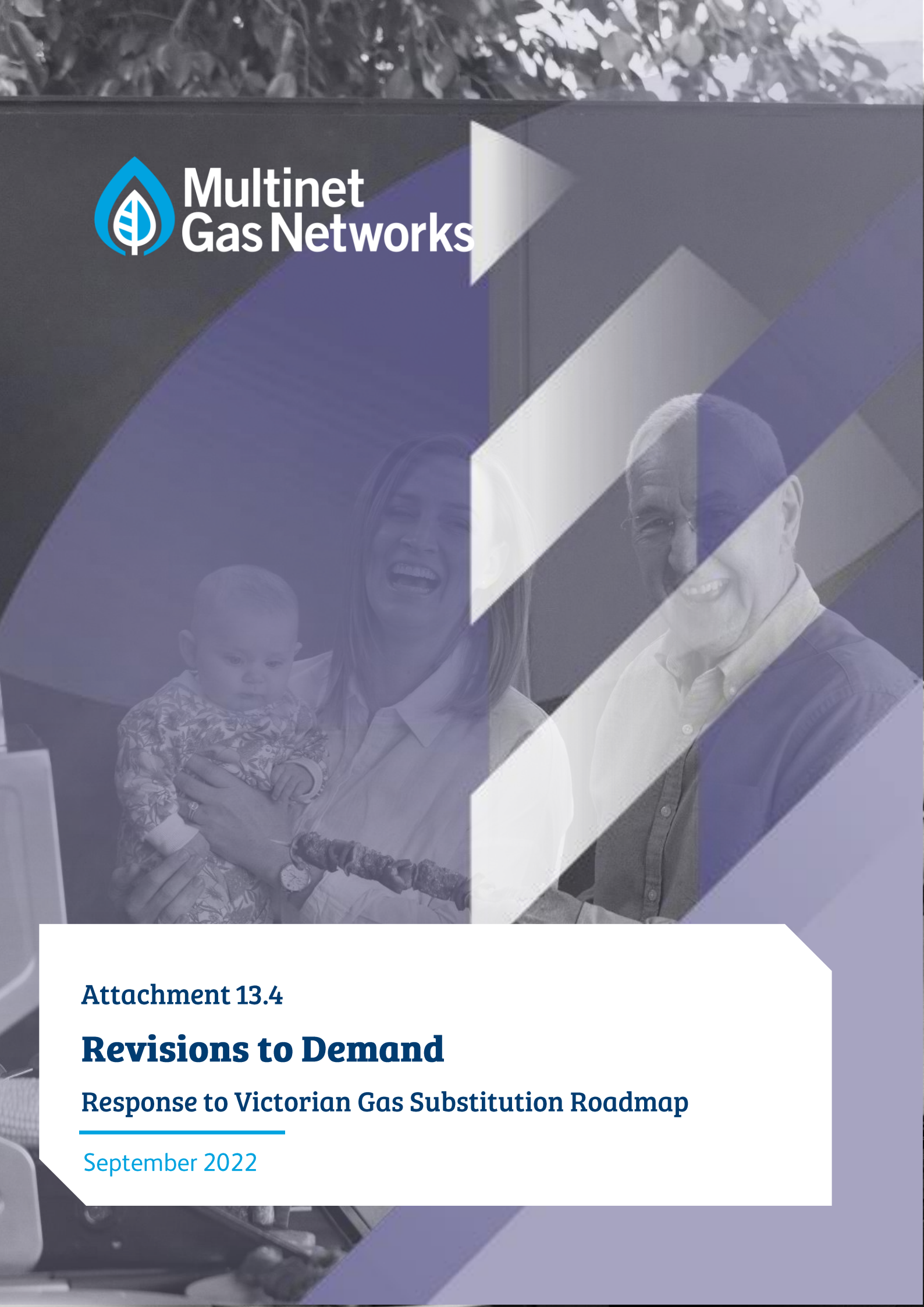


Multinet Gas Networks

Attachment 13.4

Revisions to Demand

Response to Victorian Gas Substitution Roadmap

September 2022

1 Revisions to our Demand Forecast

The Victorian Government's Gas Substitution Roadmap was released on 2 July 2022. It maps out the strategy for Victoria's gas sector towards net zero emissions by 2050 and contains several measures which will reduce gas demand, particularly in the Residential and Commercial sectors.

We have revised our Final Plan demand forecast to reflect the impact of the Gas Substitution Roadmap.

1.1 Overview

This attachment sets out revisions to our Final Plan demand forecast proposal for the Multinet gas distribution network over the next (2023/24 to 2027/28) Access Arrangement (AA) period in response to the Victorian Government's Gas Substitution Roadmap (GSR). In the next AA period we expect demand in our Residential segment to fall by 5.5% per annum and in the Commercial segment to fall by 1.9%. The industrial forecast remains unchanged from our Final Plan.

1.2 Customer and stakeholder feedback

Table 1.1: Customer and stakeholder feedback

What we heard	Our response
Final Plan	
• Stakeholders noted that they were comfortable with the approach to forecasting demand, including taking account of decarbonisation policies which will affect future demand. • Stakeholders questioned whether our demand forecast was overly optimistic given policy uncertainty in Victoria.	Our Final Plan demand forecast was based on the best information available at that time, acknowledging that the outcomes of the Gas Substitution Roadmap were then uncertainty. Now that the GSR has been released, we have more policy direction than we had when writing our Final Plan. We can break down the GSR's likely impacts on the drivers of the total natural gas demand on our networks by forecast driver. Core Energy (Core) has allocated the various GSR impacts to both connections and consumption per connection. Using all available information Core
Post-Final Plan	
• Stakeholders observed that the 7-star rating standard in the National Construction Code biases customer choice towards electrification, given the difficulty outlined in achieving this with gas appliances. • Stakeholders asked whether we were starting to see any changes (slow down) in new connection rates this year. • There is significant uncertainly among more than a third of developers as to whether they will reticulate gas to connecting developments or not. • Significant work undertaken on all-electric options across home builder sector. • Customer sentiment research suggesting that customers are less likely to advocate for the use of gas than they were 12-months ago, with some Victorian's seriously considering disconnecting from the gas network.	AGIG agrees that the 7-star rating standard in the National Construction Code biases customer choice towards electrification, as do the ending of rebates for gas appliances and proposed increase in the rebates for electric appliances. We are observing an increase in disconnections on the Multinet network, although this is a nascent trend and will be monitored. We are aware that some builders have announced all-electric homes will be made available and that some are considering the viability of reticulating into their new developments. We have responded to this uncertainty by reducing our demand forecast by allocating the various impacts of the GSR and NCC to the drivers of our demand forecast, connections and consumption per connection. Using data from both internal and external customer surveys, we have assessed the likely impact on both the likelihood existing connections will remain on our network and the number of new connections that will connect to our network in the future. We have assessed the impact of the GSR and NCC on the consumption per connection of our existing customers, and the consumption per connection of the new customers who join the network given the enhanced incentives that will be in place to electrify appliances.
GSR Outcome	
We have amended the Residential and Commercial segments of our demand forecast down in response to the measures outlined in the GSR and the NCC.	
Stakeholders are keen to further engage with us and the impact of the GSR on our demand forecasts.	

