Australian Gas Infrastructure Group

7 February 2024

The Hon Lily D'Ambrosio

Minister for Climate Action
Minister for Energy and Resources
Minister for the State Electricity Commission

Via online submission: https://engage.vic.gov.au/victorias-renewable-gas-future

Victoria's Renewable Gas Directions Paper – AGIG response

As owners of essential gas infrastructure throughout Victoria, and investors in local renewable gas production projects (hydrogen and biomethane), we welcome the opportunity to provide a submission to Renewable Gas Directions Paper.

Australian Gas Infrastructure Group's (AGIG) origins date back more than 150 years to the Gas and Fuel Corporation of Victoria. In 2024, we delivered around 100 petajoules of gas to over 1,460,000 Victorian residential, commercial and industrial connections, equivalent to approximately two-thirds (64%) of Victoria's total electricity consumption in the same period[1].

Customers, investors and the economy more broadly require stability, reliability and efficiency in energy, something gas network infrastructure provides. Our infrastructure is underground, and not vulnerable to the impacts of severe weather events from a physical or supply perspective. Gas infrastructure also provides buyers and sellers with access to a wider market, allowing different forms of gases (natural gas, hydrogen, biomethane) to be transported, stored, and traded efficiently.

Our ambition is to deliver infrastructure essential to Victoria's sustainable energy future. Our Low Carbon Vision is consistent with Victoria's emissions reduction ambitions, ultimately targeting net-zero emissions. We are actively pursuing opportunities to leverage our existing 21,951 km of distribution infrastructure and 501 km of transmission infrastructure by building, owning, and operating new strategic energy assets in Victoria to support achieving net zero at lowest cost, while retaining high levels of reliability 24 hours a day seven days a week.

Renewable gases such as biomethane and renewable hydrogen are critical to the energy transition and achieving emissions targets both in Victoria and nationally. In addition to carbon reduction benefits, renewable gases add to existing gas supply to support energy security and reliability. The production of renewable gases can also provide wider benefits to their supply chains; for example, biomethane production brings with it circular economy benefits, while hydrogen can provide a flexible additional market for large-scale renewable electricity supply by operating at times of surplus[2].

We are a leading Victorian hydrogen investor with construction of the $65 million Hydrogen Park Murray Valley commencing in Wodonga in October 2024 with support from the Victorian and Australian Governments. We also have operational projects in South Australia and Queensland that deliver renewable gases efficiently to industrial, commercial, and residential customers on our networks, as well as to transport and industrial sectors via tube trailer.

In addition to our own renewable gas production projects, we encourage, advocate for and promote third parties to participate in the market with a view to building supply and competition. In 2024 we conducted a granular assessment of how Victoria's biomethane potential could translate to supply into our networks, with over 18 PJ of recoverable biomethane available within 50km of our assets under a 'business as usual scenario', reflecting 4 times the target proposed[3]. These estimates could grow to 38 PJ (8.5 times the target) in Victoria under a supportive policy and regulatory framework.

Using existing infrastructure to deliver renewable gases can lower the delivered cost of energy for new projects, and reduces key risks inherent in new technology projects such as securing offtake contracts in an emerging market. It will

[1] Calculated on the basis 1 PJ is equivalent to 278 GWh, and AGIG's Victorian assets delivered 99.122 PJ equiating to around 27,536 GWh, compared with and Victoria's electricity consumption of 43,000 GWh in 2024 according to the Australian Energy Regulator's Annual Electricity Consumption report. Note AGIG's supply represents about 46% of Victoria's gas use of 215.2 PJ or ~59,800 GWh in 2022-23 according to the 2024 Australian Energy Statistics (Table K).

[2] Further detail is provided in our submissions to the Productivity Commission https://www.pc.gov.au/__data/assets/pdf_file/0007/387682/sub152-circular-economy.pdf and the Net Zero Sectoral Plan for Energy & Electricity https://consult.dcceew.gov.au/electricity-and-energy-sector-plan-discussion-paper/new-survey-7563fd36/view/70 - see p12.

[3] https://www.agig.com.au/-/media/files/agig/Annual-Reports/240712_Biomethane-potential-and-cobenefits-Public.pdf

also deliver a more robust Victorian to risks presented by the national energy transition and preserves optionality, enabling the efficient deployment of renewable and carbon neutral electricity and gas with existing and new strategic infrastructure.

We commend the Victorian government for its initiative to develop a Renewable Gas Directions Paper. The industry is looking for leadership and certainty as to how Victoria will seize the opportunity of renewable gas through the transition, in order to support further investment in the sector. The Renewable Gases Directions Paper is a good starting point for acknowledging the critical role renewable gases will play in decarbonising the use of natural gas, and steps to engage industry in genuine consultation will enable renewable gases to be delivered.

If renewable gases are to be delivered successfully as an emissions reduction tool and play a part in Victoria's path to net zero, the role of the gas distribution networks in physical delivery and market creation must be acknowledged and used to Victoria's economic advantage, both in the Renewable Gas Directions Paper and the current Building Electrification Regulatory Impact Statement (RIS)4. This position would enable Victoria to leverage the national market-based renewable gas certification scheme that recognises the emissions reduction benefits of renewable gases in networks. Further, higher and more frequent target intervals over a longer term would deliver increased investment certainty for the duration of the scheme, allowing for bankable contracts needed to incentivise investment.

The proposed policy has fundamental flaws and limitations that do not consider how physical delivery of natural gas today occurs, and how this plays a critical role in enabling the lowest-cost delivery of renewable gases. Today in Victoria, natural gas is delivered to more than 800 "Tariff D" large industrial users, and around 40,000 "Tariff V" smaller to mid-sized commercial users who are reliant on gas, via renewable-gas ready distribution networks[5].

While commercial and industrial customers represent around 2.2% of AGIG's Victorian connections, they use around 40% of gas supplied in the network. Gas usage in the commercial and industrial sector is highly varied, encompassing a wide array of business types and functions ranging from food manufacturing, dairy, and metal product manufacturing to laundromats, bakeries, automotive repairers and crematoriums. The diverse use of gas and extensive nature of Victoria's existing network mean there is significant geographic diversity of commercial and industrial users throughout the asset without any discernible geographic pattern.

The sharing of fixed network operating costs across the remaining 2.1 million residential connections on Victorian gas networks allows all users to access natural gases today efficiently, safely, and reliably without a need to consider location-specific energy costs and amenity. This allows the network to economically deliver natural gas today – and renewable gas into the future – across the same existing asset without the need for new infrastructure or supply chains. Delivery alternatives such as tube-trailer (sometimes referred to as a "virtual pipeline") or behind-the-meter supply of renewable gas may only be viable for certain bespoke end-uses where scale, location, or other individualities make it economic as well as acceptable from a reliability and lifecycle emissions perspective.

Proposed regulations such as the Victorian Gas Substitution Roadmap including the Building Electrification RIS currently seek to fundamentally alter existing economic efficiencies for Victorians to access energy supply by forcing customers to leave the network[6]. This will subsequently diminish the economic viability of networks for delivering natural gas or renewable gases, requiring industry to seek more expensive alternatives for accessing natural and renewable gases – either through truck transport via tube trailer, or behind-the-meter co-location with production.

Successful deployment models internationally in the UK and Denmark, and in New South Wales acknowledge the role of enabling infrastructure. These market-based schemes harness the opportunity presented by a vast and diverse range of users having access to the network, and Victoria can also successfully deploy renewable gas incentives using a similar approach of recognising enabling infrastructure's role in physical delivery and market creation.

[4] Building Electrification – Regulatory Impact Statement | Engage Victoria
[5] AHC-100-Hydrogen-Distribution-Networks-Victoria-Feasibility-Study.pdf See Section 4.2.
[6] Impacts on customers who will not have access to gas are detailed in our submission to the Building Electrification RIS.

