

## BIOENERGY AUSTRALIA SUBMISSION

### *Department of Industry, Science, Energy and Resources – Gas Reservation Issues Paper*

Bioenergy Australia is the national industry association, committed to accelerating Australia's bio economy. Our mission is to foster the bioenergy sector to generate jobs, secure investment, maximise the value of local resources, minimise waste and environmental impact, and develop and promote national bioenergy expertise into international markets.

The purpose of this submission from Bioenergy Australia is to emphasise the role of bioenergy, specifically biomethane and other natural gas alternatives, in addressing predicted gas shortfalls in Australia. Specifically, we aim to highlight how certain variations of a national reservation scheme can support the bioenergy industry, creating additional zero-emissions sources of gas for users and ensuring that exporters are able to continue their businesses sustainably.

Bioenergy is a cross-sector solution, which can support the state in overcoming environmental and socioeconomic challenges. Bioenergy Australia has recently developed a number of reports to highlight the key opportunities of the development of a national bioeconomy, as well as some recommendations to support the growth of the bioenergy industry. These are listed below, and we encourage the Department to review these in conjunction with our submission.

- [Bioenergy Australia submission to the Australian Bioenergy Roadmap](#)
- [Bioenergy Australia Economic Recovery Proposal](#)
- [Shovel Ready Sample of Bioenergy Projects Across Australia](#)
- [KPMG Bioenergy State of the Nation Report](#)
- [Biogas Opportunities for Australia Report](#)

## 1 Why Bioenergy?

Bioenergy is typically produced from biomass residues and waste materials from primary and secondary production sectors. Bioenergy in relation to the gas network includes biomethane, an upgraded form of biogas (landfill gas or biogas produced through anaerobic digestion), which has a substantially identical composition to natural gas and can be injected into pipelines and used interchangeably with natural gas in all applications.

Utilisation of organic waste to produce energy can play a central role in the national transition to a circular, low carbon economy. Organic wastes can be converted into renewable, reliable, and distributable sources of energy to produce heat, electricity, or transport fuel. They can firm other renewables and play a crucial role in the stabilisation of the grid moving forward.

As widely demonstrated by results achieved internationally, the development of a strong bioeconomy can provide skilled employment opportunities to regional areas and stimulate economic development. The International Renewable Energy Agency (IRENA) [2019 review](#) shows global employment in the bioenergy sector has grown in the last few years, reaching 3.18 million jobs in 2018.

Looking at domestic opportunities, the Clean Energy Finance Corporation (CEFC) report [“The Australian bioenergy and energy from waste market”](#) estimates that bioenergy has the potential to attract at a minimum \$3.5-\$5 billion investment, mostly in regional economies and the [Infrastructure Partnerships Australia report – putting waste to work](#) showed an investment opportunity in energy from waste of \$8.2 billion to \$13.7 billion by 2030.

Within the agriculture industry, biogas represents a key employment opportunity for regional areas. By using locally-produced waste, the biogas industry supports local economies and regional communities, creating jobs and offering new income sources, particularly for farmers. Through collaboration with different farms, a regional biogas plant can create different job opportunities along the supply chain, from raw material cultivation and collection, to transport, storage, and pre-processing. By increasing decentralised energy production, income stays in regional areas instead of going to global energy markets. In fact, a study of bioenergy projects in Ireland found 4.2 ongoing direct jobs plus 2.1 ongoing indirect jobs are estimated to be created per MWe of capacity (DKM Economic Consultants 2012). In comparison, a typical solar farm requires minimal operations staff, such as the 56 MW Moree Solar Farm which requires 5 employees to operate (0.09 ongoing direct jobs per MWe of capacity) (ARENA, 2019) and a majority of its construction costs are imported solar panels (60%) (The Australian PV Association, 2011 Modelling of Large-Scale PV Systems in Australia.).

More information on bioenergy opportunities in regional areas is provided [here](#).

Bioenergy is recognised internationally as a key contributor towards the reduction in carbon emissions. The Intergovernmental Panel on Climate Change (IPCC) has estimated substantial global mitigation potential for bioenergy in its series of assessment reports. The IPCC’s recent [report](#) on meeting a 1.5°C target (SR1.5) identified bioenergy as a major contributor in all scenarios that would meet the Paris Agreement target of “well below 2 degrees”. According to the report, “bioenergy use is substantial in 1.5°C pathways [...] due to its multiple roles in decarbonizing energy use”.