1.3 Gas Substitution Roadmap

The GSR provides several incentives and policy measures to encourage electrification of some gas loads, particularly in the residential sector. The GSR measures will affect how our existing customers use gas in their homes and businesses, as well as the rate of consumption and connection of our future customers.

The GSR includes the following measures:

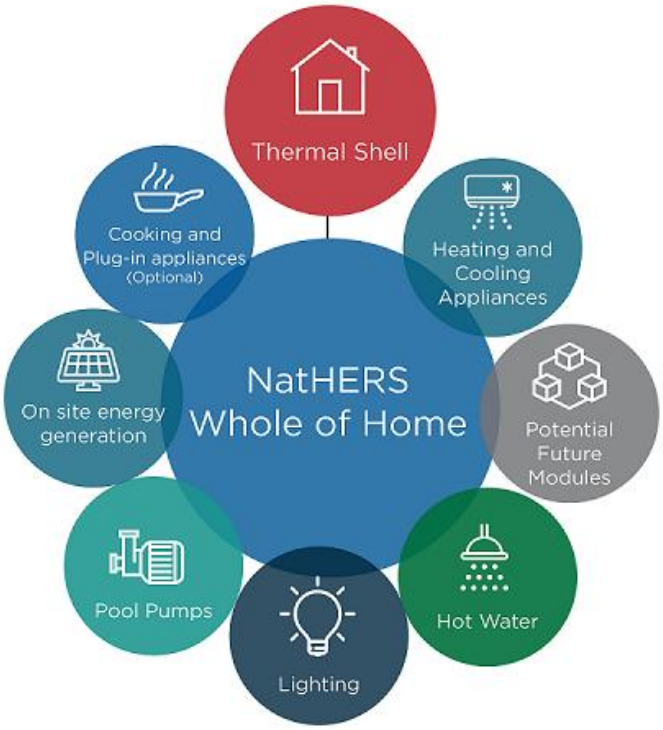
- Expansion of the Victorian Energy Upgrades (VEU) scheme with enhanced incentives to switch to electric appliances;
- Phasing out rebates for natural gas appliances by the end of 2023;
- Changes to Victoria Planning Provisions in 2022 to remove the requirement for new housing developments to be connected to gas; and
- Adopting the 7-Star Standard for new home construction in the new National Construction Code (NCC) which takes account of home energy appliances in addition to the thermal shell of the building.

We believe that the 7 Star Standard, which will utilise the National House Energy Rating Scheme (NatHERS), will have the greatest impact on natural gas demand. The NatHERS Whole of Home scheme promotes energy efficiency for new homes and apartments. The new NCC will be available for voluntary use from 1 October 2022 and 7-star rating provisions will enter into force on 1 October 2023.

NatHERS comprises of:

- Thermal Comfort which is currently required to meet a 6-star standard. The NCC will change the requirement to 7 stars in 2023; and
- Whole of Home Component (appliance efficiency component) – setting an 'annual energy use budget' for the home, which is driven by emissions intensity.

Figure 1.1: NatHERS diagram showing the factors considered in the Whole of Home score



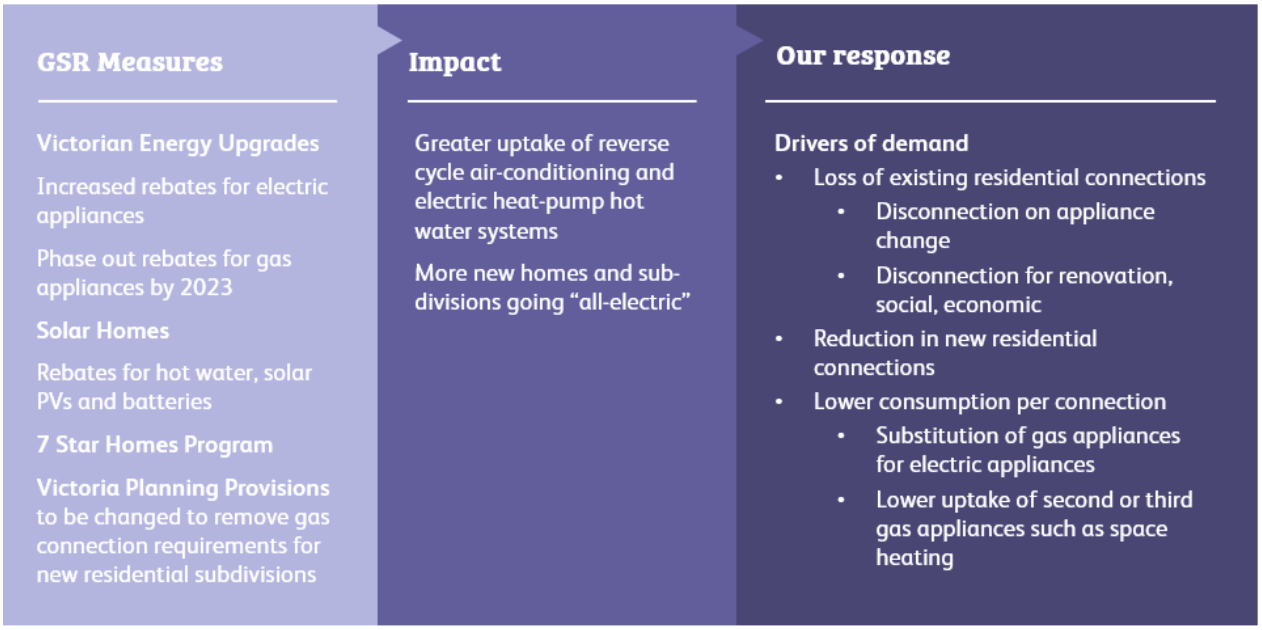
This NatHERS Whole of Home budget test can be satisfied by installing energy efficient appliances (which can be either gas or electric) as long as the annual energy budget is not exceeded. The energy budget is primarily driven by the size and features of the home. Solar panels can be installed to help meet the entire budget including if gas appliances are chosen. This will effectively make solar panels an essential part of almost every new home, particularly those that choose gas appliances as they are allocated a high emissions score.

