Otago Regional Council

Home Heating Survey

Otago Regional Council

Report | September 2016

KEYRESEARCH

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Introduction, Objectives and Methodology

Introduction

Otago Regional Council would like to better understand home heating methods used in winter and gauge perceptions of air pollution levels in Central Otago 'towns'. Results from this survey will be compared to results obtained from a similar study undertaken in 2006.

Research Objectives

- To understand the types of heating Central Otago 'towns' residents use during winter, include the use of wood fired heating
- Gauge residents' perceptions of winter air pollution

Methodology

- A telephone survey measuring attitudes towards and usage of winter heating. A sample of n=400 is designed to enable statistically robust results by selected criteria while being representative of the region
- The questionnaire was designed in consultation with staff at Otago Regional Council and is structured to provide a comprehensive set of measures relating to heating sources used and perceptions of relative performance, ease of use and effects on pollution
- The questionnaire was subjected to an initial pilot phase involving 20 interviews. The data from this phase was downloaded and carefully checked to ensure that the questionnaire was working as designed. Interviewers also confirmed that the questionnaire was flowing well and that there were no obvious issues with ambiguity
- Data collection was conducted between 15 July and 20 August 2016. A total sample of n=400 was achieved. Data collection was managed to achieve defined quota targets based on age, gender, town and ethnicity. Post data collection the sample has been weighted so it is exactly representative of key population demographics based on the 2013 Census
- At an aggregate level the survey has an expected 95% confidence interval (margin of error) of +/-4.9%
- There are instances where the sum of the whole number score varies by one point relative to the aggregate score due to rounding

Executive summary

1. The most popular heating source used in Otago homes is electric (65%) followed closely by enclosed wood/multi-fuel burners (62%). Wood or logs is the most used type of fuel (95%) in an enclosed burner or open fire with coal being used by just 9%

2. Residents living in uninsulated homes spend approximately $321 on average per month to heat their homes compared to residents in insulated homes who spend $251, being $70 less

3. When setting up a new home an enclosed wood or multi-fuel burner is the heating source most seriously considered and mostly likely to be selected, followed by electricity

4. Being convenient to use is the performance attribute most associated to electricity as a source of heating while being affordable to run is mostly associated to enclosed burners

5. Being good for the environment is less important as an overall heating source characteristic compared to in order of importance; being safe and healthy for the family, providing warmth throughout the house, having a low cost to run and being convenient to use

Air pollution

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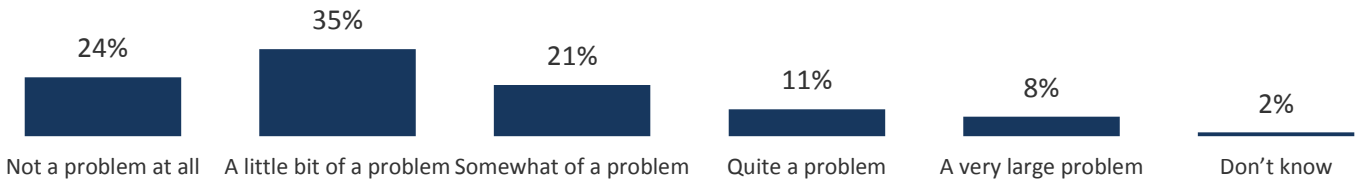
Residents who use burners or open fires as a heating source are less likely to believe that air pollution is a problem in their town during winter compared to those using electricity or gas

Air pollution in winter [1][2][3]



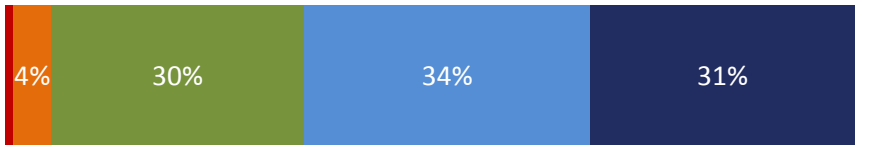
Heating source used

Electric heating	24%	34%	20%	12%	8%	2%	n=266
Gas heating	24%	25%	21%	16%	13%	1%	n=58
Burners / Open fire	24%	36%	21%	9%	7%	2%	n=255
Central heating	16%	27%	31%	13%	13%	0%	n=25
Electric heating	*0%*	*38%*	*35%*	*15%*	*12%*	*0%*	*n=8*
Gas heating	*0%*	*0%*	*65%*	*35%*	*0%*	*0%*	*n=2*
Burners / Open fire	*26%*	*20%*	*27%*	*10%*	*16%*	*0%*	*n=13*

NOTES:
1. Sample: n=400
2. HSU1. Which of the following heating sources do you have in your home? [MULTIPLE RESPONSE]
3. AP1. How much of a problem do you believe that air pollution is in your town during winter?

Of the residents that believe air pollution is a problem *(somewhat, quite and a very large problem)*, overall 65% feel that it is important to overcome with this number dropping to four in ten (41%) in the 18-39 year age group

Importance of overcoming air pollution [1][2][3]

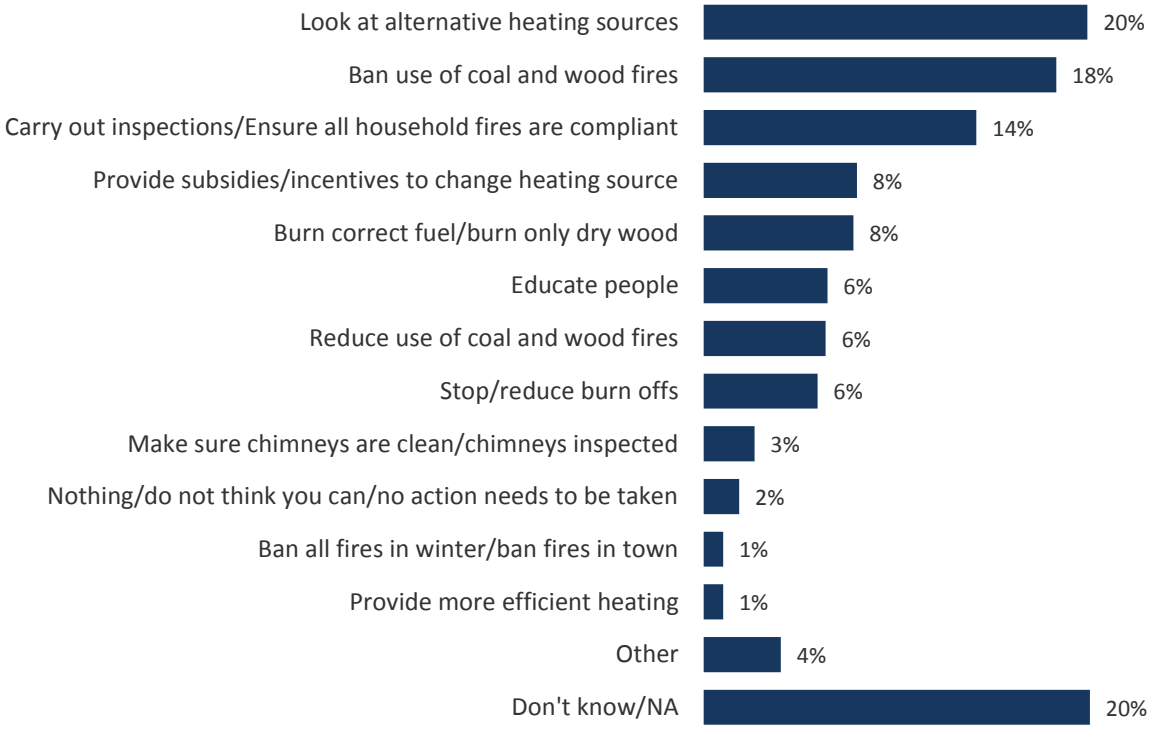


Important (% 7-10)	Not important (% 1-4)	Important (% 7-10) 18-39 years	40-64 years	65+ years
65%	5%	41%	75%	64%

NOTES:
1. Sample: n=400; Air pollution is a problem n=172 AP1=(somewhat, quite and a very large problem)
2. AP3. How important is it to you that the problem of air pollution is overcome?
3. Excludes 'don't know'

Looking at alternative heat sources and banning the use of coal and wood fires are the two top mentioned ways to reduce air pollution with an almost equal number of people providing a don't know answer indicating a low awareness of what could be done

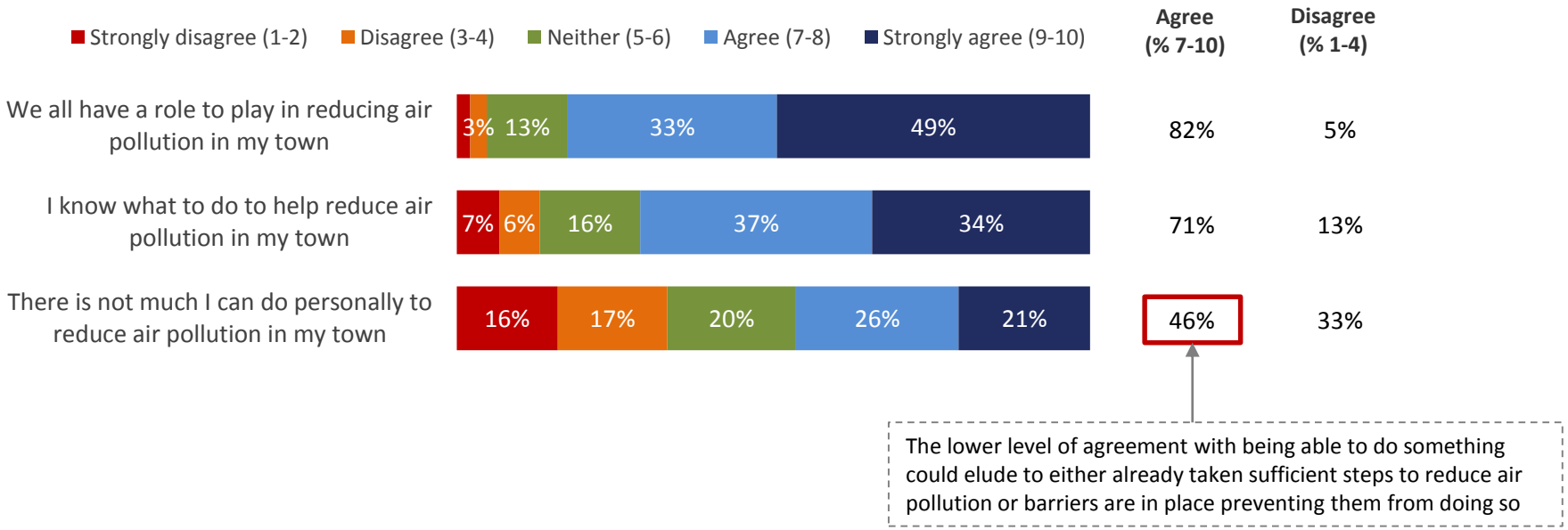
Ways to reduce air pollution [1][2]



NOTES:
1. Sample: n=400; Air pollution is a problem n=172
2. AP4. What do you think should be done to reduce winter air pollution in your town?

Just over eight in ten (82%) residents who believe air pollution is a problem agree that everyone has a role to play in reducing air pollution in their towns

Attitudes to air pollution [1][2][3]



NOTES:
1. Sample: n=400; Air pollution is a problem n=172
2. AP6. How strongly do you agree with the following statements:
3. Excludes 'don't know'

Of the residents that believe air pollution is a problem and who use an open fire or burner as a heating source, just under one quarter agree that they could easily change how their home is heated to help reduce air pollution in their town

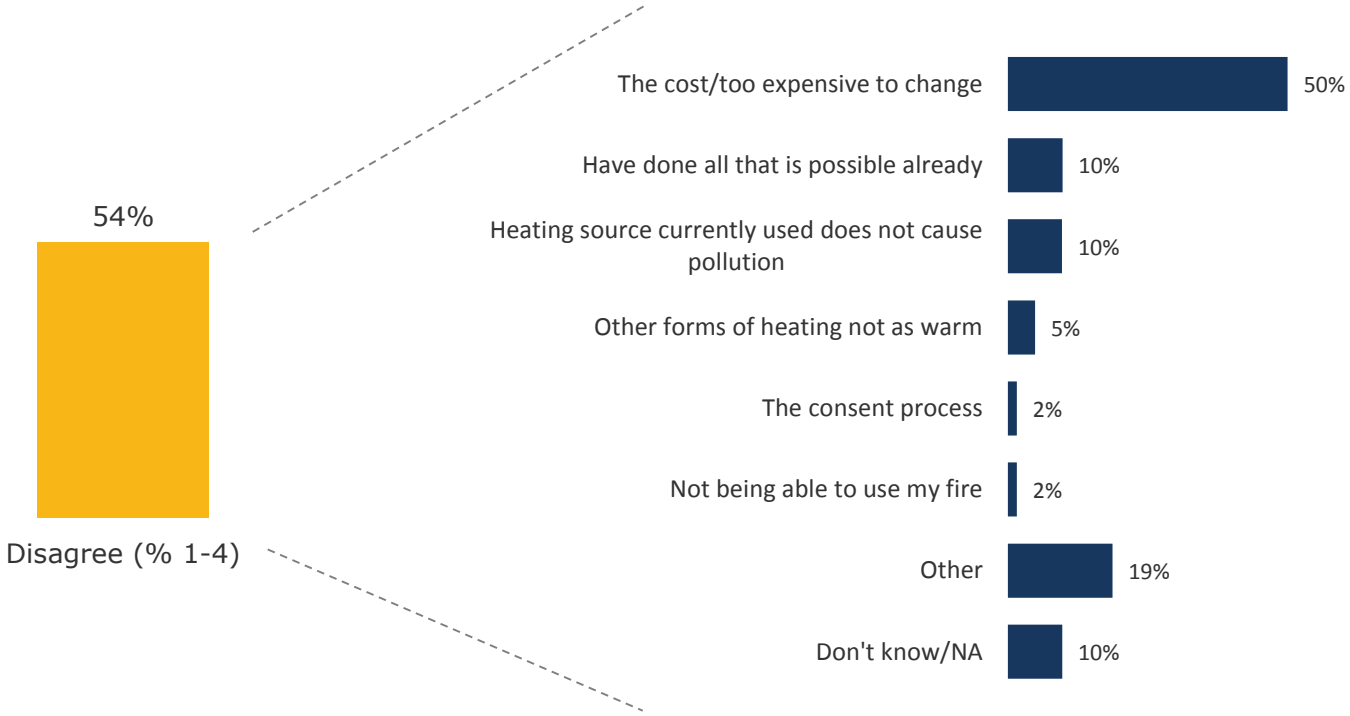
Change of heating habits (1)(2)(3)

Agree (% 7-10)	Disagree (% 1-4)	Agree (% 7-10) 18-39 years	Agree (% 7-10) 40-64 years	Agree (% 7-10) 65+ years
23%	54%	17%	23%	42%

NOTES:
1. Sample: n=400; Air pollution a problem, using the following heat source; HSU1=Enclosed wood or multi-fuel burner, open fire or oil or diesel burner heating sources n=111
2. AP6D. If I needed to, I could easily change how I heat my home to help reduce air pollution in my town
3. Excludes 'don't know'

The biggest barrier for those who find it difficult to change their heating habits in order to reduce air pollution is cost

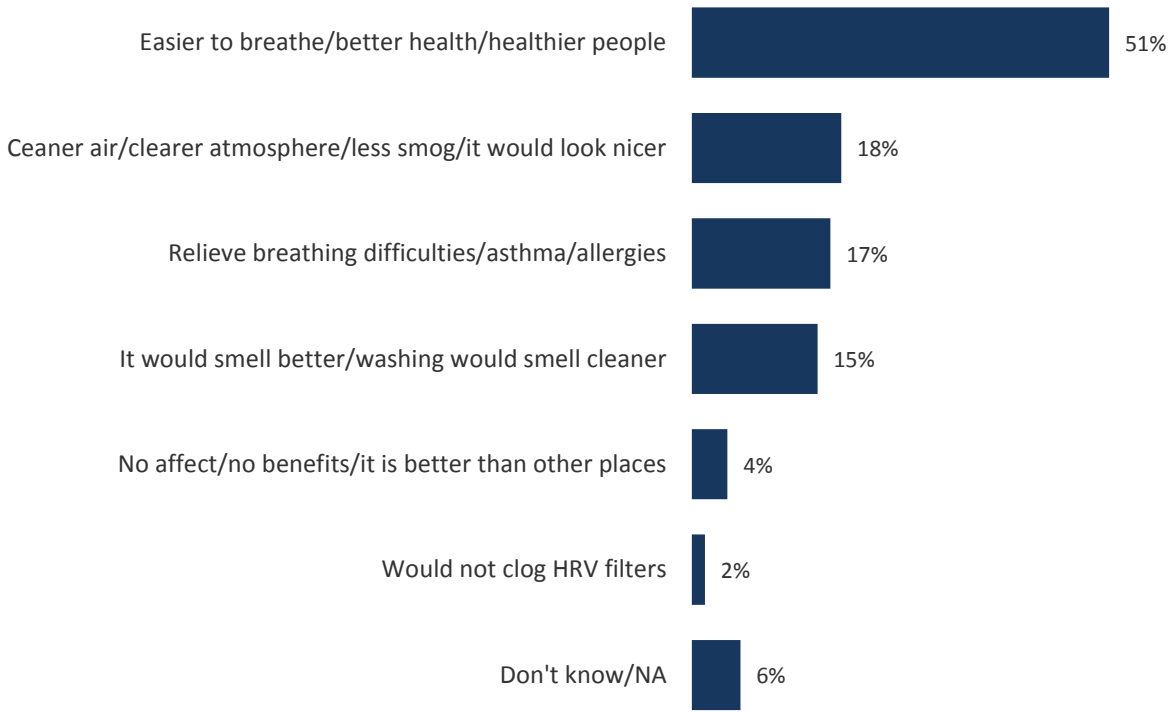
Barriers to change heating habits [1][2][3]



NOTES:
1. Sample: n=400; Air pollution a problem/Disagree (1-4) n=57
2. AP6D. If I needed to, I could easily change how I heat my home to help reduce air pollution in my town.
3. AP6E. Please describe what would make that change difficult?

