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Bioenergy Australia Submission: NSW Net Zero Commission Consultation

Bioenergy Australia (BA) is the national industry association committed to accelerating Australia's bio economy. Through targeted advocacy, campaigns, education, industry building and allied sector engagement, we're:

- Enabling decarbonisation of Australia's hard to abate sectors
- Enhancing energy security, supply and supporting the transition of Australia's energy system
- Growing Australia's economy and providing jobs and economic development including for regional Australia
- Enabling the development of Australia's circular economy

This submission from Bioenergy Australia is on behalf of the Renewable Gas Alliance (RGA) and The Low Carbon Fuels Alliance of Australia and New Zealand (LCFAANZ). These alliances were founded to accelerate the development and deployment of Low Carbon Liquid Fuels (LCLF) and Biomethane in Australia. Individual members of the alliances will be providing more detailed submissions specific to their business and expertise. This submission is a collective response and does not represent the views of any specific member

Australia's Bioenergy Roadmap (ARENA, November 2021) outlines how, by the start of the next decade, Australia's bioenergy sector could contribute to around $10 billion in extra GDP per annum and 26,200 new jobs (predominately regional), reduce emissions by about 9 per cent, divert an extra 6 per cent of waste from landfill, and enhance fuel security. Now is the time to capitalise on these opportunities by prioritising the development of renewable liquid fuels and renewable gas within the NSW Net Zero Commission consultation.

Bioenergy Australia thanks the NSW Government for the opportunity to provide feedback on the NSW Net Zero Commission Consultation Paper. We welcome the NSW governments recognition that without accelerated action, NSW may not reach net zero by , thus, there is the need for substantial emissions reductions across all sectors. Thus, in transitioning to net zero, we appreciate that all sectors and voices need to be heard to create a more liveable and sustainable community.

We provide the following feedback to the consultation questions:

1. What can you tell us about your experience of the impacts of climate change and how can the commission seek to reflect and respond to this in its work?

We have observed the increasing impacts of climate change in recent years. These include more frequent and intense heatwaves, unpredictable rainfall, and periods of both drought and flooding. Such changes have had direct consequences for our local infrastructure, public health, and the natural environment.

These climate-related disruptions have also placed pressure on local services, agriculture, and water supply systems. The cumulative effects are contributing to a sense of instability and long-term concern within the community. Stronger and more urgent government action is required—not only to reduce emissions but also to invest in local adaptation measures that build resilience and protect communities already facing climate-related stress.

The development of ambitious, achievable and advantageous targets comes at a pivotal time where Australia is primed to take on and accelerate key opportunities that can significantly contribute to Australia's emissions reduction objectives.

We support the NSW Government's recognition that renewable liquid fuels and renewable gas will play a central role in helping Australia meet its emission reduction targets and encourage the government to continue work to support is local development. .

As highlighted in our response to the Opportunities for a renewable fuel industry in NSW Discussion Paper, the following renewable fuels will play a key role in supporting NSW decarbonisation and economic agenda:

- *For natural gas users in NSW*:
  - Biomethane (domestic transition, industrial, manufacturing, food processing)
- *For Road Transport/Marine and remote energy users (e.g. mines) in NSW:*
  - Renewable Diesel (heavy haulage, rail, construction, mining, agriculture)
  - Biodiesel (heavy transport, marine, construction, agriculture)
  - Ethanol (Road and pathway for aviation)
  - Biomethanol (Marine and heavy transport)
  - BioLPG including propane, butane and dimethyl ether (DME) (standalone high intensity heat, industrial manufacturing and food processing)
- *For* Aviation *in NSW:*
  - Sustainable Aviation Fuel (SAF) (aviation)

The NSW Government can help Australia prepare for and respond to the development and deployment of renewable liquid fuels and renewable gas as an emission reduction pathway by helping develop its social licence.

Renewable liquid fuels and renewable gas are ready and proven emissions reduction technology that can start decarbonising our infrastructure, vehicles and machinery today. However, there is limited understanding among the Australian public, government and industries regarding renewable fuels existence and accessibility.

Renewable fuels can be immediately deployable as a drop-in replacement for fossil fuel equivalent, achieving emission reduction without requiring overhaul of existing infrastructure, vehicles, or gas grid. However, many remain unaware of its existence, benefits, and the fact that it is readily available for use. Many users are also not familiar with the production processes, co-product benefits, diverse applications or the international markets already taking advantages of these fuels. As a result, they may not consider it as a viable option for their energy needs.

Education, awareness, government commitment, and policy action supporting renewable fuels are crucial for developing and maintaining the social licence of this sustainable energy solution. These measures will affirm the essential role, reliability, and availability of renewable fuels in reducing emissions.

2. What actions can the commission take to engage across the community to help drive the shifts needed for the net zero transition and for effective climate change mitigation and adaptation?

Government action is key in engagement across the community. The Government's commitment to supportive policy is important and will act as the catalyst for investment, development and adoption of renewable fuels. Promotion of knowledge-sharing campaigns and resources are vital in raising awareness and increasing education for consumers about the role compatibility, and sustainability of renewable energy.

