - Wall Heaters
 - Portable
 - Steam or hot water system
-

Which fuel oil/Kerosene form do you use as a secondary method to heat your home?

- Central furnace
 - Portable
 - Steam or hot water system
-

Which propane form do you use as a secondary method to heat your home?

- Central furnace
 - Portable
 - Steam or hot water system
-

Do you have any outdoor wood-burning fireplaces, chimeneas, or fire rings?

- Yes
- No

End of Block: Residential Heating

Start of Block: Residential Wood Heating

Thinking about the last 12 months, how much of each wood type did you burn?

	Estimated Use
	#

# of cords (use table below to estimate cords burned)	
# of bags (40-lb bags are typical)	
# of wax-based logs (typically 2.5 lbs each)	
# of compressed wood logs (typically 8 lbs each)	
# of tons	
# of pick-up loads	

Thinking about the last 12 months, what type of Cordwood did you burn? Please put the percent of each type you burned.

	Percentage
Douglas-fir	
Alder	
Oak	
Maple	
Cedar	
Ponderosa or Yellow Pine	
Lodge Pole Pine	
Madrone or Tamarack	

Other

Which of the following type(s) of appliance(s) do you HAVE in your primary residence? (Please select all that apply by clicking on the example photographs.)

Conventional fireplaces (without an insert)

Conventional fireplaces (with an insert)

Woodstoves (firewood/ cordwood)

Pellet Stove

Wood-burning furnaces (firewood/ cordwood or pellets)

Wood-burning boilers (firewood/ cordwood or pellets)

In the last 12-months, did you USE any of following type(s) of appliance(s) as a heating source in your primary residence? (Please select all that apply by clicking on the example photographs.)

Conventional fireplaces (without an insert)

Conventional fireplaces (with an insert)

Woodstoves (firewood/ cordwood)

Pellet stove

Wood-burning furnaces (firewood/ cordwood or pellets)

Wood-burning boilers (firewood/ cordwood or pellets)

How many conventional fireplaces (without an insert) are in your primary residence?

1

2

3

How many conventional fireplaces (with an insert) are in your primary residence?

1

2

3

How many woodstoves (firewood/ cordwood) are in your primary residence?

1

2

3

grates or other devices intended to increase heat flow Includes freestanding fireplaces

What is the primary purpose of your `{Im://Field/2}` wood-burning fireplace?

- Pleasure/aesthetics
- Primary source of heat
- Back-up, room heating or supplemental heating
- I do not use my wood-burning fireplace

Please indicate the amount of wood that you use in your **#{Im://Field/2}** fireplace in a typical year. For any of the following that apply, please put the amount in the space provided. (If you do not know the exact amounts, please give us your best estimate)

	Full cords	Wax logs (such as Duraflame, Enviro-log, Pine Mountain, etc.)	I use something else (place an X)
Number of			

You answered you use something else not listed in your **#{Im://Field/2}** fireplace. Please specify what you use and how much you use in a typical year.

End of Block: Conventional Fireplaces (without an insert)

Start of Block: Conventional fireplaces (with an insert)

This next group of questions asks about fireplace inserts at your primary residence.

Please keep in mind the following while going through this section of the survey:

Fireplace inserts are space heaters designed to fit into an existing fireplace opening. Fireplace inserts have either conventional or EPA-certified air pollution control technology. Most conventional inserts were sold or installed prior to 1989, whereas most EPA-certified inserts were sold or installed beginning in 1989. Some

EPA-certified inserts have a ceramic catalytic element that improves combustion of particles in the woodsmoke.

Click to write the question text

- Click to write Choice 1
 - Click to write Choice 2
 - Click to write Choice 3
-

Thinking about your fireplace insert, what is the primary purpose of your $\{\text{Im://Field/2}\}$ fireplace insert?

- Pleasure/aesthetics
 - Primary source of heat
 - Back-up, room heating or supplemental heating
 - I do not use my fireplace insert
-

Thinking about your $\{\text{Im://Field/2}\}$ fireplace insert, is your fireplace insert EPA certified?

- Yes
 - No
 - I don't know
-

Thinking about your **#{Im://Field/2}** fireplace insert, does your fireplace insert have a catalytic element?

- Yes
 - No
 - I don't know
-

Was your **#{Im://Field/2}** fireplace insert purchased before or after 1986?

- Before 1986
 - After 1986
 - I don't know
-

Thinking about your **#{Im://Field/2}** fireplace insert, how much wood, in cords, do you typically burn each year in your fireplace insert?

