Survey of ATCO Gas Residential Customers - Undertaken for the Economic Regulation Authority (ERA)

PREPARED FOR:	Economic Regulation Authority
CLIENT CONTACT:	Tyson Self
PATTERSON CONTACT:	Keith Patterson
DATE:	March 2024

TABLE OF CONTENTS

ISO 20252: MARKET, OPINION AND SOCIAL RESEARCH

Patterson Research Group operates using systems that have been developed in compliance with the ISO 20252 Standard for Market, Opinion and Social Research. In accordance with our Quality Assurance System, this report has been reviewed and approved by:

NAME:	KEITH PATTERSON
POSITION:	SENIOR CONSULTANT OF PATTERSON RESEARCH GROUP
DATE:	MARCH 2024
DOCUMENT VERSION:	FINAL

1.0 SUMMARY

This document presents the findings of a large scale (n=981) survey of ATCO connected households throughout the Mid-West and South-West Gas Distribution Systems. See section 3.0 for details of the survey methodology.

An Important Note About Data Tables

Patterson Research Group does not report survey data to the level of any decimal places. We believe that to do so implies an unrealistic level of survey accuracy (+/- 3% in the current survey). The reported figures are thus rounded to the nearest whole figure. This means that in some instances, the summary result (e.g. Net High Satisfaction) may not **exactly** equal the manual addition of the individual components of the summary figure. These summaries are produced within the analysis program using the un-rounded results, which can produce apparent inconsistencies.

For example, a "very high" satisfaction of 34.4% (reported as 34%) and "high" satisfaction of 24.4% (reported as 24%) would be calculated in the NET HIGH satisfaction summary as 58.8% - shown as 59% in the summary tables. Similarly, a "very high" figure of 24.6% would be reported as 25%, and a "high" figure of 31.7% would be reported as 32%. But the resultant NET high figure of 56.3%, would be rounded down to 56%.

Where inconsistencies appear, we recommend reference to the NET summary figures.

The consumer engagement survey had three basic objectives:

- Sustainability expenditure (should ATCO be undertaking emissions reduction initiatives or should others such as retailers be doing this?).
- Price (price paths, size of price changes, willingness to pay for key investment proposals).
- Future of gas usage and demand over time, particularly for new connections, existing connections and whether current technology installations such as solar rooftop or battery storage, affects decisions. What are the factors affecting new or existing connections to switch to electric only households (e.g. environmental concerns, cost of switching, optionality of household energy mix etc).

1.1 SUSTAINABILITY EXPENDITURE

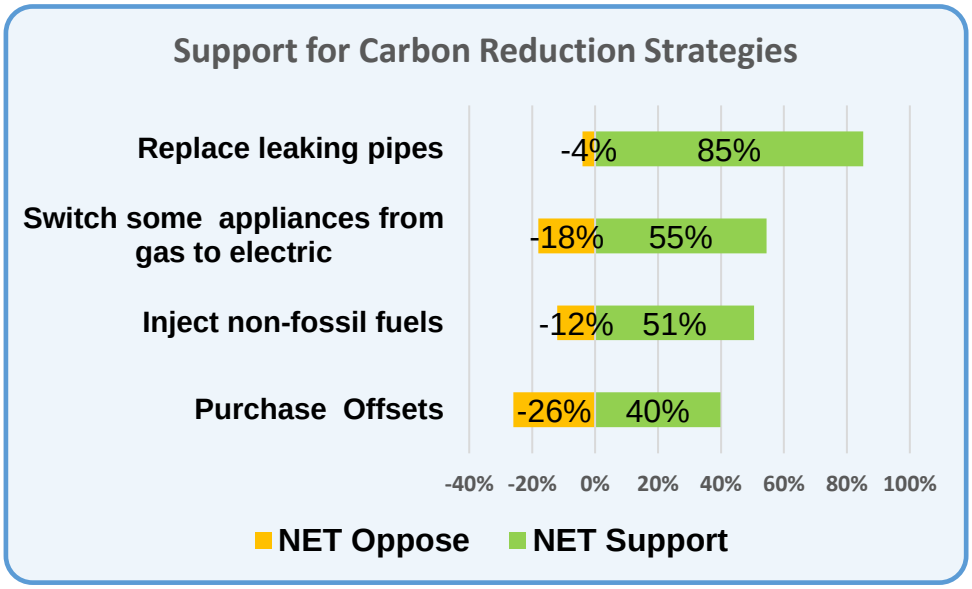
Section 2.4 addresses consumer interest in reducing the household carbon footprint. That section shows that only about one in five put low importance on the aim of reducing their household's carbon footprint. However the level of commitment is not strong. Just 39% rate this notion as being either "extremely" (16%) or "very" (23%) important. The most common response being that it was "quite important". Our interpretation being that households largely support the concept but are wary of any associated costs to be borne by them.

Even amongst the subgroup with solar PV panels we found just 42% rating it as either "extremely" (18%) or "very" (23%) important. In short, households would support any steps to reduce their household carbon emissions, regardless of the means – provided they themselves are not materially affected by any cost increases.

Indeed, when the question was asked about reducing the carbon footprint from using gas in the household, the level of rated importance fell to just 31% either "extremely" (12%) or "very" (19%) important. Again the lower commitment of "quite important" was the most common response (36%). So while quite a low proportion (27%) of customers rate the importance as "low", there does not appear to be a strong commitment to reducing these emissions if it entails any material financial contribution.

1.1.1 CARBON REDUCTION STRATEGIES

There was quite strong support for the ATCO strategy of reducing leaks from the gas network. Section 2.5 shows this to be the most well supported proposition compared to switching some appliances from gas to electric, injecting non-fossil fuel into the system, or purchasing offsets. The figure below shows the relative support and opposition to these emissions reduction strategies. (The "neutral" responses of neither support nor oppose have been omitted for clarity).



Note that the concept of replacing some gas appliances with electric options is the second most favoured strategy, and the purchase of offsets (which implies a cost to the consumer) has the lowest level of support.

Whilst the level of support appears strong in the above, there is a distinct lack of enthusiasm to make a material contribution to those strategies. Note that 85% supported the strategy of replacing leaking pipes, suggesting a level of commitment. However when asked to indicate if they would be prepared to contribute even modest amounts to support that initiative, the support falls away materially.

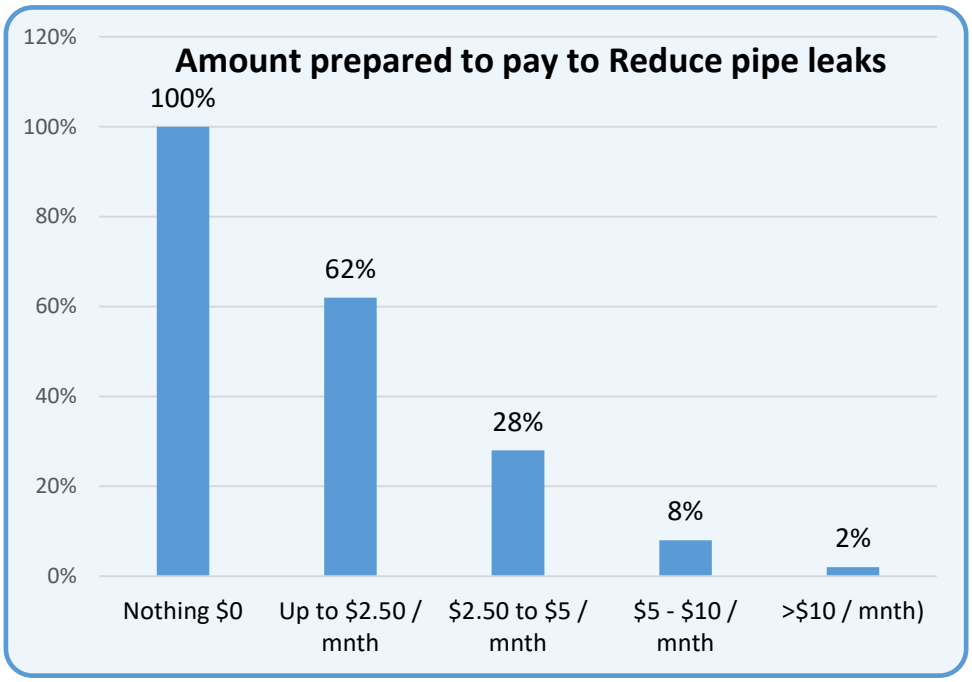
1.1.1.1 PREPAREDNESS TO PAY FOR LEAK REDUCTION

Whilst 85% of gas customers support the concept of reducing leaks by increasing expenditure on pipeline maintenance, this is not strongly backed up with a financial commitment.

The figure below shows the proportion of all gas customers (whether supportive of this strategy or not) who would be prepared to pay gradually increasing amounts per month to support a greater investment in pipe replacement to reduce the amount of leaks into the environment.

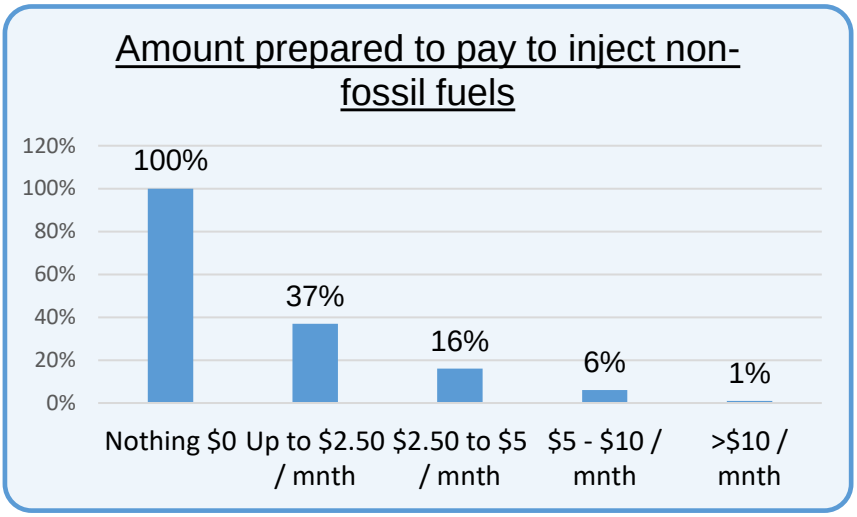
It starts at all customers being prepared to pay at least nothing. **We have assumed that those who do not support this strategy would fall into the "pay nothing" category.**

Then when the level of commitment is at least "up to $2.50 per month" the preparedness to pay falls materially to 62%, then 28% willing to pay at least $2.50 to $5 a month, 8% at $5-%$10 a month and 2% for figures beyond $10 a month.