Understanding how renewable fuels can contribute to the wellbeing of Australian workers, communities, and regions through the following opportunities is vital: '

- Australia-wide, a domestic SAF industry alone could generate nearly **13,000 jobs** in feedstock supply and **5,000 high-value jobs** in facility construction and operation.[1]
- By 2050, the market value of biogenic SAF in NSW could amount to **A$11.9 billion** in Australia and **A$4.8 billion** in NSW based on projected demand volumes.[2]
- The 2023 Jobs and Skills Australia Report, estimating that existing workers in petroleum refining (around 1,500 in 2021) could easily transition to biofuel employment, including at the same worksites. [3]The adoption of biogas technology could provide over 18,000 full-time jobs, mostly in regional areas, and contribute $50 billion to Australia's GDP.48
- The 2023 Jobs and Skills Australia Report highlighted that there is around 2,100 people already working in pipeline transport, and the gas sector will be able to leverage this existing workforce to support future infrastructure works.[4]
- These fuels ensure that Australian consumers, businesses, and industries have access to a variety of emission reduction pathways that can integrate with existing technologies and lifestyles. This will enhance consumer choice (by allowing consumers the flexibility to continue using technologies that align with their lifestyle and preferences); support the ongoing operability of legacy technology (as these renewable energies can operate within existing technology without the need for significant upgrading); and product availability (providing consumers with a broader range of energy choice while still reducing emissions).

Furthermore, confidence in the supply of renewable fuels can be a barrier. Potential users may worry about the reliability and consistency of supply, especially in comparison to conventional energy

[1] https://www.qantas.com/content/dam/qantas/pdfs/qantas-group/icf-report-australia-saf-policy-analysis-nov23.pdf
[2] NSW Sustainable Aviation Fuel Prospectus (2024)
[3] Jobs and Skills Australia, The Clean Energy Generation: workforce needs for a net zero economy (2023)
[4] Ibid.

sources. This uncertainty can deter them from committing to and transitioning to renewable fuel solutions.

However, these renewable fuels can be rapidly scaled to accommodate Australia's energy and fuels needs which is further supported by the significant feedstock availability within Australia. Australia has the natural resources and an agricultural sector with the capabilities and sustainability to meet the growing demand for renewable feedstocks to be used to create this energy, while minimising or avoiding land use change. There are emerging solutions and innovations in technology, waste management and agriculture that will enable Australia feedstock providers to meet the rapidly rising demand for these renewable feedstocks while improving their productivity and sustainability.

3. What additional information and evidence should the commission consider when assessing progress towards NSW's targets for reducing net greenhouse gas emissions?

Australia lags behind the rest of the world in supporting its renewable fuels industry. However, NSW is primed to play a driving role in the renewable sector's domestic growth, establishing itself a leader for low-carbon fuels development, and supporting its decarbonisation goals.

To accelerate progress, the NSW Government can support renewable fuel projects to validate these technologies in real-world conditions, build trust in their viability, attract additional investment for scaling, support the transition from pilot stages to full-scale operations, boost market confidence, and demonstrate the government's genuine commitment to advancing a local renewable fuels industry.

The NSW Government can implement a range of strategic actions:

- Expansion of the NSW Renewable Fuels Scheme (on the basis that the liable entities are those that receive the benefit or have access to the fuel) to include the following for liable entities:
    - *For natural gas users in NSW*:
        - Biomethane (domestic transition, industrial, manufacturing, food processing)
    - *For Road Transport/Marine and remote energy users (eg mines) in NSW:*
        - Renewable Diesel (heavy haulage, rail, construction, mining, agriculture)
        - Biodiesel (heavy transport, marine, construction, agriculture)
        - Ethanol (Road and pathway for aviation)
        - Biomethanol (Marine and heavy transport)
        - BioLPG including propane, butane and dimethyl ether (DME) (standalone high intensity heat, industrial manufacturing and food processing)
    - *For* Aviation *in NSW:*
        - Sustainable Aviation Fuel (SAF) (aviation)

- Implement supply-side support: Mechanisms could include capital and development grants, production credits or tax incentives, Contracts for Difference (CfD), and R&D support. These supply-side mechanisms are essential stackable incentives alongside Federal Government support. By enhancing supply availability and providing offtakers with greater certainty regarding access to supply, this support can effectively complement and amplify national initiatives.

- Subsidies or rebates for end-users: To reduce costs and encourage the adoption of renewable fuels.
- Regulated demand-side levers tied to carbon intensity (i.e mandates and low carbon fuel standards): We have been calling on the Federal Government to implement these demand levers. It is essential for the NSW Government to coordinate with the Federal Government in this area to avoid inconsistent policies.
- Introduce Government Procurement Programs: Support renewable fuel adoption through government contracts and purchasing programs.
- Streamline regulatory approvals: Simplify processes to facilitate local project development and increase domestic supply.
- Support research and development: This could focus on developing feedstock varieties and farming techniques to enhance yield, quality, and sustainability. Additionally, support should be directed towards optimising logistics for feedstock transportation and advancing emerging technologies and production pathways.
- Promote knowledge-sharing campaigns: Support knowledge-sharing campaigns and resources to raise awareness and educate consumers about the role, compatibility, and sustainability of renewable fuels.