	Full cords	Wax logs (such as Duraflame, Enviro-log, Pine Mountain, etc.)	I use something else (place an X)
Number of			

You answered you use something else not listed in your $\{\text{Im://Field/2}\}$ fireplace. Please specify what you use and how much you use in a typical year.

Thinking about your $\{\text{Im://Field/2}\}$ fireplace insert, how long have you owned your fireplace insert?

- 0-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- More than 25 years

End of Block: Conventional fireplaces (with an insert)

Start of Block: Woodstoves

This next group of questions asks about woodstoves at your primary residence.

Please keep in mind the following while going through this section of the survey:

Woodstoves are free-standing space heaters often used to heat a specific room or zone of a house. Woodstoves have either conventional or EPA-certified air pollution control technology. Most conventional woodstoves were sold or installed prior to 1989, whereas most EPA-certified woodstoves were sold or installed beginning in 1989. Some EPA-certified woodstoves have a ceramic catalytic element that improves the combustion of particles in the woodsmoke.

Thinking about your **`\${Im://Field/2}`** woodstove, what is the primary purpose of your **`\${Im://Field/2}`** woodstove?

- Pleasure/aesthetics
 - Primary source of heat
 - Back-up, room heating or supplemental heating
 - I do not use my woodstove
-

Was your **`\${Im://Field/2}`** woodstove purchased before or after 1986?

- Before 1986
 - After 1986
 - I don't know
-

Is your **`\${Im://Field/2}`** woodstove certified by either DEQ or the EPA? The certification label will be present on the outside of the woodstove.

- Yes
 - No
 - I don't know
-

Catalyst: All catalytic woodstoves have a lever-operated catalyst bypass damper, which is opened for starting and reloading. The catalyst is typically a ceramic honeycombed device mounted in the baffle plate of the woodstove. They are various

shapes and sizes, but the most common shape is a wheel about five inches in diameter and about two inches thick. Wood smoke passes through the catalyst, which allows for the smoke gases and particles to ignite and burn.

Is there a catalyst present in this **#{Im://Field/2}** woodstove?

- Yes
 - No
 - I don't know
-

Thinking about your **#{Im://Field/2}** woodstove, how much wood, in cords, do you typically burn each year in your **#{Im://Field/2}** woodstove?

	Full cords	Wax logs (such as Duraflame, Enviro-log, Pine Mountain, etc.)	I use something else (place an X)
Number of			

You answered that you use something else not listed for your **#{Im://Field/2}** wood stove, please specify what you use and how much.

Thinking about your woodstove, how long have you owned your $\${m://Field/2}$ woodstove?

- 0-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- More than 25 years

End of Block: Woodstoves

Start of Block: Pellet stoves

This next group of questions asks about pellet stoves at your primary residence.

Please keep in mind the following while going through this section of the survey:

Pellet stoves burn small compressed fuels, typically using a hopper to hold the fuel. This enables pellet stoves to burn for a long time without reloading. Pellet stoves rely on electricity to release pellets into the combustion chamber and to operate fans. Pellets can be made from a variety of biomass products such as wood, corn or pits. Pellet stoves have either conventional or EPA-certified air pollution control technology. Most conventional pellet stoves were sold or installed prior to 1989, whereas most EPA-certified pellet stoves were sold or installed beginning in 1989. Some EPA-certified pellet stoves have a ceramic catalytic element that improves the combustion of particles in the woodsmoke.

Thinking about your $\${Im://Field/2}$ pellet stove, what is the primary purpose of your $\${Im://Field/2}$ pellet stove?

- Pleasure/aesthetics
 - Primary source of heat
 - Back-up, room heating or supplemental heating
 - I do not use my pellet stove
-

Thinking about your $\${Im://Field/2}$ pellet stove, what type of pellets do you burn in your pellet stove? (Please select all that apply.)

- Wood
 - Corn
 - Other, please specify _____
-

Thinking about your $\${Im://Field/2}$ pellet stove, is your pellet stove EPA certified?

- Yes
 - No
 - I don't know
-

Thinking about your $\{\text{Im://Field/2}\}$ pellet stove, does your pellet stove have a catalytic element?

- Yes
 - No
 - I don't know
-

Thinking about your $\{\text{Im://Field/2}\}$ pellet stove, how many bags of pellets do you typically burn each year in your pellet stove?

Pellets are usually sold in 40 lb bags; 50 bags = 1 ton.

- # of full bags _____
-

Thinking about your $\{\text{Im://Field/2}\}$ pellet stove, how long have you owned your pellet stove?

- 0-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- More than 25 years

End of Block: Pellet stoves

Start of Block: Wood-burning furnace

This next group of questions asks about wood-burning furnaces at your primary residence.

