

Pathways Call for Evidence Submission

18 July – 14 August 2026

Submission type	Upload
Submitter	Australian Gas Infrastructure Group
Response ID	388461

Disclaimer

This document is a submission to the Net Zero Commission’s 2026 Pathways Call for Evidence. As part of the consultation process, the commission has committed to publishing the submissions it receives. Submissions do not represent the views of the commission.

14 August 2026

Net Zero Commission

Via online submission

To the Consultation Team,

Re: New South Wales Decarbonisation Pathways

Australian Gas Infrastructure Group (AGIG) welcomes the opportunity to provide a submission to the Net Zero Commission (the Commission) to inform the development of the New South Wales Decarbonisation Pathways (the Pathways).

AGIG's Vision is to deliver infrastructure essential to a sustainable energy future. Through our transmission pipelines, distribution networks, gas storage assets and renewable gas projects we deliver energy to more than two million Australians each day, supplying natural and renewable gas that underpins small business, power generation, manufacturing, and other essential industrial and economic activity across Australia.

In New South Wales, AGIG owns and operates distribution networks that serve a broad range of residential, commercial and industrial customers across the state, including regional centres such as Wagga Wagga, Tamworth and Albury. Through these networks, AGIG powers regional communities and industry, delivering reliable energy that supports jobs and economic activity across regional New South Wales, and is investing in renewable gas projects to support customers to achieve their net zero goals. Supporting the transition of these customers often means adopting new fuels within the infrastructure and equipment they already rely on, an approach that is often quicker and less capital-intensive than installing entirely new systems and processes.

New South Wales' net zero targets are best reached through a technology-neutral, customer-driven approach. No single technology suits every customer or end use: some applications are well suited to electrification, while others are better served by renewable or carbon-neutral gas. The Pathways should preserve this choice, allowing customers to adopt the solution that best fits their needs across electrification, renewable gases, efficiency and emerging technologies such as carbon capture. Such an approach would lower overall system cost and improve the resilience of the transition.

New South Wales' gas network infrastructure can deliver emissions reductions without requiring new capital investment in alternative systems. In the near term, natural gas reduces emissions directly, through continued coal-to-gas switching of electricity generation and heavy industry. Over the longer term, renewable gas reduces emissions progressively, as the natural gas currently supplied to households, businesses and industry is increasingly replaced by biomethane and/or hydrogen. Both draw on the same network infrastructure and thus this submission treats natural gas and renewable gas as stages of one continuous transition rather than separate policy questions. The Australian Energy Market Operator's (AEMO's) 2026 Integrated System Plan and the NSW Renewable Fuel Scheme, taken together, point to continued reliance on natural and renewable gas over the course of this transition.

Natural and renewable gases offer emissions reduction benefits across multiple sectors including power generation, residential and commercial customers and industrial customers, as well as providing an important emissions reduction pathway for customers across these sectors who cannot or choose not to electrify.

The reasons for this vary by customer type. Industrial users often have no commercially available electric substitute for high-grade process heat and chemical feedstock applications. Commercial users such as commercial kitchens and laundry services often select gas for its rapid heat response and consistent performance. Residential and smaller commercial customers face barriers including appliance replacement and electrical upgrade costs, structural or space constraints, and, in heritage-listed properties, restrictions on structural modification. Beyond these constraints, customer preference for gas, based on its reliability during outages and its established performance, is itself a legitimate factor in the pace and shape of the transition.

With recoverable biomethane potential alone exceeding half of current gas consumption in the state, and combined with hydrogen blending within established technical limits, renewable gas supply could extend well beyond industrial offtake to serve a substantial share of the demand of the full customer base connected to the network, subject to feedstock recovery, investment and scheme design.