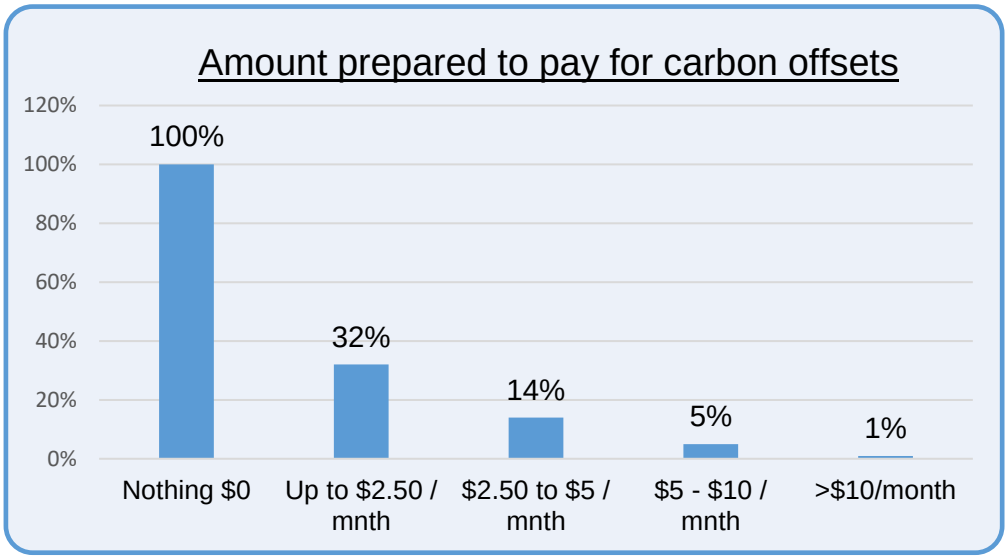
1.1.1.2 Preparedness to pay for Injecting non Fossil Fuels.

Just 51% of gas customers supported the prospect of injecting non-fossil fuels into the gas network. The figure below shows the extent to which customers are prepared to accept extra costs on their gas bill to achieve this. It starts with all customers prepared to pay zero, and just 37% prepared to pay up to $2.50 per month. This proportion is approximately halved at the payment of $2.50 to $5.00 a month, 6% at $5 - $10 a month, and 1% at levels beyond that.



1.1.1.3 Preparedness to pay to Offset Carbon Emissions

Just 40% of customers supported the strategy of paying for carbon offsets. Their financial commitment to that strategy is shown below. All customers would be prepared to pay nothing, 32% would pay up to $2.50 a month, 14% would pay $2.50 to $5.00 a month, 5% would pay $5-$10, and 1% more than that.



1.1.2 TARIFF PREFERENCES

When asked about their preferences for the gas tariff structure over the next five years, the most common response was to opt for an initial increase of about 11%, followed by minimal changes over the next few years. Initially this notion seems to defy logic in a time of cost-of-living stresses. However, the question put to customers included the reference to the proposition that this option was the lowest overall cost over the five-year period.

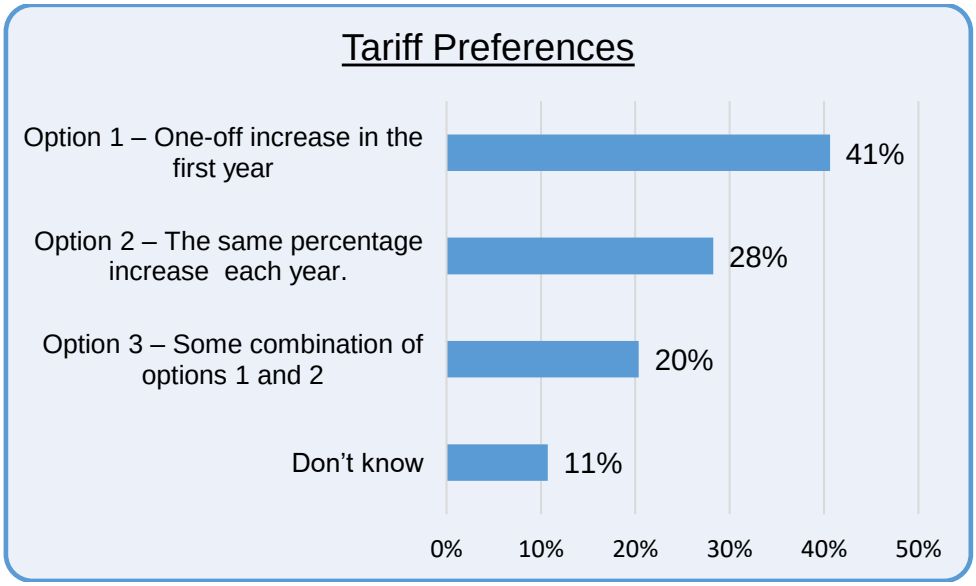
It is important that the actual question wording be considered in the interpretation of this result. The three options presented to customers were as follows:

Option 1 – One-off increase in the first year and constant prices for the remaining years (least overall cost option over five-year period)

Option 2 – The same percentage increase in prices each year (much lower percentage increase than first year of Option 1 but you will pay more over the five-year period)

Option 3 – Some combination of options 1 and 2, which results in a higher increase in the first year/s and lower annual percentage increases thereafter (pay more than Option 1 but less than Option 2 over the five-year period).

The responses showed most in either of the second two camps, but the most often selected option was option 1, with almost four in ten taking this view.



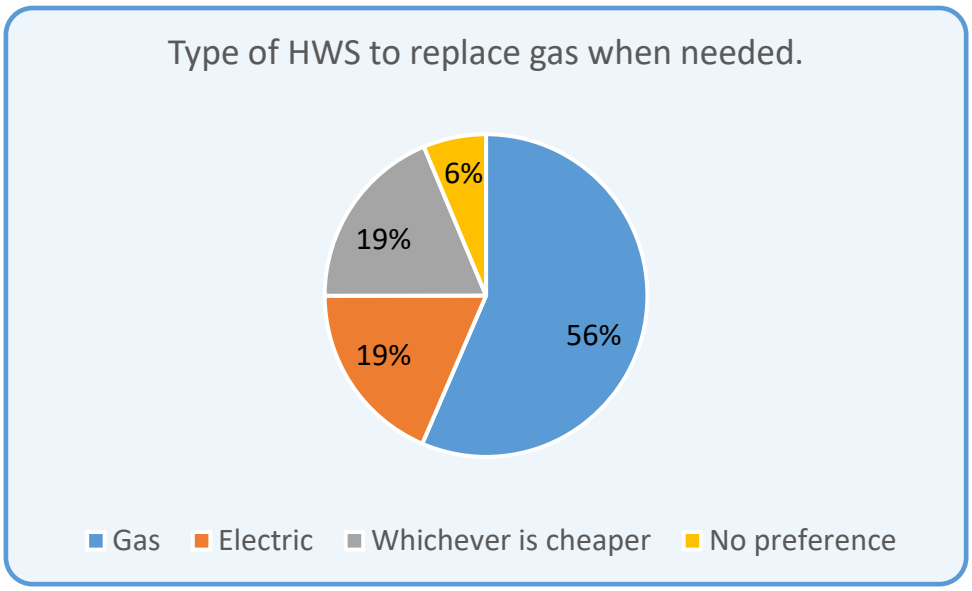
1.2 FUTURE DEMAND

The future demand for domestic gas supplies is dependent on both the rate of expansion of the network into (primarily) new housing developments, and the rate at which current gas customers consider switching from gas to electric appliances.

1.2.1 PROSPECTS FOR ELECTRIC SUBSTITUTION FOR GAS APPLIANCES.

Currently, 73% of gas customers have a gas cooktop, and almost seven in ten of them would simply replace like for like if the appliance needed replacement. Seventeen per cent indicated that they would switch to electric, and the remainder expressed no preference. So, in the main there is unlikely to be much leakage of gas cooktop appliances to electric over the five-year period.

Sixty-three per cent of gas customers reported that they currently have a gas HWS. Their initial attitudes are that when due for replacement, 56% of them would simply opt for a replacement with a similar gas unit, 19% expressed a desire to switch to an electric unit, and the remainder were open to either option, depending on cost.



There appears to be little prospect for a quite rapid change in gas volume per household over the AA6 period.

The “no preference” and “whichever cheaper” responses would be driven by their investigations at the time, and it is unlikely that any more than half of the 25% (19% “whichever cheaper”, and 6% “no preference”) would replace with something other than gas. So the gas replacement with gas is likely to be in the order of 70% of current gas HWS users.

There was much less usage of gas for space heating (27% of gas customers) and about four in ten of them would simply replace it with a gas unit if it needed replacement. A third (34%) had no particular preference, (being driven solely by cost and performance assessment at the time) and 27% expressed a desire to switch to an electric system.

Given the high proportion of gas domestic usage consumed by the hot water service, it would appear that the greatest risk for a material decrease in gas volume usage by gas connected households rests with the prospect of the transition from a gas to an electric HWS.

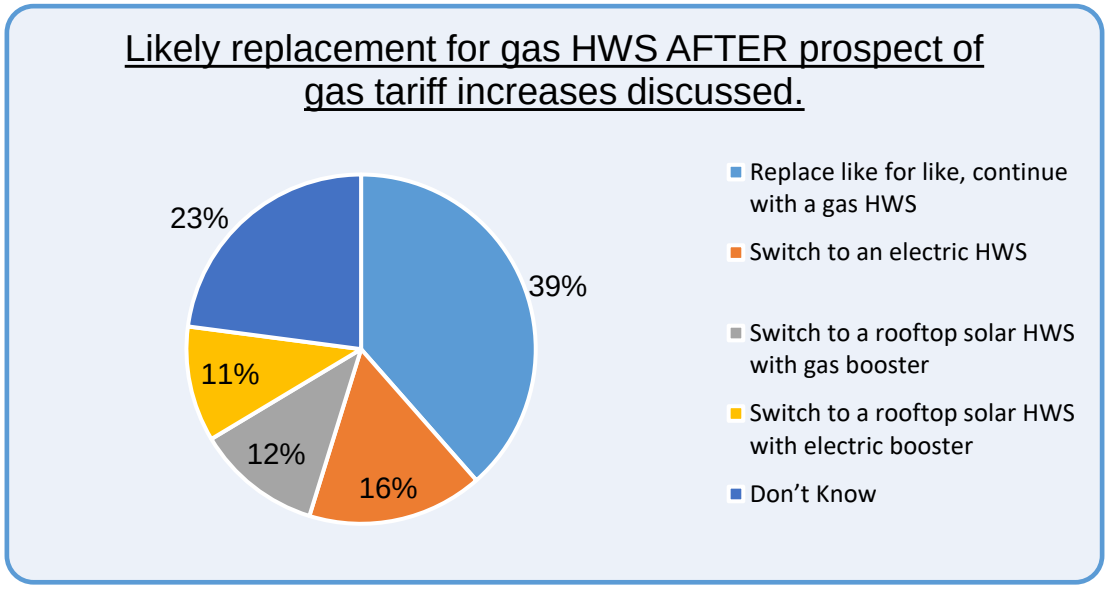
1.2.1.1 The Effect of Gas cost increases

The potential for concerns over GHG emissions and gas cost increases due to inflationary and capital cost pressures, to move consumer sentiment is reflected in a question about HWS service replacement which was posed after the questions about gas tariff increases, and some information about the ways for GHG gases could be curtailed. (See sections 2.5 and 2.6).

Following the questions about tariff increase options (section 2.3) and the financial commitments that customers would make to support the various GHG reduction strategies, the question about gas HWS replacement options produced a much smaller proportion who would simply replace "like for like".

The initial thoughts about replacing an end-of-life gas HWS were that approximately 70% (including the "no preference" and "whichever cheaper" responses) would simply replace the gas unit. However, the replacement plans for the 63% of customers who had a gas HWS **after the cost and GHG emissions questions** are shown below.

Thirty–nine per cent would simply replace "like for like". Sixteen per cent report plans to change to an electric system, 12% plan to install rooftop solar with a gas booster, and 11% a rooftop solar with an electric booster (though 23% were unsure).