1.4 Impact of the Gas Substitution Roadmap on our distribution network's demand

In the near-term the GSR targets residential and commercial natural gas consumption with a view to freeing up that natural gas for the industrial sector. The reduction in residential and commercial natural gas demand will be achieved in a number of ways, including but not limited to:

- Lower consumption per connection as gas appliances are replaced with electric appliances at or before the end of their useful life, driven by enhanced subsidies for electric appliances and no ongoing subsidies for gas appliances;
- These subsidies will increase conversion of existing homes to all electric appliances when homeowners renovate and drive increased disconnection from our network. The subsidies will also further encourage change out of gas to electric appliances by those customers who either believe that converting to electric appliances will reduce their energy bills, those who believe that electricity has lower emissions intensity than natural gas, or those who consider there is no future for the gas network;
- Lower connections growth due to changes to planning laws and the introduction of the 7-star rating standard, which will foster growth in all electric developments, thus reducing new connections and also influencing appliance choice in all new homes; and
- Lower consumption per connection driven by the national 7-star standard for new home construction which will be adopted in Victoria. This will drive appliance choice away from gas and will see more houses constructed with fewer gas appliances. For instance, new homes may only contain appliances for cooking and hot water but use reverse cycle air conditioning instead of a gas space heater in order to satisfy the 7-star rating requirements. This is because gas appliances are deemed higher emissions, so those customers who choose gas appliances may have to also install solar panels, or other measures, to offset the deemed higher emissions. The measures required to offset the gas appliance will therefore increase the overall construction cost of a new home, providing a strong disincentive to connect to our network.

Figure 1.2: GSR measures, impacts and AGIG response



There will also be indirect impacts on industrial gas consumption. However this addendum to the Final Plan demand forecast updates only for the impacts of the GSR on the residential and commercial segments, hence our industrial forecast remains unchanged.

1.5 Comparison with AEMO Forecasts

The Final Plan demand forecast largely followed the trajectory of AEMO's Progressive Change[1] scenario until 2025 when AEMO's forecast increases. The Final Plan demand forecast now requires revision due to the GSR's release shortly after the submission of our Final Plan. The GSR is designed to reduce demand for gas in Victoria, particularly in the residential and commercial segments.

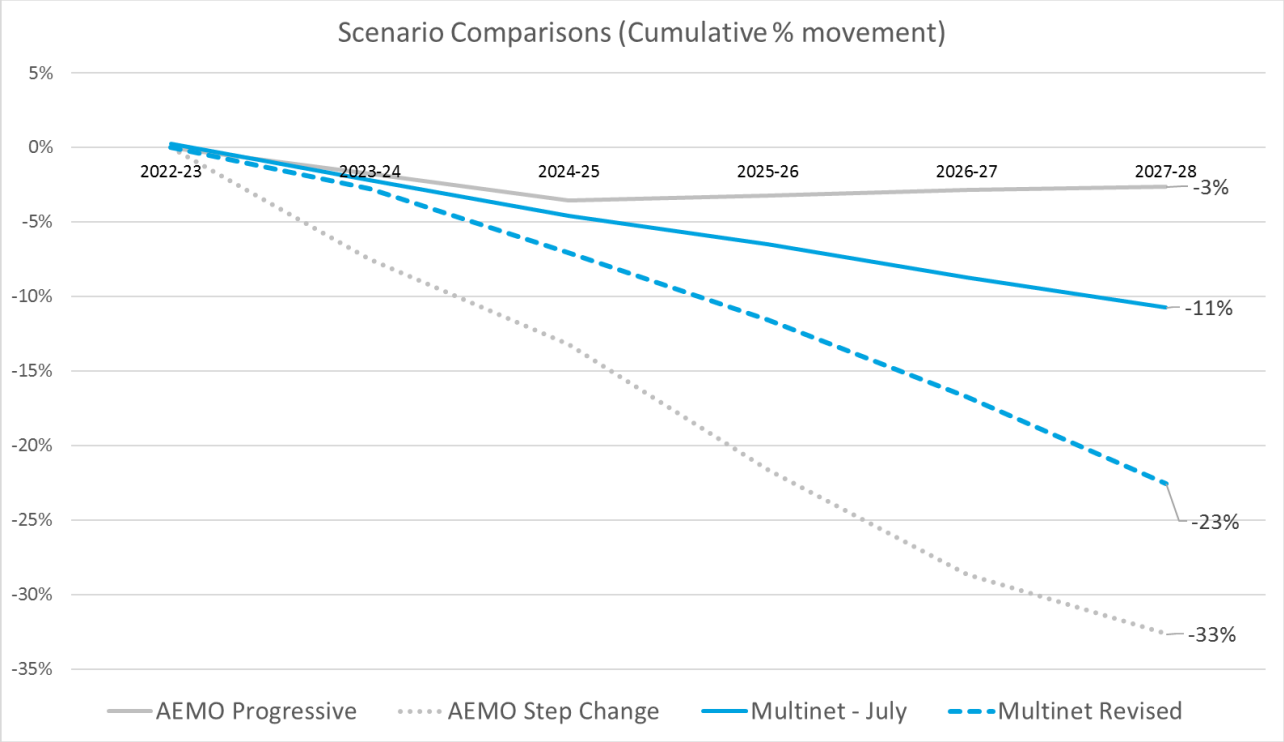
The objective of the GSR is to significantly accelerate electrification of gas load in the near future, while acknowledging that renewable gases including blending in the network have a role to play in the future. This focus on near term electrification significantly changes the outlook for gas demand in Victoria over the next five-year period, and brings our updated demand forecast more into alignment with AEMO's Step Change scenario[2].

Although our revised Final Plan demand forecast is significantly more conservative than AEMO's Step Change scenario as our view is that demand will not reduce as swiftly as contemplated in the Step Change scenario. However, it is important to bear in mind that the GSR assumes that the gas sector will do more than its share of the heavy lifting to achieve the legislated emissions targets set out by the Victorian State Government, so an argument could be made that our forecasts should be as low, or lower than, AEMO's Step Change Scenario shown in Figure 1.3 below.

[1] AEMO's Progressive Change scenario assumes a slower transformation and gas consumption closer to historical levels: https://aemo.com.au/-/media/files/gas/national_planning_and_forecasting/gsoo/2022/2022-gas-statement-of-opportunities.pdf?la=en, page 5

[2] Step Change assumes tangible and rapid change, with gas demand declining quickly and significant electrification (users switching from gas to electricity): https://aemo.com.au/-/media/files/gas/national_planning_and_forecasting/gsoo/2022/2022-gas-statement-of-opportunities.pdf?la=en, page 5

Figure 1.3: Multinet Residential and Commercial Forecast comparison with AEMO Scenarios



The Step Change scenario contemplates a near doubling of electricity consumed from the grid as transport, heating, cooking and industrial process go through a process of electrification. The scenario assumes this will be achieved by increasing wind and solar generation ninefold, solar PV fourfold and tripling the electricity network's firming capacity. AEMO consulted with stakeholders on which scenario is the most likely and after an 18 month consultation period beginning in September 2020, the results were overwhelmingly that the Step Change was the most likely future scenario.[3]

As can be seen in Figure 1.3 above, our revised Final Plan forecast reflects our view that the accelerated declines in gas consumption driven by the GSR will take longer to take effect than the AEMO Step Change scenario assumes. By the end of the next AA period, our demand forecast assumes that total gas demand is 23% lower than in 2022/23, whereas the AEMO Step Change scenario assumes it will have fallen by 33%.