A dual-fuel approach, retaining natural and renewable gas alongside continued electrification of other end uses, reduces whole-of-system cost and risk. It maintains gas-powered generation firming capacity for the electricity system, avoids unnecessary overbuild of electricity transmission and distribution infrastructure, reduces pressure on the renewable generation build required to meet electrification-driven demand growth, and avoids the customer-level cost of appliance replacement and electrical connection upgrades inherent under a broader electrification pathway.^{1, 2}

AGIG recommends that the Commission:

1. Support a technology neutral and customer driven approach to reaching New South Wales' net zero targets, allowing customers to choose the solution that best meets their needs across electrification, renewable gases, efficiency and carbon capture. This means modelling distinct technology approaches – including an electrification-led approach and a mixed natural and renewable gas and electricity approach – rather than varying only the pace of a single assumed electrification pathway.
2. Treat natural gas and renewable gas as a single, continuous transition in the Pathways, rather than modelling gas exit and renewable gas supply as separate or sequential questions.
3. Identify and prioritise sectors with the greatest potential for meaningful emissions reduction, as part of determining the most effective role for electrification across the gas-connected customer base.
4. Require, or commission directly, explicit network cost recovery and total-system cost analysis wherever a pathway scenario assumes electrification-driven exit of gas customers, including avoided electricity transmission investment. This analysis should recognise that investment across electricity and gas infrastructure is concurrent, not substitutable, consistent with AEMO's own optimal development path.
5. Recognise biomethane and hydrogen blending as capable of serving the full customer base connected to the gas network, not only hard-to-abate industrial offtake, and extend the Renewable Fuel Scheme's eligibility and support settings progressively beyond its initial industrial focus as feedstock supply and certificate markets scale.
6. Require each Pathway scenario to identify the marginal generation source that meets electrification-driven demand growth, given New South Wales' current coal-dominated generation mix.

Coal-to-gas switching and renewable gas: two complementary abatement pathways

Natural and renewable gas reduce emissions through two distinct mechanisms: coal-to-gas switching in electricity generation, and biomethane and hydrogen blending in existing gas supply.

International evidence supports the direct emissions reduction benefit of coal-to-gas switching. The International Energy Agency estimates that switching from coal to existing gas-fired plants could cut global power-sector CO₂ emissions by up to 1.2 gigatonnes, around 10% of power-sector emissions, and finds coal-to-gas switching has already saved approximately 500 million tonnes of CO₂ globally between 2010-2019.³

In the United States this mechanism drove a larger share of power-sector emissions reduction than renewables growth: the US Energy Information Administration found that 65% of the 819 million tonne decline in US electricity sector CO₂ emissions between 2005 and 2019 came from the shift from coal-fired to gas-fired generation, against 30% from renewables.⁴

Where coal-to-gas switching reduces emissions from electricity generation, biomethane and hydrogen blending reduce emissions from the gas already supplied to households, businesses and industry. Biomethane is chemically identical to natural gas and can therefore be used as a drop-in fuel, produced by upgrading biogas derived from agricultural, livestock and organic waste feedstocks to pipeline quality. NSW's biomethane potential is significant. Blunomy, in a study prepared for Energy Networks Australia, estimates the state has approximately 88 petajoules of recoverable biomethane potential from existing agricultural, livestock and organic waste feedstocks against approximately 137

¹ Boston Consulting Group, *The Role of Gas Infrastructure in the Energy Transition* (2023).

² Frontier Economics, *The Benefits of Gas Infrastructure to Decarbonise Australia* (2020).

³ International Energy Agency, *The Role of Gas in Today's Energy Transitions* (2019), <https://www.iea.org/reports/the-role-of-gas-in-todays-energy-transitions>.