Better health and being easier to breath are the main benefits mentioned from having cleaner air during winter

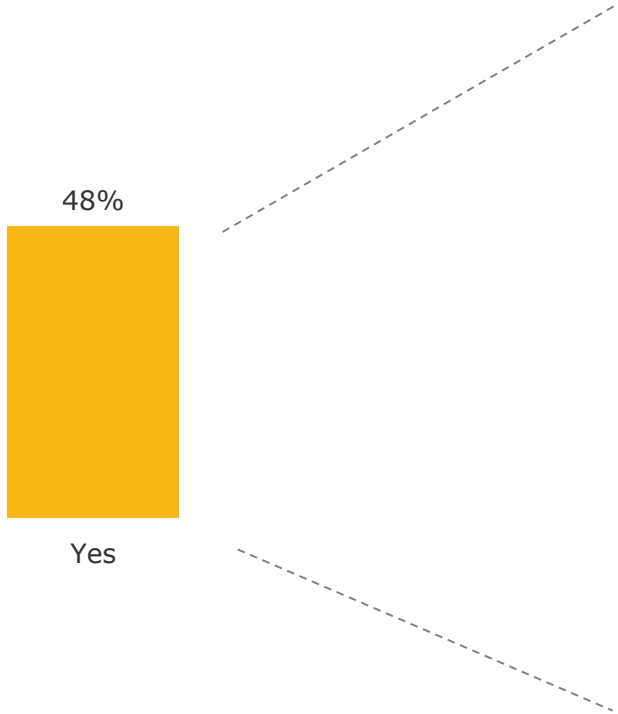
Main benefits of cleaner air (1)(2)

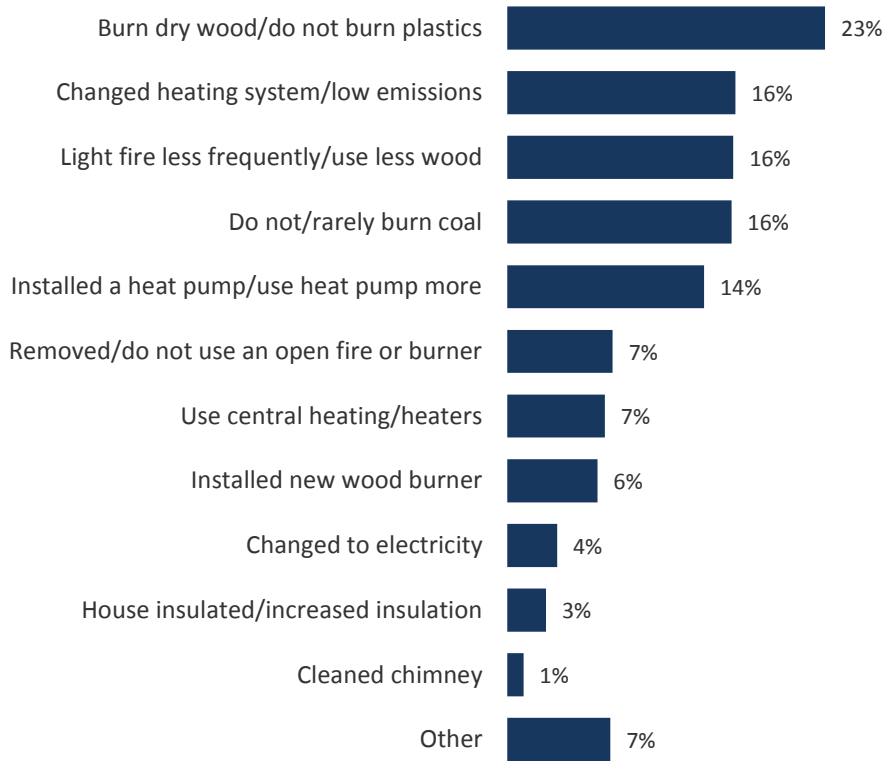


NOTES:
1. Sample: n=400; Air pollution is a problem n=172
2. AP5. What would be the main benefits to you of cleaner air in your town during winter?

Nearly half (48%) of residents state that they are doing something different to help decrease winter air pollution with burning dry wood and not plastic being the most mentioned action

Personal actions to decrease winter air pollution (1)(2)(3)





NOTES:
1. Sample: n=400; Air pollution a problem; Doing something different to decrease air pollution n=80
2. AP7. Is there anything that you are now doing differently to help decrease winter air pollution?
3. AP8. Can you describe what you are doing to help reduce winter air pollution?

Heating in the home

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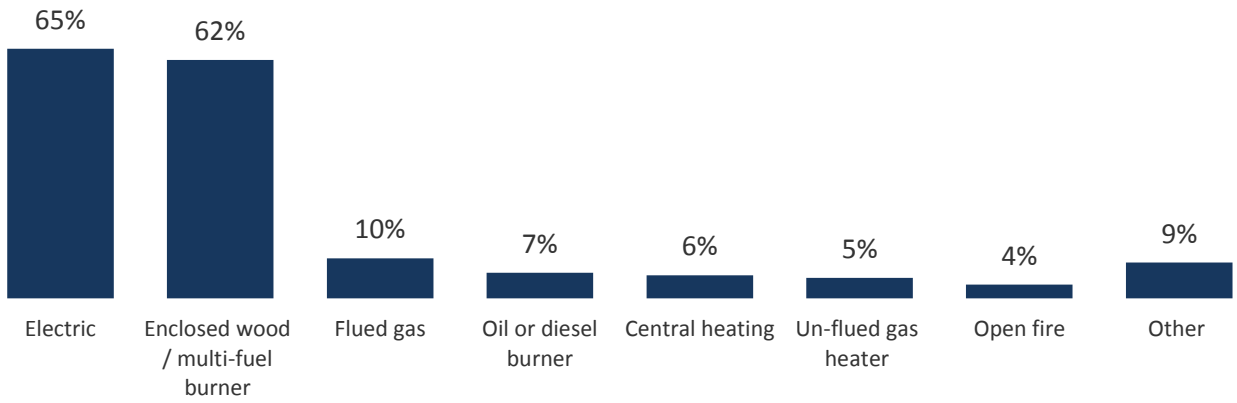
KEYRESEARCH

Electricity and enclosed wood/multi-fuel burners are almost equally, and by far the most preferred sources for heating

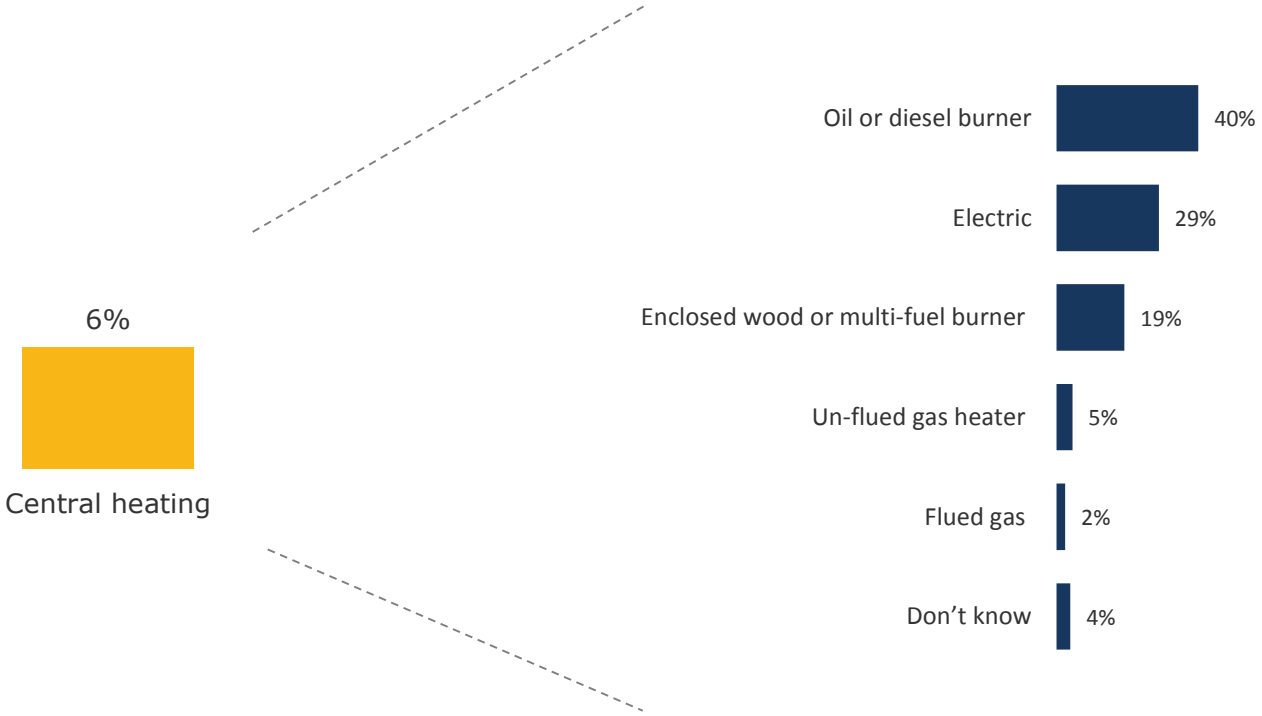
Heating sources in the home [(1)(2)]



NOTES:
1. Total Sample: n=400
2. HSU1. Which of the following heating sources do you have in your home? [MULTIPLE RESPONSE]

For the 6% of residents who stated that they use central heating, an oil or diesel burner followed by electricity were the main source of heat

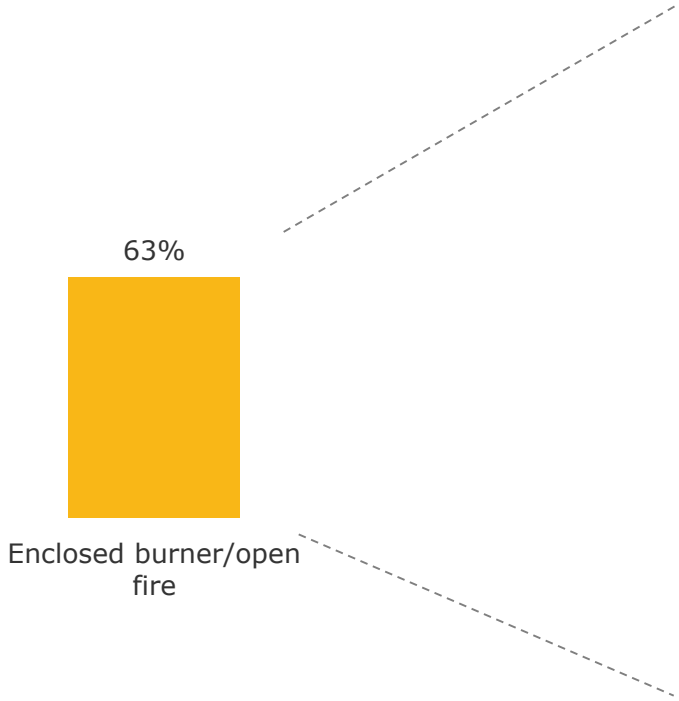
Heating source for central heating (1)(2)(3)

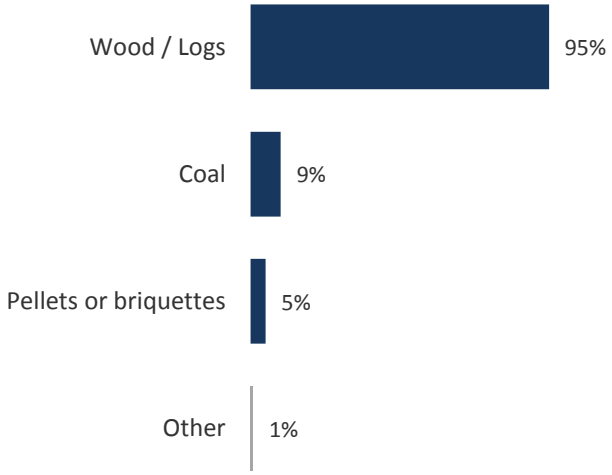


NOTES:
1. Sample: n=400; Central heating n=25
2. HSU1. Which of the following heating sources do you have in your home?
3. HSU2. What do you use as the heating source for your central heating?

Wood and logs is by far the most used fuel type for enclosed burners and open fires followed by almost one in ten residents using coal

Fuel used in enclosed burner/open fire (1)(2)(3)

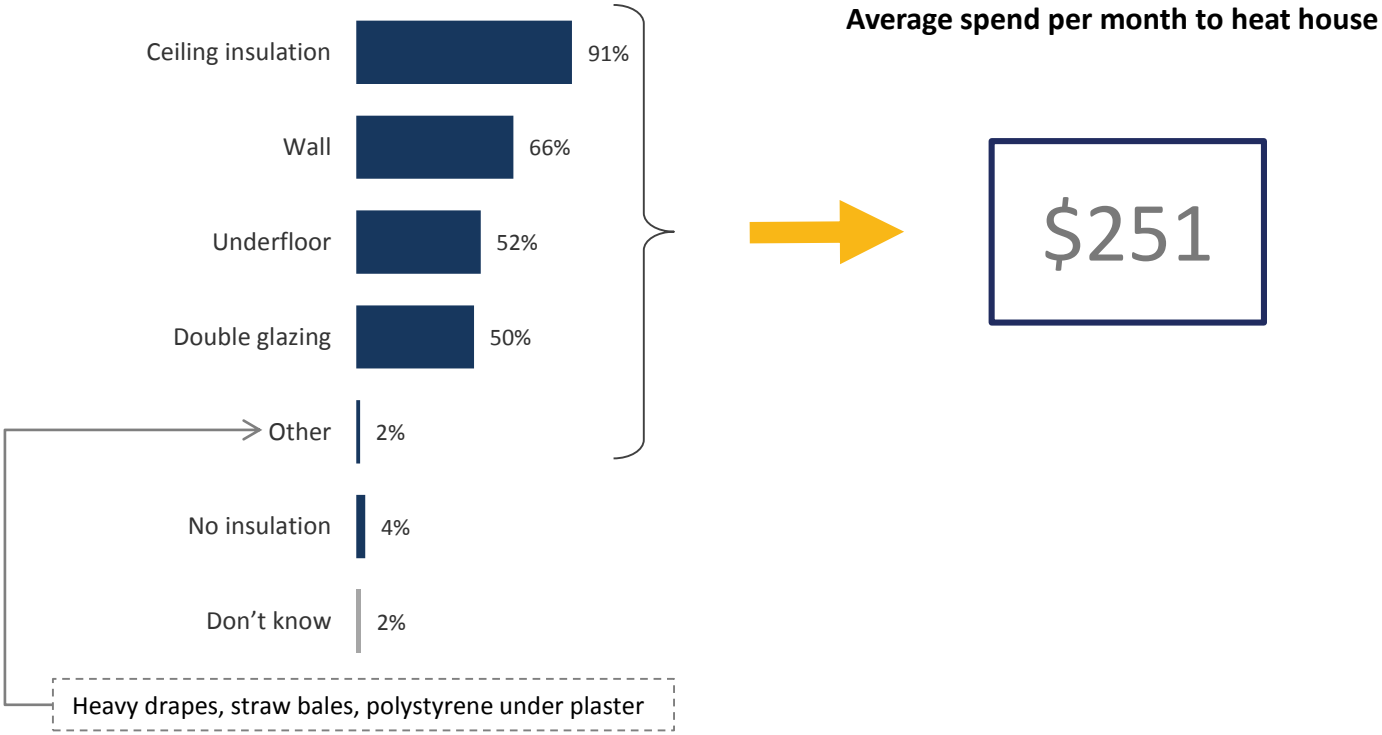




NOTES:
1. Sample: n=400; Have enclosed burner/open fire in home n=237
2. HSU1. Which of the following heating sources do you have in your home?
3. HSU2. What do you use as the heating source for your central heating?
4. HSU3. Which of the following fuels do you use in your enclosed burner or open fire?