The NSW Government should consider how renewable fuels is being supported in international markets as a means to advance their own decarbonisation targets and progress. For example:

- The success of "stackable" renewable fuel policies has been demonstrated in the US, where incentives such as the Blenders' Tax Credit (production tax incentives), the Renewable Fuel Standard (RFS) (as a demand side policy) at the national level, and state-level low-carbon fuel standards (LCFS) (also driving demand) like California's, contribute significantly to the cost competitiveness of renewable fuel products. These incentives and demand levers when stacked, further enhances the financial attractiveness of renewable fuel production, de-risks investment reduces the cost premium for consumers.
- California's Low Carbon Fuel Standard (LCFS): Low Carbon Fuel Standards are a variant of a mandate where volumes are based on an emissions intensity reduction trajectory and apply across all fuel use, not just jet fuel. Implemented in California, with success observed in reducing emissions in line with stated targets and delivering regional economic benefits to value chain participants. Recent analysis suggests the Californian LCFS has increased fuel prices for consumers by around 8c/L.[5]
- US SAF Grand Challenge has allocated US$4.3 billion in funding to support the development of SAF projects and for fuel producers.[6]
- British Columbia, Canada, Low Carbon Fuel Standard: The BC-LCFS Program sets carbon intensity reduction targets for transportation fuels, and these targets are gradually increased over time. Fuel suppliers are required to meet these targets by either blending lower-carbon fuels into their products or purchasing credits from other suppliers who have succeeded to exceed their targets. This program covers both road and aviation but implements a slower reduction schedule for aviation (given the nascency of the SAF market relative to renewable

[5] Deloitte, prepared for the Queensland Department of State Development, Infrastructure, Local Government and Planning 'Preparing for take-off: the case for public-private collaboration to catalyse an Australian SAF value chain' (September 2023).
[6] Ibid.

diesel) and includes a volumetric sub-mandate for SAF (starting at 1% in 2028, 2% in 2029 and 3% in 2030) to ensure SAF adoption.[7]

- UK SAF Mandate: New targets to ensure 10% of all jet fuel in flights taking off from the UK comes from sustainable sources by 2030 (approximately 1.5 billion litres). This includes a 2% SAF Mandate for 2025 and a progressive trajectory of related caps and obligations on industry.[8] Some key design elements of this Mandate include:
    - Periodical Review Assessment: Targets will be continuously assessed and formally reviewed at least every five years. The government will immediately review the mandate in case of a shortage causing significant unexpected price increases or potential buyout.
    - Stability and Predictability: Sufficient duration: Target is currently set for 15 years, from 2025 to 2040 to provide certainty to SAF producers and investors.
    - Recognise and promote emissions reduction performance: The Mandate will deliver carbon savings by setting annual targets on fuel suppliers to blend in a proportion of SAF into their fuel supply. It will operate as a tradeable certificate scheme where the supply of SAF is rewarded in proportion to its GHG emissions reductions.
    - Harmonisation and interplay with other domestic and international policy (stackability): The mandate will operate alongside the UK ETS, RTFO scheme, EU ETS, and CORSIA, allowing airlines to make emissions reduction claims under the UK ETS for eligible SAF.
    - Access to financing instruments to create price certainty (de-risk investment and provide stability): Government announced plans to design and implement a revenue certainty mechanism to attract private investment and enable SAF projects to be deployed at scale in the UK. The announcement also clarified that any mechanism will be industry-funded.
- Sweden has introduced a SAF mandate, commencing in 2021 at 0.8% of fuel sold, growing to 27% by 2030.5
- United States: In the United States, biomethane development has been driven by the transport sector and supported by schemes such as the Renewable Fuel Standard (RFS) and California's Low Carbon Fuels Standard (LCFS). For example, the new RFS Set Rule aims to double biomethane supplies in the next three years. Given the obligation volumes proposed, the pipeline of projects under development and California's targets for injected biomethane, biogas and RNG supplies combined are expected to expand 2.1-fold in the next five years. Generous financial support from various programmes that permit additionality provide a very favourable framework for the accelerated growth.[9]
- The EU Emissions Trading System (EU ETS) is a cap-and-trade system to reduce emissions of greenhouse gases covering operators of large industrial and power plants, and in the future also covering the transport and buildings sectors. Biomethane is an attractive option to reduce greenhouse gas emissions and comply with EU ETS obligations in all sectors based on its high lifecycle emission reduction.[10] The European Union has also initiated the inclusion of biogas and biomethane in its Guarantee of Origin system that industry can use to comply

[7] British Columbia's Low Carbon Fuel Standard: Pioneering Clean Fuel Standard Programs
[8] UK Government 'Aviation fuel plan'
[9] IEA, 'Renewables 2023 - Special section: Biogas and biomethane" (2024)
[10] Biomethane Industrial Partnership, 'A vision on how to accelerate biomethane project development' (October 2023)

with the EU ETS or private companies can utilise to achieve their own emissions reduction targets.[11]