⁴ US Energy Information Administration, 'Electric Power Sector CO₂ Emissions Drop as Generation Mix Shifts from Coal to Natural Gas', *Today in Energy*, <https://www.eia.gov/todayinenergy/detail.php?id=48296>. Figures are for the US market and are cited here as international evidence of the mechanism, not as a claim about the Australian NEM.

petajoules of current gas consumption in the state.⁵ A further approximately 3.7 petajoules of landfill gas potential is identified separately.⁶

This is not a fixed ceiling. Unlike waste-stream feedstocks alone, biomethane supply can increase over time as dedicated energy crops are grown and harvested specifically for feedstock, meaning recoverable potential grows with cultivated area rather than being capped at current or declining waste volumes. Combined, waste-stream and landfill feedstocks alone put biomethane potential at 92 petajoules, before any energy-crop contribution is counted. Biomethane alone could therefore supply a substantial majority of current gas demand in New South Wales, with room to grow further as cultivated feedstock area expands.

Hydrogen produced from renewable electricity provides an additional pathway to reducing gas emissions and can be blended with natural gas for delivery through existing distribution networks and gas-powered generation infrastructure. Hydrogen blends are already being delivered to gas customers: AGIG's Hydrogen Park South Australia supplies a blend of up to 15% hydrogen by volume to more than 4,000 homes and businesses in metropolitan Adelaide.⁷

Hydrogen also has direct application in gas-powered generation. Several gas-fired generators committed or under development are designed for hydrogen blends above those achievable in an unmodified distribution network, ranging from 5 to 35%, with some carrying a stated pathway to 100% hydrogen.⁸

Biomethane and hydrogen are complementary, not competing, pathways. Biomethane can reduce emissions across the great majority of connected gas demand as a direct substitute, while hydrogen extends the emissions reduction achievable within the same customer base once blending limits and supply are considered together.

AGIG recommendation 1: The Commission should support a technology neutral and customer driven approach to reaching New South Wales' net zero targets, allowing customers to choose the solution that best meets their needs across electrification, renewable gases, efficiency and carbon capture. This means modelling distinct technology approaches – including an electrification-led approach and a mixed natural and renewable gas and electricity approach – rather than varying only the pace of a single assumed electrification pathway.

AGIG recommendation 2: The Pathways should treat natural gas and renewable gas as a single, continuous transition, rather than modelling gas exit and renewable gas supply as separate or sequential questions.

Biomethane's benefits beyond emissions reduction

Biomethane's value to New South Wales extends beyond its role in emissions reduction. Because it is produced domestically from agricultural, livestock and organic waste feedstocks already available within the state, biomethane production reduces exposure to the price volatility and supply risk associated with internationally traded gas, strengthening the state's long-term energy security.

Biomethane production also delivers a direct waste management co-benefit. Capturing biogas from landfills, wastewater treatment and agricultural residues prevents the release of fugitive methane, a far more potent greenhouse gas than CO₂, that would otherwise escape to the atmosphere as these materials break down. The Commission's own 2024 Annual Report found that the landfill gas capture rate in NSW was only 39% in 2022 and identified increasing this rate as essential to reducing emissions in the waste sector.⁹ Biomethane production provides a commercial pathway to close this gap: capturing more of this biogas for upgrading to pipeline-quality biomethane addresses the waste sector abatement task the Commission has already identified, while also displacing natural gas elsewhere in the network.

Biomethane production further supports regional economic diversification. Feedstock supply draws on agricultural and waste-sector byproducts already generated across NSW's regional communities, creating an additional revenue stream for farmers and regional waste operators rather than requiring new resource extraction.

⁵ Blunomy and Energy Networks Australia, *Biomethane Opportunities to Decarbonise Australian Industry* (2025).

⁶ Ibid.

⁷ Australian Gas Infrastructure Group, 'Hydrogen Park South Australia', AGIG, <https://www.agig.com.au>

⁸ Tallawarra B (Energy Australia, 320MW): 5 %, [[Opening of Australia's first dual-fuel gas and green hydrogen capable power plant in New South Wales | GE News](#)]. Tallawarra A (Energy Australia, 440MW): up to 30 % post-upgrade [[Opening of Australia's first dual-fuel gas and green hydrogen capable power plant in New South Wales | GE News](#)]. Dubbo (Squadron Energy, 180MW): 25 % [[Dubbo Firing Power Station](#)]. Brigalow (CS Energy, 400MW): 35 %, with a pathway to 100 % [[973-2024.pdf](#)].