The upshot is that the consumed gas volume would not change for 39% of households, it would be reduced for the 12% who would switch to a rooftop solar with gas booster, it would reduce more for the 11% who would switch to a rooftop solar with an electric booster, and similarly for the 16% who would opt for a full electric system.

As an illustrative example, using the same logic that only half those who express an interest in making a change actually do so, we can estimate that with the information provided about tariff increases, and options to reduce GHG emissions, about 19% [(11%+12%+16%) /2] of current gas HWS users would make a switch away from a full gas HWS – noting that 23% are undecided, though are most likely to follow the line of least resistance and replace like for like. Nonetheless, the 19% switch X [1]40% of gas volumes per household X households with a gas HWS (63%) suggests the potential for a net gas volume loss of approximately 5% from existing customers across the network by the end of the AA6 period.

[1] Our assumed typical gas consumption for a full gas household is 40% heating, 40% HWS and 20% cooking appliances.

It is interesting that solar PV households are only marginally more likely to switch than are the non-PV households (see section 2.6.1 for details).

1.2.1.2 The effect of Concerns over Greenhouse Gas Emissions

Only about one in five customers rate it as unimportant that their household reduces its carbon footprint. Thirty-nine per cent rate it as at least very important, and a further 38% that it is "quite important". When the scope was narrowed to reducing the carbon footprint from burning gas in the household appliances, the "not important" proportion increased to one in four (27%).

So there is a fairly strong sentiment that reductions in carbon footprint is important. This was also evident in the KANTAR research, reflected in the support for the injection of non-fossil fuels into the natural gas network.

When customers were informed that the gas HWS is a significant consumer of gas and therefore a major source of the household's carbon footprint, 38% indicated that they were more likely to switch from gas to some other HWS when their current system reached its end of life.

1.2.1.3 The Potential Impact of Electric HWS Technology

Currently only 17% report they either already have a heat pump HWS (4%) or are actively considering one (13%). A further 22% report some awareness of the technology (28% amongst solar PV households) leaving six in ten (61%) who have no awareness of the technology at all.

So in the absence of any major information campaign about the potential for heat pumps to reduce household greenhouse emissions, the likely take up of heat pump options by current gas HWS users at the appliance's end of life is limited to about 19%, with the prospect that a further approximate 20% - 25% may switch if they do some research and find that the heat pump technology is a cheaper solution. Given the higher "up front" cost in the switch, compared to remaining with gas, the prospects for more than 20% overall seem pretty remote.

However, once the heat pump technology was explained to customers (see the question in section 2.7), we find the preparedness to switch from gas surges materially. Just one in five gas HWS users report that they are still unlikely to change from gas, 40% report that they are more likely to change from gas and overall almost two thirds (64%) report that they will at least look into it (see section 2.7 for details).

Effect of heat pump technology Information		Age group			'Solar Panels? *	
	NET	18-39 yrs.	40-64 yrs.	65+	Yes	No
Summary						
NET unlikely to change from gas	20%	13%	21%	29%	17%	24%
NET more likely to change from gas	40%	49%	40%	30%	45%	36%
NET At least look into it	64%	74%	64%	51%	69%	60%
Sample n	815	295	305	215	395	413

Some respondents did not know whether or not they had solar PV's installed. They have been omitted from the table. Note from the table that the younger cohort and those with solar PV systems have elevated interest compared to the remainder.

1.2.1.4 The potential for Heat Pumps to Reduce Gas demand.

Currently about 4% of gas customers report that they have a heat pump HWS, and a further 13% indicate plans to at least look into it when the time comes to update the HWS. However while about a further one in five report some awareness of the technology, overall almost two thirds (61%) have no awareness of it at all. The motivations for the 4% with heat pumps, and the 13% considering the technology were equally driven by environmental and economic factors.

We have attempted to predict the potential for heat pumps to become more widely used over the AA6 period, as awareness of the technology expands into the "no awareness" group.

Once the heat pump technology was explained to respondents, (see section 2.7) including the observation that households with solar PV would have almost no running cost for their hot water, we found almost two thirds of all respondents (64%), and almost seven in ten solar PV households (69%) would at least look into the proposition.

Of course, the initial hurdle of the extra costs of the heat pump over the cost of a simple replacement of a gas HWS with a similar unit, would sharply curtail this level of interest. However the economic case for households with solar PV is likely to encourage a significant proportion of them to make the switch. The analysis below shows the possible levels of heat technology uptake and resultant impact on overall gas volumes, amongst solar PV owners, assuming that over the AA6 period the level of solar PV ownership does in fact reach 50% (quite possibly more).

Consider that:

- 63% of gas households have a gas HWS.
- 57% of households have a gas HWS that is 5+ years of age (i.e. likely to fail within the AA6 period)
- 50% solar PV's – (A 2022 Roy Morgan Research report showed 42% penetration of solar PV systems in WA. Government estimates are that the penetration of solar PVs in WA will reach or exceed 50% by 2030).
- [2]40% of domestic gas consumption is in the HWS (amongst gas HWS households).

The resultant potential for reductions in gas HWS units, **amongst the total ATCO customer base**, over the AA6 period would be in the order of:

63% have gas HWS	X	57% HWS 5+ yrs. old	X	50% solar PV	=18%

of all gas households with failing gas HWS units, AND solar PVs over the AA6 period.

If all solar PV owners with failing gas HWS units convert to heat pumps, the fall in **overall gas volume across the domestic gas customer base** will be 40% X 18% = 7% by the end of the AA6 period. If three out of four make the change, the net fall would be about 6%.

That assumes of course full awareness of the heat pump technology and potential benefits for solar PV households. This does not seem likely.

[2] Our assumed typical gas consumption for a full gas household is 40% heating, 40% HWS and 20% cooking appliances.

So our conclusion is that the **potential** for the heat pump technology to reduce gas volumes over the AA6 period is limited to approximately 6 – 7%. But the likely reality is about half that (due to imperfect awareness of the technology). This may be offset by increases in new gas connections.

1.2.2 FUTURE GAS CONNECTIONS

Overall about one in five (18%) report that they are at least quite likely to have a new home built within the next five years, and 40% report that it is at least possible (see section 2.8). The table below indicates, the younger cohort is naturally more likely than their older counterparts to be considering a new home build.

Likelihood of new home build within 5 years.		**Age Group**		
	NET	**18-39 years**	**40-64 years**	**65+**
Summary				
NET at least quite likely	18%	34%	10%	3%
NET at least possible	40%	68%	29%	12%
Sample n	981	394	347	240

When those reporting that it is "at least possible" that they would build within the next five years (40% of gas customers) were asked about the importance of a gas connection at the new home, we find about three out of four regard it as being at least quite important.

Importance of gas connection to new home amongst possible new home buyers.		**Age Group**		
	NET	**18-39 years**	**40-64 years**	**65+**
Summary				
NET Low Importance	18%	14%	22%	40%
NET High Importance	40%	45%	33%	29%
NET at least quite Important	76%	82%	72%	50%
Sample n	418	271	113	34

The likely outcome is that in the absence of any government regulation to limit new gas connections, the rate of new gas connections in new developments will approximate that of recent history.

2.0 SURVEY FINDINGS

2.1 SAMPLE PROFILE

The sample was of adults with connection to the ATCO gas network, who were sole or jointly responsible for the payment of the gas bills.

It covered both the greater Perth metropolitan area, and the regional areas covered by the ATCO southwest network coverage area. The sample was monitored for age and gender measures, to ensure a stable final sample to weight to the actual adult population of the target areas.

The final sample of 981 gas customers provides a theoretical survey error of +/- 3% at the 95% confidence level. The main demographic components of the sample are shown below. (There are some minor rounding errors for some totals).

Sample Profile		
Gender	Male	49%
	Female	51%
	Total	100%
Age group	18-39 years	40%
	40-64 years	35%
	65+	24%
	Total	100%
Location	Metro	90%
	Regional	10%
	Total	100%
Solar PV Panels?	Yes	50%
	No	49%
	Don't know	1%
	Total	100%
Household Income	Up to $75K	32%
	$76,000 - $115,000	26%
	$116,000 - $185,000	19%
	$186,000 or more	12%
	Refused	11%
	Total	100%
Home status	Own Home	79%
	Renting	18%
	Not my home (with relatives)	3%
	Total	100%
	Total Sample	981

2.1.1 CURRENT APPLIANCE STRUCTURE

Customers were asked to indicate the type of appliances they had in their homes. The question asked was:

Can you please indicate the type of appliances you have in your household?

The table below shows the extent to which gas connected customers use gas or electricity to power the more significant household appliances.

	Stove top	Oven	Fireplace	Laundry dryer	Hot water unit	Pool/spa heater	Outdoor kitchen (mains gas)	Heater (other than a fireplace)
Natural gas	73%	21%	13%	3%	63%	4%	15%	27%
Electricity	17%	68%	7%	64%	21%	15%	7%	42%
Both	8%	9%	6%	5%	10%	5%	6%	11%
Not applicable	2%	2%	74%	28%	6%	75%	72%	20%
NET	100%	100%	100%	100%	100%	100%	100%	100%

Customers show a high penetration of gas for their stove top, hot water units, and fireplace (where applicable). Note also that electricity is the dominant (42%) energy source for a room heater (not a fireplace). This is probably related to the high rate of reverse cycle air conditioning installations (see section 2.1.2 below).

About six in ten (58%) reported that they have a quarterly gas bill, 40% reported monthly gas bill payment (the residual unsure).

2.1.2 AIR CONDITIONING

The type of installed air conditioning was also asked, and the results show almost four in ten (37%) report ducted reverse cycle air conditioning.

Air Conditioning status:		Gender		Age group			Household Income			
	NET	Male	Female	18-39 yrs.	40-64 yrs.	65+	Up to $75K	$76 - $115K	$116 - $185K	$186K +
Reverse cycle ducted	37%	35%	40%	34%	43%	35%	33%	34%	39%	52%
Room reverse cycle units	32%	31%	34%	30%	30%	40%	30%	34%	31%	29%
Evaporative ducted	20%	21%	20%	20%	21%	19%	21%	21%	23%	18%
No air conditioning (apart from fans)	8%	12%	5%	13%	5%	5%	14%	7%	6%	1%
Movable evaporative units	2%	2%	2%	3%	1%	1%	2%	4%	1%	0%
NET	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Sample n	981	486	495	394	347	240	310	252	192	116

As may be anticipated, the use of ducted reverse cycle air conditioning is related to household income, but even amongst the more modest income groups ducted reverse cycle is the dominant technology.

2.1.3 SOLAR PV PANELS.

The question about solar PV panels showed a similar income effect, in that the upper income groups had higher rates of solar PV installations than the more modest income level households.

Solar PV Panel status:		Gender		Age group			Household Income			
	NET	Male	Female	18-39 yrs.	40-64 yrs.	65+	Up to $75K	$76 - $115K	$116 - $185K	$186K +
Yes	50%	57%	44%	41%	52%	64%	46%	53%	49%	57%
No	49%	43%	55%	58%	48%	35%	54%	47%	50%	42%
Don't know	1%	0%	1%	1%	1%	0%	0%	0%	1%	1%
NET	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
solar n	981	486	495	394	347	240	310	252	192	116

Households without solar PV were asked how likely it was that they would install them within the next five years. As the table below indicates, two thirds indicate it is at least possible, and one third rule it out altogether. Almost 3 in ten (28%) of non-PV households indicate that it is at least quite likely that they will have them installed within the next 5 years. In common with the current application of PV panels, this intention is related to household income.