- **Biomethane quotas:** The introduction of biomethane quotas applied to energy suppliers, notably in France and the Netherlands, requires gas suppliers to have a given share of biomethane in their sales of gas to customers, and is an effective measure to increase the integration of biomethane into the energy mix.
- **Feed in Tariffs for Biogas:** Danish legislation encourages the use of biogas for industrial purposes through a Feed in Tariff that consists of two price components: The base price settlement and a natural gas supplement, that varies in relation to the price of natural gas. The Feed in Tariffs cover uses such as upgrading and injection as well transport, heating and other industrial uses.[12]
- **Contracts-for-Difference:** In the Netherlands the SDE++ scheme (stimulation of sustainable energy production and climate transition) is soon to be replaced by a two-way Contract-for Difference.[13]
- **Tax exemptions** to final users are another form of demand-side financial mechanisms. In Germany, tax exemptions were applied to purchasing biomethane in both CHP and heat generations, as well as for vehicle fuelling. Norway and Switzerland have implemented full energy tax exemptions for biomethane use in transport.[14]
- **Government procurement programs:** Setting government procurement targets would also strengthen market confidence and encourage investment. A successful model of this proposal is the KLM Corporate SAF Program in the Netherlands, where public servants flying on KLM pay a premium for their ticket to opt-in to the airline's SAF purchasing program, reducing the government's carbon footprint in the process.[15]
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- The European Union has initiated the inclusion of biogas and biomethane in its Guarantee of Origin system that industry can use to comply with the EU ETS or private companies can utilise to achieve their own emissions reduction targets.[17]
- EU Renewable Energy Directive (EU RED) includes binding targets for renewable energy in transport. The targets for renewable road transport fuels in the EU RED already effectively incentivises biomethane investments in some countries today, in particular, Germany, where an attractive incentive exists to reduce the greenhouse gas intensity of fossil transport fuels by using renewable fuels including biomethane.[18]
- The introduction of biomethane quotas applied to energy suppliers, notably in France and the Netherlands, requires gas suppliers to have a given share of biomethane in their sales of

[11] The International Energy Agency (IEA), 'Renewables 2023 Analysis' (2024)
[12] Tara Sabbagh Amirkhizi "FutureGas – Markets and Regulation for Renewable Gases in an Integrated Energy System" March 2020
[13] https://cms-lawnow.com/en/ealerts/2024/05/netherlands-replaces-sde-subsidies-with-cfds-for-onshore-wind-solar
[14] The International Energy Agency (IEA), 'Renewables 2023 Analysis' (2024)
[15] The World Economic Forum, 'Clean Skies for Tomorrow: Sustainable Aviation Fuel Policy Toolkit' (November 2021)
[16] Biomethane Industrial Partnership, 'A vision on how to accelerate biomethane project development' (October 2023)
[17] The International Energy Agency (IEA), 'Renewables 2023 Analysis' (2024)
[18] Ibid.

gas to customers, and is an effective measure to increase the integration of biomethane into the energy mix. [19]

- In Germany, tax exemptions were applied to purchasing biomethane in both CHP and heat generations, as well as for vehicle fuelling. Norway and Switzerland have implemented full energy tax exemptions for biomethane use in transport.[20]
- As part of its REPowerEU plan, the European Commission has proposed a rapid acceleration of renewable energy including 35 bcm biomethane by 2030 and a new Biomethane Industrial Partnership to 'support the achievement of the target and create the preconditions for a further ramp up towards 2050'.[21]
- The UK's Renewable Fuel Transport Obligation (RTFO) is one of the Government's main policies for GHG emissions from transport in the UK. It requires that a certain percentage of UK road and non-road transport fuel supplied is renewable and that it meets the sustainability criteria. Biomethane producers can earn Renewable Transport Fuel Certificates (RTFCs) based on each unit of biomethane that is used for fuel in road vehicles and each RTFC has a monetary value that can be traded.[22]
- In the United States, biomethane development has been driven by the transport sector and supported by schemes such as the Renewable Fuel Standard (RFS) and California's Low Carbon Fuels Standard (LCFS). For example, the new RFS Set Rule aims to double biomethane supplies in the next three years. Given the obligation volumes proposed, the pipeline of projects under development and California's targets for injected biomethane, biogas and RNG supplies combined are expected to expand 2.1-fold in the next five years. Generous financial support from various programmes that permit additionality provide a very favourable framework for the accelerated growth.[23]
- The US Department of Treasury has recently agreed to revise Section 48 Investment Tax Credit (ITC) of the Inflation Reduction Act to ensure the final language promotes the conversion of biogas into renewable natural gas to support American manufacturing innovation, the waste management industry, and American farmers.[24]

4. **The speed of deployment of electricity generation and infrastructure is a key risk to emissions reduction targets. What more could be done to fast-track deployment?**

We strongly recommend that the NSW Government recognise the complementary role renewable fuels can play alongside electrification in achieving the state's emissions reduction targets.

Even with ongoing electrification trends, Australia will still require 30 billion litres of liquid fuel in 2050. With targeted investment in refining and infrastructure, Australia's domestic LCLF production — leveraging abundant waste and feedstock resources — has the potential to displace up to 19% of imported fuels by 2040, and as much as 47% by 2050. NSW is perfectly positioned to lead in this sector, with significant waste sources availability to support the development of a robust LCLF industry.

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[19] Ibid.
[20] Ibid.
[21] Macquarie, 'Here and now: Europe backs biomethane' (2023)
[22] Department of Transport, 'Renewable Transport Fuel Obligation Annual Report 2022' (2024)
[23] IEA, 'Renewables 2023 - Special section: Biogas and biomethane" (2024)
[24] US Treasury revises rule to "support American biogas manufacturing" (2024)

Furthermore, biomethane should be recognised as essential for industrial and manufacturing operations that cannot be electrified, while also playing a complementary role in electricity generation to support these sectors. Electricity is the second largest end-use market for bioenergy globally and in 2016-17, electricity generation from biomethane was about 1,200 GWh1 (4,320 TJ), or 0.5 per cent of the national electricity generation.[25] Here in Australia, landfill biogas is already playing a role in Australia's electricity system.