Incentivising widespread deployment of renewable gas using existing infrastructure can provide an opportunity to decarbonise Victorians who choose to access gas. These include regions in Northern Victoria with a large agricultural or manufacturing presence such as Wodonga, or the Greater Shepparton region[7]. The demand and existing supply chains in these regions, enabled by the network and the access to the customers it provides, can be leveraged for the delivery of renewable gases. However, the right investment signals must be provided to producers, infrastructure providers, and customers – policies such as the Building Electrification RIS which seek to explicitly remove demand do not encourage stability, reliability and efficiency needed for investment in cost-effective renewable energy supply.

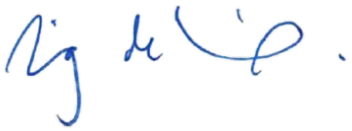
Summary of our recommendations for renewable gas policy

We therefore recommend the Victorian government to adapt the implementation of the Renewable Gas Directions Paper objectives to meet the following:

- Acknowledgement of the distribution network's role in delivering and scaling up renewable gas projects, and the opportunity to use it for Victoria's economic advantage as an efficient and reliable way to deliver energy at scale[8]; in both this Directions Paper and the Building Electrification RIS.
- A more ambitious target of at least 14.5 PJ per annum of renewable gas by 2035. Further, implementation of a renewable gas scheme for a longer time horizon (i.e. 20 years) with frequent interim targets that increase in terms of ambition over time would further incentivise private sector certainty and implementation.
- The proposed scheme should apply to all customers who support it, including Victorian residential customers, to maximise market reach, promote overall cost efficiencies, and ensure fairness for all Victorians in choosing their energy needs in a net-zero world.
- Consider implementing the Victorian Renewable Gas scheme via AEMO as the scheme administrator to provide renewable gas developers with long term revenue certainty needed to bring projects to financial close.

Further details are provided in our submission which follows. We look forward to open and genuine consultation on this critical policy for decarbonising Victorian gas users. If you would like to discuss this submission in detail please contact Shawn Tan, Manager Policy, at shawn.tan@agig.com.au.

Yours sincerely,



Craig de Laine
Chief Executive Officer, Australian Gas Infrastructure Group

[7] Decarbonisation Pathways for Victorian Businesses: Experiences of Commercial and Industrial Gas Users. KPMG report prepared for AGIG, July 2024
[8] See footnote 37 and Section 2.4 Policies that artificially reduce demand on the network will mean higher-cost alternatives are needed to access renewable gas.

Australian Gas Infrastructure Group

Submission – Renewable Gas Directions Paper

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Our submission firstly provides contextual information on potential demand and supply, and the role of the network, which should be considered in detail before answering specific consultation questions. This highlights the crucial role of the network in delivering renewable gases, and the incompatibility with the proposed Building Electrification RIS.

Potential demand and supply

To stimulate a nascent market, adequate demand and supply signals need to be matched. Target levels need to strike the balance between being achievable and being sufficiently ambitious to stimulate private sector investment. The proposed target of 4.5 PJ by 2035 represents approximately 6.7% of actual 2023 industrial and gas powered generation (GPG) demand[9] for natural gas which in our view, is insufficient. A higher target level would more accurately address the forecast energy needs of Victorian gas users to 2035 and beyond, and incentivise supply to meaningfully reduce emissions and overall costs with efficiencies of scale. We recommend that at least 14.5 PJ is targeted to create sufficient investment signals.

1.1 Existing demand

Our Victorian network is used for a wide range of applications, across residential, commercial, and industrial purposes, reflecting the diversity of its role in energy supply. Commercial and industrial gas use is spread across various locations without any discernible geographic pattern, indicating that its utilisation is not concentrated in specific regions or communities. Similarly, residential customers are dispersed geographically and represent a variety of dwelling types, usage patterns, and levels of financial wellbeing, contributing to the complexity of our customer base.

Each household and business faces a range of complexities when assessing best solution for their energy needs including practical challenges, upfront and ongoing cost, regulatory and location restraints, ability to control (e.g. small businesses in a shopping centre), and the cost and reliability of electricity network connections particularly in regions.

The availability of an electric energy alternative alone does not guarantee suitability for all residents or businesses, and the concept of 'hard to electrify' is not contained to the industrial sector in isolation but is rather a complex notion reflecting the diversity of all Victorians' energy use. Customers are ideally placed to access an efficient and robust Victorian renewable gas scheme through existing networks, with key considerations for potential renewable gas demand including:

- For facilities covered under the Safeguard Mechanism in Victoria alone there are 5.8 million tonnes of reportable Scope 1 emissions[10] – including natural gas consumed onsite. Given a conservative assumption of around 20% of natural gas use in industry[11], this would lead to a 5% (1.1 PJ) at a minimum, needing to be decarbonised annually from these facilities alone. Over the 10-year horizon to 2035, the 5% p.a. declining baseline from the Safeguard Mechanism would result in a doubling of the 4.5 PJ target to 9 PJ just on the legislated Safeguard facility emissions reductions alone. This represents a no-regrets minimum ambition for a Victorian renewable gas scheme.

- From surveys with our customers, we understand that the demand for gas and renewable alternatives exists. A survey undertaken by KPMG for AGIG[12] indicated a strong preference for natural gas or biomethane (59% compared to 17% preference for electric alternatives) for large industrial users. For commercial customers around 42% preferred natural gas or biomethane (compared to 38% for electric alternatives)[13], with cost,

[9] Table 5, AEMO Victorian Gas Planning Report, March 2024 2024-victorian-gas-planning-report-update.pdf
[10] 2021-22 Safeguard facility data | Datasets | Data Services
[11] States and territories | energy.gov.au
[12] Refer to footnote 7.
[13] Remaining survey respondents indicated no preference for either.

performance and reliability being the key drivers for wanting to continue to use gas. Respondents also indicated that to mitigate risk, their preference would be to receive renewable gas through initial blends.

- Detailed analysis of Victorian customers on our networks (excluding AusNet and direct transmission network customers) undertaken by GPA Engineering[14] indicates that industrial and commercial customers represent 38.4 PJ of demand. Of this use, 9.2 PJ (24%) cannot be electrified, with a further 13.6 PJ (35%) considered difficult and 15.3 PJ (40%) rated moderate. Only 0.7 PJ (1.8%) of AGIG's existing commercial and industrial customers were considered easy or moderate-to-easy to electrify under the comprehensive assessment.

1.2 Potential supply

We have mapped biomethane potential and recently commenced development on our 10MW Hydrogen Park Murray Valley (HyP MV) project, which is expected to commence blending at 10% volume to 40,000 homes and businesses in Albury-Wodonga once complete in late 2025. The HyP MV project is an example where we can assist in decarbonisation of industrial customers, where Mars Petcare Australia will be the offtaker of 100% of the Renewable Gas Guarantee of Origin (RGGO) certificates produced[15] for this site, which is made possible through the injection of renewable gas into the local network.

We propose an uplift of the current 4.5 PJ target by 2035 to at least 14.5 PJ, the aspirational target highlighted in the Renewable Gas Directions Paper. Within the catchment area of our networks, Blunomy has indicated a recoverable potential of approximately 18.8 PJ p.a[16] itself. Under a supportive policy and regulatory framework, we estimate that volumes can be as high as 38 PJ p.a could be achieved across Victoria by 2035.

Providing positive investment signals is critical to unlocking this supply and mitigating risks to getting projects off the ground. Specifically:

a) Biomethane currently does not have established markets for the procurement of feedstock, meaning there is increased risk on the input side to producers. Revenue support certainty can assist producers to take on this increased contracting risk.
b) From our experience delivering hydrogen projects, offtake risk is a key risk for deliverability of projects. This arises particularly when industrial appliances need to be converted to use 100% hydrogen. While network blending assists in partially mitigating this risk, long term revenue support certainty can also assist producers to produce hydrogen, giving offtakers and potential customers confidence that the physical product will be available. Refer also to discussion in section - "*2.3 The network is critical to enabling certification and tradeability"*.
c) Providing positive investment signals for both producers and customers wishing to access this via the network, also creates greater investment certainty across the supply chain. This is explained in greater detail in the section titled "*1.4 Case study – Australian* Hydrogen Centre

The Australian Hydrogen Centre (AHC), jointly supported by the Victorian Government and the Australian Renewable Energy Agency, delivered a detailed blueprint on how we can transition our Victorian networks to 10% and 100% hydrogen by 2050.