Intent to install Solar PV Panel within 5 years:		Household Income			
	NET	Up to $75K	$76 - $115K	$116 - $185K	$186K +
Not likely at all	33%	46%	28%	24%	10%
It is possible, but no real plans	38%	32%	41%	42%	45%
Quite likely	18%	14%	24%	18%	26%
Very likely - I have made initial enquiries	8%	6%	5%	15%	10%
Definite	2%	2%	2%	1%	8%
NET	100%	100%	100%	100%	100%
AT Least quite likely	28%	22%	31%	34%	44%
Sample n	477	165	118	96	49

The aim of reducing the electricity bill is the primary driver of the interest in solar panels, followed by environmental considerations. The table below shows the reasons proffered by the subset considering solar PV installation over the next five years (note small sample of 135).

Reasons for considering Solar PV panels within five years. *	
Reduce electricity bill	52%
Environmental impact	23%
Electrify household	10%
Government Rebate(s)	9%
Off-grid potential	4%
Other	1%
Purchase of EV	1%
NET	100%
Sample n	135

2.1.4 GAS RETAILER

The distribution of gas retailers across the sample is shown in the table below.

Gas Retailer	NET	Male	Female	18-39 years	40-64 years	65+
Alinta Energy	43%	41%	45%	31%	49%	56%
Kleenheat	31%	29%	34%	32%	30%	32%
AGL	16%	19%	13%	24%	13%	7%
Origin Energy	4%	5%	4%	7%	3%	0%
Simply Energy	3%	3%	3%	5%	1%	2%
Other (please specify)	0%	0%	0%	0%	0%	0%
Prefer not to say	2%	3%	2%	1%	2%	3%
NET	100%	100%	100%	100%	100%	100%
Sample n	981	486	495	394	347	240

2.2 POTENTIAL FOR ENERGY TRANSITION – GAS TO ELECTRIC

The survey probed the likely way that householders would approach the replacement of their main energy intensive appliances. Specifically they were asked:

Some types of household appliances can run on either electricity or gas. When your current appliance is due for replacement which option (in the grid below) are you likely to install?

The tables below show the way that the current gas users would respond to the need to replace specific appliances.

2.2.1 GAS COOKTOP.

Almost three in four (73%) of gas customers reported that they currently have a gas cooktop. The way that this subset of 720 respondents would react to the need to replace their cooktop is shown below.

What energy choice would CURRENT gas cooktop owners choose?	
Gas	68%
Electric	17%
Whichever is cheaper	10%
No preference	5%
NET	100%
Sample n	720

Almost seven in ten (68%) report that they would replace their gas cooktop with another gas cooktop. 17% indicate that they would opt for an electric system, and 15% either had no preference or would go for whichever was the cheaper option. The reasons for the choice of gas as a cooktop replacement were provided as:

Reasons for replacing gas cooktop with gas *	
Better temperature regulation	61%
Always available / more reliable	49%
Running cost of appliance	38%
Tradition/familiarity	38%
Ease of installation (like for like replacement)	25%
Ease of cleaning	17%
Environmental impact	8%
Modern appearance	6%
Other (Please specify)	6%
Health	4%
Sample n	487

NB This was a multiple response question.

Note that the main reasons relate to the assessed superior performance of gas in this application, and cost.

As noted, only 17% would change the gas cooktop to an electric version. The reasoning for the 123 respondents who would opt for that choice are shown below.

Reasons for changing Gas cooktop to electric *	
Environmental impact	47%
Ease of cleaning	32%
Running cost of appliance	32%
Modern appearance	24%
Better temperature regulation	19%
Health	18%
Other (Please specify)	13%
Always available / more reliable	10%
Ease of installation	7%
Tradition/familiarity	3%
Sample n	123

NB This was a multiple response question.

The main reasons are related to environmental considerations and ease of cleaning. The perception of lower running costs may be related to awareness of induction cooktops. Note also the 24% mentioning “modern appearance”.

2.2.2 GAS OVEN.

Just 21% of ATCO customers report that they currently have a gas oven. Slightly over half (54%) of them would simply replace it with a similar unit. However 28% would make the switch to an electric oven, and 18% either would choose the cheapest option (13%) , in which case they are likely simply replace “like for like”, and 5% had no preference, probably taking the line of least resistance when the time came to replace the oven.

Type of Oven owners would choose to replace their gas oven	
Gas	54%
Electric	28%
Whichever is cheaper	13%
No preference	5%
NET	100%
Sample n	205

The reasoning for those who would simply replace the gas oven with a similar unit is shown below.

Reasons for choosing gas oven replacement with a similar gas oven *	
Always available / more reliable	47%
Better temperature regulation	47%
Tradition/familiarity	39%
Running cost of appliance	36%
Ease of cleaning	20%
Ease of installation (like for like replacement)	19%
Environmental impact	17%
Modern appearance	13%
Health	6%
Sample n	110

NB This was a multiple response question.

In the main the reasons revolve around the notion that the gas oven is more reliable (not prone to power failures etc).

Amongst the 28% gas oven owners who would switch to an electric oven, we found the reasoning to be focused on the performance of the oven and the environmental impacts.

Reasons gas oven owners would switch to electric *	
Better temperature regulation	31%
Running cost of appliance	29%
Environmental impact	28%
Modern appearance	26%
Ease of cleaning	23%
Tradition/familiarity	19%
Health	16%
Always available / more reliable	14%
Ease of installation (like for like replacement)	10%
Other (Please specify)	7%
Sample n	58

NB This was a multiple response question.

2.2.3 GAS HOT WATER UNIT

Sixty-three per cent of gas connected customers reported that their hot water unit is currently gas fired. The way that this subset of 622 respondents would react to the need to replace their hot water unit is shown below.

What energy choice would CURRENT gas Hot water unit owners choose?	
Gas	56%
Electric	19%
Whichever is cheaper	19%
No preference	6%
NET	100%
Sample n	622

Slightly over half (56%) report that they would replace their gas HWS with another gas HWS. 19% indicate that they would opt for an electric system, and 25% either had no preference or would go for whichever was the cheaper option. The reasons for the choice of gas as a HWS replacement were provided as:

Reasons for replacing gas Hot Water Service with gas *	
Running cost of appliance	54%
Always available / more reliable	49%
Ease of installation (like for like replacement)	36%
Tradition/familiarity	28%
Better temperature regulation	25%
Environmental impact	8%
Modern appearance	5%
Ease of cleaning	5%
Health	4%
Other (Please specify)	4%
Sample n	351

NB This was a multiple response question.

Note that the main reasons relate to the perception of cheaper performance, followed by reliability of performance, and ease of installation.

The 19% who indicated that they would opt for an electric HWS when their current gas unit failed indicated the following reasons:

Reasons for choosing an electric replacement for a gas HWS *	
Running cost of appliance	47%
Environmental impact	43%
Always available / more reliable	21%
Better temperature regulation	20%
Ease of installation	15%
Other (Please specify)	11%
Modern appearance	10%
Health	9%
Tradition/familiarity	8%
Ease of cleaning	4%
Sample n	116

NB This was a multiple response question.

The main factors are a perception of lower running costs and environmental factors. It is possible that much of the lower costs sentiment is related to SOME understanding of heat pump HWS technology (see section 2.7). Note that 19% of gas HWS unit owners plan to replace it with an electric unit, and 47% **of them** (i.e. about 9% of gas HWS service owners) mentioned the prospect of lower running costs as the main reason for the switch.

2.2.4 GAS SPACE HEATING

Whilst only 27% of ATCO customers nominated gas as the fuel source for their space heating (compared to 42% nominating electricity), almost four in ten of them (39%) would choose gas as the replacement for their gas space heater when it reached the end of its useful life. The implication being that about six in ten would either choose electric (27%), whichever is cheaper (22%) or express no preference (12%).

The way that the subset of 262 respondents would react to the need to replace their gas space heater is shown below.

What energy choice would CURRENT gas space heater owners choose?	
Gas	39%
Electric	27%
Whichever is cheaper	22%
No preference	12%
NET	100%
Sample n	262

The net position is that four in ten would simply replace the gas space heater with a similar unit, and about six in ten would consider alternatives. The main reasons for continuing with gas were running costs, reliability and ease of installation.

Reasons for replacing gas space heater with gas *	
Running cost of appliance	50%
Always available / more reliable	40%
Ease of installation (like for like replacement)	28%
Better temperature regulation	27%
Tradition/familiarity	24%
Modern appearance	16%
Health	9%
Ease of cleaning	9%
Environmental impact	6%
Other (Please specify)	3%
Sample n	102

NB This was a multiple response question.

The reasoning behind the 27% who would opt for an electric unit is shown below.

Reasons gas heater owners would opt for electric as replacement *	
Better temperature regulation	34%
Running cost of appliance	33%
Environmental impact	27%
Ease of installation	26%
Always available / more reliable	25%
Health	19%
Ease of cleaning	19%
Tradition/familiarity	17%
Modern appearance	13%
Other (Please specify)	8%
Sample n	70

NB This was a multiple response question.

There were only 70 respondents in this category (survey error more than +/- 12%), so care needs to be taken in the interpretation of the table. We suspect that the “ease of installation” is related to the prevalence of reverse cycle air-conditioning doubling as a heat source in winter.

2.3 TARIFF INCREASE PREFERENCES.

The issue of the increases in tariffs to factor into the next five-year access agreement was addressed with the following question.:

In WA the cost of maintaining and extending the gas pipeline network is estimated in five-year periods.

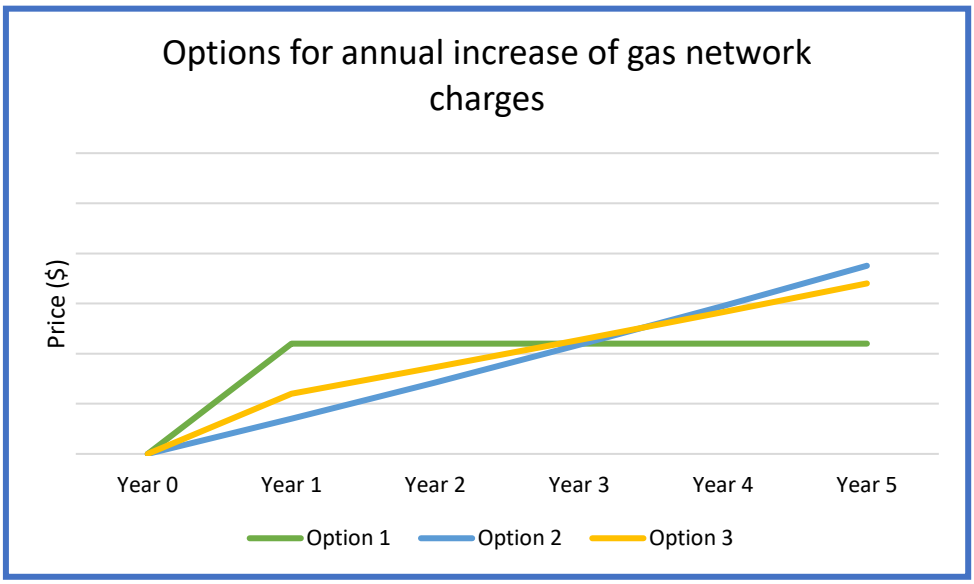
The WA gas network operator's costs are forecast to increase over the next five years due predominantly to higher interest rates and inflation. While no one likes to pay more, how would you prefer this cost is passed through to you?