More information can be found at our submission to *Electricity and Energy Sector Plan.*

5. What are likely to prove the most effective approaches to accelerate rapid decarbonisation across freight and passenger transport?

The development and deployment of the following renewable and low carbon fuels are a key opportunity for decarbonising the freight and passenger transport sector:

- Sustainable Aviation Fuel (SAF) (aviation)
- Renewable Diesel (heavy haulage, rail)
- Biodiesel (heavy transport, marine)
- Bioethanol or e-methanol (Marine and heavy transport)
- Ethanol (Road and pathway for aviation)
- Renewable Very Low Sulphur Fuel Oil (VLSFO) (Marine)
- Biogas/biomethane - Gas-to-liquid (GTL) fuel conversion and e-fuels (SAF, renewable diesel)

These fuels offer the following transport decarbonisation benefits:

- Sustainable Aviation Fuel can reduce emissions across the lifecycle by 80%, compared to fossil jet fuel, depending on the feedstock.[26] Replacing just 10 per cent of jet fuel with Sustainable Aviation Fuel, based on airline targets, could be the equivalent of around 220 million less kms flown annually by a Boeing 747.[27] SAF is widely considered the primary lever to reducing emissions in the aviation sector. This is because there is limited alternative options to reduce emission in the sector with:
    - International flights accounting for 71% of aviation emissions in Australia, with these flights being incompatible with electric or hydrogen aircraft for decades.[28]
    - 87% of domestic aviation emissions deriving from flights over 150 seats and 60 minutes, making them unsuitable for electric or hydrogen aircraft in the foreseeable future.[29]

  Due to this, IATA predicts that by 2050, 65% of the industry's decarbonisation efforts will come from SAF.[30]
- Renewable diesel offers an excellent, tested and readily available alternative to mineral diesel for heavy trucks, with as much as a 75-95% reduction in life cycle emissions compared with mineral

[26] IATA, 'Developing Sustainable Aviation Fuel (SAF)'
[27] Transitioning Australia's Liquid Fuel Sector: The Role of Renewable Fuels
[28] A4ANZ, The Australian Roadmap for Sustainable Flying: Reaching Net Zero by 2050
[29] Ibid
[30] IATA, Net zero 2050: sustainable aviation fuels (2023)

diesel. [31] It can be used as a 100% drop-in replacement for diesel-reliant technologies like rail, buses, marine and heavy haulage. Additional benefits include improvements to air quality compared with mineral diesel by reducing pollutants. Replacing just 2 per cent of diesel with biodiesel or renewable diesel, based on current targets, would be the equivalent of taking 29,000 rigid trucks off the road.[32]

- Biodiesel (which differs from renewable diesel[33]) is also a pathway which produces less carbon dioxide emissions than oil-based fuels over the full lifecycle of production and use. Biodiesel can lead to reduced tailpipe emissions, and depending on the feedstock, the replacement of 1 litre of fossil diesel with 1 litre of B100 biodiesel can result in an 86 per cent reduction in carbon dioxide equivalent emissions (or at least 15% for B20).[34] Biodiesel is already being produced in Australia by its three biodiesel facilities, which have a combined capacity to produce at least 100 million litres annually.[35]
- Ethanol burns cleanly, lowers emissions, and improves the efficiency of engine combustion by providing additional oxygen (it is known as both an octane enhancer and oxygenate). Australia has a significant ethanol production capacity, with existing ethanol refineries producing approximately 175 million litres in 2022 and the potential to expand production to at least 440 million litres annually.[36] Australian ethanol is a key feedstock for producing SAF via the alcohol-to-jet pathway and offers Low Carbon Fuels producers a readily available and economically viable feedstock.
- Biomethanol or e-methanol is produced from sustainable biomass (biomethanol) or from carbon dioxide and hydrogen using renewable electricity (e-methanol).[37] It is chemically identical to fossil fuel based-methanol but results in significantly lower GHG emissions during the entire life cycle.[38] It is compatible with current methanol dual-fuel marine engine technology, offering a clear pathway to decarbonisation without future investment or compatibility issues.
- Biomethane can meet all technical requirements set by the vehicle manufacturers and natural gas transportation system operators and can be used everywhere in the same way as natural gas itself. Its use can result in significantly lower emissions of pollutants (such as hydrocarbons, carbon monoxide, nitrogen oxides, and particulate matter).[39] Vehicles which can be fuelled using compressed natural gas, and as a result biomethane, include ships, heavy duty vehicles and buses.,

Due to Australia's geographical remoteness and vast distances between regions, the transport of people, goods, and services over long distances will continue to be vital to the local economy. However, overhauling the equipment used in these sectors to run on alternative energy sources is often prohibitively expensive, disruptive, or impractical, highlighting the urgent need for emissions reduction solutions compatible with existing systems.