A comprehensive assessment of Victorian gas distribution network assets found that the pipes, their components, and constituent materials are generally compatible and have the capacity to transport 10 and 100% hydrogen supply with minimal modifications. Importantly, this work is already well advanced as part of our planned asset upgrades to new generation polyethylene (plastic pipes) suitable for transporting 100% hydrogen.

Further, the AHC Reports show that it is technically and economically feasible to use existing gas infrastructure for scaled hydrogen distribution, delivering:

[14] Victorian Future Network Mapping Study – Summary Report. GPA Engineering, January 2025.
[15] Media Release - Hydrogen Park Murray Valley a key step forward for renewable hydrogen | AGIG
[16] https://www.agig.com.au/-/media/files/agig/Annual-Reports/240712_Biomethane-potential-and-cobenefits-Public.pdf

1. net-zero carbon emissions gas;
2. minimised customer disruption while retaining security and diversity of supply;
3. services to the electricity grid through flexible electricity demand and frequency control;
4. 12 gigawatts (GW) of electrolysis supported by existing and new renewable electricity generation;
5. 30 petajoules (PJ) of hydrogen storage to harness the ability of gas to store vast amounts of energy, balancing renewable electricity supply and demand swings between colder and warmer months; and
6. over AU$1.5 billion in additional economic value a year including more than 12,500 jobs during construction and 6200 jobs during operation.

Supported by a range of independent technical studies, the Reports provide a better understanding of the opportunity to access Victoria's world-class gas distribution infrastructure to unlock hydrogen opportunities while retaining energy security and affordability; identifying a range of low-regret enablers that could trigger coordinated action by government and industry.

d) The role of the network*".*

To address points a) and b), we recommend a 15-year revenue support contract administered by AEMO for renewable gas producers to assist them in achieving financial close. These contracts with AEMO minimise revenue risk, improve bankability of projects and lower overall cost of capital for developers. This proposed design, described in greater detail in our response to consultation Q5 on page 19, will result in lowering the cost of renewable gas production and can be implemented efficiently due to the standard nature of these AEMO revenue support contracts, avoiding the long and protracted period of commercial negotiations with other liable entities like retailers.

1.3 Case study – Greater Shepparton region

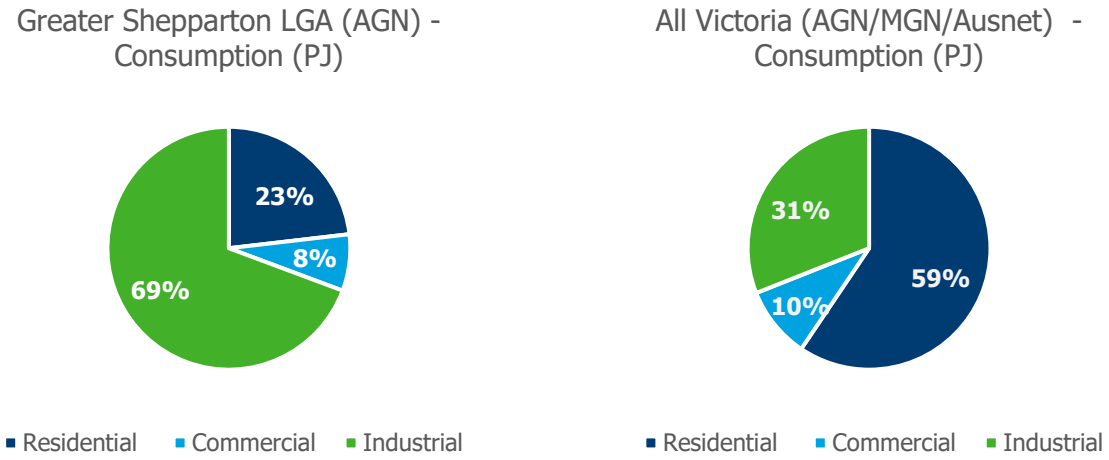
The Greater Shepparton LGA region has around 48,500 gas connections serviced by AGN Victoria's distribution network[17]. It is located within the Goulburn Valley "food bowl" consisting of a cluster of large gas users for whom renewable gases such as biomethane are an attractive decarbonisation pathway due to the prevalence of agricultural and waste feedstocks in the region.

This is created by the fact that it is a centre for food manufacturing, fabricated and primary metal manufacturing, machinery and equipment manufacturing - and located strategically along an agricultural trucking route. The region is significant, and produces 48.5% of Victoria's fruit, and with 18% of regional Victoria's food processing with large household brands[2618].

The region alone used around 6.3 PJ p.a. as of 2023, with industrial customers using around 69% of total consumption. When compared to the rest of Victoria, this proportion was higher, as illustrated in Figure 1.

[17] Includes Greater Shepparton and surrounds, Moira Shire, Campaspe Shire
[18] P11, https://www.c4gs.com.au/building-on-strength-strategy/

Figure 1 - Consumption by customer type - Shepparton LGA vs. Victoria



Source: AGIG operational data

Of the 48,500 connections, approximately 96% were residential customers as illustrated in Figure 2 - this is similar to the rest of Victoria, indicating a reliance on the fixed cost of infrastructure.

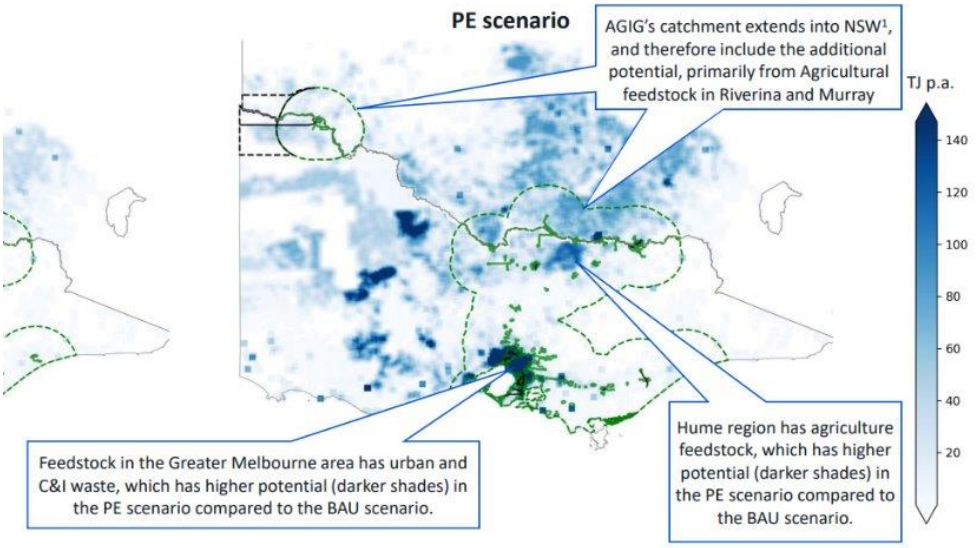
Figure 2 – Connections by customer type – Shepparton LGA vs. Victoria

Source: AGIG operational data

Blunomy's mapping of biomethane potential indicates the Hume region has over 8 PJ p.a. of biomethane potential arising mostly from agricultural feedstock and some organic waste, if supportive policy is provided[19]. While AGIG and other producers are actively exploring biomethane opportunities, supportive policies are required to accelerate renewable gas projects to come online.

Figure 3 - Extract from biomethane mapping report for AGIG by Blunomy

[19] Refer to pp59-60 of Biomethane Potential in AGIG's Network Catchment and Associated Co-benefits Final Report, July 2024 for more specific maps



The 8 PJ p.a. potential in the Hume region alone would form around 127% of current natural gas consumption in the Shepparton region – indicating that the excess can be transported via the existing distribution network to other users who may be willing to pay more for the excess supply (for example, in Wodonga, or to the south in Melbourne) and blended into existing natural gas usage and supply. Using gas networks to distribute renewable gas enables numerous industrial customers connected to the network to decarbonise through renewable gas certificates. This additional function of utilising the network to provide renewable gas availability to industrial customers further highlights the benefits of combining the RGGO certification scheme with the injection of renewable gas into the network, facilitating industry decarbonisation. Conversely, if the network only existed to service the Shepparton region, supply would be in excess of demand and there would be lowered incentives for private sector investment.