It is important to note that our revised forecast of demand is more conservative in its forecast reduction of gas demand across our network, both in timing and the eventual annual reductions expected, than AEMO's Step Change scenario as the GSR has yet to be fully implemented and uncertainty remains around the exact legislative and policy change that will eventuate.

For instance, the GSR states that rebates on gas appliances will be phased out by the end of 2023 and conversely that rebates on electric appliances will be increased, but the value of those individual rebates has yet to be announced. The 7-star provisions of the new NCC will commence on 1 October 2023 with a transition period beginning in May 2023, but will require implementation in Victorian law. However, we do not yet know when the NCC will be enacted through Building regulations in Victoria specifically. Exactly how other measures in the GSR will be implemented is yet to be clarified and so we continue to be conservative in our estimate of demand in response to this uncertainty.

AEMO's Step Change scenario contemplates significant electrification and government intervention to transform energy markets and there is no doubt that whatever the final form of regulation resulting from the implementation of the GSR, it is likely to constitute a significant intervention in the Victorian energy market to accelerate electrification.

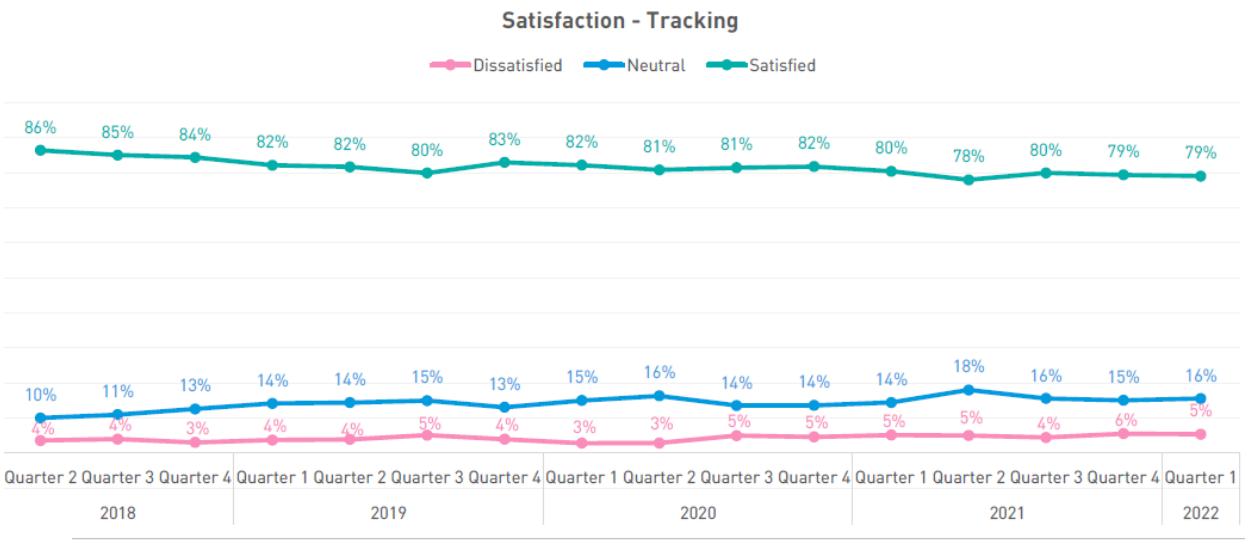
3 https://aemo.com.au/newsroom/media-release/nem-prepares-for-step-change

1.6 Customer and industry insights

To provide context to our revised demand forecasts, it is important to analyse the current state of the natural gas market, prior to the introduction of the measures in the GSR. McGregor Tan, a market research firm, conduct regular customer satisfaction surveys of our customer base. We have used the latest McGregor Tan survey which only became available just prior to the submission of our Final Plan.

The April 2022 survey identified that the number of satisfied customers is falling, whilst those who are neutral towards gas or dissatisfied with their gas connection are rising (see Figure 1.4).

Figure 1.4: McGregor Tan Survey - satisfaction tracking

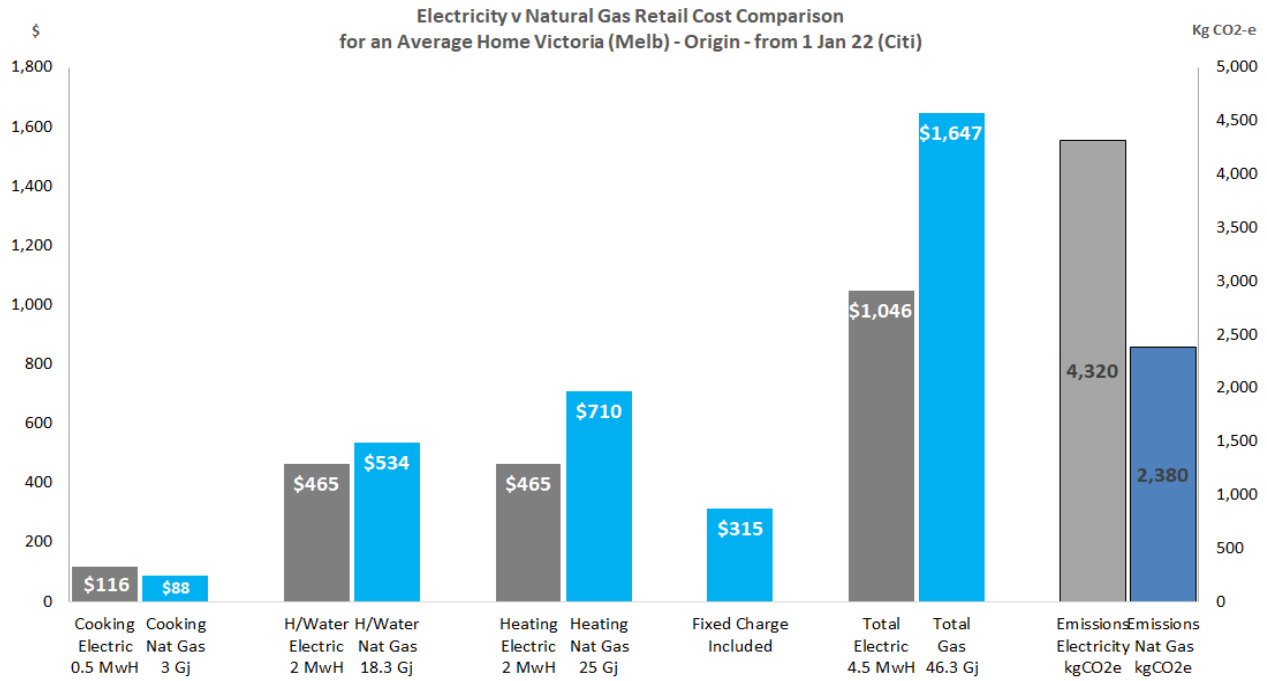


There are a few reasons for these falling levels of satisfaction:

- Cost – this is perhaps the primary driver of the falling satisfaction levels as many customers have the perception that gas is more expensive than electricity
- Emissions – there is a perception that gas is more emissions intensive than electricity

Many of these perceptions have been formed off the back of negative media coverage around gas as a form of energy, however gas is currently cheaper and cleaner than electricity, and has its own decarbonisation path. Through the use of renewable gases, i.e. biogas and hydrogen, the gas industry will decarbonise. However negative sentiment driven by negative media coverage continues to shape perceptions.