Homes that have some form of insulation are spending approximately $251 on average per month to heat their homes in winter

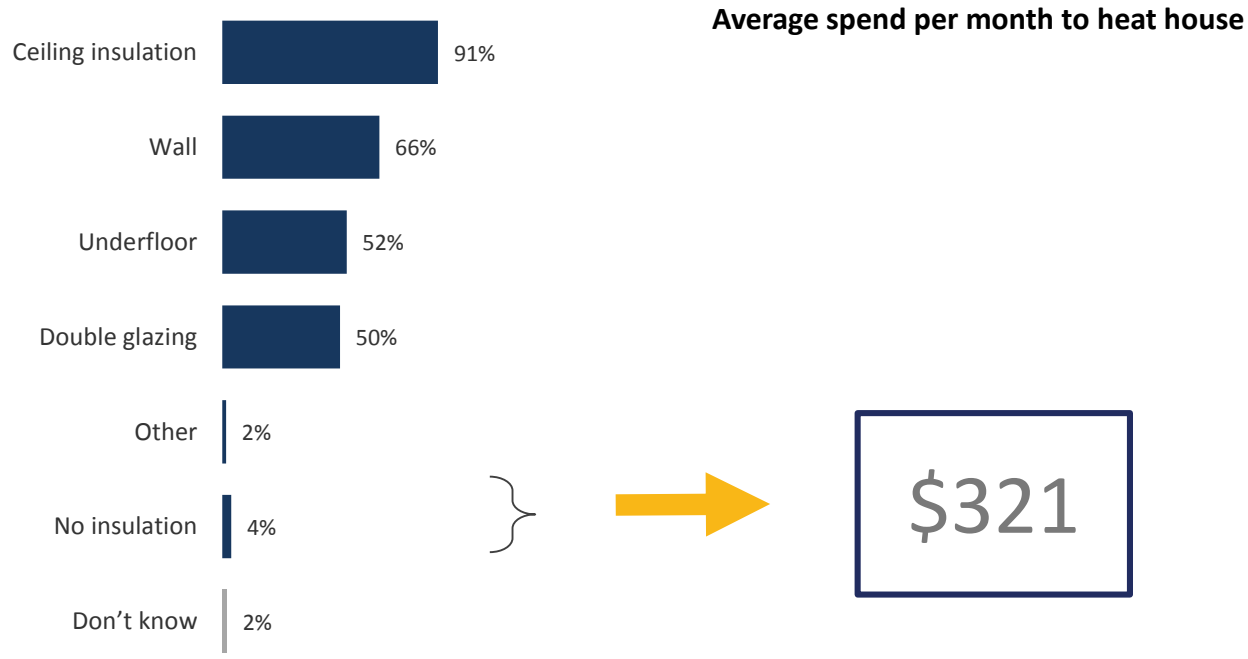
Insulation used; average spend (1)(2)(3)



NOTES:
1. Sample: n=400; With any insulation n=379
2. HSU4. Which of the following insulation do you have? [MULTIPLE RESPONSE]
3. HSU5. Off the top of your head, approximately how much would you spend on average per month to heat your house in winter months?

Homes that have no form of insulation are spending approximately $321 on average per month to heat their homes in winter, being $70 more than insulated homes spend

Insulation used; average spend [1][2][3]

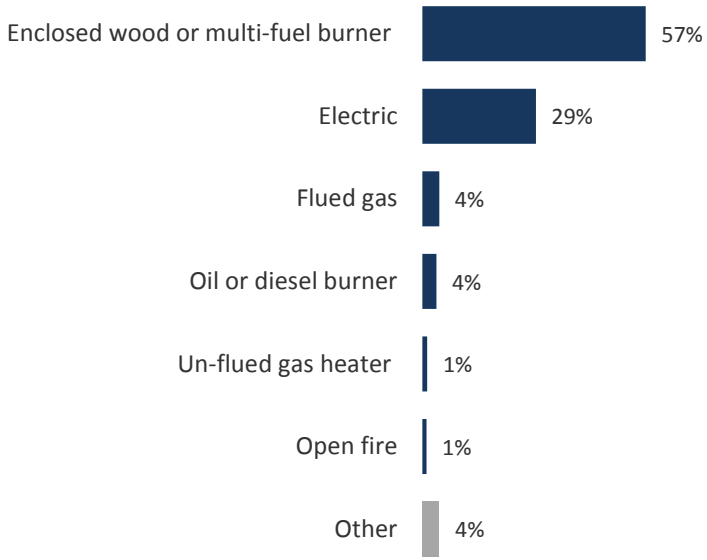


NOTES:
1. Sample: n=400; With no insulation n=13
2. HSU4. Which of the following insulation do you have? [MULTIPLE RESPONSE]
3. HSU5. Off the top of your head, approximately how much would you spend on average per month to heat your house in winter months?

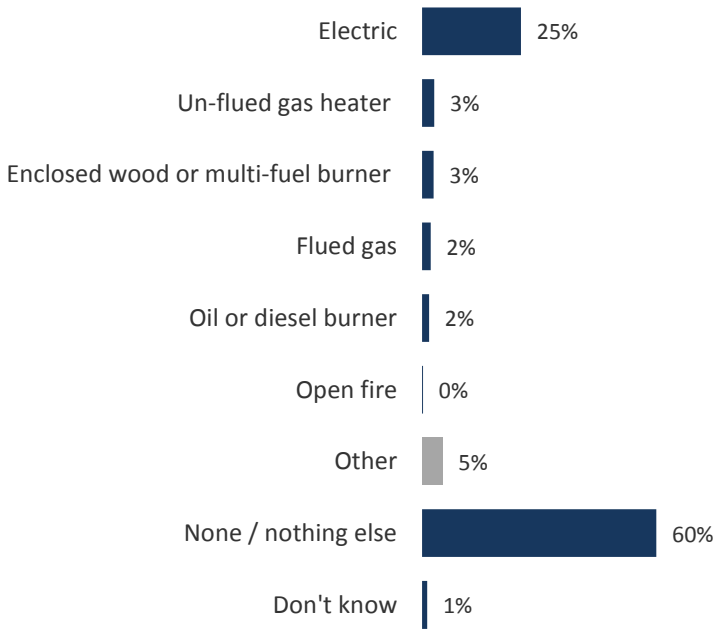
An enclosed wood or multi-fuel burner is the most used method (57%) for heating the living area with electricity being used by 29% as a main method and by 25% as an alternative method

Heating of the living area (1)(2)(3)

Main method of heating



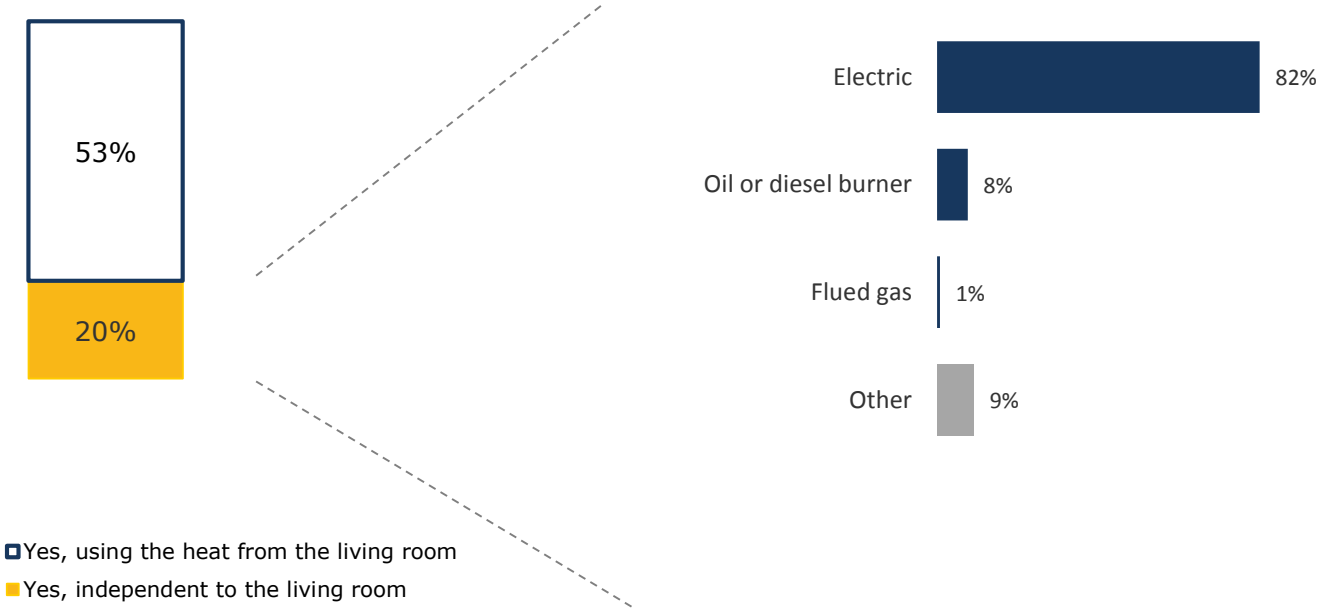
Other ways of heating



NOTES:
1. Sample: n=400
2. WRH1. What do you mostly use to heat your main living area?
3. WRH2. What else might you use to heat your main living area? [MULTIPLE RESPONSE]

Nearly three quarters (73%) of residents heat their bedrooms with two in ten doing so independently to the living room and predominantly using electricity as the source

Heating of the bedroom [1][2][3]



NOTES:
1. Sample: n=400; Heat bedroom independent of living room n=80
2. WRH3. Do you heat your bedroom?
3. WRH4. What do you mostly use to heat your bedroom?

Heating preferences

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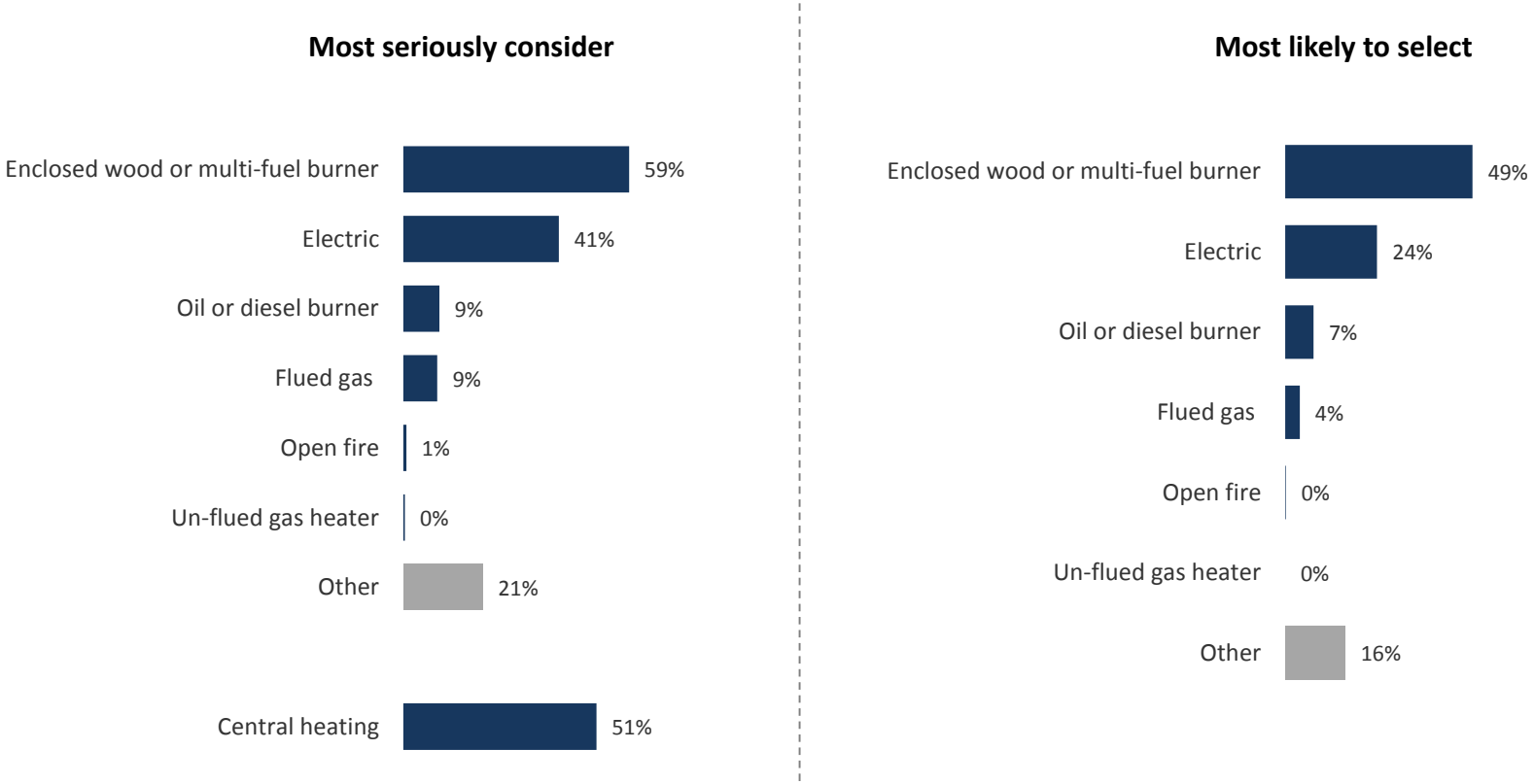
KEYRESEARCH

Enclosed wood or multi-fuel burners are the heating sources that are most seriously considered and most likely to be selected when setting up a new home

Heating sources consideration (1)(2)(3)(4)

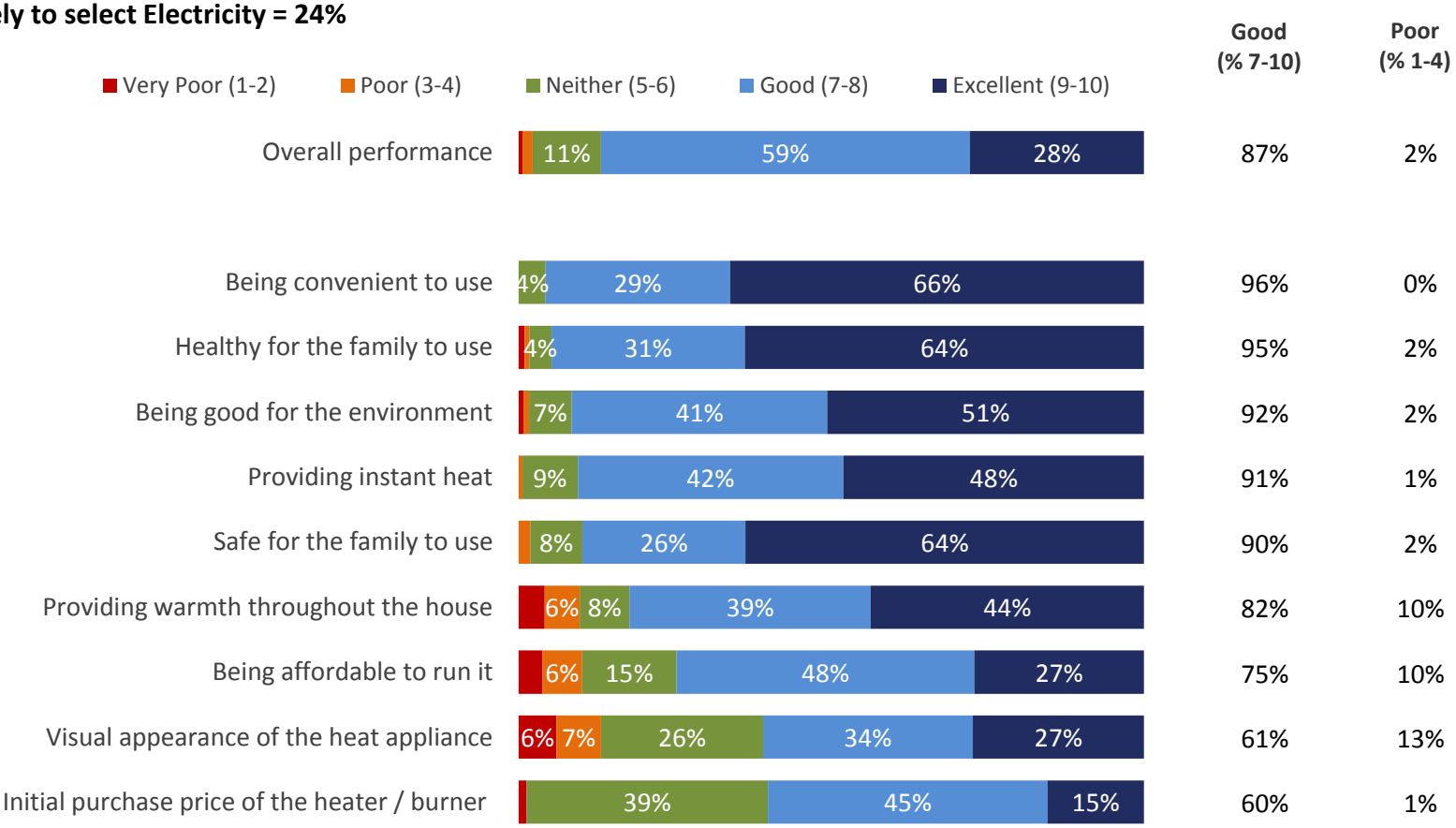


NOTES:
1. Sample: n=400
2. HP1. If you were to set up your home from new, which heating sources would you most seriously consider installing? [MULTIPLE RESPONSE]
3. HP2. Would you consider central heating?
4. HP6. Which heating source would you most likely select if setting up a new home? [SINGLE RESPONSE]

Being convenient to use and healthy for the family are what most residents rate electricity as being good at (7-10) when selecting it as a heat source

Heating source performance; Electricity (1)(2)(3)(4)(5)