This demonstrates how existing network infrastructure enables markets today by balancing out supply and demand. Policies that remove the efficiencies of fixed infrastructure risk not only impacting industry and the regions in which they exist, but also significantly alter the economics of industry accessing renewable gas.

1.4 Case study – Australian Hydrogen Centre

The Australian Hydrogen Centre (AHC), jointly supported by the Victorian Government and the Australian Renewable Energy Agency, delivered a detailed blueprint on how we can transition our Victorian networks to 10% and 100% hydrogen by 2050[20].

A comprehensive assessment of Victorian gas distribution network assets found that the pipes, their components, and constituent materials are generally compatible and have the capacity to transport 10 and 100% hydrogen supply with minimal modifications. Importantly, this work is already well advanced as part of our planned asset upgrades to new generation polyethylene (plastic pipes) suitable for transporting 100% hydrogen.

Further, the AHC Reports show that it is technically and economically feasible to use existing gas infrastructure for scaled hydrogen distribution, delivering:

7. net-zero carbon emissions gas;
8. minimised customer disruption while retaining security and diversity of supply;
9. services to the electricity grid through flexible electricity demand and frequency control;
10. 12 gigawatts (GW) of electrolysis supported by existing and new renewable electricity generation;

[20] Australian Hydrogen Centre (2023) Australian Hydrogen Centre Summary Report. Available at https://arena.gov.au/knowledge-bank/ australian-hydrogen-centre-summary-report/

11. 30 petajoules (PJ) of hydrogen storage to harness the ability of gas to store vast amounts of energy, balancing renewable electricity supply and demand swings between colder and warmer months; and
12. over AU$1.5 billion in additional economic value a year including more than 12,500 jobs during construction and 6200 jobs during operation.

Supported by a range of independent technical studies, the Reports provide a better understanding of the opportunity to access Victoria's world-class gas distribution infrastructure to unlock hydrogen opportunities while retaining energy security and affordability; identifying a range of low-regret enablers that could trigger coordinated action by government and industry.

The role of the network

Customers, investors and the economy more broadly require stability, reliability and efficiency in energy, something gas network infrastructure provides. Our gas infrastructure is underground, and not vulnerable to the impacts of severe weather events from a physical or supply perspective. Gas infrastructure also provides buyers and sellers with access to a wider market, allowing different forms of gases (natural gas, hydrogen, biomethane, carbon etc) to be transported and traded efficiently. Total connections of Victorian households, businesses and industry to our networks continues to grow as our customers continue to value the cost efficiency and reliability our network currently provides.

The distribution network today physically distributes natural gas to customers – allowing renewable gases to be blended in natural gas via a renewable-gas ready network[21], the same way that renewable electricity is today blended into the electricity grid. This enables the market today to match producers and buyers anonymously, matching the prices and costs each are willing to produce at and pay for respectively[22]. This is the basis of the Declared Wholesale Gas Market[23] for natural gas operated by AEMO today, and enables the market-based certificate scheme envisaged in the Directions Paper.

Supplying renewable gas in existing networks stands to substantially reduce carbon emissions from Victoria's economy soonest and at lowest cost, while retaining high levels of reliability 24 hours a day seven days a week. It will also deliver a more robust Victorian to risks presented by the national energy transition and preserves optionality, enabling the efficient deployment of renewable and carbon neutral electricity and gas with existing and new strategic infrastructure.

This model of using existing distribution network infrastructure to enable renewable gas development and scaling up has been replicated in several international schemes looking to scale up renewable gases – notably, in Denmark, and the United Kingdom.

[21] Refer to footnote **Error! Bookmark not defined.**.
[22] How Markets Work: Supply, Demand and the 'Real World' - Robert E. Prasch, 2008
[23] Declared Wholesale Gas Market

Bioenergy – Effective Implementation in Denmark

Since the introduction of a new subsidy scheme in 2012, Denmark's biogas production has seen a significant increase, with approximately 150 biogas plants currently in operation[24]. This growth has been driven by the use of livestock waste, which accounts for around 75% of the feedstock, while the remaining 25% comes from various organic wastes, including household and industrial waste, straw, and energy crops[25].

Subsidy Details

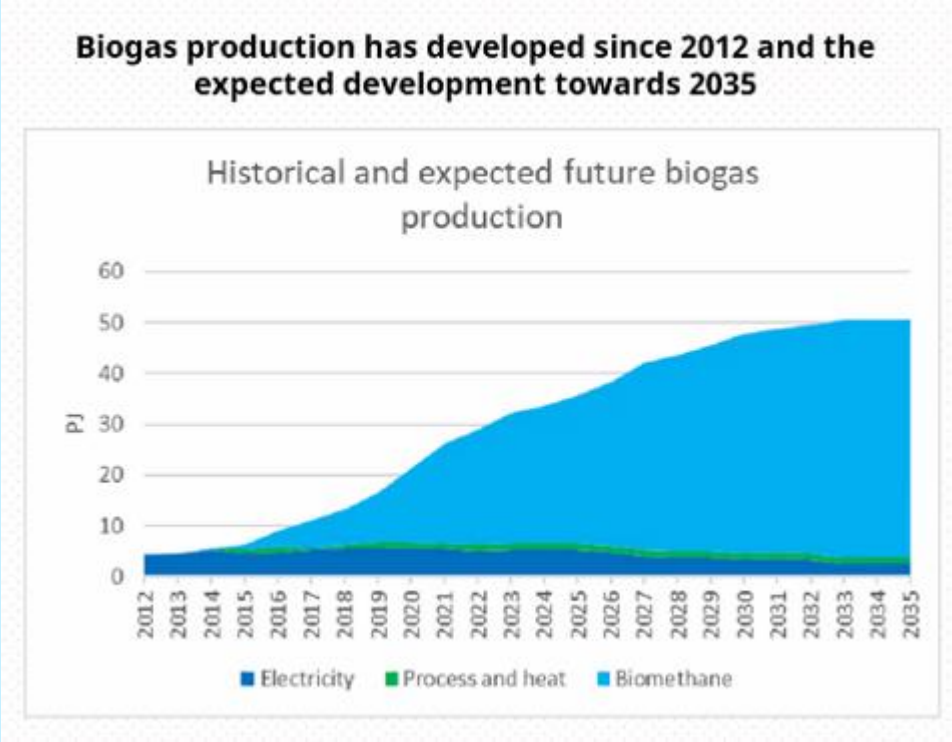
The subsidy program supports all uses of biogas, including combined heat and power (CHP) generation, industrial heat, vehicle fuel, and upgrading biogas to Biomethane for injection into the natural gas network. The subsidy consists of three components: a basic subsidy amount for certainty, an amount adjusted in proportion to natural gas prices, and an additional 'early bird' subsidy to incentivise quick starts. Long-term policies and targets were also essential to create stability in the biogas sector and attract investment.

Initially, biogas in Denmark was primarily used for electricity production. However, today around 80% of biogas produced is upgraded and fed into the natural gas grid, a trend that is expected to continue[26]. This shift not only enhances the efficiency of biogas utilisation but also integrates renewable energy into the existing gas infrastructure, promoting a more sustainable energy system. In 2023, the share of biomethane in the Danish gas system reached nearly 40%, showcasing the country's commitment to renewable energy. Denmark has set an ambitious goal to achieve 100% renewable gas consumption by 2030. This target underscores the importance of continued investment in biogas infrastructure and the development of supportive policies to maintain momentum in the transition to renewable energy.

Denmark's experience highlights the potential of biogas as a key component of a sustainable energy strategy. By leveraging existing waste streams and integrating biogas into the natural gas grid, Denmark is paving the way for other countries to follow suit in their pursuit of a greener future.

This is evidenced by further support by the Danish Government for renewable gases. In December 2024, the Danish Government announced a further €1.7 billion (AUD$2.83 billion[27]) to support the production of around 7.9 PJ p.a. of renewable gases into the grid[28].