⁹ Net Zero Commission, *2024 Annual Report* (2024).

Abatement effort should target the highest-value sectors

Emissions reduction does not occur uniformly or in a linear sequence across the energy system. Different end-uses, sectors and technologies transition at different rates determined by cost, technical readiness and the availability of substitutes, pathway design should concentrate abatement effort accordingly. Transport illustrates where that effort is better directed. It is the second-largest source of emissions in New South Wales, at approximately 21% of the state's total, and the fastest-growing.¹⁰ Road transport accounts for 87% of transport sector emissions and, unlike many other sectors, has a straightforward electrification pathway.

The renewable electricity supply available to meet this demand is itself constrained. Industry analysis estimates that fully electrifying light vehicles and residential end uses, in addition to meeting the 82% renewable electricity target, would require approximately 120 terawatt-hours per year of new renewable generation, against a forecast pipeline of 20-35 terawatt-hours per year.¹¹ This constrained supply is better directed toward applications that deliver the greatest system-wide benefit as shown in Figure 1 below. Displacing coal-fired generation delivers between 0.8 and 1.2 tonnes of CO₂-e abated per megawatt-hour of renewable electricity, against 0.9 tonnes for electrifying light vehicles and 0.7 tonnes for electrifying residential gas use – with the residential case carrying additional system costs, including network augmentation, consumption profile-matching and appliance capital cost, that coal displacement does not.¹²