Option 1 – One-off increase in the first year and constant prices for the remaining years (least overall cost option over five-year period)

Option 2 – The same percentage increase in prices each year (much lower percentage increase than first year of Option 1 but you will pay more over the five-year period)

Option 3 – Some combination of options 1 and 2, which results in a higher increase in the first year/s and lower annual percentage increases thereafter (pay more than Option 1 but less than Option 2 over the five-year period).

Respondents were presented with the following graph to illustrate the different options:



Annual percentage change (%)					
	Year 1	Year 2	Year 3	Year 4	Year 5
Option 1	11%	0%	0%	0%	0%
Option 2	3.5%	3.5%	3.5%	3.5%	3.5%
Option 3	6%	2.5%	2.5%	2.5%	2.5%

The responses showed option one to be the most acceptable of these options. The expressed preferences are shown in the table overleaf.

Tariff Increase preferences		Gender		Age group			Household Income			
	NET	Male	Female	18-39 yrs.	40-64 yrs.	65+	Up to $75K	$76 - $115K	$116 - $185K	$186K +
Option 1 –	41%	42%	39%	45%	37%	38%	42%	39%	40%	40%
Option 2 –	28%	32%	24%	29%	30%	26%	30%	28%	28%	31%
Option 3 –	20%	17%	24%	20%	19%	23%	18%	24%	22%	20%
Don't know	11%	8%	13%	6%	14%	13%	10%	9%	9%	10%
NET	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Sample n	981	486	495	394	347	240	310	252	192	116

The preference for option one is probably due to the reference to the "least overall cost over the five-year period", along with the relatively modest increase of just 11% in the first year. Given the scale of cost increases experienced by households over the course of 2023 – 24 the prospect of an 11% increase to a relatively modest gas bill, with a lower overall cost, is easy to choose.

Having said that a greater proportion opted for either option 2 or option 3.

2.4 INTEREST IN REDUCING CARBON FOOTPRINT

Respondents were asked to indicate how important it was to them to reduce their household carbon footprint. The question asked was:

How important is it to you to reduce your household's carbon footprint?

As the table below illustrates, whilst there is very widespread general support for the concept, for most there is not a very strong motivation to reduce the household carbon footprint. Note that while only 19% rated it as being at "very low" or of "no importance at all" four in ten (39%) rate it as either "very" or "extremely" important.

Importance of reducing household carbon footprint		Gender		Age group			'Solar Panels?	
	NET	Male	Female	18-39 yrs.	40-64 yrs.	65+	Yes	No
Not important at all	7%	10%	3%	3%	9%	8%	7%	7%
Very low importance	13%	16%	10%	12%	14%	13%	13%	12%
Quite important	38%	35%	42%	39%	40%	35%	37%	40%
Very important	23%	26%	19%	27%	18%	23%	23%	22%
Extremely important	16%	12%	20%	17%	15%	19%	18%	15%
Don't know	3%	1%	5%	3%	3%	2%	1%	4%
NET	100%	100%	100%	100%	100%	100%	100%	100%
Summary								
NET Low Importance	19%	26%	13%	15%	24%	21%	20%	19%
Quite important	38%	35%	42%	39%	40%	35%	37%	40%
NET High Importance	39%	39%	40%	44%	33%	42%	41%	37%
Sample n	981	486	495	394	347	240	497	477

The implication being that there will be widespread support for reductions in household emissions, but only if it is at moderate cost (see section 2.5.2).

It is interesting to note the lack of material difference in attitudes between the solar PV owners and non-owners. If the solar PV owners had been much more heavily influenced by environmental factors than they were by other factors, it would be logical to expect a greater difference between them and non-PV owners on this measure. There is little effective difference.

2.4.1 IMPORTANCE OF REDUCING THE HOUSEHOLD CARBON FOOTPRINT BY FROM THE USAGE OF GAS APPLIANCES IN THE HOME.

In an endeavour to focus specifically on the potential role that changes in the balance between gas and electricity can have in reducing the carbon footprint, respondents were asked:

How important do you think it is to reduce your household's carbon footprint from the usage of GAS APPLIANCES in the home?

Importance of reducing carbon footprint from household gas appliances		Gender		Age group			'Solar Panels?	
	NET	Male	Female	18-39 yrs.	40-64 yrs.	65+	Yes	No
Not important at all	9%	13%	6%	5%	12%	13%	11%	8%
Very low importance	18%	20%	16%	12%	21%	22%	19%	17%
Quite important	36%	35%	36%	40%	35%	28%	34%	37%
Very important	19%	19%	18%	21%	16%	19%	19%	18%
Extremely important	12%	11%	14%	15%	9%	12%	14%	11%
Don't know	6%	2%	10%	6%	7%	6%	4%	8%
NET	100%	100%	100%	100%	100%	100%	100%	100%
Summary								
NET Low Importance	27%	33%	21%	17%	33%	35%	29%	25%
Quite important	36%	35%	36%	40%	35%	28%	34%	37%
NET High Importance	31%	30%	32%	37%	25%	31%	32%	29%
Sample n	981	486	495	394	347	240	497	477

The level of enthusiasm for reducing the emissions from gas appliances is somewhat lower than that for reducing the household carbon footprint overall. Note again the relative closeness in attitudes of the samples with and without solar PV installations. Younger residents were more likely to be supportive than their older counterparts, with just 17% rating it as of low importance compared to 33% and 35% for the 40 – 65 and 65+ age brackets respectively.

Having noted that, about seven in ten overall (67%) believe it is at least quite important to reduce the carbon footprint from the usage of gas appliances in the home. We interpret this to suggest that almost seven in ten are prepared to do something to reduce their carbon footprint from gas usage, but they will only do so if it is possible at a "reasonable" cost (see section 2.5.2).

2.5 SUPPORT FOR VARIOUS CARBON REDUCTION STRATEGIES.

The question about the prospect of reducing carbon emissions by a range of possible strategies was addressed with the following question:

Currently, WA household gas usage produces greenhouse gas emissions through:

- ***Gas leaking from the pipelines***
- ***Operational emission from gas network infrastructure***
- ***Households burning gas***

These emissions can be reduced by:

- ***Increasing efforts to replace leaking pipelines,***
- ***Injecting non-fossil fuels such as hydrogen into the gas network,***
- ***Purchasing carbon offsets (Investments in projects that reduce or remove greenhouse gas emissions on your behalf to balance out the carbon emissions that can't be avoided),***
- ***Consumers reducing their emissions by limiting gas usage and/or switching from gas appliances to electric in the home.***

By how much do you support or oppose each of these paths to reduce the greenhouse gas emissions from household gas usage?

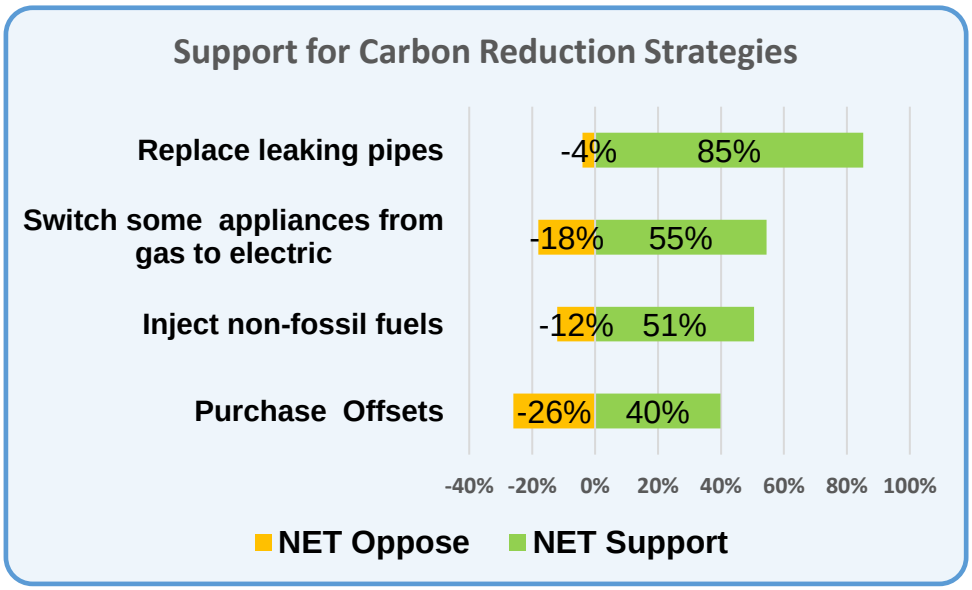
The table below shows the extent to which gas customers support or oppose each of these propositions.

Support for Carbon reduction / offset strategies	Replace leaking pipes	Inject non-fossil fuels	Purchase Offsets	Switch some appliances from gas to electric
Completely oppose	1%	4%	13%	8%
Tend to oppose	2%	8%	13%	11%
Neither	11%	38%	34%	27%
Tend to support	31%	35%	27%	35%
Completely support	54%	16%	13%	20%
NET	100%	100%	100%	100%
Summary				
NET Oppose	4%	12%	26%	18%
Neither	11%	38%	34%	27%
NET Support	85%	51%	40%	55%
Sample n	981	981	981	981

The reduction of leaks from the system pipelines is clearly the most supported strategy. Fifty-four per cent “completely support” and a further 31% “tend to support” this strategy.

Note that, whilst at some distance behind the most favoured strategy, the second most strongly supported option (20% “completely support”, 35% “tend to support”) is the prospect of switching from gas to electric household appliances. This option (55%) has slightly more support than the notion of injecting non-fossil fuels into the gas network (51%). The purchase of offsets has the lowest net support.

The scale of the differences in support can also be shown in the following graph, in which the "neither" response has been omitted for clarity.



The relative levels of support are clear int the above.

The section overleaf provides a measure of the strength of commitment that customers have towards each of the strategies.

2.5.1 AMOUNTS WILLING TO PAY FOR CARBON REDUCTION STRATEGIES.

In an endeavour to estimate the amount of a financial commitment gas customers were prepared to make to achieve the supported strategies, respondents who supported the various strategies (other than switching from gas to electric appliances) were asked to indicate the acceptable level of monthly or quarterly increase to their gas bill to achieve the desired outcome. The question posed was:

How much extra would you be prepared to pay on your gas bill to achieve this, noting that the WA gas network operator's charges are forecast to increase over the next five years due predominantly to higher interest rates and inflation?

The response options were:

- Nothing $0
- Up to $10 per quarter ($2.50 per month)
- From $10 to $15 per quarter ($2.50 to $5 per month)
- From $15 to $30 per quarter ($5 to $10 per month)
- More than $30 per quarter More than $10+ per month)

2.5.1.1 REPLACE LEAKING PIPES.

Almost nine in ten (85%) supported the strategy of repairs to leaking pipes – (54% "completely support", and 31% "tend to support"). This produced a subset of 838 respondents who supported the concept. They were asked to indicate the amount extra they would pay above the other increases due to rising costs of providing the network (due to elevated interest rates and inflation) . For convenience the table below expresses the costs as a monthly figure only.