Please keep in mind the following while going through this section of the survey:

Wood-burning furnaces provide central heating and can be controlled with thermostats. Indoor wood-burning furnaces are usually installed in basements or utility rooms. They heat air directly and are connected to ducts that move warmed air around the building. “EPA-qualified” or “EPA-certified” appliances are typically labeled “Qualified at EPA” or “EPA Certified” on the permanent label.

What is the rated heat output of your $\${m://Field/2}$ wood-burning furnace?

- BTU (British Thermal Unit) per hour: _____
 - I don't know
-

Which of the following fuels do you burn in your $\${m://Field/2}$ wood-burning furnace?

- Firewood/Cordwood
 - Pellets
-

Is your $\${m://Field/2}$ wood-burning furnace EPA qualified/certified?

- Yes
- No
- I don't know

What is the brand or model of your $\{Im://Field/2\}$ wood-burning furnace?

	Brand	Model	Not Sure (Place an X)
Wood-burning furnace			

Please indicate the amount of fuel burned in your $\{Im://Field/2\}$ wood-burning furnace in a typical year.

For any of the following that apply, please put the amount in the space provided. (If you do not know the exact amounts, please give us your best estimate.)

	Full cords	Tons of pellets (pellets are usually sold in 40lb bags; 50 bags = 1 ton)	I use something else (place a X)
Number of			

You answered that you use something not listed in your **#{Im://Field/2}** wood burning furnace. Please specify what you use and how much.

How long have you owned your **#{Im://Field/2}** wood-burning furnace?

- 0-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- More than 25 years

End of Block: Wood-burning furnace

Start of Block: Wood-burning boiler

This next group of questions asks about wood-burning boilers at your primary residence.

Please keep in mind the following while going through this section of the survey:

Wood-burning boilers provide central heating and can be controlled with thermostats. Wood-burning boilers heat water that moves through pipes to where the heat is used. Wood-burning boilers can be located inside or outside a house. “EPA-qualified” or “EPA-certified” appliances are typically labeled “Qualified at EPA” or “EPA Certified” on the permanent label.

What is the rated heat output of your $\${Im://Field/2}$ wood-burning boiler?

- BTU (British Thermal Unit) per hour: _____
 - I don't know
-

Which of the following fuels do you burn in your $\${Im://Field/2}$ wood-burning boiler?

- Firewood/Cordwood
 - Pellets
-

Is your $\${Im://Field/2}$ wood-burning boiler EPA qualified/certified?

- Yes
 - No
 - I don't know
-

What is the brand or model of your **wood-burning boiler?**

	Brand	Model	Not Sure (place an X)
Wood-burning boiler			

Please indicate the amount of fuel burned in your wood-burning boiler in a typical year.

For any of the following that apply, please put the amount in the space provided. (If you do not know the exact amounts, please give us your best estimate.)

	Full cords	Tons of pellets (pellets are usually sold in 40 lb bags; 50 bags = 1 ton)	I use something else. (Place an x)
Number of			

You answered that you use something else not listed for your $\{\text{Im://Field/2}\}$ wood-burning boiler, please specify what you use and how much.

How long have you owned your $\{\text{Im://Field/2}\}$ wood-burning boiler?

- 0-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- More than 25 years

End of Block: Wood-burning boiler

Start of Block: Outdoor wood-burning fire pits, Chimeneas or fire rings

This next group of questions asks about wood-burning fire pits, Chimenea, or fire rings at your primary residence.

Please keep in mind the following while going through this section of the survey:

Wood-burning fire pit(s), Chimenea(s), or fire ring(s) can be above the ground or dug into the ground. Wood-burning fire pit(s), Chimenea(s), or fire ring(s) are located outside of the house. When completing this section, please answer only for your fire pit(s), Chimenea(s), or fire ring(s) that burn wood.

Which of the following types of outdoor wood-burning appliances do you use at your primary residence? (Please select all that apply.)

- Fire pit(s)
- Chimenea(s)
- Fire ring(s)
- Other _____

Please indicate the amount of wood or biomass burned in your fire pit(s), Chimenea(s), or fire ring(s) in a typical year. For any of the following that apply, please put the amount in the space provided.

	Full cords	Wood bundles	Wax logs (such as Duraflame, Enviro-log, Pine Mountain, etc.)	Wood pallets	Bags of yard waste (such as sticks, twigs, leaves, etc.)	I use something else (Place an X)
Number of						

You answered that you use something other than what was listed for your fire pits(s), chimenea(s), or fire ring(s). Please specify what you use and how much?

End of Block: Outdoor wood-burning fire pits, Chimeneas or fire rings

Start of Block: Heating Opinions and Choices

The goal of this section is to better understand your opinion on different heating options and decisions.