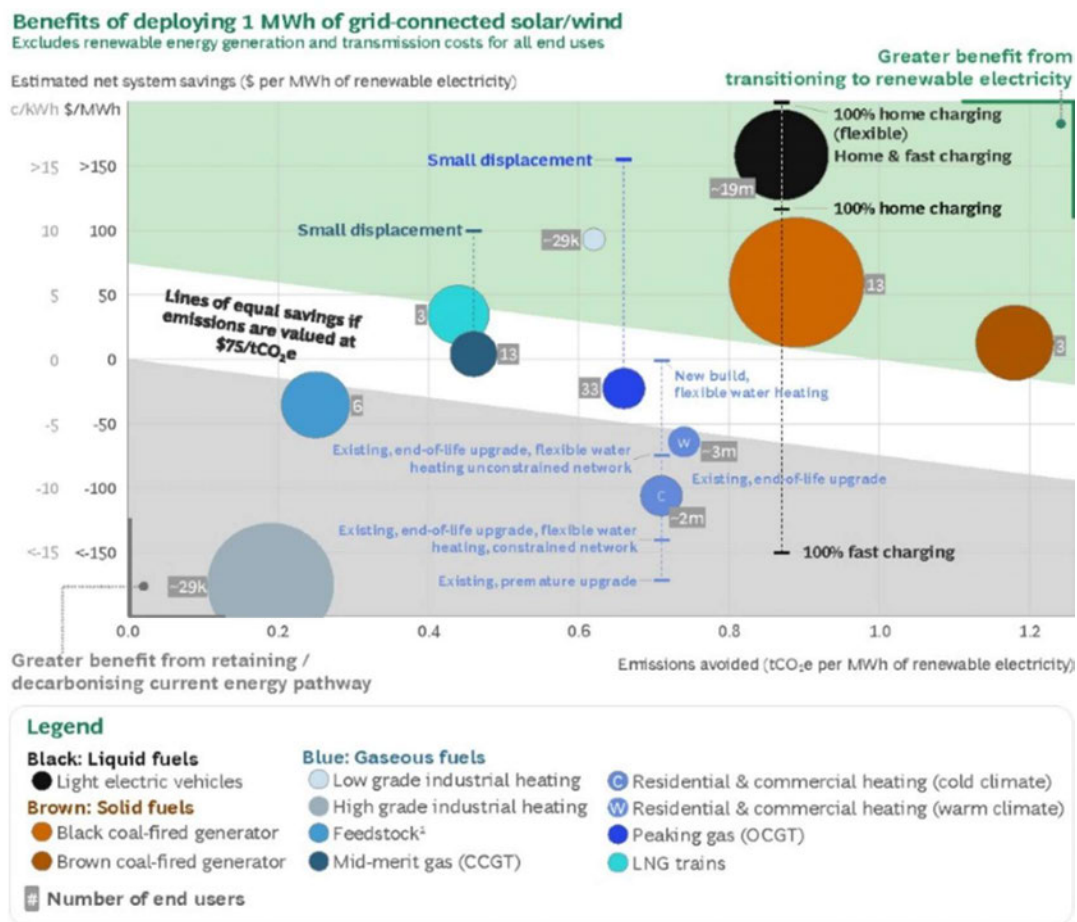


Figure 1: Boston Consulting Group analysis of net system savings and emissions avoided per megawatt-hour of grid-connected renewable electricity, by end-use application (Boston Consulting Group, *The Role of Gas Infrastructure in Australia's Energy Transition*, June 2023).

¹⁰ NSW Environment Protection Authority, *State of the Environment 2024: Transport* (2024), <https://soe.epa.nsw.gov.au>, citing Australian Government Department of Climate Change, Energy, the Environment and Water, *Australia's National Greenhouse Accounts* (2024). Road transport represented 89 % of NSW transport sector emissions in 2022.

¹¹ Boston Consulting Group, *The Role of Gas Infrastructure in Australia's Energy Transition* (2023).

¹² Ibid.

Solid fuels such as coal-fired generation offer the highest emissions reduction and lowest system cost per unit of renewable electricity deployed. Liquid fuels such as petrol in light vehicles offer the next highest benefit, though this depends on charging time and location. Gaseous fuels used in applications such as residential and commercial heating rank lowest, at higher system cost, driven by the same network augmentation, profile-matching and appliance cost factors that apply to residential electrification specifically.¹³ Prioritising renewable electricity toward coal displacement and transport therefore delivers more abatement per unit of constrained renewable supply than prioritising residential electrification.

Sector-by-sector pathway modelling introduces a structural error specific to energy networks. Network costs are shared across all connected customers. Removing one segment of demand, for example through mandated or assumed electrification of residential and commercial buildings, changes the cost base and throughput of the network as a whole. This affects the network's capacity to deliver gas, including renewable gas, to customers for whom no substitute exists, including gas-powered generation firming capacity and hard-to-electrify industrial heat.

An electrification assumption applied to residential and commercial buildings therefore has cost and feasibility consequences for the Electricity and Energy and Industry sectors. These consequences are not visible in a model that treats each sector in isolation. Reducing demand in a sector with more available substitutes, while imposing cost and reliability consequences on sectors with fewer or none, is inconsistent with directing abatement effort to where it is most effective.

Consistent with a technology-neutral approach, the value of the Pathways depends on whether they test different technology mixes, not only different speeds of a single assumed mix. The Commission is developing three Pathways: Balanced, a plausible route to net zero by 2050 reflecting a middle level of technology uptake and behaviour change; Delayed, illustrating what net zero by 2050 requires if barriers to technology uptake and behaviour change are higher; and Fast-tracked, an optimistic scenario with fewer barriers.¹⁴ On this design, the three Pathways share a common assumption that electrification is the default technology outcome for gas-connected customers, and differ mainly in how quickly that outcome is reached, not in what technology mix is used to reach it.

Electrification is a technology choice, not an emissions outcome. A pathway design that varies only the speed of electrification risks treating the two as interchangeable. Biomethane and hydrogen blending can reduce emissions from the same connected customer base without requiring that customer's appliances, connections or supply source to change, and can do so while avoiding some of the network cost recovery and electricity transmission consequences of a faster, broader electrification pathway.