Whilst this strategy clearly had the highest level of support, slightly over one in four (27%) supporters indicated that they would be prepared to pay nothing to achieve this outcome. Certainly, 73% of supporters were prepared to pay something, but only a third (33%) were prepared to pay more than $2.50 extra a month to achieve extended rate of replacement of leaking pipes.

The second column of figures below shows the proportion of all gas customers (including those who did not support this strategy) who would be prepared to pay various amounts to achieve this strategy. **We have assumed that those who did not support the strategy would be prepared to pay nothing in support of this endeavour.**

The third column shows that 62% of all gas customers would be prepared to pay up to $2.50 a month. Just 28% would be prepared to pay more than $2.50 a month, 8% would be prepared to pay more than $2.50 to $5.00 a month and just 2% more than $10 a month.

Amount prepared to pay to increase rate of replacement of leaking pipes	Amongst Supporters	Amongst total Customer base	Total Customers "At least" accumulative proportions
Nothing $0	27%	38%	100%
Up to $2.50 / month	40%	34%	62%
$2.50 to $5 / month	23%	20%	28%
$5 - $10 / month	8%	7%	8%
>$10+ / month)	2%	2%	2%
Sample	838	981	

The upshot is that whilst 62% of gas customers would be prepared to pay at least something on top of their normal gas bill to support the strategy of increasing the rate of replacement of leaking pipes, that commitment falls away sharply beyond levels of $2.50 per month.

2.5.1.2 INJECTION OF NON-FOSSIL FUELS.

Just 51% of gas customers supported the strategy of injecting non-fossil fuels into the gas network. This subgroup of 495 were asked to indicate how much they would be prepared to pay above their normal gas bill in support of the injection strategy.

The table below shows the proportions willing to commit to various levels of additional expenditure. As before we have expressed in terms of monthly cost increase only. Again we have assumed that those who did not support this strategy would not be prepared to pay anything.

Amount prepared to pay to Inject non-fossil fuels into the gas network	Amongst Supporters	Amongst total Customer base	Total Customers "At least" accumulative proportions
Nothing $0	27%	63%	100%
Up to $2.50 / month	42%	21%	37%
$2.50 to $5 / month	20%	10%	16%
$5 - $10 / month	9%	4%	6%
>$10+ / month)	2%	1%	1%
Sample	495	981	

Just 37% of gas customers are prepared to contribute anything in their gas bill to support the non-fossil fuel injection strategy. This falls away materially to just 16% prepared to pay at least an additional $2.50 to $5 a month, 6% at least $5 - $10 a month and just 1% are prepared to pay more than $10 a month.

2.5.1.3 PAYING FOR CARBON OFFSETS.

This strategy was given the lowest level of support, at just 40% of gas customers in support of this option. This subgroup of 390 supporters was asked about their level of financial support. The table below follows the same format as the previous two.

Amount prepared to pay to Purchase carbon Offsets	Amongst Supporters	Amongst total Customer base	Total Customers "At least" accumulative proportions
Nothing $0	21%	68%	100%
Up to $2.50 / month	44%	18%	32%
$2.50 to $5 / month	23%	9%	14%
$5 - $10 / month	9%	4%	5%
>$10+ / month)	3%	1%	1%
Sample	390	981	

Whilst 79% of supporters of this concept would be prepared to pay something towards this goal, that represents just 32% of the total gas customer base (see the third column). That modest level of commitment falls away quickly at levels of at least $2.50 to $5 a month (14%), at least $5 - $10 a month (5%) and just 1% prepared to pay more than $10 a month in addition to their normal gas bill.

2.6 PROSPECTS FOR ELECTRIC SUBSTITUTION FOR GAS HOT WATER SERVICE.

Householders with a gas hot water service (HWS) were asked a series of questions about their HWS in an endeavour to predict the rate at which there may be a transition from gas to electric HWS over the next five years.

The 723 gas customers with a gas HWS were asked how old it is. Thirty-eight per cent reported it to be between 5 – 10 years old, and 19% that it was more than 10 years old. Given that the average working life of a gas HWS is about 10 – 12 years, the data suggests that over the AA6 period approximately half the current gas HWS units across the ATCO network are likely to be replaced.

The question of what is used to replace those units has the potential to become a significant factor in trends in domestic gas demand.

Age of Gas Hot Water Units	
Up to 5 years old	33%
From 5 – 10 years	38%
More than 10 years	19%
Don't know	9%
NET	100%
Sample	723

2.6.1 INITIAL PLANS FOR GAS HWS REPLACEMENT.

All gas HWS owners were asked about the path they would choose to replace their gas HWS. The question was posed as follows:

Gas hot water systems usually last about 10 – 12 years. When your system is due for replacement what sort of hot water system would you most likely install?

- ***Replace like for like, continue with a gas HWS***
- ***Switch to an electric HWS***
- ***Switch to a rooftop solar HWS with gas booster***
- ***Switch to a rooftop solar HWS with electric booster***
- ***Don't Know***

The table overleaf shows the responses, comparing the gender age group and solar PV status household responses.

It may be seen in the table below that whilst the most common response is to simply replace the unit with a like for like gas HWS, more than half are considering an alternative (or are unsure).

The younger cohort (18-39) is more likely than their older counterparts to opt to change to an electric system, and the oldest cohort (65+ yrs.) is the most likely to simply replace “like for like”. It is also notable that almost one in four don’t know what they will do. In the event of a sudden loss of hot water, it seems likely that they will opt for the simplest quickest and very often the most cost-effective solution – the “like for like” option.

		Gender		Age group			'Solar Panels?	
	NET	Male	Female	18-39 yrs.	40-64 yrs.	65+	Yes	No
Replace like for like, continue with a gas HWS	39%	38%	39%	22%	47%	51%	37%	40%
Switch to an electric HWS	16%	19%	13%	26%	10%	11%	18%	15%
Switch to a rooftop solar HWS with gas booster	12%	10%	13%	18%	8%	7%	13%	10%
Switch to a rooftop solar HWS with electric booster	11%	13%	9%	12%	9%	12%	15%	7%
Don’t Know	23%	20%	26%	22%	26%	19%	17%	28%
NET	100%	100%	100%	100%	100%	100%	100%	100%
NET Switch to lower gas consumption solution	39%	42%	35%	56%	27%	30%	46%	32%
Sample n	723	358	365	279	267	177	340	377

Overall some 39% of current gas HWS owners (16%+12%+11%) intend to change to a lower gas usage solution when their current HWS reaches the end of its useful life. This is the same proportion (39%) that would simply replace the gas unit with a similar one.

It is interesting to note the difference in plans between households with and without solar PV systems. Whilst approximately four in ten of each group plan to simply replace the gas HWS with a similar system, solar-PV households seem much more certain about their plans, having a much small “Don’t Know” response. Indeed they may be slightly more likely to opt for an electric system, or a rooftop solar with either a gas or (perhaps more likely) an electric booster. Overall 46% of the current gas HWS solar PV households (13%+15%+18%) are likely to switch away from the simple replacement of a “like for like” gas HWS. This compares with 32% (15%+10%+7%) of the gas HWS non-solar PV households.

2.6.2 THE EFFECT OF GREENHOUSE GAS ISSUES

To assess whether awareness of the significance of the HWS in gas usage had any effect on the HWS replacement plans, respondents **who had a gas HWS** were asked:

The largest gas consumers in the household are the hot water system and space heating. One way for consumers to reduce their greenhouse gas emissions would be to change from a gas hot water system to electric. Does this make you any more or less likely to switch to an electric hot water system when your current system needs replacing?

The results are shown in the table below. Note that about 3 in 10 (31%) indicate the information will have no effect in changing them from a gas HWS, and that almost 4 in 10 (38%) report that they are more likely to consider a change from the gas HWS. This result is consistent with the expressed desire to reduce greenhouse gas emissions. (see section 2.4). It would come with little financial penalty; if they have to change their HWS anyway, it would be a relatively simple step to make a change to a less carbon intensive solution.

Note that there is now a more significant difference in attitudes between the solar PV and non-solar PV households. Respectively 42% and 34% report that they would be more likely to switch to an electric system.

The younger cohort has the highest likelihood to switch from gas to electric, probably as a reflection of a greater environmental awareness.

Effect of information about the level of gas usage in an HWS		**Gender**		**Age group**			**'Solar Panels?**	
	NET	**Male**	**Female**	**18-39 yrs.**	**40-64 yrs.**	**65+**	**Yes**	**No**
Still very unlikely to change from gas	19%	18%	20%	6%	21%	36%	18%	19%
Still quite unlikely to change from gas	12%	12%	12%	9%	15%	13%	12%	12%
No effect one way or the other	23%	29%	18%	31%	22%	13%	20%	26%
Quite more likely to change from gas	24%	22%	25%	31%	23%	13%	24%	24%
Very much more likely to change from gas	14%	14%	14%	18%	10%	13%	18%	10%
Don't know	8%	5%	11%	6%	9%	10%	7%	9%
NET	100%	100%	100%	100%	100%	100%	100%	100%
Summary								
NET unlikely to change from gas	31%	31%	31%	14%	36%	49%	31%	31%
NET More likely to change from gas	38%	36%	40%	49%	33%	27%	42%	34%
Sample n	723	358	365	279	267	177	340	377

2.6.3 TECHNOLOGY IMPLICATIONS

All respondents (with or without a gas HWS) were asked if they were aware of the heat pump technology. The question posed was:

Are you aware of the heat pump technology in electric hot water systems?

The responses below show the majority are completely unaware of the technology.

Awareness of heat pump technology		Gender		Age group			'Solar Panels?	
	NET	Male	Female	18-39 yrs.	40-64 yrs.	65+	Yes	No
Yes, I know a bit about heat pump technology	22%	30%	14%	18%	21%	29%	28%	16%
Yes, considering installing a heat pump	13%	18%	8%	20%	8%	7%	16%	10%
Yes, I have a heat pump	4%	5%	3%	5%	3%	3%	5%	3%
No	61%	47%	75%	56%	67%	61%	51%	71%
NET	100%	100%	100%	100%	100%	100%	100%	100%
Sample n	981	486	495	394	347	240	497	477

Only one in four females, and slightly over half the males have any awareness at all of the heat pump technology. It is interesting to note the greater awareness amongst solar PV than non-PV households. Respectively 49% and 29% have at least some awareness of the technology. The younger cohort also reports much greater awareness than do their older counterparts and are much more likely to be considering heat pumps when their current system fails.

2.6.3.1 Reasons for adoption of Heat Pump Technology

The 17% who either had a heat pump (4%) or were considering one (13%) were asked what had motivated them to follow that path. The reasons nominated by the resultant sub group of 166 respondents are shown below.

Reasons for choosing heat pump technology for the hot water system.	
Environmental impact	28%
Reduce electricity bill	28%
Electrify household	22%
Purchase home with heat pump already installed	9%
Off-grid potential	8%
Other	3%
Don't know	2%
Sample n	166

As may be seen the environmental benefits rate equally in importance with the prospect of reducing electricity bills. Slightly more than one in five also commented that the step was part of a plan to electrify the household appliances.

