31 July 2026

NSW Net Zero Commission Call for Evidence: Decarbonisation Pathways for New South Wales

The LPG industry safely and securely supplies 43 PJ of energy annually to industrial, commercial and residential consumers across Australia, including around 30% of regional Australian households. Gas Energy Australia (GEA) represents Australia's liquid gas supply chains, including Liquefied Petroleum Gas (LPG) and associated gases, with members spanning producers, distributors and retailers.

GEA welcomes the opportunity to provide a submission to the NSW Net Zero Commission's Call for Evidence: Decarbonisation Pathways for New South Wales.

Australia's liquid gas industries support Australia's net zero transition. LPG produces 14% less Scope 1 emissions than diesel today and is stored at costs 1000x cheaper than home batteries. As drop-in renewable liquid gas (rLG) such as BioLPG emerge, consumers can continue using existing LPG infrastructure and appliances while producing 99% less greenhouse gas[1], making LPG the perfect partner for renewable electricity in the cities and the bush.

GEA commends the NSW Government's leadership in supporting GreenPower's development of a BioLPG Low-carbon Liquid Fuel (LCLF) Certificate Scheme. While many choose LPG in metropolitan Australia, it often provides energy access to regional Australians where other energy sources can be unreliable or unavailable. Pursuing BioLPG certification does the hard, valuable work of enabling decarbonisation for those with fewer options, delivering a pathway to net zero for all.

GEA supports the Commission's objective of identifying practical, evidence-based pathways to achieve net zero emissions. We consider it important that future pathway modelling recognises renewable liquid gases, existing LPG infrastructure and policy settings that promote affordability, resilience and consumer choice.

More detailed recognition of Renewable Liquid Gas (rLG)
GreenPower inclusion is a valuable first step. Recognising rLG's regional decarbonisation potential in government policy and including it as an emerging fuel in future pathway modelling would go further still.

[1] Frontier Economics, 2023, *Pathways to Zero Emissions for LPG*, https://www.gasenergyaus.au/get/2016/pathway-zero-emissions-for-lpg-frontier.pdf

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Leverage Existing LPG infrastructure
Recognise the billions of dollars of existing LPG infrastructure in NSW as a transition asset capable of supporting decarbonisation through fuel substitution, avoiding costly infrastructure replacement.

Near-term emission reductions
With rLG around the corner, pathway modelling should evolve to recognise opportunities for immediate emissions reduction through substituting LPG in place of higher-emitting fuels, such as coal and diesel.

Investment certainty
Provide policy certainty that encourages investment in rLG production and deployment to the same degree as support for other renewable fuels including Sustainable Aviation Fuel (SAF) and Renewable Diesel (rDiesel).

Further information supporting these recommendations is provided in Appendix 1.

GEA appreciates the opportunity to contribute to the Commission's Call for Evidence and welcomes continued engagement as the Commission develops its recommendations.

To discuss any of the above feedback further, please contact me on +61 422 057 856 or via jmccollum@gasenergyaus.au.

Yours sincerely,

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The Role of LPG in Australia's Energy Landscape

Liquefied Petroleum Gas (LPG) plays a vital role in Australia's energy security and net zero transition. As a versatile energy source with drop-in renewable alternatives, LPG provides essential energy services to millions of Australians, particularly in regional and remote areas where it serves approximately 30% of households[2]. The LPG industry safely and securely supplies 43 petajoules of energy annually across industrial, commercial, and residential applications nationwide[3]. A further 120 petajoules of LPG is exported annually, with the LPG sector as a whole contributing over $5bn of GDP and 20,500 FTE to the Australian economy[4].

LPG stands out as a cleaner alternative to many traditional fossil fuels, producing 14% fewer greenhouse gas emissions than diesel[5]. The industry is actively embracing Australia's transition to net zero through the pursuit of renewable forms of LPG[6]. These include bioLPG (a co-product of Sustainable Aviation Fuel) and renewable LPG (rLPG) produced from hydrogen. These alternatives reduce scope 1 emissions by 99% while utilizing existing infrastructure and appliances.