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[31] Industry Letter, 'Open Letter to The Hon Chris Bowen MP - Minister for Climate Change & Energy' (2023).
[32] Transitioning Australia's Liquid Fuel Sector: The Role of Renewable Fuels
[33] https://www.dpi.nsw.gov.au/dpi/climate/energy/clean-energy/bioenergy/biofuels
[34] Lifecycles, 'Greenhouse gas and sustainability footprints of current and future biofuels for Queensland' (2016)
[35] https://ethanolproducer.com/articles/report-biofuel-consumption-in-australia-remains-minimal-in-2022-19909
[36] Ibid
[37] Biomethanol offers renewable fuel alternative
[38] 'BIOMETHANOL PRODUCTION AND USE AS FUEL' p5
[39] https://www.europeanbiogas.eu/wp-content/uploads/2019/07/Biomethane-in-transport.pdf

Renewable fuels provide a practical and effective path forward. Their compatibility with existing transport assets enables emissions reductions without disrupting current operations, requiring an overhaul of existing assets, or demanding the development of extensive new infrastructure.

6. What specific actions or policies could increase uptake of emissions reduction strategies in agriculture, both in the short and long term?

Renewable liquid fuels will be needed to both assist the agricultural sector meet emission reduction goals as well as relying on its support. Agriculture is a hard to abate sector that will continue to rely on liquid fuel technologies. Renewable diesel, ethanol and biodiesel can be used as drop-in or blended replacements, without requiring significant changes to existing agricultural/farming technologies, infrastructure, generators, or vehicles.

Biomethane can also play a key role in the agricultural sector as rural operators facing technical, economic, and accessibility barriers preventing full electrification, biomethane offers a key solution for emission reduction. It enables reductions in heating, refining feedstock, and reforming machinery emissions without requiring significant investment in upgrades, making it a cost-effective pathway for reducing emissions in gas dependent processes.

Additionally, utilising the existing gas network to accommodate biomethane can alleviate the need for extensive transmission projects and renewable energy infrastructure. While these projects play a key role in Australia's clean energy transition, they often disrupt land, particularly in rural communities. Therefore, leveraging existing gas infrastructure for biomethane helps decarbonise the gas network while minimising disruption to rural areas. This approach promotes a smoother, fairer, and more sustainable energy transition that addresses the needs of the diverse Australian communities.[40]

Supporting feedstock development is essential not only for driving emissions reduction in agriculture but also for unlocking new economic opportunities in regional and rural areas. To enable sustainable local feedstock production, key principles include:

- Maximise the reliability and efficiency of existing production, while simultaneously improving environmental performance in an economically sustainable manner. This provides a platform on which the industry can expand to provide domestically sourced renewable fuel feedstock so that NSW can meet its net zero targets.
- Ensuring practices and developments are environmentally responsible throughout the entire value chain.
- Improved reliability of production and processes, along with increased efficiency along the supply chain, can support significant long-term scale and opportunities.
- Realising NSW feedstock opportunities will take significant effort and collaborative action across the industry, supported by both the State and Federal Government.

Policy action that the NSW Government could undertake, include:

- Feedstock development grants: Provide targeted grants to support the cultivation and processing of feedstocks.

[40] The Financial Review, ''They will fight to the death': Farmers revolt at Victorian power plan' (2023)

- Feedstock aggregation hubs: Develop regional hubs to streamline collection, storage, and processing of feedstocks, reducing logistical costs for producers.
- Support feedstock research: Invest in research to advance plant science, crop management, rotation techniques and farming technologies in aiding in the development of new feedstock varieties and improving farming methods to boost yield, quality, and sustainability.
- Support Transport Options: Invest in feedstock transportation options to increase feedstock availability and access.
- Support Market Development: Implement wider demand-side and supply-side policies to provide feedstock providers with domestic market certainty.
- Support development of Farming Practices and Technologies: Provide incentives to develop farming practices that support feedstock production

More information can be found at submission to the *Agriculture and Land Sectoral Plan consultation*

7. What policies or programs at a sectoral level could complement the Safeguard Mechanism to support the accelerated decarbonisation of heavy industry in NSW?

To accelerate the use of renewable fuels, the NSW Government can implement a range of strategic actions that could complement the Safeguard Mechanism:

- Expansion of the NSW Renewable Fuels Scheme (on the basis that the liable entities are those that receive the benefit or have access to the fuel).
- Implement supply-side support: Mechanisms could include capital and development grants, production credits or tax incentives, Contracts for Difference (CfD), and R&D support. These supply-side mechanisms are essential stackable incentives alongside Federal Government support. By enhancing supply availability and providing off takers with greater certainty regarding access to supply, this support can effectively complement and amplify national initiatives.
- Subsidies or rebates for end-users: To reduce costs and encourage the adoption of renewable fuels.
- Regulated demand-side levers tied to carbon intensity (i.e mandates and low carbon fuel standards): We have been calling on the Federal Government to implement these demand levers. It is essential for the NSW Government to coordinate with the Federal Government in this area to avoid inconsistent policies.
- Introduce Government Procurement Programs: Support renewable fuel adoption through government contracts and purchasing programs.
- Streamline regulatory approvals: Simplify processes to facilitate local project development and increase domestic supply.
- Support research and development: This could focus on developing feedstock varieties and farming techniques to enhance yield, quality, and sustainability. Additionally, support should be directed towards optimising logistics for feedstock transportation and advancing emerging technologies and production pathways.
- Promote knowledge-sharing campaigns: Support knowledge-sharing campaigns and resources to raise awareness and educate consumers about the role, compatibility, and sustainability of renewable fuels

8. What measures could accelerate industrial heat electrification in NSW, where technology is viable?

We refer to our response to question 4.