2.7 POTENTIAL FOR HEAT PUMP TECHNOLOGY TO ENCOURAGE GREATER TRANSFER FROM GAS THE ELECTRIC HWS.

The measures above are based on the level of understanding that the community currently has about heat pump technology. To estimate the potential of the greater awareness of the attributes of the technology they heat pump was explained to customer as follows:

A heat pump is an electric hot water system that can be two to three times more energy efficient than a conventional electric hot water system. Paired with a solar PV systema heat pump can provide hot water at minimal operating costs to most households.

Replacing a gas hot water system with a heat pump costs more up front but has minimal costs to provide hot water using energy supplied by rooftop solar PV system.

Does this information make you any more or less likely to change from a gas HWS to a heat pump electric system when your gas unit needs replacing?

Effect of heat pump technology Information		Gender		Age group			'Solar Panels?	
	NET	Male	Female	18-39 yrs.	40-64 yrs.	65+	Yes	No
Still very unlikely to change from gas	13%	15%	12%	8%	15%	20%	11%	16%
Still quite unlikely to change from gas	7%	7%	7%	5%	7%	10%	6%	8%
Tend towards retaining gas but I'll look into it	24%	25%	24%	25%	24%	22%	24%	24%
Quite more likely to change from gas	26%	27%	26%	30%	29%	18%	26%	27%
Very much more likely to change from gas	14%	14%	14%	19%	11%	12%	19%	9%
Don't know	15%	12%	17%	13%	15%	19%	14%	16%
NET	100%	100%	100%	100%	100%	100%	100%	100%
Summary								
NET unlikely to change from gas	20%	22%	19%	13%	21%	29%	17%	24%
NET more likely to change from gas	40%	41%	40%	49%	40%	30%	45%	36%
NET At least look into it	64%	66%	64%	74%	64%	51%	69%	60%
Sample n	815	375	440	295	305	215	395	413

Once the fundamental aspects of the technology are explained to people, 40% report that they are more likely to change from gas when their hot water service needs replacement and almost two thirds will at least look into it. To the extent that the technology can show genuine cost savings over time, we expect that a large proportion of these household will make the switch to the heat pump system. That is particularly the case for households with solar PV's already in situ, for whom the likely running cost of hot water will be close to zero. The decision would be affected by the barrier of the initially higher cost of simply replacing the gas HWS with a similar system.

2.7.1.1 REASONS LIKELY TO REMAIN WITH GAS HWS.

The 20% who indicated that they were still unlikely to change from the gas HWS provided the following reasons:

Reasons Prefer to remain with Gas HWS *	
Just prefer Gas / reliable when power out	32%
Stay with what you know	23%
Heat pump initial cost	21%
Reduce costs /cheaper over time	10%
Doubt heat pump technology / savings	9%
Electricity too costly/gas cheaper	8%
No solar PV	4%
Don't know enough / need to investigate	4%
Environmental benefits	2%
Energy efficiency	1%
Rooftop solar HWS	1%
Very low usage of Hot water/not worthwhile	1%
Column n	137

NB This was a multiple response question.

The reasons provided amongst the 24% who were "tending towards gas but would look into" the prospect of a heat pump replacement for their end-of-life gas HWS are shown in the table below.

Reasons tend towards gas but would look into heat pump *	
Don't know enough / need to investigate	36%
Heat pump initial cost	16%
Reduce costs /cheaper over time	16%
Just prefer Gas / reliable when power out	12%
Stay with what you know	10%
Doubt heat pump technology / savings	5%
Electricity too costly/gas cheaper	4%
Environmental benefits	4%
Very low usage of Hot water/not worthwhile	4%
Energy efficiency	2%
Rooftop solar HWS	1%
Heat pump plus solar	1%
Sample	175

NB This was a multiple response question.

After “lack of knowledge” the heat pump initial cost is the main barrier to the uptake. There is some recognition of the prospect of cheaper costs over time, but the reliability of gas is also a factor inhibiting customers who (presumably) do not have a solar PV array.

The reasons amongst the 40% who indicated that they were more likely to switch to a heat pump are shown below.

Reasons likely to switch to heat pump *	
Reduce costs /cheaper over time	48%
Environmental benefits	43%
Don't know enough / need to investigate	9%
Energy efficiency	6%
Heat pump initial cost	5%
Heat pump plus solar	5%
Stay with what you know	4%
Just prefer Gas / reliable when power out	4%
Rooftop solar HWS	2%
Electricity too costly/gas cheaper	1%
Doubt heat pump technology / savings	1%
Very low usage of Hot water/not worthwhile	0%
No solar PV	0%
Column n	287

NB This was a multiple response question

The importance of the financial factor is clear in the above. This is followed by environmental considerations, perceptions of energy efficiency. Even amongst this group however there is a sentiment that gas is a more reliable energy source. It will require a solar PV array in the household to fully address this limitation of the electric option.

2.8 NEW HOMES GAS CONNECTIONS

Some 40% of respondent indicated that it was at least possible that they would have a new home built within the next 5 years. The younger 18 – 39 cohort was more likely, with 34% indicating it was at least quite likely, and 68% that it was at least possible.

Likelihood of new home build within 5 years.		Age Group		
	NET	18-39 years	40-64 years	65+
Definitely not	35%	17%	39%	58%
Very unlikely	23%	14%	29%	28%
No plans but it is possible	22%	33%	19%	10%
Quite likely	13%	25%	7%	2%
Definitely (have already made enquiries / plans)	5%	9%	3%	1%
Don't know	2%	1%	4%	2%
NET	100%	100%	100%	100%
Summary				
NET at least quite likely	18%	34%	10%	3%
NET at least possible	40%	68%	29%	12%
Sample n	981	394	347	240

The subset of gas customers who would at least possibly have a new home built within the next five years were asked about the importance of a gas connection. The results are shown overleaf.

The question asked of possible new homes buyers was:

How important is a connection to mains gas when considering to purchase/build a new home?

The results from the 418 potential new homes buyers are shown below:

Importance of gas connection to new home amongst possible new home buyers.		**Age Group**		
	NET	**18-39 years**	**40-64 years**	**65+**
Not important at all	5%	3%	7%	15%
Very low importance	13%	10%	15%	26%
Quite important	36%	37%	39%	21%
Very important	24%	27%	17%	17%
Extremely important	17%	18%	16%	12%
Don't know	6%	5%	7%	9%
NET	100%	100%	100%	100%
Summary				
NET Low Importance	18%	14%	22%	40%
NET High Importance	40%	45%	33%	29%
NET at least quite Important	76%	82%	72%	50%
Sample n	418	271	113	34

The great majority of new homes buyers report that it is at least "quite important" that a new home they have built would have natural gas connection. Four in ten rate it as being either "very" (24%) or "extremely" (17%) important. The suggestion is that any new home development that does not have reticulated gas connection will be at a significant marketing disadvantage if competing developments do have such a connection. Developers are only likely to offer properties without gas connections **at scale,** if there is some legislative imperative to do so.

3.0 THE SURVEY DETAILS

The survey was conducted over the period of 23 February 2024 to 10 March 2024. It was conducted as an online self-completion exercise, using the Thinkfield WA -specific online panel of some 45,000 adult WA residents. This is the same panel that PRG uses for its quarterly opinion polling program. The survey area was limited to the ATCO reticulation network – which is primarily dominated by the approximate 800,000 connections in greater Perth, and the regional towns of:

- Geraldton,
- Eneabba,
- Bunbury,
- Busselton,
- Harvey,
- Pinjarra,
- Kemerton,
- Capel

The sample was designed to reflect that distribution, resulting in a sample of 881 from greater metropolitan Perth and 100 from the ATCO country regions.

Only adults who were responsible for the gas account were surveyed, and all respondents confirmed that they were connected to the reticulated natural gas network.

The sample profile was managed by an iterative sample approach in which the profile of respondents was monitored and progressively adjusted over multiple iterations to ensure a stable final sample suitable for weighting to the Census derived adult population profile of the target area.

The final sample of 981 respondents provides a theoretical survey error of+ /-3% at the 95% confidence level.

3.1 SURVEY PRECISION

The survey results have quoted sample sizes in each of the tables and figures to provide a guide on the accuracy or the reliability of the data. Survey accuracy is a function of both the sample size and the distance that the survey results are from 50% (broadly, the further a survey estimate is from 50%, the more accurate it will be). Hence, while the exact confidence limits will vary according to the survey result itself, some broad tolerance limit guidelines have been quoted to provide a guide as to the accuracy of the survey results.

The survey error grid overleaf shows the extent to which survey error varies from the “worst case” of a 50% estimate, to the “most confident” assessment of 10% of the sample (or 90%) expressing a particular view.

Figure 3.1: Survey Precision Table

SURVEY PRECISION at 95% level of confidence		
	– Sample of 981	Population of 850000+
50/50	± 3 %	
60/40	± 2.83%	
70/30	± 2.45 %	
80/20	± 2.18 %	
90/10	± 2.05 %	

3.2 QUESTIONNAIRE DESIGN

The questionnaire was created by PRG and updated in consultation with ERA executives. The questionnaire was scripted as an online survey. It may be found in Appendix A to this document.

APPENDIX A QUESTIONNAIRE

Standard survey introduction then:

To start with can you please indicate:

S1 Place of residence postcode _____

S2 How old are you? (_____)

S3 Do you have mains gas connected to the property you live in?

Yes	1
No	2 Thank and terminate
Don't Know	3 Thank and terminate

S4 Are you the person who usually pays or manages the energy bills for the household?

Yes main person responsible	1	
Joint responsibility	2	
No – others look after that	3	Terminate

This survey is about the energy options for the household.

Q1 Can you please indicate the type of appliances you have in your household?

RANDOMISE	**MR** **Natural gas**	**MR** **Electricity**	**MR** **Both**	**MR** **Not applicable**
Kitchen stove top	1	2	3	99
Kitchen oven	1	2	3	99
Fireplace	1	2	3	99
Laundry dryer	1	2	3	99
Hot water unit	1	2	3	99
Pool/spa heater	1	2	3	99
Outdoor kitchen (not bottled gas)	1	2	3	99
Heater (other than a fireplace)	1	2	3	99

Q1a Thinking of your gas bills. Do you have a monthly direct debit arrangement, or do you pay a quarterly bill?

Pay a quarterly bill	1
Have a monthly direct debit	2 >Q2c
Not sure	3 >Q3

Q2a Approximately, how much was your last SUMMER quarterly **natural gas bill** in your household? If you're not sure of the amount, please provide your best estimate.

	Q2a	Q2b
Up to $50		
$50 to $100	1	1
$101-$150	2	2
$151-$200	3	3
$201-$250	4	4
$251-$300	5	5
$301-$350	6	6
$351-$400	7	7
$401-$450	8	8
More than $450	9	9
Don't know/ not sure	99	99

Q2b Approximately, how much was your last WINTER quarterly **natural gas bill** in your household? (CODE ABOVE) NB All who answered Q2b SKIP TO Q3.

Q2c What is the monthly debit amount for your gas?

Up to $15 a month	1
From $15 to $30 per month	2
From $30 to $50 per month	3
From $50 to $100 per month	4
More than $100 per month	5

Q3 Do you have air-conditioning in your household?

No air conditioning at all (apart from fans)	1
Evaporative ducted air conditioning	2
Reverse cycle ducted air conditioning	3
Individual room reverse cycle units	4
Movable evaporative units	5

Q4 Do you have solar PV panels?

Yes	1 >Q5
No	2
Don't know	3 >Q5

Q4a How likely are you to have a solar PV system installed within the next 5 years?