Figure 1.5: Electricity v Natural Gas Cost Comparison (AGIG analysis)



With the recent completion of the 2021/22 financial year, we have found growth in net connections fall by 70% when compared to the 2020/21 financial year. This reflects the changes in sentiment outlined above which translated into weak demand for natural gas prior to the implementation of measures in the GSR. Some builders are responding to this consumer sentiment by offering 'all electric' options in their new homes, with one prominent builder operating in Victoria only offering all electric ranges for new homes.

These builders have a significant influence on appliance selection, as the customer must choose options which bundle up into the total cost of construction. Given the incentives that will be on offer in 2023 for electric appliances and the lack of incentives for gas appliances, combined with the additional cost driven by the NCC necessitating solar panels, particularly when gas appliances are chosen, builders will likely drive significant falls in gas demand through their offerings to the Victorian market.

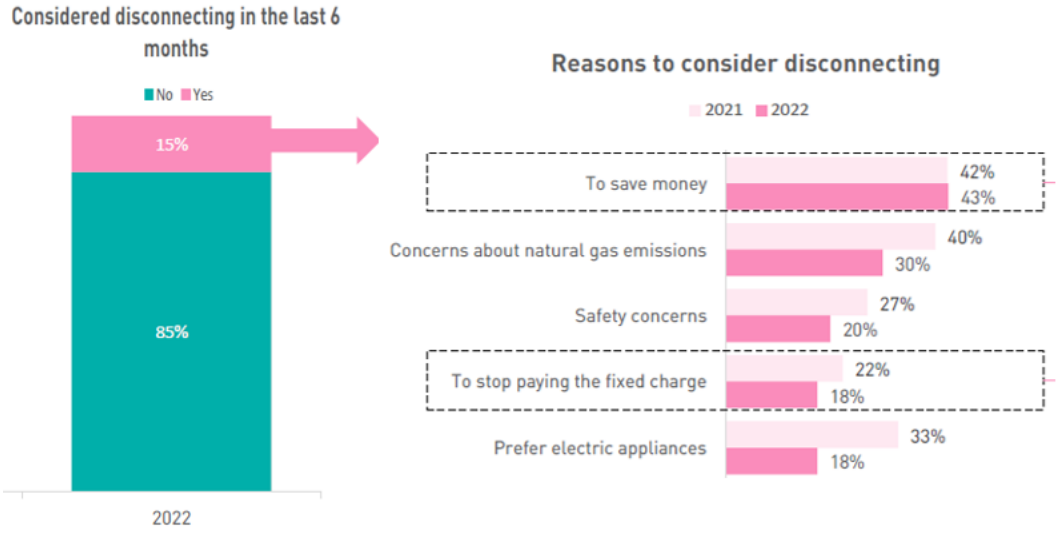
First home buyers are particularly affected by these changes, as the soaring cost of building a new home is already placing significant financial burden on this group.

Furthermore the Victorian Plumbing Regulations will be amended to reflect the NCC which means there will no longer be a requirement for solar gas hot water if a home is connected to our network. The appliance choice will simply be driven by the NatHERS Whole of Home rating tool.

We are also observing that many existing customers are considering leaving the network, with 15% having considered disconnecting in the last 6 months (see Figure 1.6 below).[4]

4 McGregor Tan, Australian Gas Networks - Voice of Consumers: Quarter 1 2022, page 50

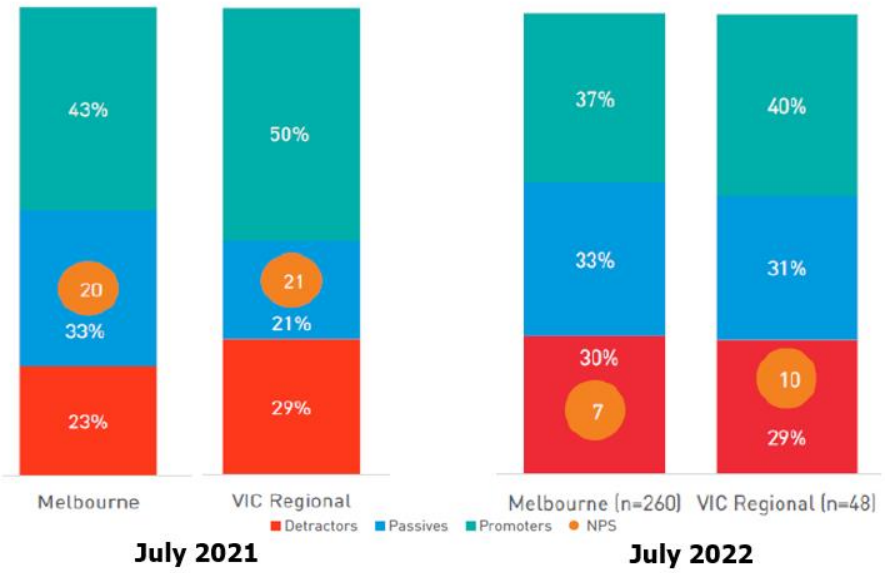
Figure 1.6: McGregor Tan Survey - customers considering disconnecting



We have a regular Voice of Customer (VoC) survey that we undertake twice yearly across AGIG's national operations. In this survey we ask customers the question 'Using a score of 0 to 10, where 0 is not at all likely and 10 is extremely likely, how likely are you to recommend your friends, family or colleagues to natural gas?'. This score is then tallied up and the percentage of detractors (scored a 0-6) are subtracted from the percentage of promoters (scored a 9-10) to give an overall Net Promoter Score (NPS). The NPS score can range from –100 to +100, with the closer the number to +100 the higher the levels of satisfaction with natural gas.

In the June 2021 iteration of this survey (see Figure 1.7), we scored an overall NPS of +20 and +21 in Melbourne and regional Victoria, respectively. One year later, these scores had dropped to +7 in Melbourne and +10 in regional Victoria. Of note, was the proportion of customers shifting from being a 'promoter' of gas to becoming more 'passive' in regional Victoria and the growth of 'detractors' in Melbourne. These findings suggest that there is a downward trend emerging around customers' views on gas and the extent to which they would advocate for its use among friends and family. AusNet has found a similar trend, albeit via a slightly differently worded question, in their energy sentiments tracker.