The Pathways should be structured to compare distinct technology approaches to reaching New South Wales' targets: an electrification-led approach, a mixed natural and renewable gas and electricity approach, and a natural and renewable gas-led approach for hard-to-electrify or cost-sensitive segments, in addition to any variation in the pace at which each is achieved. Modelling only the speed of a single assumed pathway does not test whether that pathway is the lowest-cost or lowest-risk route to the target. That is a distinct question from how quickly any given pathway can be delivered.

New South Wales' current policy settings for renewable gas are oriented toward industrial use. The NSW Renewable Fuel Strategy sets a 15% renewable industrial gas use target by 2035; the Renewable Gas Production Program – the mechanism responsible for delivering this target – requires supported biomethane to be supplied to industrial facilities, particularly high-emitting, hard-to-abate users. However, the Renewable Fuel Scheme's certificate obligation is structured as an economy-wide obligation on gas retailers and large direct users, not an industrial-only carve-out. This is consistent with a broader role for renewable gas, even though the Strategy's framing emphasises industrial application.¹⁵

AGIG recommendation 3: AGIG recommends that the Commission Identify and prioritise sectors with the greatest potential for meaningful emissions reduction, as part of determining the most effective role for electrification across the gas-connected customer base.

¹³ Ibid.

¹⁴ Net Zero Commission (NSW), *Decarbonisation Pathways for NSW: Call for Evidence* (2026).

¹⁵ NSW Climate and Energy Action, *'Renewable Fuel Scheme'*, energy.nsw.gov.au (accessed July 2026).

AGIG recommendation 4: AGIG recommends that Commission require, or commission directly, explicit network cost recovery and total-system cost analysis wherever a pathway scenario assumes electrification-driven exit of gas customers, including avoided electricity transmission investment. This analysis should recognise that investment across electricity and gas infrastructure is concurrent, not substitutable, consistent with AEMO's own optimal development path.

AGIG recommendation 5: AGIG recommends that the Commission recognise biomethane and hydrogen blending as capable of serving the full customer base connected to the gas network, not only hard-to-abate industrial offtake, and extend the Renewable Fuel Scheme's eligibility and support settings progressively beyond its initial industrial focus as feedstock supply and certificate markets scale.

A dual-fuel pathway lowers whole-of-system cost and reliability risk

Electrification is often treated as inherently decarbonising, on the assumption that displacing direct fossil fuel combustion with electricity reduces emissions. Whether this is accurate depends on the marginal source of that additional electricity. New South Wales' generation mix remains majority fossil-fuelled: renewables reached approximately 41% of the state's electricity generation at June 2026, with the remaining share still met predominantly by coal.¹⁶ As long as electricity demand exceeds the renewable and storage capacity available to meet it, additional demand is met by dispatchable generation – predominantly coal in New South Wales. Absent a matching increase in renewable and firming capacity, electrification-driven demand growth risks extending reliance on coal generation rather than displacing it.

Australia's renewable rollout has drawn first on the lowest cost, most readily connectable sites, and subsequent capacity is increasingly constrained by Renewable Energy Zone (REZ) capacity and grid connection delays: national investment in new renewable capacity fell to one of its lowest levels in a decade in 2025, even as generation share grew to 43%.¹⁷ The Commission's own 2024 Annual Report found only 17% of the NSW Electricity Infrastructure Roadmap's 12 GW target had been commissioned as of 2023-24, requiring the remainder to be built at roughly triple the recent rate.¹⁸