Figure 4: Biogas production has developed since 2012 and the expected development towards 2035



Source: Danish Energy Agency available at https://ens.dk/en/our-responsibilities/bioenergy/biogas-denmark

2.1 Case study: Great Britain – Green Gas Support Scheme

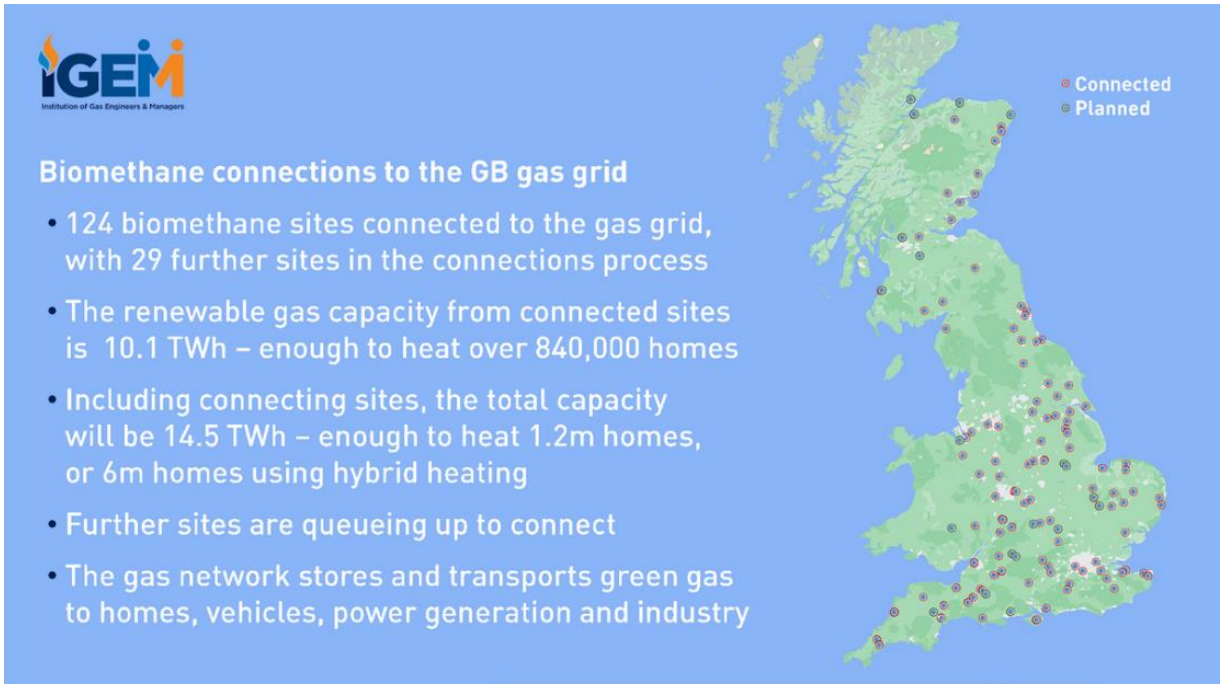
In the UK, the Green Gas Support Scheme (GGSS)[29] is a government scheme that provides financial incentives for new anaerobic digestion biomethane plants to increase the proportion of renewable gas in the gas grid.

Registered participants in the GGSS receive quarterly support payments based on the volume of eligible biomethane injected into the gas grid. Payments continue for up to 15 years from the tariff start date, provided participants meet eligibility and compliance requirements. Producers receive a decreasing tiered tariff in addition to the wholesale gas price starting at around AUD $36 per GJ for smaller projects, and around $20/GJ for larger projects as at 1 October 2024[30].

With supportive policies in place in Great Britain such as the GGSS acknowledging the role of the distribution network, The Institute of Gas Engineers & Managers notes that *"there are currently 124 biomethane sites connected to the gas grid, with 29 further sides in the connections process. The renewable gas capacity from connected sites is 10.1 TWh – enough to heat over 840,000 homes. Including connecting sites, the total capacity will be 14.5 TWh (approx. 52.5 PJ) – enough to heat 1.2m homes, or if maximising the potential for hybrid heating systems, with boilers burning biomethane used in conjunction with heat pumps powered by renewable electricity, biomethane can help heat up to £6m homes – 22% of all homes in the UK."*[31]

[24] Biogas in Denmark, Danish Energy Agency available at https://ens.dk/en/our-responsibilities/bioenergy/biogas-denmark
[25] Biogas in Denmark – Biomass input and biogas production, Danish Energy Agency available at https://ens.dk/en/our-responsibilities/bioenergy/biogas-denmark
[26] Biogas in Denmark – Biogas production and use, Danish Energy Agency available at https://ens.dk/en/our-responsibilities/bioenergy/biogas-denmark
[27] EUR=AUD conversion as of 22 Jan 2025 based on 1EUR=1.66AUD
[28] Danish State aid scheme
[29] Green Gas Support Scheme and Green Gas levy, Ofgem available at https://www.ofgem.gov.uk/environmental-and-social-schemes/green-gas-support-scheme-and-green-gas-levy
[30] Green Gas Support Scheme Tariff Table, Ofgem available at https://www.ofgem.gov.uk/publications/green-gas-support-scheme-tariff-table?dm_i=1QCB,8Q36J,RJMFGO,108W11,1. Converted based on an exchange rate of GBP to AUD = 1.94 as of 21 October 2024.
[31] Call for Evidence: Future Policy Framework for Biomethane Production, IGEM available at https://www.igem.org.uk/resource/call-for-evidence-future-policy-framework-for-biomethane-production.html

Figure 5 IGEM - Biomethane connections to the GB gas grid



Source: IGEM Launches ground-breaking grid connections research at Parliamntary Reception, IGEM available at https://www.igem.org.uk/resource/igem-launches-groundbreaking-grid-connections-research-at-parliamentary-reception.html, slide 5[32]

2.2 Victorian customers are dispersed throughout our networks

Victoria's gas networks are used for a wide range of applications, across residential, commercial, and industrial purposes, reflecting the diversity of its role in energy supply.

Gas usage within each sector is also highly varied. Residential customers are represented by a variety of dwelling types, usage patterns, and levels of financial wellbeing. The commercial and industrial sector encompasses a wide array of business types and functions ranging from food manufacturing, dairy, and metal product manufacturing to laundromats, bakeries, automotive repairers and crematoriums.

Figure 6 and Figure 7 below illustrate how our commercial and industrial customers are geographically dispersed across our distribution networks across Victoria and metropolitan Melbourne respectively and rely on the existing extensive network to be able to access renewable gases, and conversely, for it to be made available to new users.

The black dots represent customers that cannot be electrified, with blue dots representing C&I customers with varying degrees of difficulty to electrify. These customers, who are predominantly commercial Tariff V customers, will find it difficult to electrify, or cannot electrify based on analysis on technological, economic viability and practical considerations, in addition to the fact they are also geographically dispersed.

[32] IGEM Launches ground-breaking grid connections research at Parliamentary Reception, slide 5, IGEM available at https://www.igem.org.uk/resource/igem-launches-groundbreaking-grid-connections-research-at-parliamentary-reception.html

Figure 6 - Industrial and commercial customers and ease of electrification - all Victoria