9. What short to medium term measures could be prioritised to address the systemic challenges regarding waste generation and resource recovery?

A common concern in the renewable fuels sector is the limited information on feedstock locations, uses, and supply chains. The ABBA study remains the primary national data set for waste energy availability. Refreshing this study and conducting a more comprehensive assessment would significantly benefit the market by providing more accurate data and boosting investor confidence.

10. What measures should be considered beyond the Safeguard Mechanism to reduce emissions of the resources sector, particularly methane emissions, to meet NSW's emissions reduction targets?

Gas processing and liquefied natural gas (LNG) subsectors make up the large majority of the Resources sector's emissions. The straightforward solution to reducing emissions in this sector is replacing natural gas with biomethane - a drop-in or blended replacement for natural gas. To unlock this potential, the domestic industry requires a clear market signal from government such as the measures outline in our response to question 3, that the emission reduction potential of this product will be adequately recognised. This will provide gas customers the confidence that they will receive the emission reduction benefits by switching from natural gas to biomethane.

11. How could social equity be better addressed in the transition to an electrified built environment?

Electrification can be a substantial upfront expense, and renewable fuels provides an opportunity to address this challenge.

For households, biomethane provides a decarbonisation pathway where transitioning to electrification is neither feasible nor financially viable. Without recognising biomethane as key to our household energy transformation:

- Households remaining on the gas grid may face increased costs as maintenance becomes the burden of fewer users.
- The cost of electrification transition could unfairly impact low-income households or vulnerable populations that may be financially unable to transition.
- Tenants are in a precarious position when landlords are responsible for the clean energy transition, and with limited landlord incentives, tenants may bear higher energy costs without reaping the benefits of a more sustainable energy source.
- Removal of household gas access would also drive-up costs for Australian gas-reliant businesses if they become increasingly responsible for gas grid maintenance.

For Australian manufacturing and gas reliant industries:

- Biomethane offers a genuine short-to-medium term solution for not only emissions reduction but reducing energy costs overall.
- Australian manufacturing, industrial and gas-reliant businesses (including brickmaking, metalworking, glass manufacturing, pharmaceutical manufacturing, hospitality, food and beverage processing etc) cannot electrify all their heating, refining and reforming processes required in their operations and thus, biomethane presents as a key decarbonisation solution.[41]
- Access to biomethane enables businesses to maintain competitiveness by reducing environmental impact while continuing operations, ensuring viability in a sustainability-focused business environment.
- Biomethane offers an affordable alternative to electrification measures for businesses facing financial constraints in transitioning to clean energy, ensuring sustainable practices adoption. Biomethane allows businesses of all sizes and financial capabilities to participate in clean energy transition, promoting equity within the business community.
- Biomethane diversifies energy sources, reduces reliance on imported fossil fuels, and ensures stable energy supply crucial for uninterrupted operations and meeting customer demands.
- Businesses without access to biomethane may bear a disproportionate regulatory burden, as they may be subject to stricter emissions regulations or penalties for not meeting sustainability targets. This could create an uneven playing field in the market, disadvantaging businesses unable to access biomethane and reduce emissions.
- Biomethane provides a practical decarbonisation solution for industrial processes, ensuring industry sustainability, competitiveness, and longevity, without significant operational changes. This fosters job growth and minimises supply disruptions, enhancing energy security.
- Without access to biomethane, certain businesses will continue to rely on fossil gas for their operations, hindering their ability to meet emission reduction targets and potentially causing reputational damage.

Biomethane allows businesses of all sizes and financial capabilities to participate in clean energy transition, promoting equity within the business community.

12. The adaptation objective is for NSW to be more resilient to a changing climate. The Act allows for regulations to further define the adaptation objective. What does a more resilient NSW look like to you?

A more resilient NSW would place renewable liquid fuels and renewable gas at the core of its energy and fuel security strategy, strengthening regional stability and ensuring a more resilient energy supply.

13. What other information or tools are needed to support decision-makers in NSW?

[41] IEA Bioenergy Task 40, 'Decarbonizing industrial process heat: the role of biomass' (2021)

Decision-makers in NSW should consider the growing recognition and adoption of renewable fuels at the international, federal, and state levels.

Internationally:

- The technology, production, and market readiness of renewable liquid fuels and renewable gas are well-established, as demonstrated by our international counterparts who have been realising the significant benefits of the renewable fuels industry for many years.
- As outlined in our response to Question 3, many countries are progressing policies that support the development and uptake of renewable fuels. We urge the NSW Government to examine international case studies, which demonstrate the long-standing success and value of these fuels.