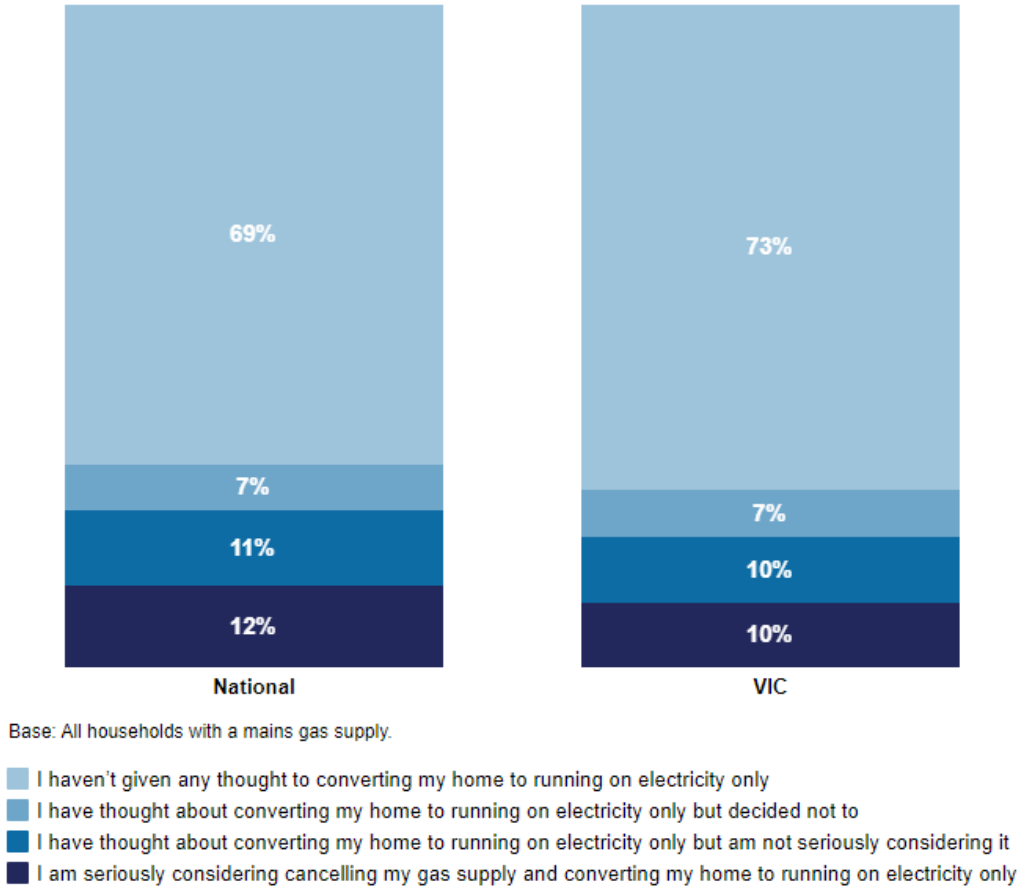
Figure 1.7: Voice of Customer Net Promoter Score



We have also drawn from external research to understand customer sentiment around gas. Energy Consumers Australia have been undertaking a national energy sentiments tracker survey since 2016. In the June 2021 iteration of this twice-yearly survey, they introduced a new question asking respondents '*Some Australian households have recently been cancelling their gas supply and converting their home to run on electricity only. Which of the following best describes you?'* respondents are then provided with the following response options *(i) I haven't given any thought to converting my home to running on electricity only (ii) I have thought about converting my home to running on electricity only but decided not to (iii) I have thought about converting my home to running on electricity but am not seriously considering it, and (iv) I am seriously considering cancelling my gas supply and converting my home to running on electricity.*

As shown below, the results of their June 2021 survey indicates that 10% of Victorian households are seriously considering switching out their gas appliances in favour of electric options, the motivations for this are not explored in the survey. The ECA is expected to publish an updated figure on this question in October 2022.

Figure 1.8: ECA June 2021 Survey



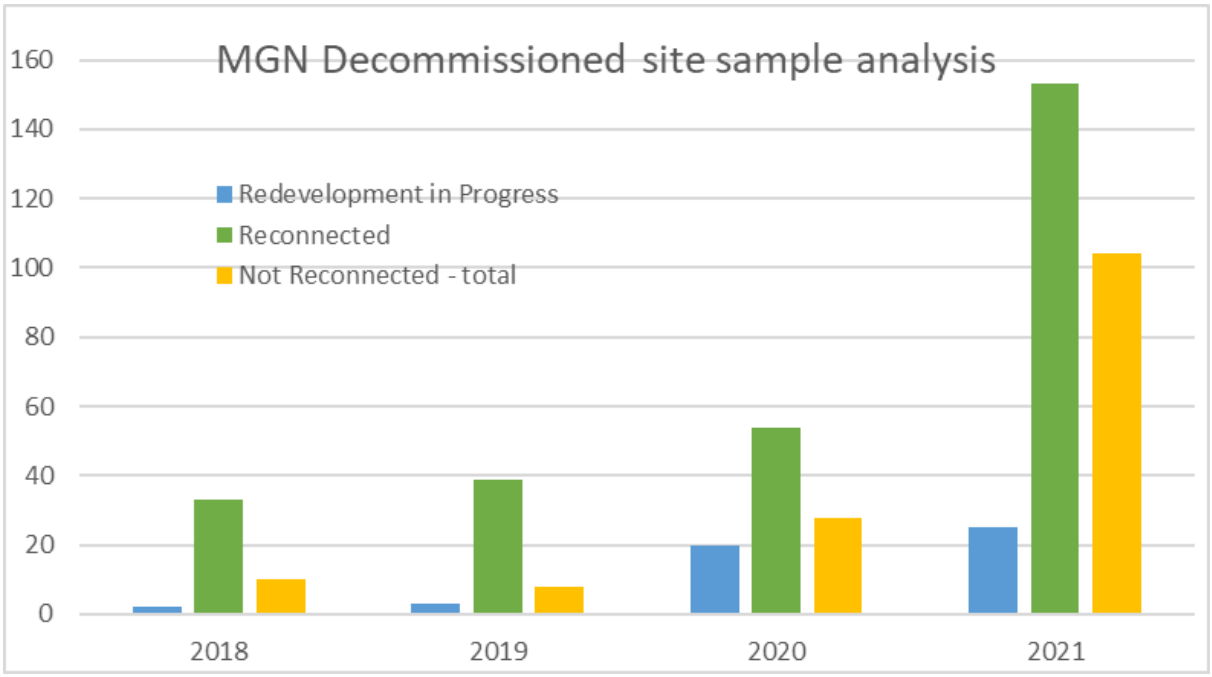
These customer insights allow us to gauge customer sentiment which will inform customer choice going forward. This weak customer sentiment combined with enhanced subsidies for electric appliances and the NCC will drive natural gas demand on our network lower. Statistics such as this have been used to form assumptions around the likelihood of customers to disconnect from our network, particularly when presented with the GSR incentives.