Not likely at all	1 >Q5
It is possible, but no real plans	2 >Q5
Quite likely	3 >4b
Very likely - I have made initial enquiries	4 >4b
Definite	5 >4b

Q4b You have indicated that within the next year 5 years, it is likely your household will install a solar PV system. Can you indicate why? (Select multiple if applicable)

Environmental impact	1
Electrify household	2
Government Rebate(s)	3
Reduce electricity bill	4
Purchase of EV	5
Off-grid potential	6
Other (Please specify)	9

Q5 Some types of household appliances can run on either electricity or gas. When your current appliance is due for replacement which option (in the grid below) are you likely to install?

	Gas	Electric	Whichever is cheaper	No preference
Cooktop	1	2	3	4
Oven	1	2	3	4
Hot water system	1	2	3	4
Heating (gas fire or reverse cycle air conditioning)	1	2	3	4

Q5b FOR EACH CODE 1 OR CODE 2 IN Q 5 ASK:

You mentioned you would install (Gas / Electric) for your (Appliance). Can you indicate why you have that preference? (select multiple if applicable)

Ease of cleaning	1
Modern appearance	2
Better temperature regulation	3
Tradition/familiarity	4
Always available / more reliable	5
Environmental impact	6
Running cost of appliance	7
Health	8
Ease of installation (like for like replacement)	9
Other (Please specify)	99

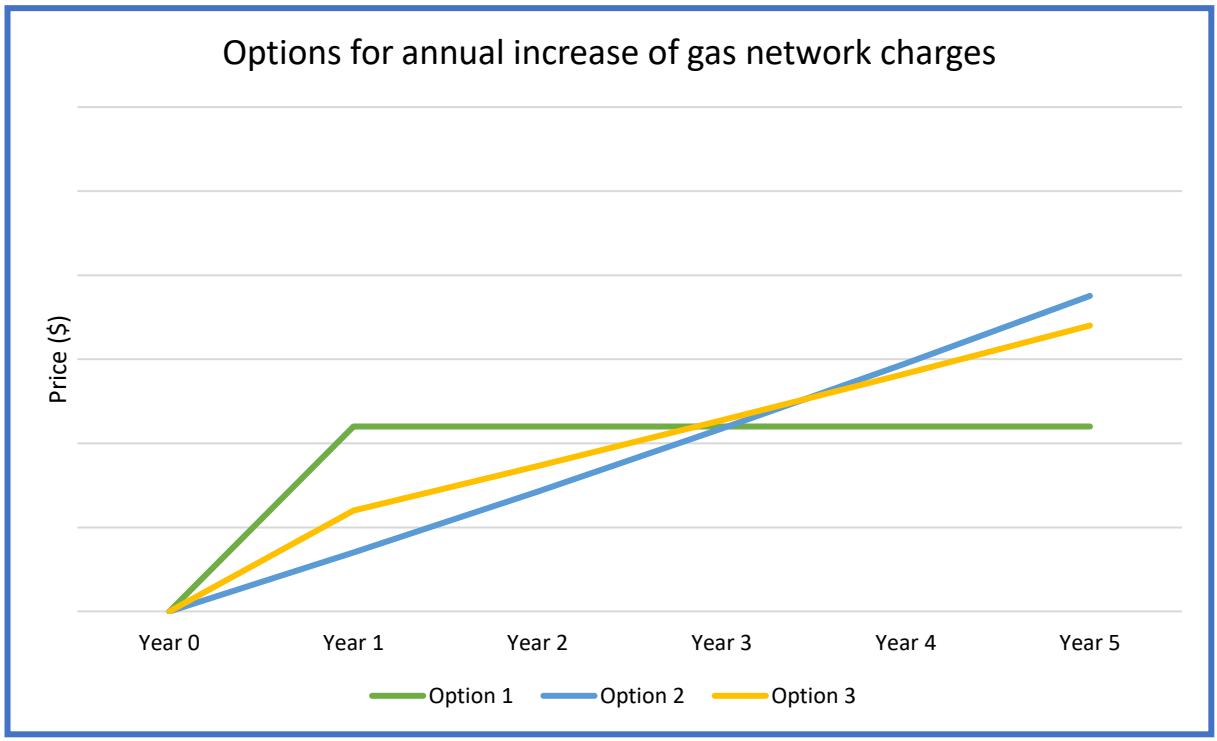
Q6 In WA the cost of maintaining and extending the gas pipeline network is estimated in five-year periods.

The WA gas network operator's costs are forecast to increase over the next five years due predominantly to higher interest rates and inflation. While no one likes to pay more, how would you prefer this cost is passed through to you?

Option 1 – One-off increase in the first year and constant prices for the remaining years (least overall cost option over five-year period)

Option 2 – The same percentage increase in prices each year (much lower percentage increase than first year of Option 1 but you will pay more over the five-year period)

Option 3 – Some combination of options 1 and 2, which results in a higher increase in the first year/s and lower annual percentage increases thereafter (pay more than Option 1 but less than Option 2 over the five-year period).



Annual percentage change (%)					
	Year 1	Year 2	Year 3	Year 4	Year 5
Option 1	11%	0%	0%	0%	0%
Option 2	3.5%	3.5%	3.5%	3.5%	3.5%
Option 3	6%	2.5%	2.5%	2.5%	2.5%

Can you indicate which of these three options you would prefer?

Option 1 – One-off increase in the first year and constant prices for the remaining years.	1
Option 2 – The same percentage increase in prices each year.	2
Option 3 – Some combination of options 1 and 2	3
Don't know	4

Q7 vacant.

Q8 How important is it to you to reduce your household's carbon footprint?

NB ROTATE DIRECTION OF SCALE

Not important at all	1
Very low importance	2
Quite important	3
Very important	4
Extremely important	5
Don't know	6

Q8a How important do you think it is to reduce your household's carbon footprint from the usage of GAS APPLIANCES in the home?

Not important at all	1
Very low importance	2
Quite important	3
Very important	4
Extremely important	5
Don't know	6

Q9 Currently, WA household gas usage produces greenhouse gas emissions through:

- Gas leaking from the pipelines
- Operational emission from gas network infrastructure
- Households burning gas

These emissions can be reduced by:

- Increasing efforts to replace leaking pipelines,
- Injecting non-fossil fuels such as hydrogen into the gas network,
- Purchasing carbon offsets (Investments in projects that reduce or remove greenhouse gas emissions on your behalf to balance out the carbon emissions that can't be avoided),
- Consumers reducing their emissions by limiting gas usage and/or switching from gas appliances to electric in the home.

By how much do you support or oppose each of these paths to reduce the greenhouse gas emissions from household gas usage?

RANDOMISE	Completely oppose	Tend to oppose	Neither	Tend to support	Completely support
Replace leaking pipes	1	2	3	4	5
Inject non-fossil fuels	1	2	3	4	5
Purchasing carbon Offsets	1	2	3	4	5
Switch some household appliances from gas to electric	1	2	3	4	5

Q9a FOR EACH CODE 4 OR 5 OF THE GREY SHADED ITEMS ASK:

How much extra would you be prepared to pay on your gas bill to achieve this, noting that the WA gas network operator's charges ~~tariffs~~ are forecast to increase over the next five years due predominantly to higher interest rates and inflation?

Nothing $0	1
Up to $10 per quarter ($2.50 per month)	2
From $10 to $15 per quarter ($2.50 to $5 per month)	3
From $15 to $30 per quarter ($5 to $10 per month)	4
More than $30 per quarter ($10 per month)	5

Q10 CHECK Q1 FOR GAS HOT WATER SYSTEM If yes continue. If no skip to Q13

You indicated that you have a gas hot water system. Do you know APPROXIMATELY how old that hot water unit is?

Up to 5 years old	1
From 5 – 10 years	2
More than 10 years	3
Don't know	4

Q11 Gas hot water systems usually last about 10 – 12 years. When your system is due for replacement what sort of hot water system would you most likely install?

Replace like for like, continue with a gas HWS	1
Switch to an electric HWS	2
Switch to a rooftop solar HWS with gas booster	3
Switch to a rooftop solar HWS with electric booster	4
Don't Know	5 >Q12

Q11a What are your reasons for that choice?

Q12 The largest gas consumers in the household are the hot water system and space heating. One way for consumers to reduce their greenhouse gas emissions would be to change from a gas hot water system to electric. Does this make you any more or less likely to switch to an electric hot water system when your current system needs replacing?

Still very unlikely to change from gas	1
Still quite unlikely to change from gas	2
No effect one way or the other	3
Quite more likely to change from gas	4
Very much more likely to change from gas	5
Don't know	6

Q13. Are you aware of the heat pump technology in electric hot water systems?

Yes, I know a bit about heat pump technology	1 >Q14
Yes, considering installing a heat pump	2
Yes I have a heat pump	3
No	4 >Q14

Q13a You have indicated that your household uses a heat pump hot water system or is considering installing one. What are the reasons for choosing a heat pump hot water system?

Environmental impact	1 >D1
Electrify household	2 >D1
Purchase home with heat pump already installed	3 >D1
Reduce electricity bill	4 >D1
Off-grid potential	5 >D1
Don't know	6 >D1
Other (Please specify)	9 >D1

Q14 A heat pump is an electric hot water system that can be two to three times more energy efficient than a conventional electric hot water system. Paired with a solar PV systema heat pump can provide hot water at minimal operating costs to most households.

Replacing a gas hot water system with a heat pump costs more up front but has minimal costs to provide hot water using energy supplied by rooftop solar PV system.

Does this information make you any more or less likely to change from a gas HWS to a heat pump electric system when your gas unit needs replacing?

Still very unlikely to change from gas	1
Still quite unlikely to change from gas	2
Tend towards retaining gas but I'll look into it	3
Quite more likely to change from gas	4
Very much more likely to change from gas	5
Don't know	6

Q14a Can you indicate the main reasons for that?

DEMOGRAPHICS

D1 Are you?

Male	1
Female	2
Non binary/ other	3

D2 Which of the following best describes your current employment circumstance?

Casual worker	1
Part time worker	2
Full time worker	3
Sole trader	4
Unemployed	5
Not in workforce (student, home duties, pension, retired etc)	6

D3 And can you estimate your annual household income (before tax taken out).

(Household income is the combined income of the household heads if both working)

Up to $40,000	1
$41,000 - $75,000	2
$76,000 - $115,000	3
$116,000 - $185,000	4
$186,000 or more	5
Prefer not to say	98

D4 Do you currently own or rent the home you are living in?

Own Home – with mortgage	1
Own Home – no mortgage	2
Renting	3
Not my home (with parents / relatives)	4

D5 How likely are you to have a new home built in the next 5 years?

Definitely not	1 >D7
Very unlikely	2 >D7
No plans but it is possible	3
Quite likely	4
Definitely (have already made enquiries / plans)	5
Don’t know	6

D6. How important is a connection to mains gas when considering to purchase/build a new home?

Not important at all	1
Very low importance	2
Quite important	3
Very important	4
Extremely important	5
Don't know	6

D7 Who is your natural gas retailer?

(RANDOMISE 1-9)	**SR**
Alinta Energy	1
AGL	2
Kleenheat	3
Origin Energy	4
Simply Energy	5
Other (please specify)	9
Prefer not to say	10

That's it. Thank you for completing the survey.