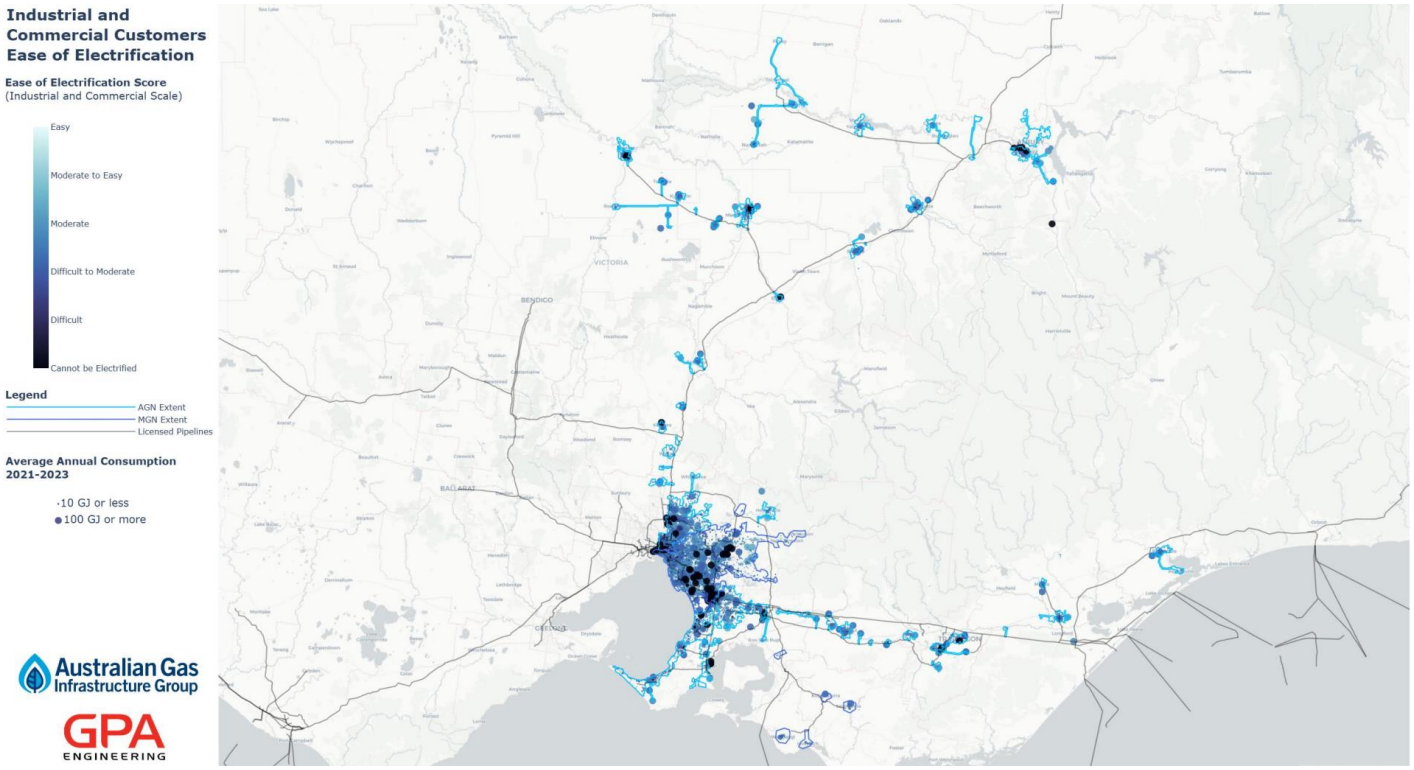
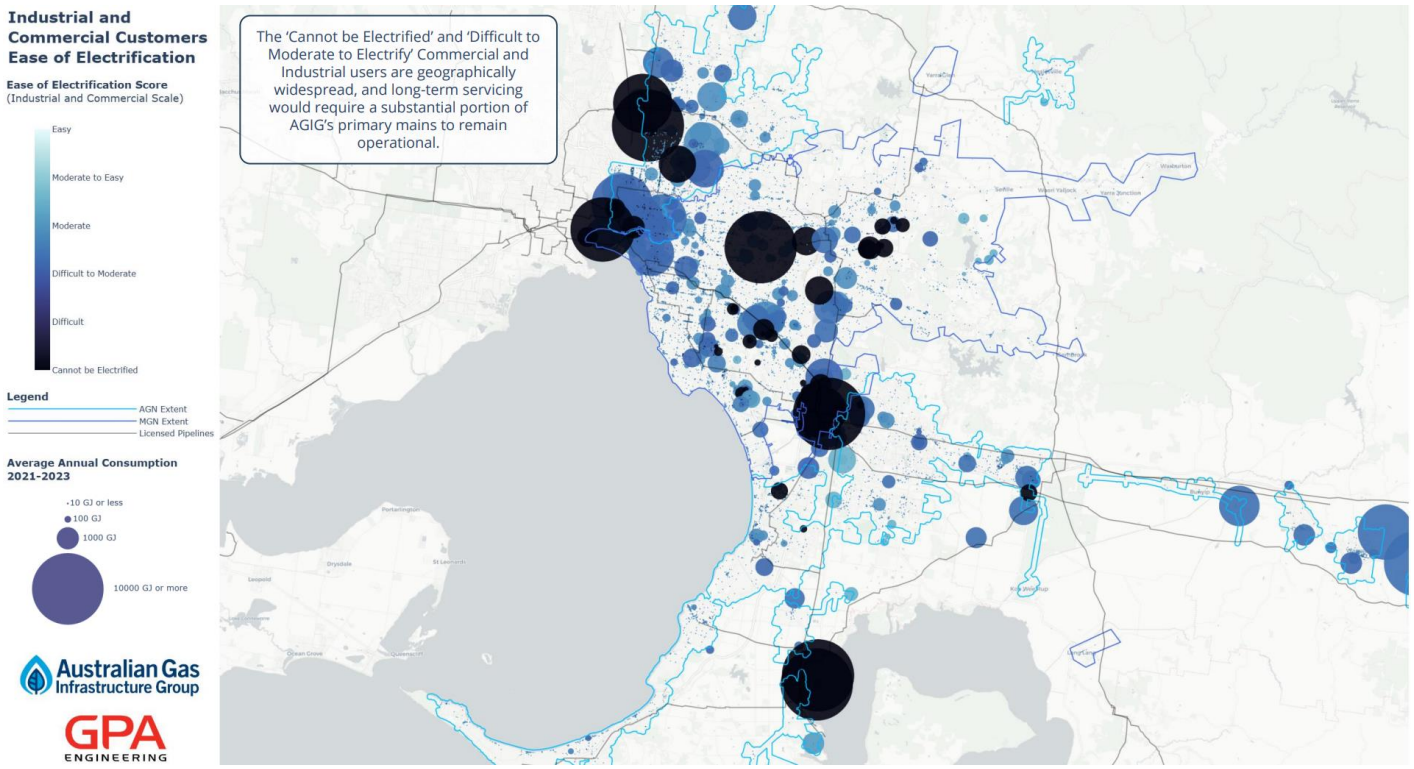