Most likely to select Electricity = 24%

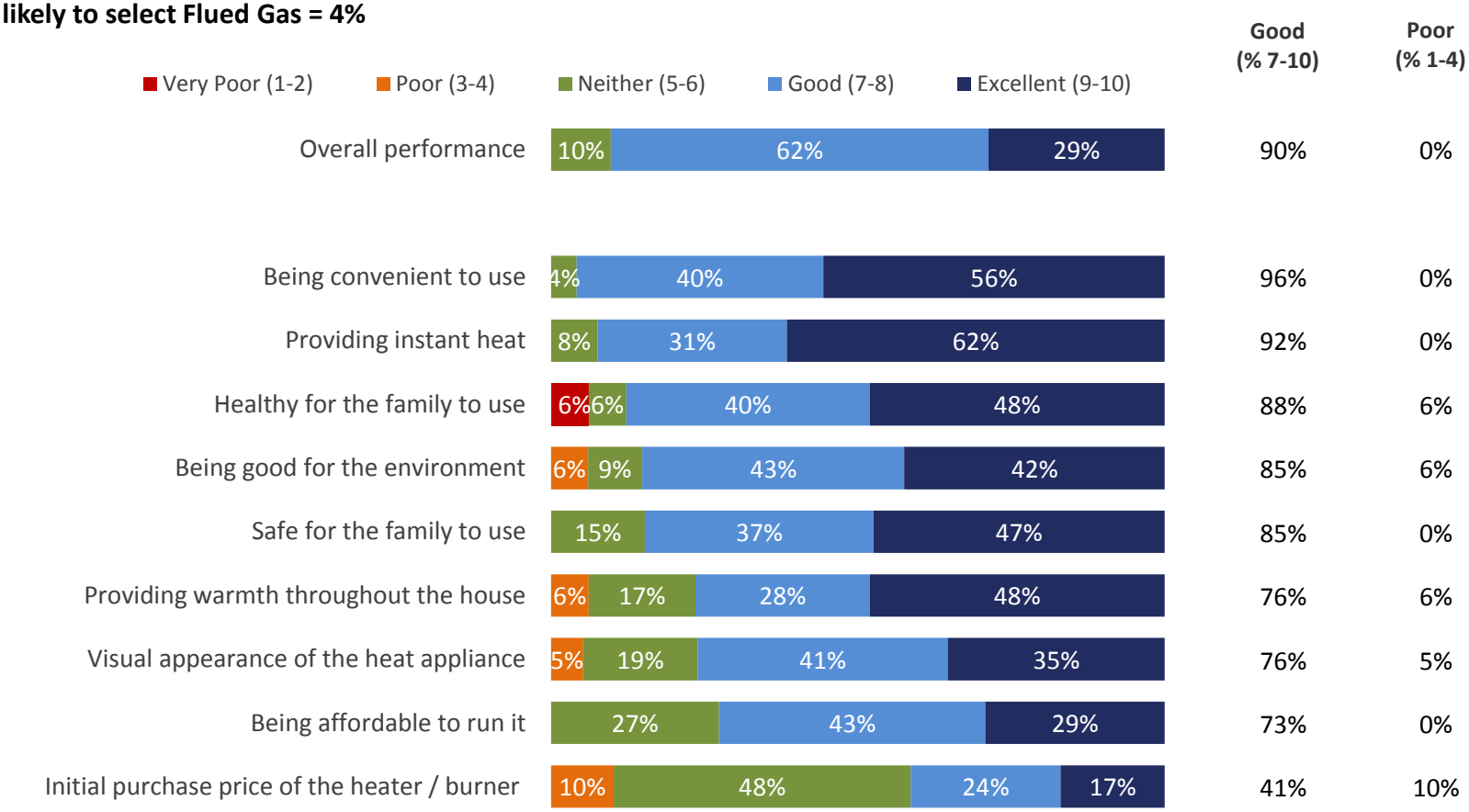


NOTES:
1. Sample: n=400 ; Most likely select electricity n=104
2. HP6. Which heating source would you most likely select if setting up a new home?
3. HP8. When you think about [RESPONSE AT HP6] as a heating source, how would you rate it on each of the following?
4. HP8A. And when you think about [RESPONSE AT HP6} as a heating source, how would you rate it overall considering performance, cost and environmental impact?
5. Excludes 'don't know'

Just over six in ten residents that would consider gas as a heating source when setting up a new home rate it as excellent (9-10) for providing instant heat

Heating source performance; Flued Gas (1)(2)(3)(4)(5)

Most likely to select Flued Gas = 4%

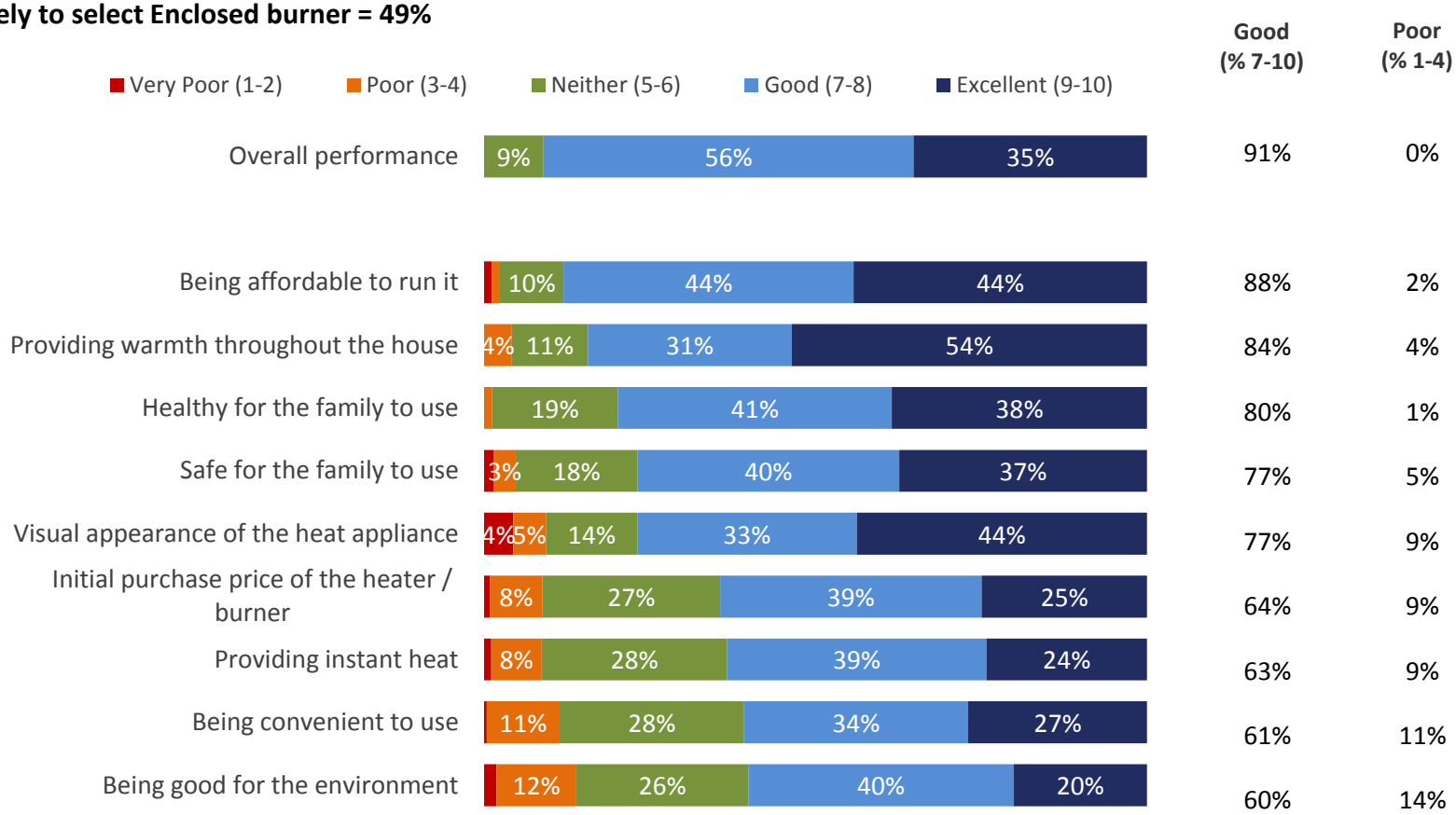


NOTES:
1. Sample: n=400 ; Most likely select gas n=19
2. HP6. Which heating source would you most likely select if setting up a new home?
3. HP8. When you think about [RESPONSE AT HP6] as a heating source, how would you rate it on each of the following?
4. HP8A. And when you think about [RESPONSE AT HP6} as a heating source, how would you rate it overall considering performance, cost and environmental impact?
5. Excludes 'don't know'

Most residents (88%) rated being affordable to run as either good or excellent (7-10) when choosing an enclosed burner as the heat source in their new home

Heating source performance; Enclosed burner (1)(2)(3)(4)(5)

Most likely to select Enclosed burner = 49%

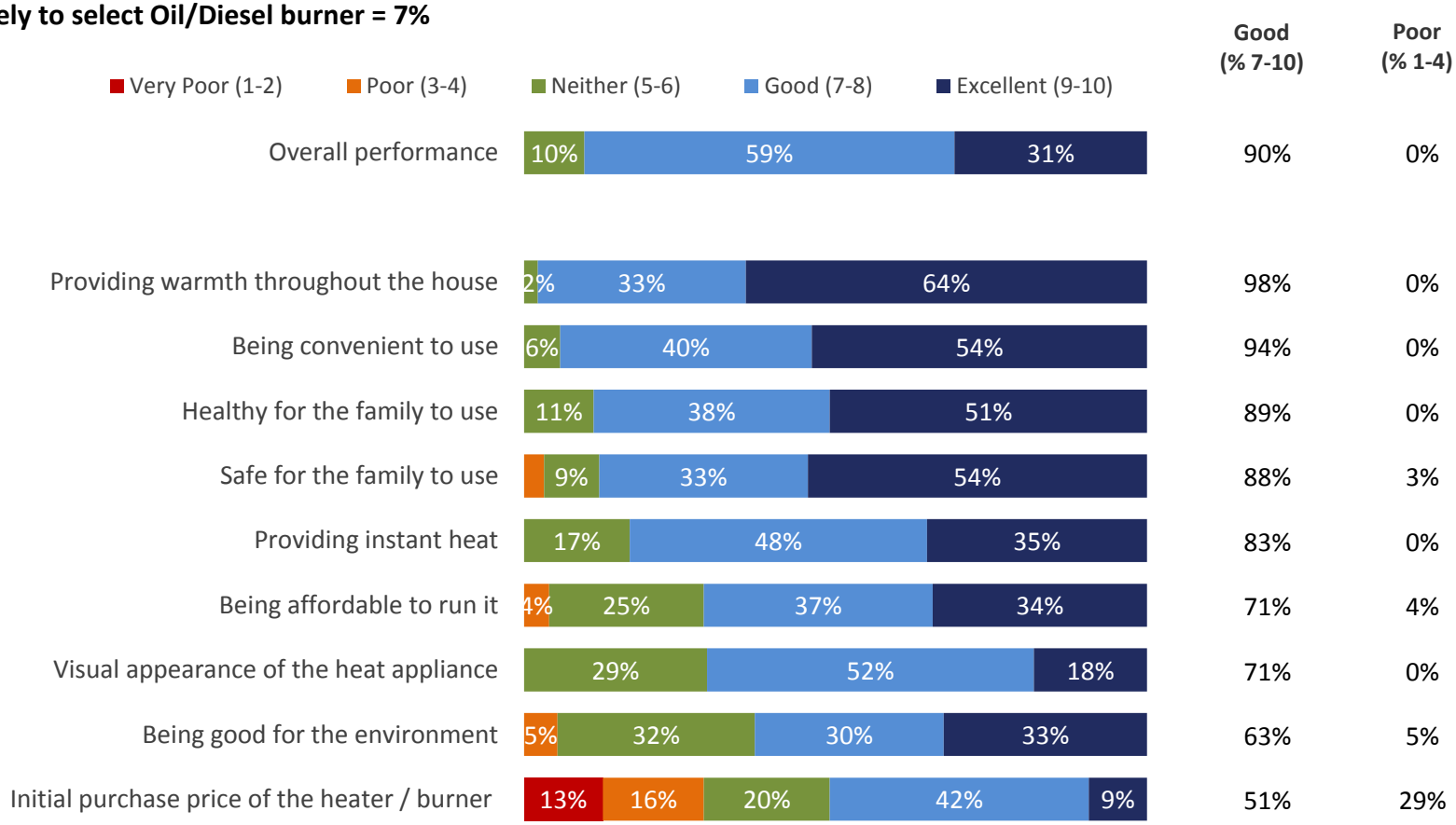


NOTES:
1. Sample: n=400 ; Most likely select enclosed burner n=179
2. HP6. Which heating source would you most likely select if setting up a new home?
3. HP8. When you think about [RESPONSE AT HP6] as a heating source, how would you rate it on each of the following?
4. HP8A. And when you think about [RESPONSE AT HP6} as a heating source, how would you rate it overall considering performance, cost and environmental impact?
5. Excludes 'don't know'

The initial purchase price of an oil or diesel burner was rated as poor (1-4) by 29% of residents that would most likely choose this method of heating for a new home

Heating source performance; Oil/Diesel burner (1)(2)(3)(4)(5)

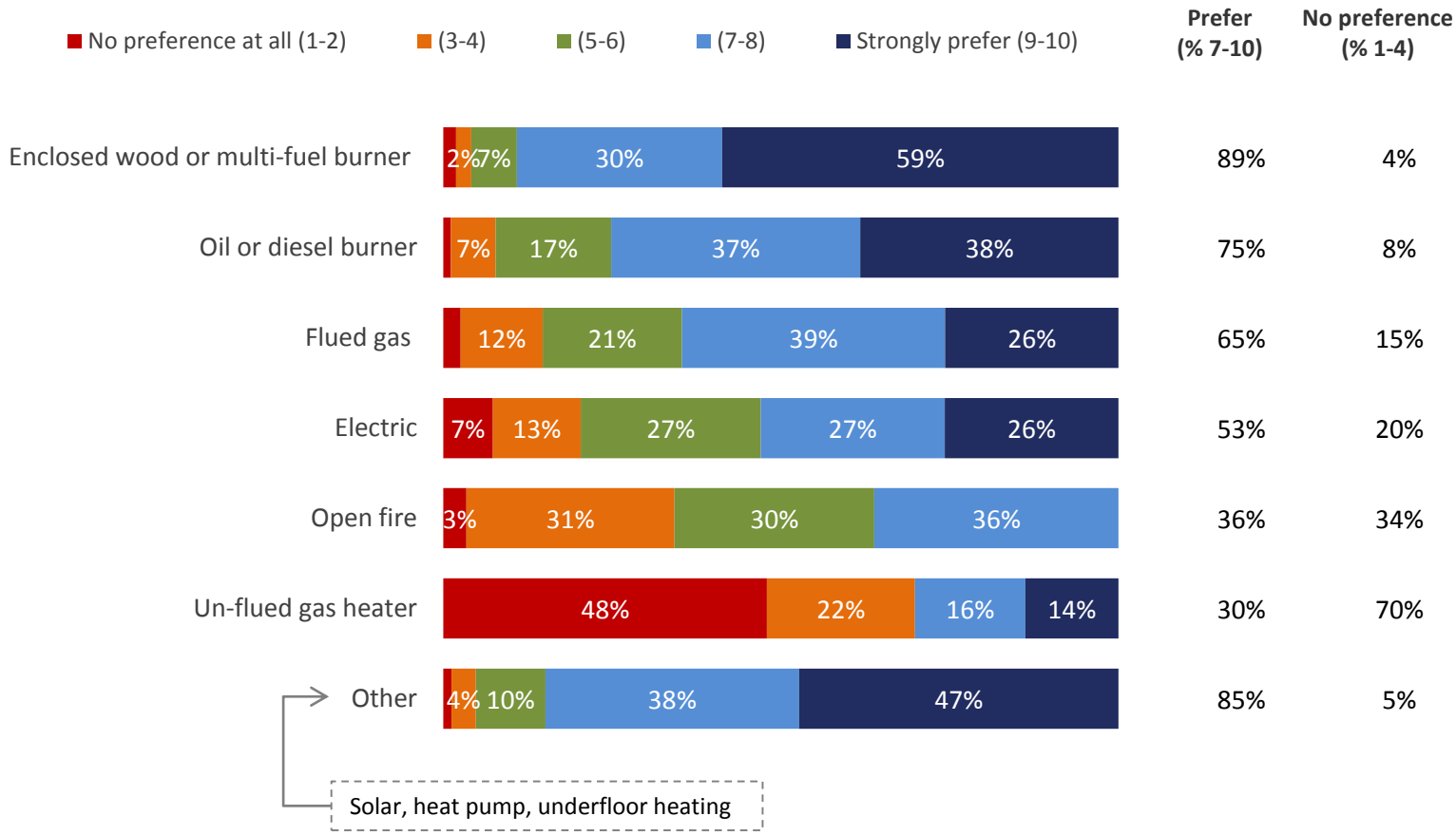
Most likely to select Oil/Diesel burner = 7%



NOTES:
1. Sample: n=400 ; Most likely select oil/diesel burner n=31
2. HP6. Which heating source would you most likely select if setting up a new home?
3. HP8. When you think about [RESPONSE AT HP6] as a heating source, how would you rate it on each of the following?
4. HP8A. And when you think about [RESPONSE AT HP6} as a heating source, how would you rate it overall considering performance, cost and environmental impact?
5. Excludes 'don't know'

Enclosed wood or multi-fuel burners is the heating source most preferred (7-10) when compared to all other heating sources

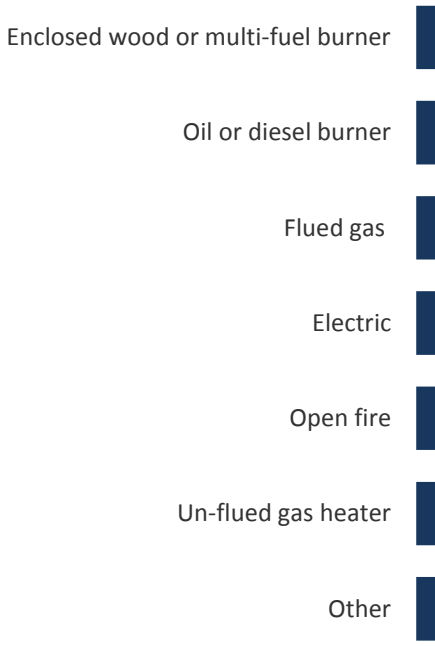
Heating source preferences (1)(2)(3)