One of LPG's most significant advantages is its superior energy storage capability in cheap, transportable LPG tanks. This is key in regional areas where mains power may be unreliable or unavailable. A standard residential LPG tank installation provides energy storage equivalent to more than 42 Tesla Powerwall 3 home battery systems at around one-tenth the cost[7]. This storage capacity, combined with the portability of LPG tanks, makes it an invaluable resource for energy security and emergency resilience.

The LPG industry is uniquely positioned to support Australia's energy transition without requiring government funding or subsidies. As the nation moves toward net zero emissions, renewable forms of LPG complement renewable electricity, offering a practical decarbonisation pathway for applications where electrification may not be feasible or cost-effective. By recognizing and supporting the development of renewable forms of LPG, Australia can ensure a diverse and resilient energy mix that retains energy security while achieving its climate goals.

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[2] Australian Bureau of Statistics, 2014, *Environmental Issues: Energy Use and Conservation*, https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4602.0.55.001Main+Features1Mar%202014

[3] Australian Federal Department of Climate Change, Energy, the Environment and Water, 2024, *Australian Energy Update 2024*, https://www.energy.gov.au/publications/australian-energy-update-2024

[4] ACIL Allen, 2022, *Economic contribution of the Australian gas economy in 2020-21*, https://www.gasenergyaus.au/get/2123/economic-contribution-of-australian-gas-economy.pdf

[5] Australian Federal Government, *2024, National Greenhouse and Energy Reporting (Measurement) Determination 2008*, https://www.legislation.gov.au/F2008L02309/latest/text

[6] Frontier Economics, 2023, *Pathways to Zero Emissions for LPG*, https://www.gasenergyaus.au/get/2016/pathway-zero-emissions-for-lpg-frontier.pdf

[7] Elgas, 2025, *LPG Gas Bottle Sizes*, https://www.elgas.com.au/elgas-knowledge-hub/residential-lpg/lpg-gas-bottle-sizes-gas-bottle-dimension-measurements/

Appendix 1

Renewable LPG and NSW's Net Zero Transition

Renewable Liquid Gas (rLG) is a category of emerging LCLFs consisting of a range of production pathways to deliver a drop in alternative to LPG[8]. Chemically identical to conventional LPG, rLG can be supplied through existing infrastructure and utilised in existing appliances without modification. Renewable Dimethyl Ether can be part-blended into LPG as well similar to hydrogen in natural gas.

BioLPG is the rLG closest to being available to market. It is typically produced as a co-product of the same HVO/HEFA and Alcohol-to-Fuel (ATF) or Alcohol-to-Jet (ATJ) pathways used to make Sustainable Aviation Fuel and renewable diesel.

Co-processed LPG via existing refineries consuming similar feedstocks as BioLPG is also just around the corner, with Viva Energy due to produce first domestic volumes within the year. This reflects growing commercial interest in rLG across Australian industry, demonstrating that rLG is no longer solely an international opportunity.

Beyond near-term BioLPG options, other options exist to produce rLG via synthetic pathways utilising a wide range of biomass or hydrogen feedstocks. This will ensure that there can be enough rLG to supply the full existing customer base if HVO/HEFA and ATF supply of rLG is exhausted.

Like more LCLFs, rLG will cost more than its fossil alternative. For many customers, this additional renewable fuel cost is anticipated to be less than the much higher cost of electric appliances and electricity energy storage in comparison to LPG appliance and storage costs.

To communicate this relationship, GEA alongside the World Liquid Gas Association and Propane Education and Research Council (USA) is undertaking a study of wholesale rLG production costs across the above pathways. Targeting publication in early 2027, this study will publish an Australian rLG cost evidence base for transparent industry, customer advocate, and government modelling. GEA would welcome the chance to share these findings with the Commission once published.

LPG's existing customer base

LPG serves a broad customer base across NSW and Australia, spanning agriculture and food production, manufacturing and industrial process heat, commercial food service, hospitals and medical centres, emergency and resilience applications, and mining and construction, alongside residential and small business use.