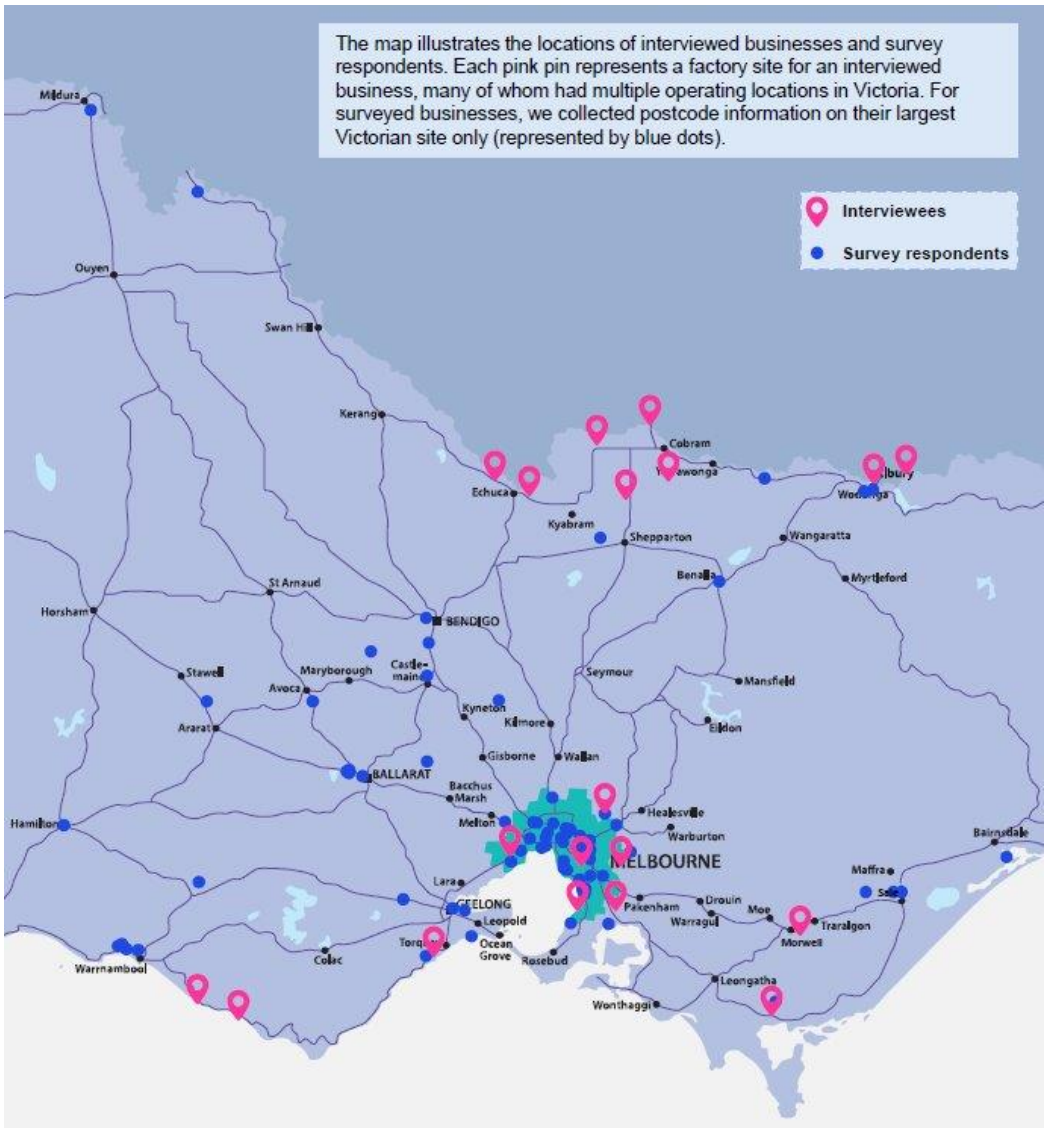
Figure 7 Industrial and commercial customers and ease of electrification - metro Melbourne



Source: GPA Engineering analysis for AGIG.

Furthermore, a survey of large gas users undertaken by KPMG indicated that most of them were keen to receive renewable gases through an initial blend[33] – Figure 8 shows the same geographic dispersion of customers across Victoria.

Figure 8 - Extract from KPMG industrial decarbonisation report - location of industrial and commercial interviewees



2.3 The network is critical to enabling certification and tradeability

We are supportive of the position in the Directions Paper enabling the tradeability of certificates (i.e. the ability to trade the renewable credentials of the renewable gas, and the physical wholesale of the renewable gases, separately), and consider it will assist in accelerating deployment of renewable gases.

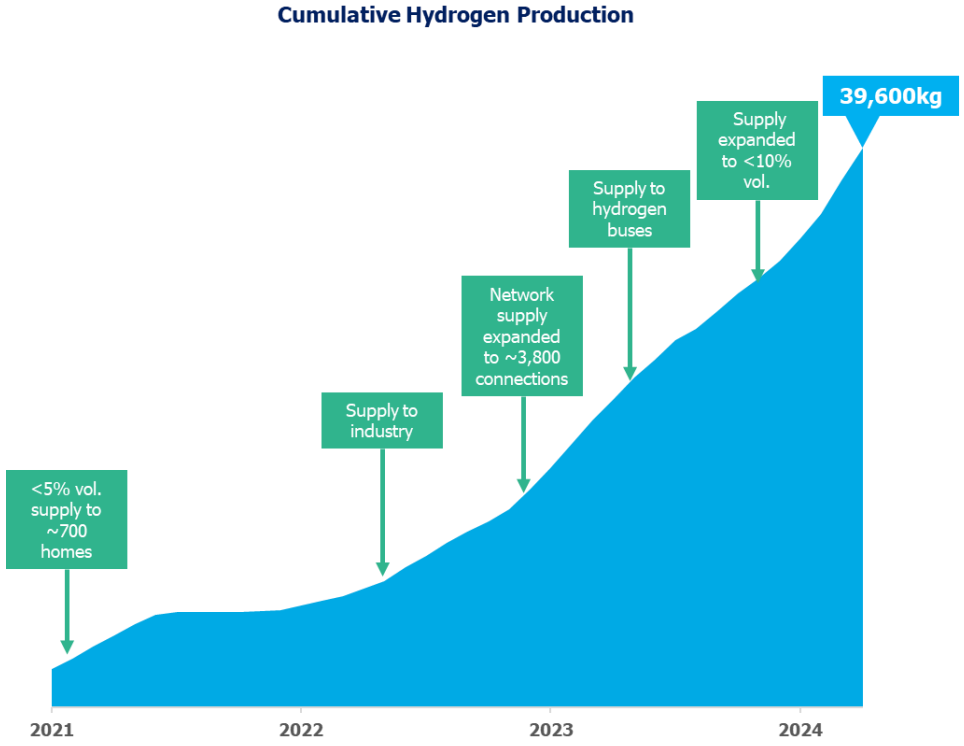
The network plays a critical role in enabling tradeability. Tradeability in turn, de-risks offtake and enables initial projects to reach commercial viability and financial close. For biomethane, which is interchangeable with natural gas,

[33] Refer to footnote 7.

injection into the network allows producers to access a broader market. For hydrogen, appliances generally have a 20% blending limit and once this is exceeded, it is more economical to adopt 100% hydrogen supply[34]. Subsequently , offtake risk is a significant challenge in getting hydrogen projects off the ground.

Our experience in hydrogen indicates that offtake risk is significantly lowered when hydrogen is already being produced and blended into the network. This is evident from the pathway taken by our Hydrogen Park South Australia project, which initially started blending into the distribution network before supplying to industry and for transport use, as demonstrated below in Figure 9:

Figure 9 - Hydrogen Park South Australia production pathway



At our Hydrogen Park Murray Valley project we have a foundation off-taker, Mars Petcare. This further demonstrates how the network benefits the viability of early hydrogen projects:

- Mars Petcare has secured all Renewable Gas Guarantee of Origin (RGGO) certificates allocated to production at Hydrogen Park Murray Valley for its manufacturing business under GreenPower's Renewable Gas Certification scheme[35]. This allows them to meet their business objectives of decarbonising their processes.
- The renewable hydrogen from Hydrogen Park Murray Valley will be blended into the local network at up to 10% by volume to commercial and industrial gas users, and around 40,000 Albury-Wodonga homes and businesses[36].

[34] See footnote **Error! Bookmark not defined.**, section 5. Note that at time of writing the Australian Hydrogen Centre report the appliance limit was noted as 10%, however subsequent research by the Future Fuels CRC and other international studies indicates this is 20%. See Compatibility of end user equipment with future fuels (RP1.4) Archives - Future Fuels CRC
[35] https://www.energymagazine.com.au/milestone-for-key-hydrogen-project/
[36] https://www.agig.com.au/large-scale-hydrogen-project-advances-to-major-milestone

2.4 Policies that artificially reduce demand on the network will mean higher-cost alternatives are needed to access renewable gas

The Building Electrification Regulations and Regulatory Impact Statement (RIS) currently proposes that all gas appliances except cooktops must be replaced with electric alternatives, and that new commercial and residential buildings must be built all-electric. Our separate submission to this process will detail the issues with the feasibility of implementing the regulations.

Under the current regulatory framework set out in the National Gas Rules and Law, efficient costs of investment for the shared infrastructure is spread across all customers. Costs to our customers are lowered as the number of connections and gas demand increases. As we demonstrated in section 1.3 Case study – Greater Shepparton region, this cost is shared amongst different types of users in Victoria, but predominantly shared by the residential customer group, and that this is particularly the case in areas with high volumes of industrial gas usage, and where regional manufacturing is concentrated, such as Shepparton. This allows economies of scale and for industrial customers to access the network at lower cost.

We have modelled the impacts of the Building Electrification RIS and expect that this will reduce demand on the gas networks in Victoria (excluding Ausnet) at a rate of around 7% p.a. in the first 5 years of implementation. During this period, network costs are also likely to increase significantly, around 20% p.a. due to the nature of the shared fixed infrastructure cost spread over the demand across the network as deemed efficient by the economic regulator.