This ECA research and the McGregor Tan report indicate that between 10% and 15% of natural gas customers are considering disconnecting from our network. This helped shape Core Energy's (Core's)

assumptions, particularly assumptions around the number of customers who will either leave the network at the appliance redundancy point, when renovating, or for economic or social reasons.[5]

We are also observing an increase in decommissioned sites on the Multinet network, i.e. customers that are choosing to disconnect entirely from our network. This is a nascent trend which emerged during 2021.

Figure 1.9: Electricity v Natural Gas Cost Comparison



A recent ECA survey[6] indicated that in Victoria, 10% of customers are 'seriously considering cancelling my gas supply and converting my home to3 running on electricity only'.

1.7 Core's Methodology

The GSR in combination with overarching federal and state emissions targets will drive gas demand lower than the historical decline in total demand in the distribution network across all segments of the gas market. This departure from historic trends means the currently accepted way of forecasting demand, i.e. forecasting connections based on forecast dwelling construction and consumption per connection based on historic trends of weather normalised demand, no longer gives rise to the best forecast available and needs to be modified. This is because these historic relationships and trends will become less relevant to future gas demand. This accepted methodology still forms the foundation of Core's revised Final Plan demand forecast, but post-model adjustments must be made to reflect the GSR and its future impacts.

Core has quantified the impact of all known policies directly impacting gas demand, i.e. the Victorian Energy Upgrades (VEU) scheme and Energy Efficiency in Social Housing Program (EESHP). It has not explicitly factored in the impact of other government programmes which will indirectly impact gas demand, for instance the Victorian Government's Solar Homes program, which program has recently announced increased rebates and zero interest loans for installed solar[7].

Core has also worked in conjunction with our internal customer experts to determine what is the most likely future demand for gas in our networks going forward. This is not a straightforward task as the GSR

5 See attachment 13.1A

6 ECA Survey, https://ecss.energyconsumersaustralia.com.au/sentiment-survey-june-2021/interactive-data-set/, June 2021

7 https://www.premier.vic.gov.au/sites/default/files/2022-08/220824%20-%20New%20Builds%20Slash%20Costs%20With%20Solar%20.pdf?utm_source=miragenews&utm_medium=miragenews&utm_campaign=news

contains measures which will eventually translate into government policy, however this policy is not yet implemented.

For instance, the NCC will likely be implemented by the Victorian Government but what is unclear at the time of writing is the transition period, which will have a material impact on the pace of change in demand throughout the AA period. The transition period is at the shorter end of its speculated duration, we therefore expect the GSR will impact building approvals as early as late 2023.

Furthermore, we know that rebates on gas appliances will end, however we do not know the quantum of the rebates that will be available for electric appliances and what the consequent impact on demand will be.

Core has responded to this policy uncertainty by breaking down the drivers of the demand forecast into connections and demand per connection and assessing the impact of the GSR on each.

On the connections side, Core has segmented the impacts into both existing and new connections. Existing connections have been further broken down into those connections that may be lost at the point of appliance redundancy and those customers that may spontaneously electrify for economic or social reasons, or at the point where they renovate their house.

On the demand per connection side Core has first looked at the average reduction in demand for existing customers who do not leave the network, where a space heater or a water heater are swapped for an electric appliance. Then they looked at the impact on demand per connection for those new customers who may choose a different mix of appliances given the influences of the GSR on those choices, i.e. both improved rebates for electric appliances and the NCC's now requiring an assessment of the emissions intensity of their chosen appliances.

Core has provided a short report which describes these adjustments to its Final Plan forecast (attachment 13.1A).

1.8 Impact of GSR in Core's Forecast

Core has mapped the impacts of the GSR to the drivers of its demand forecast to accurately quantify the reduction in demand expected. It has made this change by way of a post-model adjustment, meaning the fundamental methodology of the forecast which has been regularly accepted by the AER in the past has not changed. The impacts are an adjustment to the Final Plan forecast already submitted on 1 July 2022.

The two main drivers of Core's demand forecast are connections and consumption per connection. These two drivers are multiplied together to derive total demand.

The GSR impacts on the connections driver are split into existing and new customers. Core has separately quantified the number of existing customers who are likely to disconnect from the network given the incentives offered by the GSR and NCC and also the number of new connections we will lose using the best available information. The GSR impacts on the consumption per connection driver are split into existing and new customers, and by appliance type. Core has looked at the GSR impacts at a granular level to as accurately as possible estimate impact of the GSR on future demand.

With respect to the residential segment, Core has then adjusted for the impacts of the GSR which are as follows:

Figure 1.10: Summary of Revised Forecast Assumptions

Core Energy Scenario Manager		AA period Average	Comments
Connections			
Existing Connections - Average Annual Disconnections 1/15			
Existing Appliance Replacement (1/15)	No.	45,492	The life of a gas appliance is assumed to be 15 years. Once the appliance has been installed for 15 years it is assumed to fail and the customer faces an appliance replacement decision point. The forecast assumes that of that one fifteenth of our customer base (approximately 45,000) face this appliance replacement decision point every year. This is a conservative assumption since most customers have 2 or 3 appliances and therefore face this decision point every 5 to 10 years rather than every 15. Of this one-fifteenth, an average of 27% are expected to leave the network given the GSR electric appliance incentives and NCC requirements, starting at 1.25% and ending at 40% in 2027/28. The average consumption of existing customers is assumed to be 42 GJ, the average on the AGN network.
Reduction in Existing Connections	%	27.0%	
Reduction number	No.	12,283	
Cumulative	No.	30,593	
Estimated Loss	GJ	1,284,910	
Existing Connections - Renovation, Economic, Social Decision			
Existing G to E		0.4%	There will be other customers who disconnect from the network at the point of renovation or for economic or social reasons. Economic reasons include responding to enhanced GSR incentives on electric appliances. Social reasons would be due to concern about climate change or other social drivers. The forecast assumes that an average of 0.5% or 2,660 customers will disconnect per annum for these reasons.
Reduction number	No.	2660	
Cumulative	No.	7331	
New Connections - Average Reduction in Gas Connection			
New per annum	No.	12,393	Given the NCC driving appliance choice in new homes, new connections to our network will be constrained. Core started with the net connections assumed in our Final Plan and after input from our business development teams, assumed 13% less net new connections in year one of the next AA period, rising to 75% in year 5, would choose not to connect to the network. This assumption starts at a low percentage (13%) because there is likely to be a 12 month transition period on the adoption of the NCC in Victoria. Following that period, building approvals will be subject to the NCC. Build times are estimated to be between 12 - 24 months and so the impact on new connections builds throughout the period. The average load loss per customer is estimated to be 34 GJ since new customers consume less than existing customers given more efficient appliances and lower average dwelling sizes in new estates.
New cumulative	No.	72,285	
Reduction in Existing Connections (%)		36.5%	
Reduction number	No.	4,384	
Cumulative	No.	11,173	
Estimated Loss	GJ	379,875	