NOTES:
1. Sample: n=400
2. HP3. For each of these heating sources, how strongly do you prefer each one to all others?
3. Excludes 'don't know'

More of the younger 18-39 year old age group and residents in Alexandra have a slightly stronger preference to enclosed wood or multi-fuel burners compared to other groups

Heating source preferences (1)(2)(3)



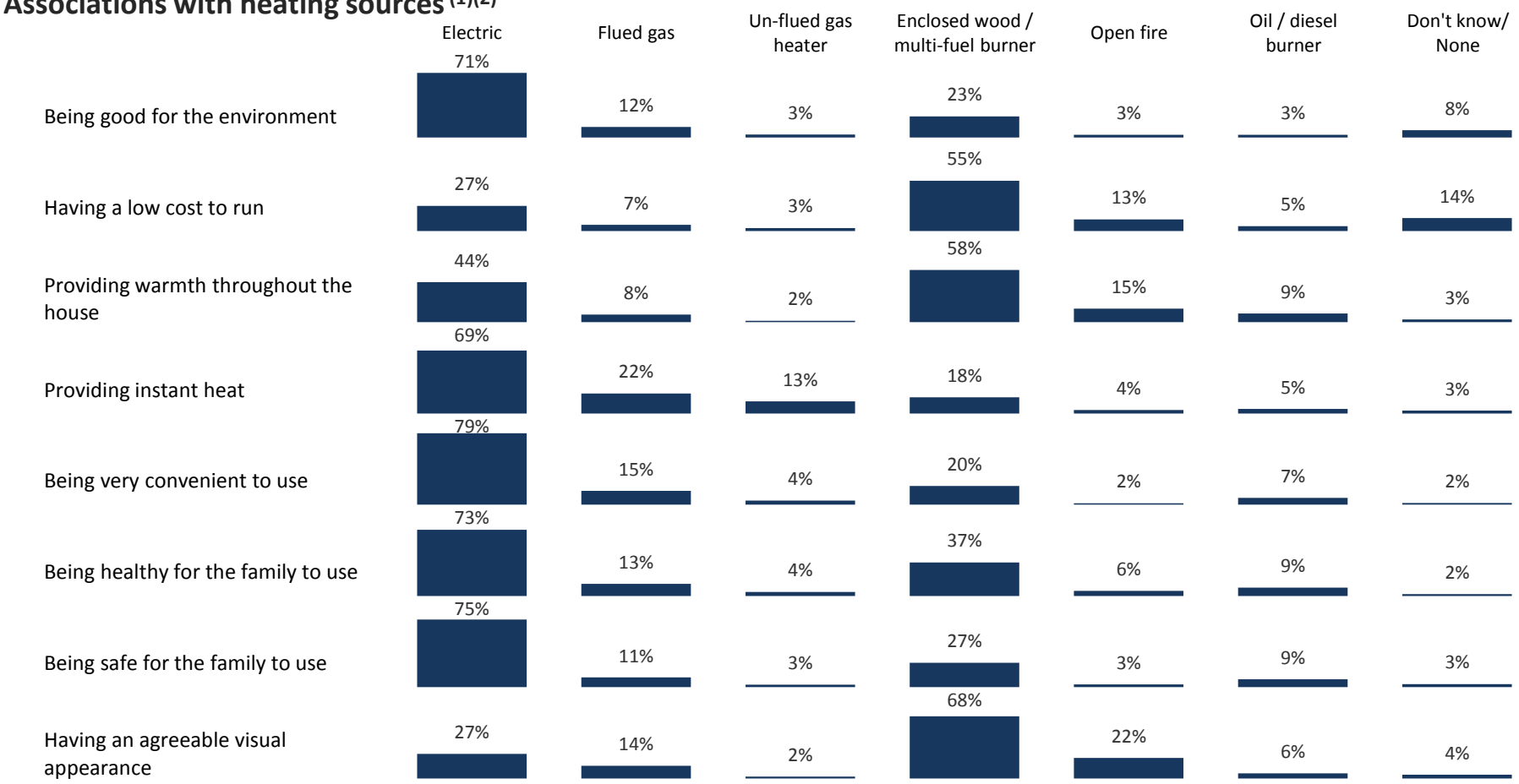
Preference (% 7-10)			Age group			Town			
			18-39 years	40-64 years	65+ years	Alexandra	Arrowtown	Milton	Mosgiel
			n=84	n=198	n=118	n=128	n=47	n=54	n=171
Enclosed wood or multi-fuel burner	89%	n=243	92%	87%	87%	95%	92%	81%	87%
Oil or diesel burner	75%	n=41	64%	79%	90%	80%	70%	100%	64%
Flued gas	65%	n=47	28%	72%	76%	71%	62%	39%	64%
Electric	53%	n=149	49%	44%	75%	48%	45%	22%	64%
Open fire	36%	n=3	54%	13%	0%	54%	0%	0%	35%
Un-flued gas heater	30%	n=7	24%	49%	22%	44%	0%	0%	21%
Other	85%	n=99	84%	86%	84%	80%	93%	73%	86%

CAUTION: Small samples

NOTES:
1. Sample: n=400
2. HP3. For each of these heating sources, how strongly do you prefer each one to all others?
3. Excludes 'don't know'

Statements that are associated with enclosed wood or multi-fuel burners more so than electric heaters are; *having a low cost to run*, *providing warmth throughout the house* and *having an agreeable visual appearance*

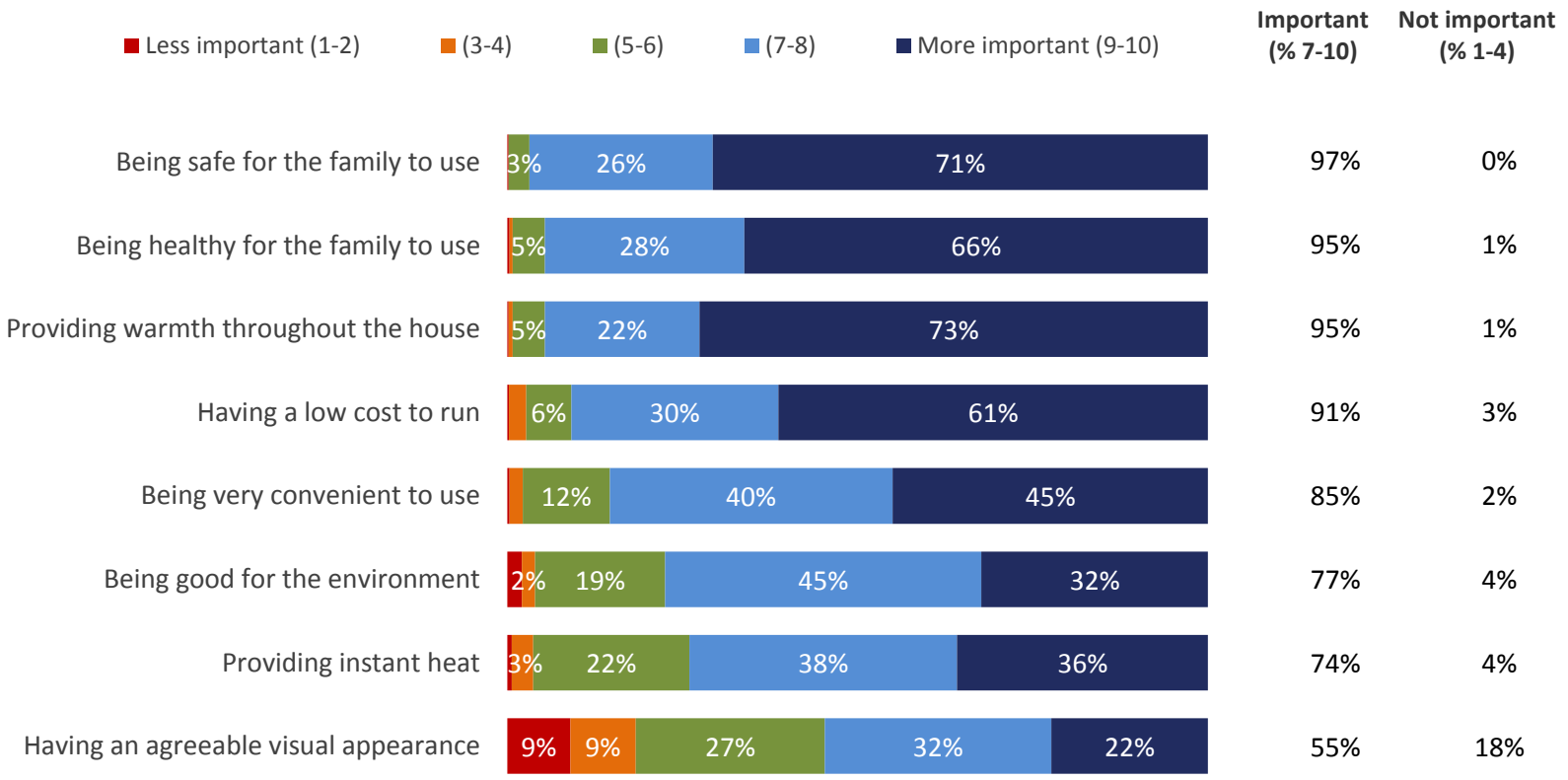
Associations with heating sources (1)(2)



NOTES:
1. Sample: n=400
2. HP5. I'm going to read some statements and I'd like you to tell me which types of heating appliances (or sources) you associate the statement with. So which types of heating do you associate with as...

The most important characteristic required from any heating source is *being safe for the family to use* while *having an agreeable visual appearance* is the least important

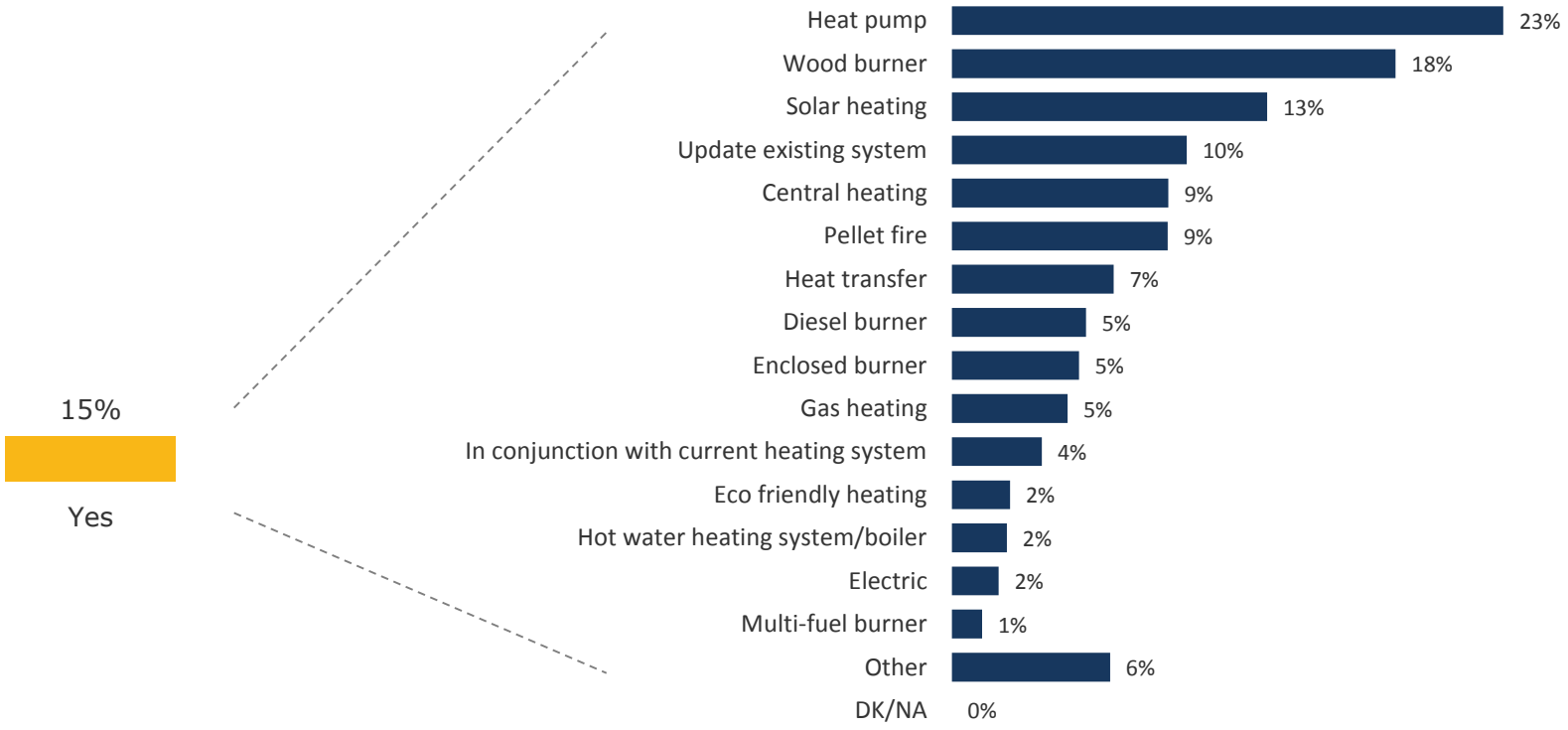
Heating source characteristics (1)(2)(3)



NOTES:
1. Sample: n=400
2. HP5A. For each of these characteristics, on a scale of 1 to 10, what is more or less important to you?
3. Excludes 'don't know'

Just 15% of residents would like to change the appliance or source they use for heating their home with a heat pump followed by a wood burner being the appliances most preferred

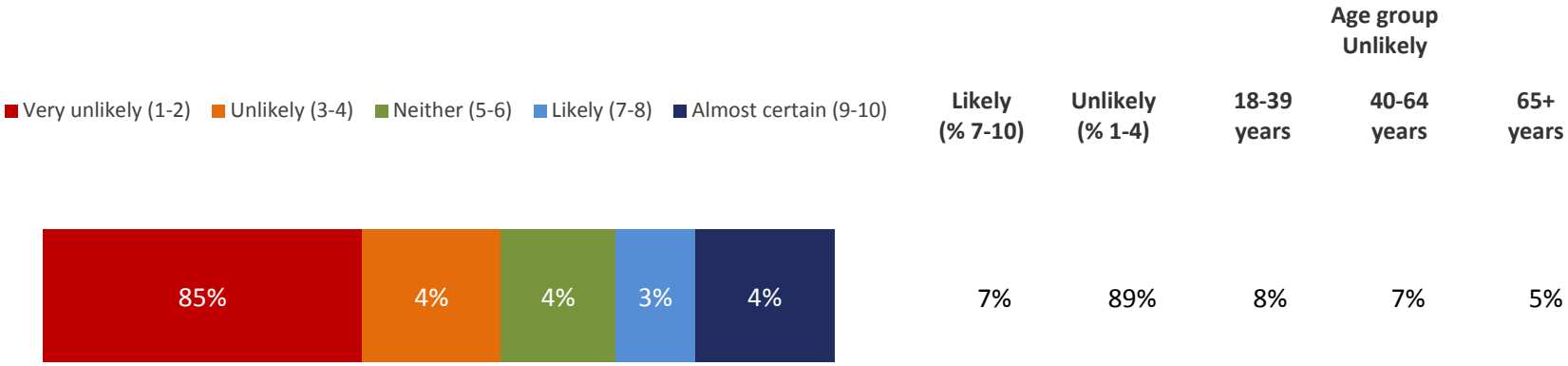
Change of heating source (1)(2)(3)



NOTES:
1. Sample: n=400
2. HP9A. Thinking of your own situation, would you like to change the appliance (or source) you use for heating your home?
3. HP9B. What would you like to change your heating appliance (or source) for?