Federally:

- Creation of the Future Made in Australia Innovation Fund, to support ARENA to commercialise net zero innovations including low-carbon liquid fuels.
- Expansion of the Federal Guarantee of Origin scheme to include low-carbon liquid fuels such as sustainable aviation fuel, biomethane, and biogas. The Federal Government is working to finalise the enabling legislation for this reform so it can commence operation in the second half of 2025.
- Undertaking regulatory impact analysis of the costs and benefits of introducing mandates or other demand-side measures for low carbon liquid fuels.
- Holding targeted consultations to identify options for production incentives and demand-side measures to support the establishment of Australia's low-carbon liquid fuel industry. We have responded to this consultation, and more details on proposed federal production incentives, demand-side support, and emission/sustainability criteria can be accessed here: *Bioenergy Australia Submission: Future Made in Australia: Unlocking Australia's low carbon liquid fuel opportunity (July 2024)*
- Amendments to the National Greenhouse and Energy Reporting (NGER) Scheme to enable market-based reporting for renewable liquid fuels and renewable gas when co-mingled and supplied through shared infrastructure.

State based:

- Victoria (VIC): Victorian Renewable Gas Directions Paper which introduced the country's first Renewable Gas Target.
- Queensland (QLD):
    - Queensland Government's Industry Partnership Program funding has now reached $415.5 million in funding and supports projects that create economic opportunities by addressing supply chain gaps, building sovereign capabilities, and strengthening key industries such as Queensland's bioeconomy. [42]

[42] QLD State Development, Infrastructure and Planning, 'Industry Partnership Program'

- Queensland Government partnered with Qantas to explore how to develop a SAF industry in Queensland and look at how to make best use of sugarcane and agricultural byproducts to produce fuel and how to develop new feedstocks and processes.[43]
- Queensland Government funding provided for the Australian Gas Infrastructure Group (AGIG) and LMS Energy Feasibility Study into the Wide Bay Biomethane project, a project that could potentially decarbonise the entire gas usage of the Wide Bay region by providing decarbonised biomethane to Bundaberg, Maryborough and Hervey Bay gas customers.
- Signed MoU between ISIS Central Sugar Mill and LMS Energy to investigate collaboration on the potential for the production of biogas from anaerobic digestion of sugar milling byproducts such as excess bagasse, mill mud, fallow cropping and other products.
- Licella has secured $8 million in funding from the ARENA to advance a feasibility study (including FEED) for a SAF-focused biorefinery in Queensland. Project Swift, proposed for co-location at the Isis Central Sugar Mill in the Bundaberg region, aims to convert agricultural residues, including mill by-products, into ~60 million litres of biofuels annually.[44]
- Ampol's Lytton refinery in Brisbane will be repurposed for SAF and renewable diesel production. The refinery will be jointed developed by Ampol and ENEOS Group under a MoU with the Queensland Government. The facility will have a capacity of 500 million litres of SAF and renewable diesel annually, using locally sourced feedstocks including agricultural waste and animal fats.[45]
- Virgin Australia has entered an agreement with Viva Energy to source SAF for its flights departing from Proserpine, Queensland, between March and July 2025.[46]
- Jet Zero Australia has welcomed Commonwealth and Queensland Government grant support worth $14 million to progress Project Ulysses, the company's flagship SAF project in Townsville. Project Ulysses aims to convert Australia's agricultural by-products into 102 million litres of SAF and 11 million litres of renewable diesel per annum.[47]
- Queensland Government providing funding to both Wagner Sustainable Fuels and Liquid Power, with grants of $760,000 each (total of $1.52m), for feasibility studies to develop the case for investment in their own SAF proposals.[48]
- Supported, through the QLD Industry Partnership Program, the establishment of Energreen's multi-seed crushing and processing facility at Yamala in the Central Queensland Inland Port at Emerald.
- Queensland Government commissioned Deloitte to review SAF international policy settings that have supported development of commercial scale SAF value chains.
- IFM, Ampol and GrainCorp signed a MOU to explore the establishment of an integrated renewable fuels supply chain in Australia. As the initial priority under the MOU, Ampol and IFM will progress the feasibility assessment of a renewable fuels' facility at Ampol's Lytton Refinery in Brisbane and work with GrainCorp to explore the supply of homegrown

[43] Deputy Premier, Steven Miles 'Qld's green jet fuel industry set to soar with Qantas partnership' (2023)
[44] Licella Secures $8m ARENA Funding for Feasibility of SAF Biorefinery in Queensland (2025)

[45] Deputy Premier, Steven Miles, 'Ampol and ENEOS launch plan to take Qld's biofuels industry to new heights' (2023)
[46] Virgin Australia and Viva Energy join forces in sustainable aviation fuel initiative (2025)
[47] Jet Zero Australia Secures Record Government Investment for Project Ulysses (2024)
[48] Deputy Premier, Miles Government support for sustainable aviation fuel takes off (2024)

feedstocks, including additional crushing capacity to supply canola oil, to the future plant.[49]

- Queensland Government supported the first Airbus helicopter trial with SAF.
- Queensland Government supported the first 100% renewable diesel trial in Queensland at the new venue in the Queensland Performing Arts Centre.
- Queensland Government partnered with shipping company ANL on the first biofuel trial on a containerised shipping vessel in Oceania.
- Queensland Government supported 2 bioethanol-fuelled buses launched in Mackay in collaboration with Scania and Mackay Transit Coaches.

Thank you for taking the time to consider our submission. Any questions or request for further assistance are welcome and can be directed to shahana@bioenergyaustralia.org.au.

Sincerely,

Shahana McKenzie
CEO Bioenergy Australia

[49] Graincorp, 'Ampol, GrainCorp and IFM unite to explore the creation of an Australian renewable fuels industry' (2024)