Core Energy Scenario Manager		AA period Average	Comments
Demand/Connection			
Existing D/C - Average Reduction in Gas Space Heating			
% Space Heating			Of those customers who don't leave the network, this section quantifies the percentage of customers who will change a space heater but not leave the network as they will still retain gas for cooking and/or hot water. Load per space existing space heater is assumed to be 25GJ. The percentage of existing customers expected to swap out a space heater for a reverse cycle air conditioner per annum is 10% in year one of the AA period rising to 30% by year 5 of the AA period. For conservatism, Core has not estimated the potential load lost due to those who change a gas cooktop from an induction cooktop.
Replacement timing	No.	21,836	
Replacement reduction	%	20.0%	
Lost Space heaters	No.	4,026	
	No.	12,868	
Lost load per heater	GJ	25	
Estimated Lost load - annual	GJ	100,650	
Estimated Lost load - cumulative	GJ	321,711	
Existing D/C - Average Reduction in Water Heating			
% Water Heating			Of those customers who don't leave the network, this section quantifies the percentage of customers who will change a water heater but not leave the network as they will still retain gas for space heating or cooking. Load per space existing water heater is assumed to be 15GJ. The percentage of existing customers expected to swap out a water heater for an electric water heater per annum is 12.5% in year one of the AA period rising to 15% by year 5 of the AA period. This percentage is lower than those who choose to change a space heater for a reverse cycle air conditioner because this is already a significant existing trend. For conservatism, Core has not estimated the potential load lost due to those who change a gas cooktop for an induction cooktop.
Replacement timing	No.	38,668	
Replacement reduction	%	14.5%	
Lost Space heaters	No.	5,607	
	No.	20,301	
Lost load per heater	GJ	15	
Estimated Lost load - annual	GJ	84,103	
Estimated Lost load - cumulative	GJ	304,509	
New D/C - Average Reduction in Gas Space Heating			
Loss of space heating appliance %		40.0%	Those new customers who choose to not to connect to the network are assumed to have a conservative average consumption of 20GJ and assumed to have a gas space heater only. The lower assumption is because new housing stock is smaller than existing (25GJ assumed above).
Estimated load	GJ	20	

With respect to the Commercial segment, Core has reduced the consumption per connection value by 1% per annum and has not adjusted connections. We believe there may be an impact on customer numbers also, but for conservatism, this has not been quantified.

1.9 Our Revised Final Plan Scenario

The reduction to our Final Plan demand forecasts do not contemplate reductions in gas demand at the pace contemplated in the AEMO Step Change scenario, and therefore Core's forecast can reasonably be viewed as conservative and reasonable based on the information currently available.

These changes will take some time to translate into falls in demand, given for instance the NatHERS 7 star rating standard has not yet been enacted in Victoria. However some home builders are already offering all

electric homes, and in some cases, exclusively offering all electric homes. We understand from engagement with the industry the number of builders are planning to provide all electric offerings in the near future. These changes foreshadow lower connections growth and lower consumption per connection on our network going forward.

The NCC imposes an emissions allowance on houses that are yet to receive development approval. If the allowance is exceeded, the proposed house with its mix of appliances does not reach the standard and does not receive development approval. The standards will incentivise investment in rooftop solar to enable compliance with the NatHERS test. This means that if a prospective home builder wishes to have gas appliances in their home, in many cases they also need to invest in solar panels.

This will further increase the costs of housing construction in Victoria, where the costs of new home construction have increased significantly over the course of the COVID-19 pandemic. Supply bottlenecks and labour shortages have driven the majority of the increase in the cost of housing construction[8]. This increased overall cost will in turn influence appliance choice within the home as the prospective homeowner will not only have to incur more cost in the construction of the home, but for the appliances that they choose within the home. This combined with enhanced subsidies for electric appliances will accelerate energy substitution within the home from gas to electricity.

We believe that as the enhanced subsidies, strengthened standards and amended planning laws start to take effect, there will be an acceleration of the declines in gas demand we already observe on our network. We believe the NCC 7 Star Standard will drive the largest impact on residential gas demand as it goes well beyond the existing construction standards, which focus exclusively on the materials and design of the home. The new standard goes a step further by also considering the choice of appliances within the home.

Natural gas is currently used in gas space heaters to produce heat in Melbourne's winter for around 700,000 MGN residential customers. Already the consumption per connection observed in our residential segment has fallen by more than 10% over the last decade. This trend is largely driven by the increased popularity of reverse cycle air conditioners, the improved thermal efficiency of new homes, improved insulation in existing homes and greater appliance efficiency. This trend will accelerate as the GSR, supported by state and federal policies, drives appliance choice through rebates and stricter standards for new construction.

Similarly, the GSR's influence on appliance choice in the commercial segment will drive consumption per connection over time as business owners take advantage of larger appliance rebates.

The GSR in combination with overarching federal and state emissions targets will drive gas demand lower across all segments of the gas market. Other forces will impact demand in parallel, for instance the widespread implementation of environmental social governance (ESG) reporting in particular in larger, listed companies. This is despite the fact that much of Victoria's current electricity is generated from brown coal, which has the highest emissions profile per unit of energy than any other conventional source, and far higher than gas generation.

The long-term trend we observe in consumption per connection will accelerate as these measures take effect and this is reflected in our revised demand forecast which shows 5-year annual growth of -5.0% for the combined Residential and Commercial segments versus -2.1% in our Final Plan.

8 https://hia.com.au/our-industry/newsroom/economic-research-and-forecasting/2022/05/home-building-in-victoria-to-remain-at-capacity-for-the-next-year

1.10 Comparison of our Revised Demand Forecast with our Final Plan

Table 1.2: Final Plan Demand forecast ($ million, 2022/23)

Final Plan	2023/24	2024/25	2025/26	2026/27	2027/28
		Residential demand			
Average Connections (no.)	700,216	702,698	704,882	707,085	709,279
Consumption per connection (GJ)	52.0	50.8	49.5	48.1	46.9
Demand (TJ)	**36,460**	**35,625**	**34,845**	**33,952**	**33,189**
Commercial demand					
Average Connections (no.)	14,367	14,337	14,307	14,277	14,247
Consumption per connection (GJ)	385.6	386.3	386.9	386.3	385.8
Demand (TJ)	**5,708**	**5,544**	**5,541**	**5,521**	**5,502**

Table 1.3: Revised Final Plan Demand forecast ($ million, 2022/23)

Revised Final Plan	2023/24	2024/25	2025/26	2026/27	2027/28
Residential demand					
Average Connections (no.)	695,977	687,177	674,772	657,566	636,712
Consumption per connection (GJ)	51.6	50.1	48.5	46.7	45.0
Demand (TJ)	**35,921**	**34,416**	**32,729**	**30,715**	**28,678**
Commercial demand					
Connections (no.)	14,804	14,352	14,322	14,292	14,262
Consumption per connection (GJ)	381.7	377.9	374.1	370.4	366.7
Demand (TJ)	**5,651**	**5,424**	**5,358**	**5,293**	**5,229**