This poses a significant challenge to renewable gas development, as current commercial development pathways described above rely on the use of existing network infrastructure. As a result, renewable gases will have to seek alternative transportation pathways such as behind-the-meter/co-location with consumption facility, or transport via tube trailer delivered on the back of a truck (also sometimes referred to as a "virtual pipeline"), which are likely not to replace natural gas usage at scale for the following reasons:

- Significant feedstock availability, vacant land and technical expertise is required to invest in a behind-the-meter solution for biogas use. Furthermore, benefits from aggregating feedstock and gas supply may be lost unless demand and supply can constantly be matched behind the meter. KPMG's study of industrial customers for AGIG indicated that most organisations surveyed did not feel they had the expertise or scale to develop their own renewable gas facilities.

- We note the cost of tube trailer is also generally higher[37] due to requirements to liquefy the renewable gases, and transport via truck at the scale required for industrial or GPG use. At higher usage volumes, particularly in industrial facilities, tube trailer would not benefit from economies of scale and require an extra step in liquefaction of the gas, potentially adding to cost.

[37] A techno-economic study of the strategy for hydrogen transport by pipelines in Canada, Journal of Pipeline Science & Engineering, Vol.3, Issue 3, September 2023, Winston Cheng & Y. Frank Cheng;
Large-scale long-distance land-based hydrogen transportation systems: A comparative techno-economic and greenhouse gas emission assessment, International Journal of Hydrogen Energy Vol.47, Issue 83, October 2022. G.Di Lullo et.al

Australian Gas Infrastructure Group

Response to consultation questions

Our responses to the consultation questions follows.

Q1: Industry Capacity: How do you assess the feasibility of the 4.5 PJ target by 2035?

- *Do you think 1 PJ of biomethane production annually is possible within the first three years of the scheme?*
  - *If so, why?*
  - *If not, why not?*

As above in Section 1.2, we suggest a more ambitious target of 14.5 PJ of renewable gas by 2035. The call for a more ambitious target will drive a stronger investment signal brining increased incentive for capital investment into renewable gas projects to meet potential demand highlighted in section 1.1. Given this and the right investment signals to industry, and availability of enabling infrastructure, it is likely that levels of biomethane production will exceed 1 PJ p.a.

We also understand that the Department of Environment, Energy and Climate Action (DEECA) is conducting its own biomethane potential assessment and look forward to understanding its results.

Q2: Could industry potentially deliver volumes greater than 4.5 PJ by 2035?

- *If so, what degree of confidence is there, and what evidence is that confidence based on?*
- *Is there likely to be demand for renewable gases that exceeds 4.5 PJ by 2035? If there is, what evidence is this based on?*

As above in Sections 1.1 and 1.2, we highlight from various independent studies that there is approximately 50 PJ of potential renewable gas that can be available by 2035, and a sufficient level of demand; approximately 66 PJ's across industrial and GPG load in Victoria, and 38.4 PJ of potential demand on our networks alone. We note this assumes demand is met through existing networks.

Q3: How should the dual ambitions of scaling up a renewable gas sector while directing renewable gases to their highest-value use cases to drive additional decarbonisation be managed?

Sections 2 and 2.3 explain the role of the network in enabling markets today (such as the existing Declared Wholesale Gas Market) in matching production and demand. Utilising the network to enable certification and the matching of buyers and sellers in a market allows the matching of prices for what users are willing to pay (relative to their "highest-value use case"), to what producers want to receive in return.

Q4: Should the costs of a renewable gas certificate scheme be recovered from all gas users, including residential and small commercial (i.e. Tariff V) users? OR Should the costs of a renewable gas certificate scheme be recovered from industrial gas (i.e. Tariff D) users only?

- *Please state your reasons in support of one option or the other.*

Our preference is for all customers to be able to access decarbonisation via renewable gases, and for customers who are paying for the scheme to be able to access its benefits. This includes residential and commercial (Tariff V) customers, who, as explained in our submission, form an important part of the economics of the fixed costs of the network.

We also note several other important points supporting our reasoning:

- Based on the costs of all gas users funding the scheme ($0.0009) and only industrial users funding the scheme ($0.0023) we expect that a large user (using around 600 TJ p.a.) would expect to pay around $37,000 p.a. more for the scheme if it was funded by only industrial and GPG users, compared to if it was funded by all users[38]. This is similar to how uptake of wind and solar was driven and accelerated by the Renewable Energy Target, a broad-based scheme funded by the market. KPMG's study of industrial customers indicated that many industrial customers were already facing competitive and inflationary cost pressures, and additional cost would further disincentivise decarbonisation efforts.

- As explained in Sections 1.1 and 2.2, there are Tariff V customers who also face difficulty electrifying who would benefit from renewable gases as a decarbonisation option, who are dispersed across distribution networks. The difference between Tariff V and Tariff D customers is not in the *way* they use gas, but in the annual consumption – meaning there is overlap in industries between Tariff V and D.

- This is also consistent with other market-funded schemes, such as New South Wales' Renewable Fuel Scheme[39].

Q5: Should the liable entity (i.e. the organisation that must procure and surrender certificates in line with annual targets) under any Victorian renewable gas certificate scheme be:

- **Licensed gas retailers along with wholesale energy purchasers who do not procure gas through a licensed retailer? OR**
- **Are there other actors that could potentially be liable entities?**

Please state your reasons in support of one option or the other.

Proposed Scheme Design

We propose an alternate structure to what has been proposed in the consultation paper. This will include AEMO as the scheme administrator who will be tasked with entering into revenue support contracts with renewable gas producers in order for Victoria to meet their renewable gas target. As AEMO is a not-for-profit organisation, it can be tasked with the objective of achieving the Victorian Renewable Gas Target at the lowest cost to consumers. This removes any potential conflicts where retailers and wholesale energy purchasers, as the alternate liable entities, are not aligned with the State's renewable gas target or is detrimental to their existing business, and therefore are not motivated to contract with renewable gas producers to provide the required support. An international example of this structure is The Office of Gas and Electricity Markets (Ofgem) in the United Kingdom, where the energy market regulator administers the collection of levies from liable entities and the revenue support scheme for renewable gas developers[40]. Retailers are not involved in the administration of this, rather the passthrough of levies from liable consumers.

Renewable gas developers will need long term revenue certainty to bring projects to financial close, and revenue support contracts with AEMO achieves that objective – while leveraging the existing framework for gas sales to retailers. Outlined below is our proposed implementation of the scheme:

1. The energy component of the renewable gas produced under the scheme is sold through the existing energy market structures, i.e. from the producer to a retailer (or an industrial customer if they are contracting directly as a Market Customer) and bid into the Declared Wholesale Gas Market (DWGM), where it can be sold to end use retail customers.
2. The renewable attributes of the renewable gas produced under the scheme, are certified through Renewable Gas Guarantee of Origin (RGGO's) certificates, which are created and administered under the existing GreenPower Renewable Gas Certification scheme. This allows the renewable attributes of the gas to be sold to

[38] Based on the mid-range assumption used the in Renewable Gas Directions Paper of natural gas prices at $16/GJ.
[39] Renewable Fuel Scheme | NSW Climate and Energy Action
[40] Green Gas Support Scheme and Green Gas Levy | Ofgem

GreenPower participants separately to the energy component and surrendered on behalf of industrial and commercial customers through the existing GreenPower process to substantiate the customers' renewable claims (for example, by Safeguard Mechanism entities).

3. AEMO contracts for renewable gas supply into the existing network which provides the necessary revenue support to Producers to bring projects to financial close. Producers propose their projects to AEMO, who is then able to enter into support contracts for the lowest cost renewable gas supply into the gas network. The cost is recovered as an uplift to AEMO DWGM participant charges, which are subsequently recovered from customers as a passthrough.

Figure 10 shows this in greater detail. We would be pleased to engage in further detail on the design of this scheme.

Figure 10 - Proposed Victorian Renewable Gas Scheme