Under one in ten residents (7%) are likely to change their current main heating appliance or source within the next two years, becoming less with the older 65+ age group

Likelihood to change current heating source [(1)(2)(3)]

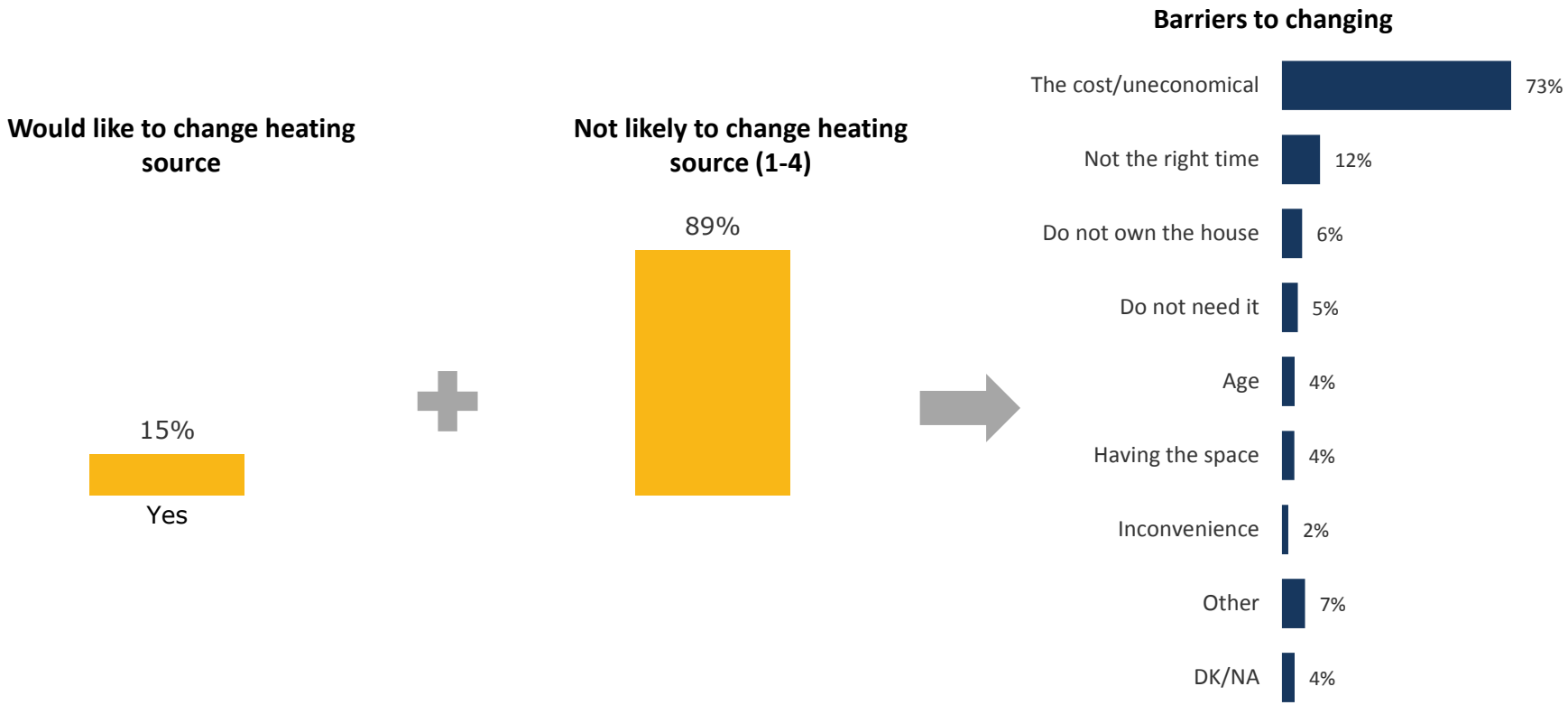


Likely (% 7-10)	Unlikely (% 1-4)	Age group Unlikely 18-39 years	40-64 years	65+ years
7%	89%	8%	7%	5%

NOTES:
1. Sample: n= 400
2. HP9. How likely are you to change your current main heating appliance (or source) within the next two years?
3. Excludes 'don't know'

Residents that would like to change their heating source but are unlikely to make a change in the next two years give the cost and being uneconomical as the main barrier to changing

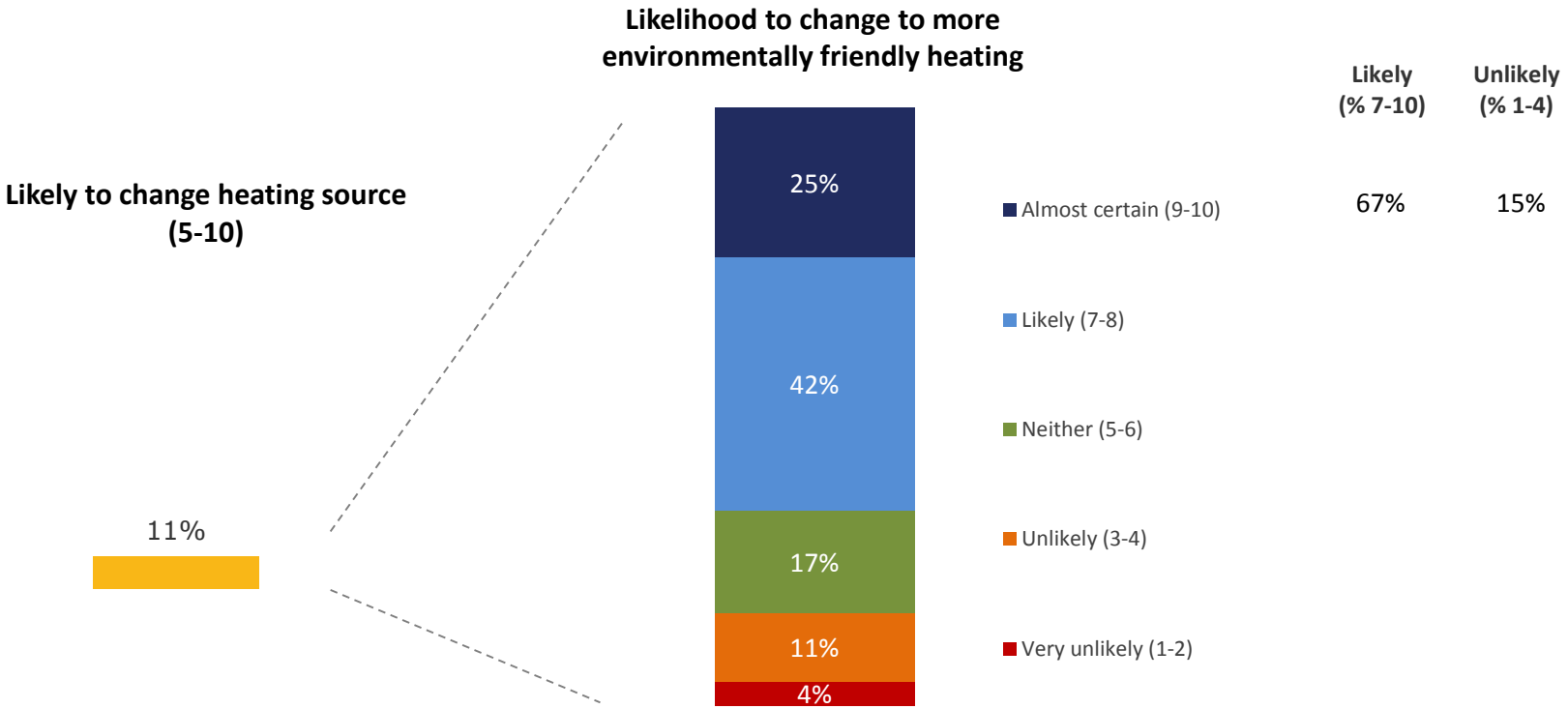
Change of heating source (1)(2)(3)(4)



NOTES:
1. Sample: n=400 ; Not likely to change n=36
2. HP9A. Thinking of your own situation, would you like to change the appliance (or source) you use for heating your home?
3. HP9. How likely are you to change your current main heating appliance (or source) within the next two years?
4. HP10. Can you explain what makes changing your heating appliance (or source) as wished difficult?

Of the one in ten residents (11%) who are likely to change their heating source, two thirds (67%) are most likely to change to more environmentally friendly heating

Likelihood to convert to environmentally friendly heating (1)(2)(3)



NOTES:
1. Sample: n=400; Likely to change heating source (5-10) n=45
2. HP9. How likely are you to change your current main heating appliance (or source) within the next two years?
3. HP11. How likely are you to convert to a form of heating which is more environmentally friendly?
4. Excludes 'don't know'

Enclosed burners and open fires

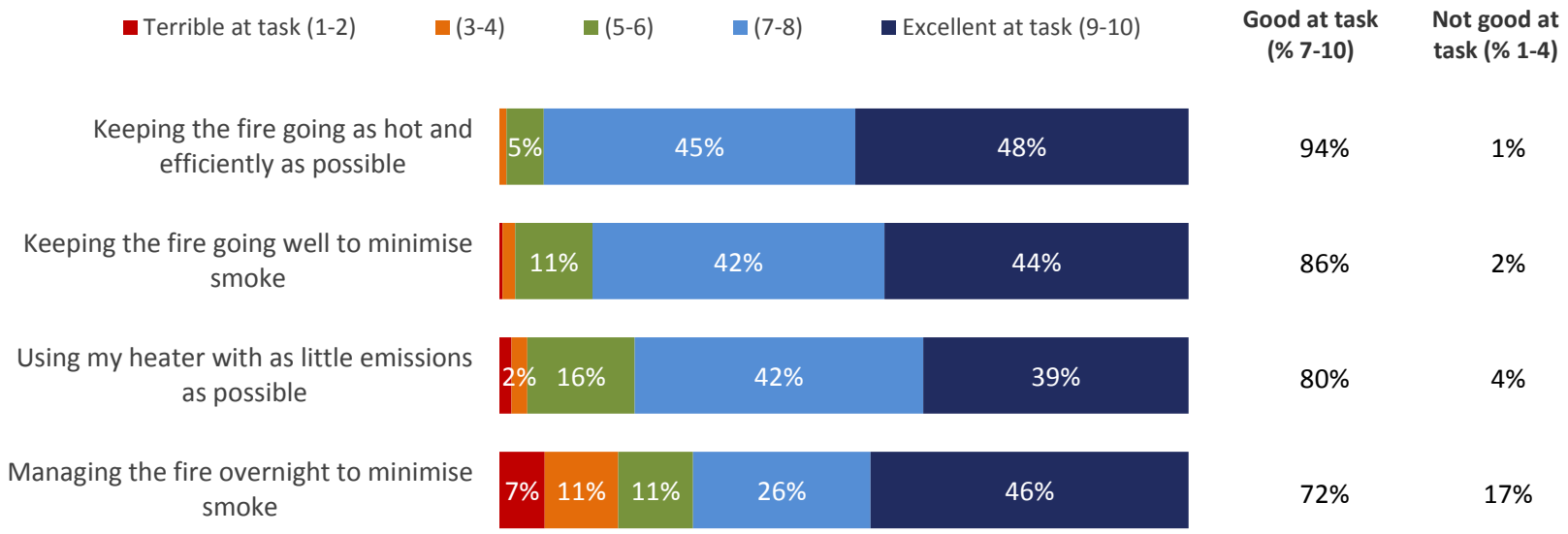
Otago Regional Council

KEYRESEARCH

Keeping the fire going as hot and efficiently as possible in enclosed burners and open fires is the task that most residents (94%) feel that they are good at doing

Personal performance of tasks (1)(2)(3)(4)

Enclosed burner/open fire as heating sources = 65%

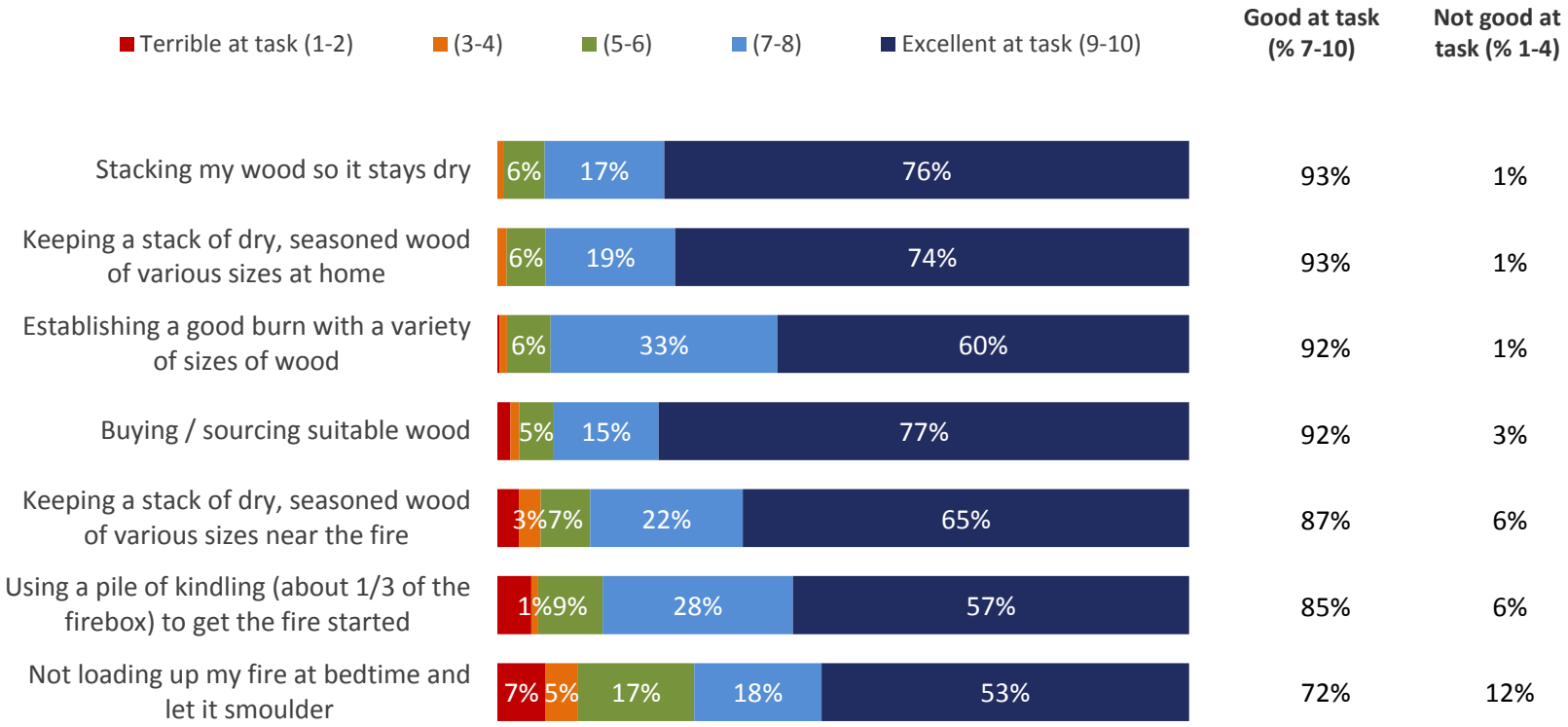


NOTES:
1. Sample: n=400; Enclosed burner/open fire as heating sources n=243
2. HSU1. Which of the following heating sources do you have in your home? [MULTIPLE RESPONSE]
3. BE1. As a [type of heater] operator, how well would you rate yourself in the following tasks?
4. Excludes 'don't know'

The task that users of wood or logs for burning feel they are the best at is stacking the wood so it stays dry

Personal performance of wood burner tasks (1)(2)(3)(4)

Use wood/logs in enclosed burner/open fire = 95%

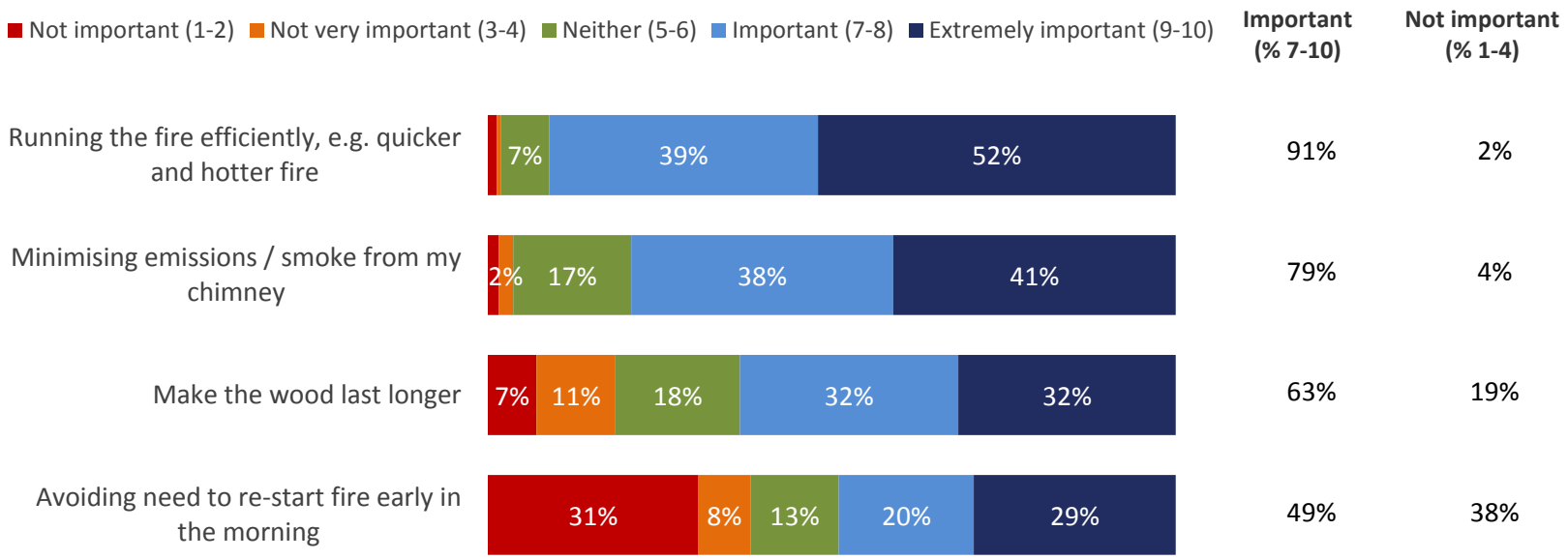


NOTES:
1. Sample: n=400; Use wood/logs in enclosed burner/open fire n=216
2. HSU3. Which of the following fuels do you use in your enclosed burner or open fire? [MULTIPLE RESPONSE]
3. BE2. As a wood burner operator, how well would you rate yourself in the following tasks?
4. Excludes 'don't know'

Running a fire efficiently is rated as important by just over nine in ten users (91%) of wood or logs and minimising emissions/smoke from their chimney is important to under eight in ten (79%)

Importance of outcomes when using burner [(1)(2)(3)(4)]