Further, biomethane specifically offers an avenue for gas supply security within Australia, and as an upcoming industry should not be forgotten as part of discussions around supply shortages. According to Deloitte in the report *Decarbonising Australia’s gas networks*, there is 371 PJ p.a. of identifiable recurring biogas potential in Australia. If *just* 20% of this potential resource were to be targeted for biomethane production, 74 PJ of domestic gas would be produced. For reference, in the AEMO’s *Gas Statement of Opportunities 2020* report, the base case in 2026 has an estimated annual southern shortfall of 51 PJ. Biomethane has significant potential to address future gas shortfalls, particularly throughout Southern Australia, where large amounts of agricultural residue provide plentiful feedstock and where the biggest gas shortages are predicted to occur.

Australia’s biomethane industry is in its infancy, particularly in comparison to markets like Europe and the North America, where biomethane is an important contributor to the energy mix. However, the industry looks set to grow, particularly as government support for bioenergy technologies grows.

This submission has been developed by Bioenergy Australia to provide overarching feedback. We have not addressed the technical aspects in detail but have instead focussed our submission generally on the effect of a domestic gas reservation on the future of the bioenergy industry as well as

bioenergy's role in addressing future gas shortfalls. We note that as a general statement, gas reservation schemes are unsupported by a number of Bioenergy Australia's member organisations and that biomethane could provide a solution which negates the need for such a scheme. Our key points are:

1. Utilising the biomethane opportunity will increase domestic gas production across the country and allow our natural gas industry to continue their supply commitment to international markets.
2. This could be achieved through:
  - a) Structuring a domestic gas reservation scheme to incentivise market participants to contract with biomethane producers to inject the renewable gas into pipelines;
  - b) Improved access to gas infrastructure, including industry partnerships, changes to injection guidelines to include biomethane and an expanded pipeline network;
  - c) Incentive schemes to encourage the uptake of renewable gas;
  - d) A fuel security target for locally produced renewable transport fuel which will increase availability of bioCNG and domestic green gas production; and
  - e) Encouraging the export of biomethane through LNG terminals, thus increasing overall gas production through the creation of value from international green gas markets.

Given that the Commonwealth Government is making a record level of investment in driving Australia's bioeconomy through funding the development of Australia's first Bioenergy Roadmap and other initiatives, we encourage the Department to consider the opportunity that bioenergy provides with regards to the future of Australia's domestic gas stability.

## 2 Biomethane and the natural gas export industry

This section pertains in part to questions one, two and three from the *Issues Paper*. As mentioned above, Australia's yearly recurring biogas potential is predicted to be 371PJ. This potential resource could be utilised through a variety of technologies, including biomethane plants. If just 20% of this potential resource were utilised for the production of biomethane, 74PJ of domestic gas would be produced, which is significant given the annual southern shortfall estimations by AEMO for 2026 are 51PJ in the base case. The *Issues Paper* emphasises that these predicted shortfalls are a major reason for considering a domestic gas reservation scheme, however anticipates concerns around the potential scheme from natural gas exporters whose have strong interests in continuing to export, particularly when significant investment has already occurred in order to be able to export domestic natural gas into higher value overseas markets.

Biomethane provides a real and tangible solution to these domestic shortfall issues. Biomethane and natural gas industries can collaborate to ensure domestic supply is met and both industries prosper in a sustainable manner. As will be discussed further in section 3.1, there is a significant opportunity to use the reservation scheme to enable and promote Australia's biomethane industry by encouraging market participants to contract with biomethane producers to inject domestic renewable gas into the gas network to meet reservation requirements.

It is also important to note that Australia's biomass and municipal waste generation is focussed in agricultural and metropolitan areas, including in southern areas where the natural gas shortfalls are predicted to be at their worst. This means that biomethane provides a unique opportunity to address these shortfalls with locally-produced gas, decreasing both the emissions and infrastructure constraints of transporting gas from northern gas fields. If appropriate policy mechanisms are put in place to support the biomethane industry, it will be possible to address predicted shortfalls without limiting exports for domestic gas producers along with the associated income generated for our

domestic economy. This is important, as placing conditions on gas producers can have negative impacts on the viability of gas supply projects which creates negative outcomes for both industry and consumers.