AEMO's 2023 Gas Statement of Opportunities (GSOO) found that a disorderly coal exit or delayed renewable build-out would require an additional 30 to 100 petajoules of gas nationally for gas-powered generation.¹⁹ Even analysis focused on the risks of extending coal-fired generation recognises the scale of gas-powered generation's backstop role. Where a lack of new renewable generation and storage capacity forces coal-fired plants to be kept online longer than planned, this increases reliance on gas-powered generation to cover the reliability gap as ageing coal plants underperform. The Institute for Energy Economics and Financial Analysis' (IEEFA) April 2025 analysis of AEMO's 2025 GSOO data found this could require an additional 49 to 93 petajoules per year of gas-powered generation over 2034 to 2043, as much as a 76% increase on recent annual GPG demand.²⁰

Modelling of least-cost, high-renewable electricity systems indicates gas-powered generation capacity in the order of 5 to 11% is retained even in a predominantly renewable system, reflecting its role as dispatchable, fast-ramping firming capacity that variable renewable generation and storage cannot yet replace.²¹ AEMO's 2026 Integrated System Plan (ISP) reinforces this point. Its optimal development path calls for approximately 17 gigawatts of flexible gas-powered generation by 2050, up from approximately 15 gigawatts in the 2024 Integrated System Plan. That is a larger, not smaller, role for gas in firming the system through extended periods of low renewable output and in meeting peak demand as coal retire.²² For the first time, the ISP also states that without timely investment in gas supply infrastructure, gas supply gaps may be large enough to risk delivery of the optimal development path as a whole.²³

ACIL Allen modelling, prepared for the Australian Pipelines and Gas Association and Energy Networks Australia, compared four national pathways to net zero for gas customer emissions between 2025 and 2050: a Theoretical Efficient Policy representing an economy-wide carbon price, an Optimal Renewable Gas Target, an Accelerated

¹⁶ Australian Government Department of Climate Change, Energy, the Environment and Water, *Australian Energy Statistics infographic (ENR212.0426)*, June 2026, energy.gov.au, *New South Wales renewable generation share*.

¹⁷ Clean Energy Council, *Clean Energy Australia 2026 report* (2026).

¹⁸ Net Zero Commission (NSW), *Annual Report* (2024).

¹⁹ Boston Consulting Group, *The Role of Gas Infrastructure in the Energy Transition* (2023).

²⁰ Institute for Energy Economics and Financial Analysis, *Delaying Coal Power Exits: A Risk We Can't Afford* (2025).

²¹ Boston Consulting Group, *The Role of Gas Infrastructure in the Energy Transition* (2023).

²² Australian Energy Market Operator (AEMO), *2026 Integrated System Plan* (2026).

²³ Ibid.

Renewable Gas Target, and an Electrify Everything Possible scenario in which gas use is switched to electricity wherever technically feasible.²⁴

Under the Theoretical Efficient Policy scenario, gas customer emissions reach net zero through a fuel mix of approximately two-thirds renewable gas and one-third electricity, at an average abatement cost of \$143 per tonne of CO₂-e. The Optimal Renewable Gas Target scenario reached the same national emissions outcome at an average abatement cost of \$150 per tonne, against \$165 per tonne under the Electrify Everything Possible scenario. Whole-of-economy modelling put this difference at a national GDP benefit of approximately \$30 billion in present-value terms for the Optimal Renewable Gas Target relative to Electrify Everything Possible.²⁵

AGIG Recommendation 6: AGIG recommends that the Commission Require each Pathway scenario to identify the marginal generation source that meets electrification-driven demand growth, given New South Wales' current coal-dominated generation mix.

AGIG welcomes the Commission's consideration of the matters and recommendations raised in this submission. AGIG's network assets and renewable gas investments across Australia position it to provide further technical and commercial evidence to support the Commission's work as the Pathways are developed. AGIG welcomes the opportunity for further engagement with the Commission on these matters. Please contact [REDACTED], should you wish to discuss this submission in more detail.

Kind Regards,

[REDACTED]

[REDACTED]

²⁴ ACIL Allen, *Renewable Gas Target: Delivering Lower Cost Decarbonisation for Gas Customers and the Australian Economy* (2024).

²⁵ Ibid.