Use wood/logs in enclosed burner/open fire = 95%

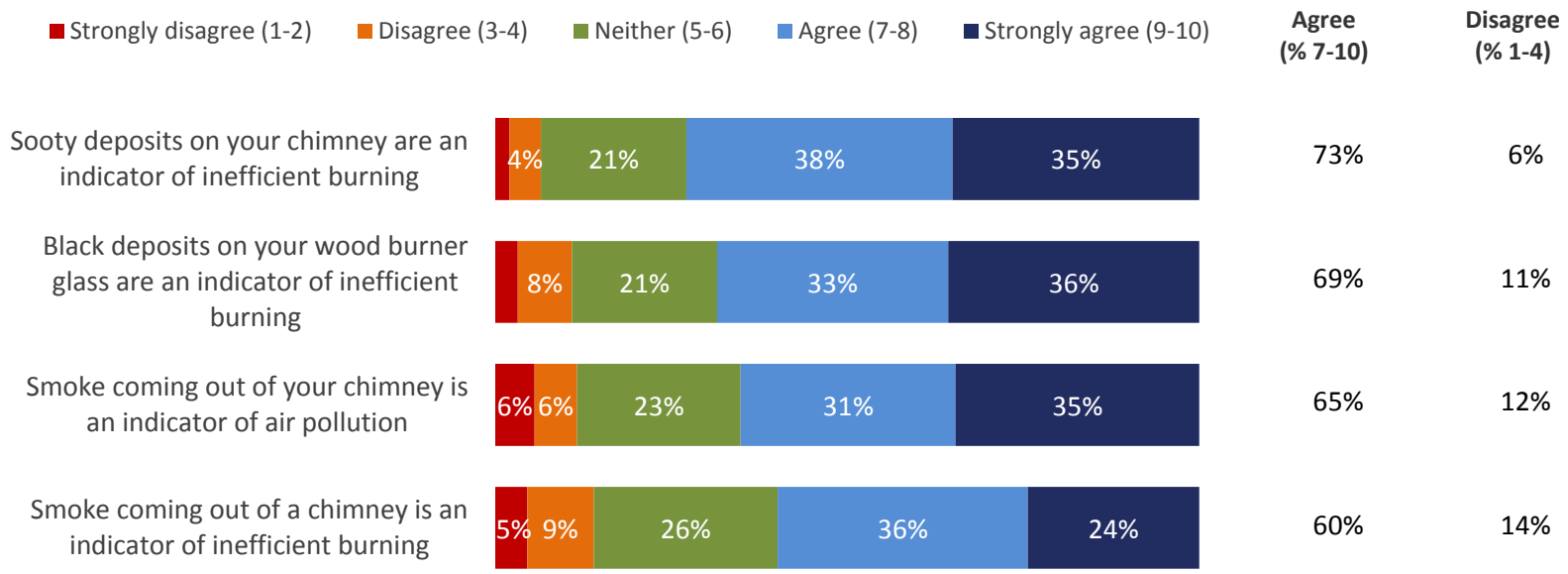


NOTES:
1. Sample: n=400; Use wood/logs in enclosed burner/open fire n=216
2. HSU3. Which of the following fuels do you use in your enclosed burner or open fire? [MULTIPLE RESPONSE]
3. BE3. When operating your burner, how important are the following outcomes?
4. Excludes 'don't know'

Nearly two thirds of users (65%) of wood or logs for heating agree that smoke coming out of their chimney is an indication of air pollution

Inefficient use of burner (1)(2)(3)(4)

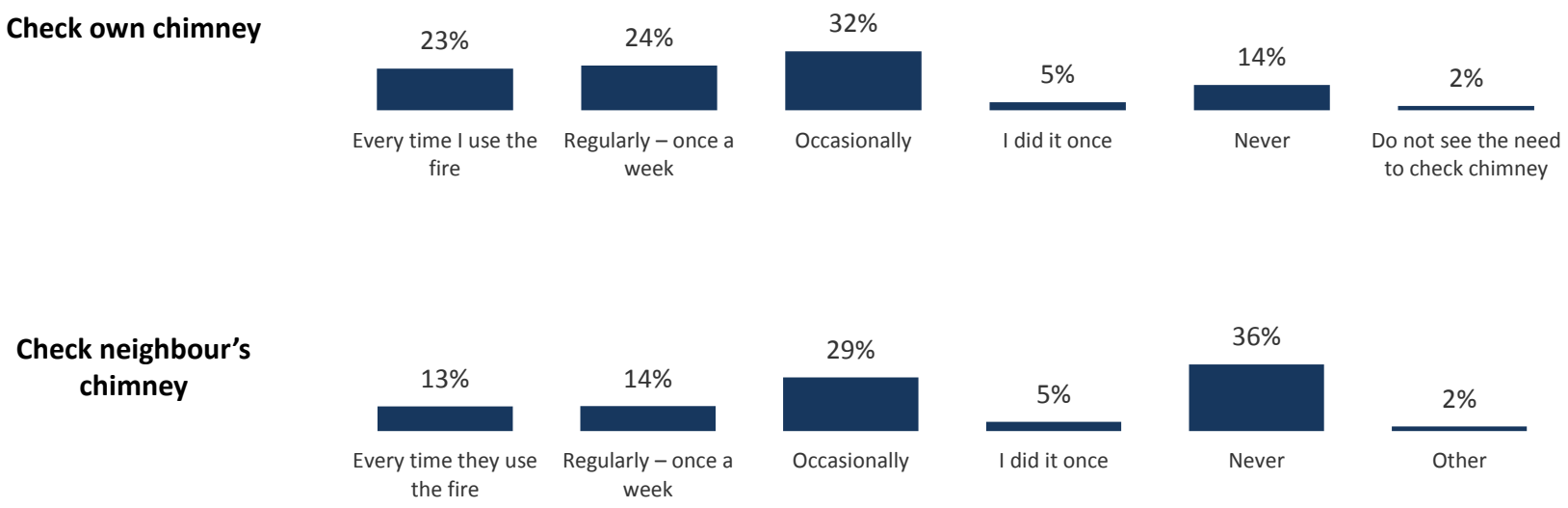
Use wood/logs in enclosed burner/open fire = 95%



NOTES:
1. Sample: n=400; Use wood/logs in enclosed burner/open fire n=216
2. HSU3. Which of the following fuels do you use in your enclosed burner or open fire? [MULTIPLE RESPONSE]
3. BE4. Which of the following statements about burners do you agree with?
4. Excludes 'don't know'

Nearly half of wood/log users (47%) check their chimney for smoke regularly and 27% check their neighbour's chimney regularly

Checking chimney for smoke [1][2][3]



NOTES:
1. Sample: n=216
2. BE5. How often do you check your chimney for smoke?
3. BE6. How often do you check your neighbour's chimney for smoke?

Demographics

Otago Regional Council

KEYRESEARCH

Demographics

Age	%	Weighted	Unweighted
18 -39 years	39%	155	84
40 – 64 years	41%	165	198
65 + years	20%	80	118

Ethnicity	%	Weighted	Unweighted
New Zealander (European)	84%	334	349
New Zealander (Maori)	9%	35	17
European	6%	23	26
Pacific Island People	1%	3	2
Asian	2%	7	4
Other	3%	12	9

Gender	%	Weighted	Unweighted
Male	48%	193	187
Female	52%	207	213

Own home / rent	%	Weighted	Unweighted
Own	87%	350	359
Rent	13%	50	41

Town	%	Weighted	Unweighted
Alexandra	30%	121	128
Arrowtown	17%	66	47
Milton	12%	48	54
Mosgiel	41%	165	171

Total household income	%	Weighted	Unweighted
Less than $15,000	2%	8	9
$15,000 - $30,000	12%	49	68
$30,001 - $50,000	14%	54	64
$50,001 - $80,000	26%	103	88
$80,001 - $100,000	12%	48	45
$100,001 – $150,000	12%	46	40
Over $150,000	4%	17	15
Don’t know/ refused	19%	74	70

Appendix - Tables

Otago Regional Council

KEYRESEARCH

How much of a problem is air pollution in winter by heating source used, broken down by town and age

Air pollution in winter [1][2][3]

		Alexandra	Arrowtown	Milton	Mosgiel	18 - 39 years	40 - 64 years	65 + years
Electric heating	Not a problem at all	24%	17%	45%	23%	36%	9%	32%
	A little bit of a problem	35%	40%	28%	33%	39%	32%	32%
	Somewhat of a problem	23%	15%	11%	21%	19%	23%	15%
	Quite a problem	8%	18%	9%	14%	1%	23%	9%
	A very large problem	8%	7%	8%	8%	2%	12%	9%
	Don't know	2%	2%		1%	2%	1%	3%
Gas heating	Not a problem at all	32%	23%		20%	37%	8%	40%
	A little bit of a problem	25%	8%	100%	24%	27%	19%	39%
	Somewhat of a problem	13%	17%		33%	27%	23%	
	Quite a problem	17%	18%		15%	8%	25%	6%
	A very large problem	12%	34%		4%		22%	15%
	Don't know				4%		3%	
Burners / Open fire	Not a problem at all	22%	41%	28%	17%	34%	13%	29%
	A little bit of a problem	32%	22%	35%	47%	40%	33%	34%
	Somewhat of a problem	23%	20%	20%	20%	17%	25%	21%
	Quite a problem	11%	8%	6%	10%	5%	14%	11%
	A very large problem	9%	10%	6%	5%	1%	14%	5%
	Don't know	2%		5%	1%	3%	1%	
Central heating	Not a problem at all	45%				78%		
	A little bit of a problem	17%	42%	46%	14%		39%	12%
	Somewhat of a problem	23%	15%	54%	57%	22%	29%	54%
	Quite a problem	14%	14%		15%		13%	33%
	A very large problem		29%		14%		20%	
	Don't know							
Electric heating	*n=*	*84*	*32*	*23*	*127*	*45*	*127*	*94*
Gas heating	*n=*	*21*	*10*	*3*	*24*	*10*	*33*	*15*
Burners / Open fire	*n=*	*89*	*30*	*45*	*91*	*66*	*140*	*49*
Central heating	*n=*	*8*	*7*	*3*	*7*	*2*	*17*	*6*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels
2. HSU1. Which of the following heating sources do you have in your home? [MULTIPLE RESPONSE]
3. AP1. How much of a problem do you believe that air pollution is in your town during winter?

Attitudes to air pollution, broken down by town and age

Attitudes to air pollution (1)(2)(3)

Agree (% 7-10)

Town / Age:	Alexandra	Arrowtown	Milton	Mosgiel	18 - 39 years	40 - 64 years	65 + years
We all have a role to play in reducing air pollution in my town	83%	74%	90%	84%	92%	79%	79%
I know what to do to help reduce air pollution in my town	68%	73%	88%	69%	64%	77%	61%
There is not much I can do personally to reduce air pollution in my town	50%	48%	62%	39%	46%	45%	52%
n=	*56*	*23*	*21*	*72*	*26*	*106*	*40*

NOTES:
1. Sample: n=400; Air pollution is a problem n=172
2. AP6. How strongly do you agree with the following statements:
3. Excludes 'don't know'

Ability to change heating habits, broken down by town and total household income

Change of heating habits (1)(2)(3)

Agree (% 7-10)

Town / Total household income:	Alexandra	Arrowtown	Milton	Mosgiel	Less than $15,000	$15,000 - $30,000	$30,001 - $50,000	$50,001 - $80,000	$80,001 - $100,000	$100,001 - $150,000	Over $150,000
If I needed to, I could easily change how I heat my home to help reduce air pollution in my town	21%	34%	20%	21%	-	25%	20%	23%	27%	32%	11%
n=	*39*	*15*	*19*	*38*	*0*	*12*	*21*	*26*	*11*	*16*	*7*

NOTES:
1. Sample: n=400; Air pollution a problem, using the following heat source; HSU1=Enclosed wood or multi-fuel burner, open fire or oil or diesel burner heating sources n=111
2. AP6D. If I needed to, I could easily change how I heat my home to help reduce air pollution in my town
3. Excludes 'don't know'

Barriers to change heating habits, broken down by town, age and total household income

Barriers to change heating habits [1][2][3]

Disagree (% 1-4)

Town / Age:	Alexandra	Arrowtown	Milton	Mosgiel	18 - 39 years	40 - 64 years	65 + years
The cost/too expensive to change	57%	34%	43%	53%	50%	50%	45%
Have done all that is possible already	5%	11%	23%	8%	8%	10%	12%
Heating source currently used does not cause pollution	3%	23%	7%	15%		15%	12%
Other forms of heating not as warm	11%				11%	2%	
The consent process				8%		3%	
Not being able to use my fire				8%		3%	
Other	21%	32%		16%	18%	17%	31%
Don't know/NA	12%		27%		22%	5%	
n=	*24*	*9*	*11*	*13*	*12*	*37*	*8*

Disagree (% 1-4)

Total household income:	Less than $15,000	$15,000 - $30,000	$30,001 - $50,000	$50,001 - $80,000	$80,001 - $100,000	$100,001 - $150,000	Over $150,000
The cost/too expensive to change		53%	67%	50%	100%	43%	39%
Have done all that is possible already			6%	19%		7%	
Heating source currently used does not cause pollution		19%		4%		18%	61%
Other forms of heating not as warm				17%			
The consent process					22%		
Not being able to use my fire		28%					
Other			10%	26%		31%	
Don't know/NA			17%				
n=	*0*	*5*	*12*	*15*	*4*	*10*	*2*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels; Air pollution a problem/Disagree (1-4) n=57
2. AP6D. If I needed to, I could easily change how I heat my home to help reduce air pollution in my town.
3. AP6E. Please describe what would make that change difficult?

Personal actions to decrease winter air pollution, broken down by town, age and total household income

Personal actions to decrease winter air pollution (1)(2)(3)

Town / Age:	Alexandra	Arrowtown	Milton	Mosgiel	18 - 39 years	40 - 64 years	65 + years
Burn dry wood/do not burn plastics	44%	19%	19%	10%	19%	24%	21%
Changed heating system/low emissions	6%	41%	24%	13%	8%	19%	16%
Light fire less frequently/use less wood	34%			13%	36%	9%	16%
Do not/rarely burn coal	13%		37%	18%	23%	14%	14%
Installed a heat pump/use heat pump more	6%	20%		21%	10%	13%	25%
Removed/do not use an open fire or burner	6%	10%	6%	8%		11%	5%
Use central heating/heaters	3%			13%		11%	
Installed new wood burner	6%	10%	17%	3%	8%	7%	
Changed to electricity	6%		6%	2%		3%	14%
House insulated/increased insulation	3%		6%	3%		3%	5%
Cleaned chimney				3%		2%	
Other		10%	14%	10%	13%	6%	
n=	*23*	*10*	*11*	*36*	*12*	*55*	*13*

Total household income:	Less than $15,000	$15,000 - $30,000	$30,001 - $50,000	$50,001 - $80,000	$80,001 - $100,000	$100,001 - $150,000	Over $150,000
Burn dry wood/do not burn plastics		10%	16%	31%	28%	15%	35%
Changed heating system/low emissions		20%	17%	8%		17%	27%
Light fire less frequently/use less wood			18%	11%	41%	26%	32%
Do not/rarely burn coal		28%	13%	31%		15%	
Installed a heat pump/use heat pump more		14%	19%	14%	31%	9%	
Removed/do not use an open fire or burner		10%	7%	6%	11%	7%	20%
Use central heating/heaters			7%			9%	
Installed new wood burner				19%			
Changed to electricity		28%		7%			
House insulated/increased insulation		10%	6%			8%	
Cleaned chimney					11%		
Other			9%	3%		27%	
n=	*0*	*7*	*16*	*19*	*8*	*10*	*5*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels; Air pollution a problem; Doing something different to decrease air pollution n=80
2. AP7. Is there anything that you are now doing differently to help decrease winter air pollution?
3. AP8. Can you describe what you are doing to help reduce winter air pollution?

Heating sources used in the home, broken down by total household income

Heating sources in the home [1][2]

Total household income:	Less than $15,000	$15,000 - $30,000	$30,001 - $50,000	$50,001 - $80,000	$80,001 - $100,000	$100,001 - $150,000	Over $150,000	Don't know/ refused
Electric	73%	84%	63%	70%	67%	73%	83%	33%
Enclosed wood / multi-fuel burner	29%	37%	61%	69%	76%	59%	45%	68%
Flued gas	17%	8%	12%	11%	3%	15%	17%	9%
Oil or diesel burner	19%	5%	4%	5%	5%	9%	19%	7%
Central heating		2%	5%	4%		20%	10%	7%
Un-flued gas heater		5%	3%	9%		10%	16%	1%
Open fire		3%		4%	2%	7%	16%	1%
Other		5%	7%	5%	13%	7%		22%
n=	*9*	*68*	*64*	*88*	*45*	*40*	*15*	*70*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels
2. HSU1. Which of the following heating sources do you have in your home? [MULTIPLE RESPONSE]

Average spend to heat a home in winter broken down by town, type of heating used and insulation used

Insulation used; average spend [1][2][3]

Town / Current heating source used:	Alexandra	Arrowtown	Milton	Mosgiel	Electric heating	Gas heating	Burners / Open fire	Central heating
Total for any insulation used *(n=379)*	**$291**	**$439**	**$200**	**$171**	**$265**	**$314**	**$248**	**$455**
• including Ceiling insulation *(n=365)*	$298	$447	$202	$171	$266	$316	$247	$462
• including Wall insulation *(n=264)*	$290	$464	$171	$186	$292	$345	$270	$469
• including Underfloor insulation *(n=201)*	$324	$481	$215	$167	$270	$314	$251	$458
• including Double glazing insulation *(n=209)*	$295	$490	$169	$191	$289	$372	$281	$475
• including Other *(n=9)*	$168		$200	$211	$204	$100	$207	$240
No insulation *(n=13)*	$263	$700		$163	$333	$100	$190	
n=	*127*	*44*	*52*	*169*	*261*	*60*	*267*	*25*

NOTES:
1. Sample: n=400; With any insulation n=379
2. HSU4. Which of the following insulation do you have? [MULTIPLE RESPONSE]
3. HSU5. Off the top of your head, approximately how much would you spend on average per month to heat your house in winter months?