While many choose LPG in metropolitan Australia, it plays an outsized role in regional Australia. Across Australia, roughly 2 million households use LPG today – with NSW

[8] Liquid Gas Europe, 2025, *Outlook for renewable liquid gas in Europe*, available at: https://www.liquidgaseurope.eu/wp-content/uploads/2025/03/Outlook_lge_digital.pdf

accounting for the largest share of any state. In metropolitan areas, LPG is often one energy option among several, chosen for cost, convenience, or specific applications where reticulated gas or electricity aren't well suited.

In regional and remote NSW however, LPG frequently plays a different role entirely. Over half of NSW's and Australia's residential LPG customers exist in regional or remote areas, where other forms of energy can be unreliable or unavailable. The same applies across regional industry, agriculture, mining and medicine, where LPG's portability and energy density make it the practical choice, not simply a preferred one.

This breadth of customers reliant on LPG means the case for rLG isn't limited to a single use case or customer type. It's a decarbonisation pathway relevant to households, farms, food service, manufacturing and resource sectors alike, wherever grid alternatives are absent, unreliable, or poorly suited to the application.

Existing LPG Infrastructure as a Transition Asset

Australia's LPG supply chain includes import terminals, storage facilities, cylinder filling plants, distribution networks, transport fleets, and customer installations. Drop in rLG can use this infrastructure without modification, and appropriate modifications will be explored if rDME is pursued in Australia. Recognising this infrastructure as a transition asset introduces billions of dollars of existing infrastructure into the service of NSW decarbonisation goals.

Taking this approach avoids the cost of infrastructure duplication. Building new energy infrastructure to replace assets already capable of supporting decarbonisation adds expense without adding emissions benefit. In fact, developing new infrastructure likely adds emissions to the transition. A transition asset approach lets NSW achieve the same outcome, lower emissions, at lower cost and with less disruption to the communities and businesses who rely on LPG today.

Investment Certainty

Successful development of any LCLF supply chain needs policy certainty that encourages investment in the production and deployment of the fuel, and rLG is no different. Enabling a NSW rLG market will require policy makers ensure rLG is provided an equivalent level of support as is extended to other LCLFs such as SAF and rDiesel.

Without this, rLG risks being treated as a lower priority product, risking the additional CAPEX required to provide access to rLG not being spent on biorefineries based upon SAF or rDiesel government support. Even if included in upfront design, without a legislated reason to choose to purchase rLG, it is unlikely that customers will choose rLG over the lower cost fossil fuel alternative.

Europe's experience with LCLF mandates illustrates the risk of this gap. Mandates that excluded rLG succeeded in driving biorefinery development but failed to create a market driver for rLG uptake itself. The unintended consequence was investment in

production capacity without a corresponding reason for customers to transition via rLG purchase.

Until recent clarification that rLG was included in European Renewable Energy Directive III's definition of biofuels, rLG made available to the European market was not taken up. This demonstrates that without a clear reason to switch, customers will default to the least-cost option – continuing to use a fossil fuel – even as the renewable alternative becomes available alongside it.

NSW has the opportunity to avoid the European outcome by ensuring policy settings create demand-side certainty for rLG from the outset, not just supply-side capacity.

Near-term emission reductions

While rLG production provides a pathway to net zero LPG emissions, there are immediate opportunities to reduce greenhouse gas emissions through the substitution of higher-emitting fuels with conventional LPG. NSW is still home to energy customers big and small which are choosing to consume coal or diesel where lower emission LPG consumption is an option.

Supporting the replacement of higher-emitting fuels with LPG use can deliver immediate Scope 1 emissions reductions and particulate emissions reductions while maintaining energy reliability and operational performance. This enables NSW businesses to begin reducing emissions today, rather than waiting for new technologies or infrastructure to become available.

Recognising these near-term opportunities within decarbonisation pathway modelling will provide a more realistic representation of emissions reduction pathways, while supporting an orderly transition towards renewable LPG as production scales over time.