How would you classify your home heating costs?

- Always too high
 - Sometimes too high
 - Rarely too high
 - Never too high
 - Other _____
-

Does your household have an alternative heating option that you could switch to should the need arise?

- Yes
 - No
-

If Yes, what is your alternative heating option?

- Natural Gas
 - Electricity
 - Fuel Oil/Kerosene
 - Propane
 - Wood
 - Other _____
-

If you do not use Natural Gas in your home, do you know if it is available in your area?

- Yes
 - No
 - I don't know
-

If you use wood to heat your home, have winter time wood burning bans affected your ability to keep your home heated?

- Yes
 - No
-

Woodsmoke can build up during certain fall and winter weather conditions. When local jurisdictions issue wood burning alerts, warnings or bans, do you:

- Always follow the suggestions or bans
 - Sometimes follow the suggestions or bans
 - Never follow the suggestions or bans
 - I am unaware of the suggestions or bans
-

Would you consider switching to a heat pump if it were free or low cost to you? (A heat pump is powered by electricity and transfer heat using refrigerant to provide both cooling and heating; homeowners may not need to install separate systems to heat their homes. Heat pumps do not burn fossil fuel like many furnaces do, making them more environmentally friendly. Heat Pumps also improve indoor air quality by replacing combustion and filtering the air. Below is a picture example of a heat pump.)

- Yes
 - No
 - Maybe
 - I don't know enough about heat pumps
 - Other _____
-

If adding solar panels to my home was affordable, I would have them installed:

- Yes
 - No
 - Already have them
-

If available, I'd use a bio-fuel in my home's fuel oil/kerosene furnace:

- Yes
 - No
 - I already do
 - Don't have a fuel oil/ kerosene furnace
-

If available, I'd fuel my diesel vehicle with renewable diesel:

- Yes
 - No
 - I already do
 - Don't have a diesel vehicle
-

The wildfire smoke from fall 2020 directly impacted my household:

- Greatly, a member of the household's medical condition was affected
 - Greatly, I voluntarily relocated temporary due to air
 - Slightly, there was concern for a member of the household's medical condition
 - Slightly, I ran/bought air filtration systems in my home
 - Was not affected
 - Other (Please specify how you were impacted)
-

I am concerned about Oregon's air quality:

- Always
 - Sometimes
 - Rarely
 - Never
-

Please answer yes or no to the following statements:

I am concerned about the increased wildfires in Oregon.	<input type="radio"/> Yes	<input type="radio"/> No
I am concerned about increased drought in parts of Oregon.	<input type="radio"/> Yes	<input type="radio"/> No
I am concerned about severe weather events.	<input type="radio"/> Yes	<input type="radio"/> No
I am concerned about hotter, longer summers and shorter drier winters.	<input type="radio"/> Yes	<input type="radio"/> No
I am concerned wildfires, drought, and weather patterns will be worsened by climate change?	<input type="radio"/> Yes	<input type="radio"/> No

End of Block: Heating Opinions and Choices

Start of Block: Demographics

DEMOGRAPHICS

What language(s) are spoken in your home?

- English
- Spanish
- Chinese (Incl. Mandarin, Cantonese)
- Vietnamese
- Russian
- German
- Amharic, Somali, or Other Afro-Asiatic Languages
- Tagalog (Incl. Filipino)
- French (Incl. Cajun)
- Korean
- Ilocano, Samoan, Hawaiian, or Other Austronesian Languages
- Arabic
- Japanese
- Hindi
- Other Indo-European Languages
- Thai, Lao, or Other Tai-Kadai Languages
- Ukrainian or Other Slavic Languages
- Other Languages of Asia

Telugu

Italian

What is the total household income, before taxes?

- Less than \$25,000
 - \$25 to \$49,999
 - \$50 to \$74,999
 - \$75 to \$99,999
 - \$100 to \$149,999
 - Greater than \$150,000
 - Prefer not to answer
-



Please provide the number of people in the following age ranges, including yourself, who live in the home.

	ages 17 or younger	ages 18-35	ages 36-50	ages 51-65	ages 66 or older	I do not wish to answer.
Number of people in household						



Which of the following describes your racial or ethnic identity? Please check ALL that apply.

- Hispanic and Latino/a/x
- Native Hawaiian and Pacific Islander
- White
- American Indian and Alaska Native
- Black and African American
- Middle Eastern/North African
- Asian
- Other _____
- Prefer not to answer

End of Block: Demographics

Start of Block: COMPLETION

Thank you! You've completed the survey!
Click at the arrow to get redirected to the Gift-card drawing page.

End of Block: COMPLETION