Main method of heating the living area broken down by type of insulation used, age and total household income

Heating of the living area (1)(2)

Main method of heating

Insulation used / Age:	Ceiling insulation	Underfloor	Wall	Double glazing	Other	No insulation	18 - 39 years	40 - 64 years	65 + years
Enclosed wood or multi-fuel burner	57%	56%	57%	48%	49%	38%	71%	56%	31%
Electric	29%	30%	27%	35%	12%	44%	18%	26%	55%
Flued gas	5%	4%	5%	4%	12%		1%	8%	3%
Oil or diesel burner	4%	5%	5%	7%	19%			6%	5%
Un-flued gas heater	1%	2%	1%	1%			3%	0%	
Open fire	1%	1%	1%	1%		12%	3%		
Other	4%	3%	5%	4%	9%	6%	4%	4%	6%
n=	*365*	*201*	*264*	*209*	*9*	*13*	*84*	*197*	*118*

Total household income:	Less than $15,000	$15,000 - $30,000	$30,001 - $50,000	$50,001 - $80,000	$80,001 - $100,000	$100,001 - $150,000	Over $150,000
Enclosed wood or multi-fuel burner	38%	30%	53%	65%	78%	52%	42%
Electric	54%	60%	34%	20%	19%	29%	48%
Flued gas	8%	3%	6%	6%		3%	4%
Oil or diesel burner		4%	2%	4%	1%	4%	6%
Un-flued gas heater		1%	2%	2%		3%	
Open fire						9%	
Other		2%	3%	3%	2%		
n=	*9*	*68*	*64*	*88*	*45*	*40*	*15*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels
2. WRH1. What do you mostly use to heat your main living area?

Other ways of heating the living area broken down by type of insulation used, age and total household income

Heating of the living area (1)(2)

Other ways of heating

Insulation used / Age:	Ceiling insulation	Underfloor	Wall	Double glazing	Other	No insulation	18 - 39 years	40 - 64 years	65 + years
Electric	25%	27%	26%	27%	23%	19%	26%	28%	19%
Un-flued gas heater	3%	5%	4%	3%			4%	3%	2%
Enclosed wood or multi-fuel burner	3%	3%	2%	4%	9%			6%	2%
Flued gas	2%	3%	3%	4%			1%	2%	4%
Oil or diesel burner	1%	1%	0%	1%		22%	4%	1%	
Open fire	0%	0%						1%	
Other	6%	4%	6%	4%	21%	6%	2%	3%	15%
None / nothing else	60%	57%	60%	59%	56%	53%	63%	57%	58%
Don't know	1%	1%	1%	1%			1%	1%	2%
n=	*365*	*201*	*264*	*209*	*9*	*13*	*84*	*197*	*118*

Total household income:	Less than $15,000	$15,000 - $30,000	$30,001 - $50,000	$50,001 - $80,000	$80,001 - $100,000	$100,001 - $150,000	Over $150,000
Electric	19%	16%	24%	36%	36%	35%	15%
Un-flued gas heater		3%	2%	3%		10%	6%
Enclosed wood or multi-fuel burner			4%	4%		6%	3%
Flued gas		1%	2%	1%		7%	10%
Oil or diesel burner	19%	2%	2%			4%	13%
Open fire		2%					
Other	17%	13%	8%	4%	4%	2%	
None / nothing else	44%	62%	60%	51%	59%	41%	56%
Don't know		3%	2%	2%	2%		
n=	*9*	*68*	*64*	*88*	*45*	*40*	*15*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels
2. WRH2. What else might you use to heat your main living area? [MULTIPLE RESPONSE]

Heating source used to heat the bedroom, broken down by type of insulation used and total household income

Heating of the bedroom [(1)(2)(3)]

Insulation used:	Ceiling insulation	Underfloor	Wall	Double glazing	Other	No insulation
Electric	82%	79%	84%	80%	34%	77%
Oil or diesel burner	9%	11%	9%	13%	27%	
Flued gas	1%	1%	1%			
Other	9%	9%	6%	7%	39%	23%
n=	*70*	*41*	*52*	*42*	*3*	*5*

Total household income:	Less than $15,000	$15,000 - $30,000	$30,001 - $50,000	$50,001 - $80,000	$80,001 - $100,000	$100,001 - $150,000	Over $150,000
Electric	100%	72%	66%	94%	89%	89%	100%
Oil or diesel burner		5%	6%	6%		11%	
Flued gas		5%					
Other		18%	28%		11%		
n=	*1*	*17*	*12*	*15*	*7*	*10*	*5*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels; Heat bedroom independent of living room n=80
2. WRH3. Do you heat your bedroom?
3. WRH4. What do you mostly use to heat your bedroom?

Heating sources most seriously consider, broken down by town, age and total household income

Heating sources most seriously consider (1)(2)(3)

Town / Age:	Alexandra	Arrowtown	Milton	Mosgiel	18 - 39 years	40 - 64 years	65 + years
Enclosed wood or multi-fuel burner	62%	55%	79%	53%	74%	54%	40%
Electric	38%	45%	23%	46%	33%	41%	55%
Oil or diesel burner	17%	10%	7%	5%	7%	13%	7%
Flued gas	8%	15%	4%	8%	2%	15%	9%
Open fire	3%				1%	0%	1%
Un-flued gas heater	1%			1%		1%	
Other	17%	19%	15%	26%	18%	26%	16%
Central heating	58%	54%	44%	46%	66%	44%	34%
n=	*128*	*47*	*54*	*171*	*84*	*198*	*118*

Total household income:	Less than $15,000	$15,000 - $30,000	$30,001 - $50,000	$50,001 - $80,000	$80,001 - $100,000	$100,001 - $150,000	Over $150,000
Enclosed wood or multi-fuel burner	40%	42%	57%	60%	83%	72%	40%
Electric	63%	58%	36%	41%	46%	42%	65%
Oil or diesel burner	9%	5%	8%	13%	11%	15%	5%
Flued gas		8%	15%	9%	2%	10%	6%
Open fire	8%		3%			1%	
Un-flued gas heater					2%		
Other		11%	25%	20%	21%	20%	38%
Central heating	19%	33%	44%	60%	52%	65%	74%
n=	*9*	*68*	*64*	*88*	*45*	*40*	*15*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels
2. HP1. If you were to set up your home from new, which heating sources would you most seriously consider installing? [MULTIPLE RESPONSE]
3. HP2. Would you consider central heating?

Heating sources most likely to select, broken down by town, age and total household income

Heating sources most likely to select [1][2]

Town / Age:	Alexandra	Arrowtown	Milton	Mosgiel	18 - 39 years	40 - 64 years	65 + years
Enclosed wood or multi-fuel burner	52%	46%	72%	41%	65%	41%	33%
Electric	22%	26%	7%	30%	17%	22%	43%
Oil or diesel burner	13%	9%	7%	3%	5%	10%	6%
Flued gas	6%	3%	1%	4%		7%	4%
Open fire	0%						1%
Un-flued gas heater							
Other	8%	16%	13%	22%	13%	19%	13%
n=	*128*	*47*	*54*	*171*	*84*	*198*	*118*

Total household income:	Less than $15,000	$15,000 - $30,000	$30,001 - $50,000	$50,001 - $80,000	$80,001 - $100,000	$100,001 - $150,000	Over $150,000
Enclosed wood or multi-fuel burner	19%	37%	50%	47%	69%	54%	36%
Electric	63%	43%	21%	24%	19%	16%	34%
Oil or diesel burner	9%	5%	8%	9%	6%	14%	
Flued gas		6%	5%	4%		1%	
Open fire	8%						
Un-flued gas heater							
Other		9%	16%	17%	5%	15%	30%
n=	*9*	*68*	*64*	*88*	*45*	*40*	*15*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels
2. HP6. Which heating source would you most likely select if setting up a new home? [SINGLE RESPONSE]

Heating source preferences, broken down by type of insulation used and total household income

Heating source preferences (1)(2)(3)

Prefer (% 7-10)

Insulation used:	Ceiling insulation	Underfloor	Wall	Double glazing	Other	No insulation
Enclosed wood or multi-fuel burner	88%	85%	90%	86%	75%	100%
Oil or diesel burner	75%	80%	73%	74%	50%	67%
Flued gas	62%	69%	57%	59%	40%	100%
Electric	54%	55%	53%	51%	67%	50%
Open fire	25%	40%	7%	11%		100%
Un-flued gas heater	22%	26%	29%	45%		
Other	84%	81%	87%	90%	100%	100%
n=	*365*	*201*	*264*	*209*	*9*	*13*

Prefer (% 7-10)

Total household income:	Less than $15,000	$15,000 - $30,000	$30,001 - $50,000	$50,001 - $80,000	$80,001 - $100,000	$100,001 - $150,000	Over $150,000
Enclosed wood or multi-fuel burner	78%	91%	94%	87%	95%	85%	75%
Oil or diesel burner	100%	100%	75%	84%	52%	60%	73%
Flued gas	100%	89%	72%	52%	50%	46%	76%
Electric	87%	74%	59%	50%	34%	47%	40%
Open fire				84%		63%	
Un-flued gas heater			41%	20%	100%	61%	
Other		92%	88%	86%	100%	75%	91%
n=	*9*	*68*	*64*	*88*	*45*	*40*	*15*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels
2. HP3. For each of these heating sources, how strongly do you prefer each one to all others?
3. Excludes 'don't know'

Heating source characteristics, broken down by total household income, age and number of people in household

Heating source characteristics (1)(2)(3)

Important (% 7-10)

Total household income / Age:	Less than $15,000	$15,000 - $30,000	$30,001 - $50,000	$50,001 - $80,000	$80,001 - $100,000	$100,001 - $150,000	Over $150,000	18 - 39 years	40 - 64 years	65 + years
Being safe for the family to use	100%	92%	100%	97%	98%	100%	76%	99%	96%	95%
Being healthy for the family to use	100%	92%	100%	94%	97%	91%	76%	95%	94%	94%
Providing warmth throughout the house	100%	94%	93%	98%	97%	95%	84%	96%	94%	93%
Having a low cost to run	90%	89%	90%	91%	92%	95%	87%	92%	90%	89%
Being very convenient to use	100%	87%	82%	88%	82%	74%	96%	89%	79%	92%
Being good for the environment	86%	83%	80%	68%	77%	77%	81%	73%	79%	82%
Providing instant heat	100%	83%	78%	74%	61%	61%	62%	69%	72%	89%
Having an agreeable visual appearance	77%	65%	69%	48%	50%	40%	47%	46%	54%	73%
n=	*9*	*68*	*64*	*88*	*45*	*40*	*15*	*84*	*198*	*118*

Important (% 7-10)

Number of people in household:	1	2	3	4	5	6	7
Being safe for the family to use	93%	95%	100%	97%	100%	100%	100%
Being healthy for the family to use	93%	95%	96%	90%	98%	100%	100%
Providing warmth throughout the house	94%	92%	100%	92%	97%	100%	100%
Having a low cost to run	88%	90%	90%	93%	93%	100%	38%
Being very convenient to use	84%	89%	86%	78%	80%	100%	100%
Being good for the environment	80%	84%	72%	72%	69%	81%	100%
Providing instant heat	83%	75%	84%	60%	68%	72%	100%
Having an agreeable visual appearance	71%	61%	47%	36%	47%	67%	100%
n=	*82*	*156*	*53*	*62*	*31*	*14*	*2*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels
2. HP5A. For each of these characteristics, on a scale of 1 to 10, what is more or less important to you?
3. Excludes 'don't know'

Likelihood to change to alternative heating source, broken down by town and current heating source used

Change of heating source (1)(2)(3)

Town / Current heating source used:	Alexandra	Arrowtown	Milton	Mosgiel	Electric heating	Gas heating	Burners / Open fire	Central heating
Heat pump	15%	17%	10%	39%	24%	8%	31%	49%
Wood burner	26%	30%	18%	7%	19%	19%	10%	
Solar heating		36%	12%	21%	9%	12%	16%	51%
Update existing system	3%		12%	19%	13%		11%	
Central heating	3%		30%	8%	6%	31%	12%	
Pellet fire	3%			22%	11%		6%	
Heat transfer	13%		11%		9%		11%	
Diesel burner	10%		12%		4%		7%	
Enclosed burner	7%		15%		5%		8%	
Gas heating	10%				5%	8%		
In conjunction with current heating system			5%	8%	3%		6%	
Eco friendly heating	6%				3%	15%	4%	
Hot water heating system/boiler			5%	4%	2%		1%	
Electric		18%			3%	12%	3%	51%
Multi-fuel burner				4%	2%			
Other	12%	17%			9%	7%	6%	
DK/NA								
n=	*128*	*47*	*54*	*171*	*261*	*60*	*267*	*25*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels
2. HP9A. Thinking of your own situation, would you like to change the appliance (or source) you use for heating your home?
3. HP9B. What would you like to change your heating appliance (or source) for?

Importance of outcomes when using wood/logs in a burner, broken down by gender and type of insulation used

Importance of outcomes when using burner (1)(2)(3)(4)

Use wood/logs in enclosed burner/open fire = 95%

Important (% 7-10)

Gender / Insulation used:	Male	Female	Ceiling insulation	Underfloor	Wall	Double glazing	Other	No insulation
Running the fire efficiently, e.g. quicker and hotter fire	96%	86%	92%	89%	92%	96%	86%	100%
Minimising emissions / smoke from my chimney	82%	76%	79%	77%	80%	83%	100%	100%
Make the wood last longer	56%	71%	63%	54%	56%	61%	47%	100%
Avoiding need to re-start fire early in the morning	50%	48%	48%	50%	46%	43%	59%	100%
n=	*101*	*115*	*201*	*107*	*145*	*103*	*6*	*5*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels; Use wood/logs in enclosed burner/open fire n=216
2. HSU3. Which of the following fuels do you use in your enclosed burner or open fire? [MULTIPLE RESPONSE]
3. BE3. When operating your burner, how important are the following outcomes?
4. Excludes 'don't know'

Signs of inefficient use of wood/log burner, broken down by town, age and gender

Inefficient use of burner (1)(2)(3)(4)

Use wood/logs in enclosed burner/open fire = 95%

Agree (% 7-10)

Town / Age / Gender:	Alexandra	Arrowtown	Milton	Mosgiel	18 - 39 years	40 - 64 years	65 + years	Male	Female
Sooty deposits on your chimney are an indicator of inefficient burning	80%	61%	87%	65%	72%	73%	75%	67%	79%
Black deposits on your wood burner glass are an indicator of inefficient burning	67%	75%	62%	70%	69%	69%	62%	68%	69%
Smoke coming out of your chimney is an indicator of air pollution	65%	34%	71%	76%	61%	70%	68%	62%	68%
Smoke coming out of a chimney is an indicator of inefficient burning	60%	58%	50%	65%	61%	57%	63%	58%	62%
n=	*76*	*24*	*41*	*75*	*63*	*118*	*35*	*101*	*115*

NOTES:
1. Total Sample: n=400; CAUTION: small sample size at sub-levels; Use wood/logs in enclosed burner/open fire n=216
2. HSU3. Which of the following fuels do you use in your enclosed burner or open fire? [MULTIPLE RESPONSE]
3. BE4. Which of the following statements about burners do you agree with?
4. Excludes 'don't know'

Checking a chimney for smoke, broken down by town, age and gender

Checking chimney for smoke (1)(2)(3)

Check own chimney

Town / Age / Gender:	Alexandra	Arrowtown	Milton	Mosgiel	18 - 39 years	40 - 64 years	65 + years	Male	Female
Every time I use the fire	30%	14%	20%	21%	24%	21%	23%	25%	21%
Regularly – once a week	17%	34%	25%	27%	21%	29%	23%	27%	22%
Occasionally	29%	39%	36%	31%	29%	35%	36%	32%	32%
I did it once	5%	3%	5%	4%	4%	5%	3%	3%	6%
Never	18%	11%	9%	13%	20%	8%	5%	11%	17%
Do not see the need to check chimney	1%	0%	6%	3%	2%	2%	9%	2%	3%
n=	*76*	*24*	*41*	*75*	*63*	*118*	*35*	*101*	*115*

Check neighbour's chimney

Town / Age / Gender:	Alexandra	Arrowtown	Milton	Mosgiel	18 - 39 years	40 - 64 years	65 + years	Male	Female
Every time they use the fire	14%	14%	15%	12%	17%	9%	14%	13%	14%
Regularly – once a week	11%	9%	20%	15%	11%	16%	13%	9%	18%
Occasionally	34%	34%	30%	22%	32%	28%	23%	28%	30%
I did it once	4%	3%	3%	8%	6%	3%	7%	5%	5%
Never	36%	40%	25%	40%	33%	41%	34%	43%	30%
Other	1%	0%	5%	4%	1%	3%	9%	1%	4%
n=	*76*	*24*	*41*	*75*	*63*	*118*	*35*	*101*	*115*

NOTES:
1. Total Sample: n=216; CAUTION: small sample size at sub-levels
2. BE5. How often do you check your chimney for smoke?
3. BE6. How often do you check your neighbour's chimney for smoke?

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