In summary, Bioenergy Australia supports a potential variation of a domestic gas reservation scheme that:

- a) encourages the production of biomethane to meet domestic gas reservation targets;
- b) allows our natural gas industry to continue exporting natural gas to utilise the billions of dollars of infrastructure invested in domestic LNG terminals and gas infrastructure;
- c) promotes the export of natural gas and green gas to international markets which can reduce emissions by using gas (fossil derived or green) instead of other carbon intensive fuels (e.g. coal); and
- d) promotes the uptake of green transportation fuels, such as bioCNG, which will increase the supply of biomethane into the gas grid and help decarbonise the heavy transport sector.

We envisage that this solution will meet the needs of a majority stakeholders, and we are looking forward to the opportunity to work with policy makers and members of the biomethane and natural gas industries to implement it.

## 3 Recommended policy changes

### 3.1 Encouraging biomethane injection

This section relates to question two in the *Issues Paper*, by providing some suggestions on how to use a reservation scheme to encourage continued investment in both the oil and gas and biomethane industries. Essentially, by structuring a reservation scheme to incentivise investment in biomethane, the wider benefits with regards to gas supply outlined above can be realised. This could take the form, for example, of encouraging market participants to contract a certain level of biomethane production to help meet domestic gas requirements. There are many mechanisms that could be implemented to achieve this outcome. For example, this could be through a biomethane target or a credit which is provided to gas producers who contract with biomethane suppliers. This way, the government can assist in fostering a mutually beneficial relationship between gas companies and biomethane producers, allowing the biomethane industry to grow and continue meeting gas shortfalls, whilst allowing the gas producers to maximise the benefits from the export of natural gas.

### 3.2 Improving access to gas infrastructure

It is important to upgrade and extend Australia's gas infrastructure in order to allow users across Australia to access available natural gas and biomethane. This will allow biomethane, which can be produced in areas where little or no natural gas extraction has occurred and where pipelines are scarce, to enter the market and address AEMO's predicted future shortfalls. Infrastructure consists mainly of pipelines, but can also consist of other mechanisms including virtual pipelines (i.e. gas which is hauled over distances using trucks) and compression stations. It is vital that biomethane is able to use this infrastructure in the same way that natural gas is, in order for the industry to continue growing and to begin supplying into the domestic gas network. The essential changes that need to be made are: 1) ensuring that biomethane is able to be injected to the natural gas grid and 2) increasing the pipeline network to include sites suitable for biomethane production. These changes will encourage an increase in the supply of biomethane which can lower the domestic price of gas. In order to make these changes, it is important that the government facilitate industry partnerships with all players (pipeliners, oil and gas companies, biomethane companies, export companies, organic

waste producers, etc.) to ensure that there is sufficient cross-industry collaboration to drive desired outcomes.

With regards to gas injection guidelines, current injection specifications cater to natural gas rather than biomethane, effectively excluding biomethane from a vast portion of the market. It is important that injection specifications are altered to allow for biomethane to enter the market and assist in addressing predicted gas shortfalls. There are examples from overseas where mechanisms have been successfully implemented which allow biomethane to be transported through a multi-user gas network:

- In the United Kingdom, the Health and Safety Executive has granted a class exemption from the regulations to permit gases containing up to 1% mol/mol of oxygen into the transmission and distribution systems.
- In Germany, 'GasNVZ' is the framework which regulates the conditions for injection of biomethane into the grid. Under the standards stipulated in working papers 260 and 262, oxygen content up to 3% for biogas is allowed to be injected into the natural gas network. There is also provision for a higher sulphur content than the standard.
- In Austria, the quality requirements for gas are defined in detail in ÖVGW (Austrian Association for the Gas and Water Industry) Directives G31 and G33.
- In Europe, the European Standard EN16726 allows for up to 1% oxygen, except for situations such as underground storage installations which tend to be wet.

With regards to increasing the domestic pipeline network, we emphasise the importance of building gas infrastructure in areas where biomethane production is occurring. This will not only boost the biomethane industry, but ensure a significant return on past investment in existing pipelines, networks and utilisation technologies. Not only will the pipelines have more users, but it provides an opportunity to encourage sustained pipeline use even as the natural gas resource depletes over the coming few decades. We note that, given the concentration of agricultural matter in specific areas of Australia, biomethane development tends to occur in 'hubs' and that gas infrastructure linking these hubs would be an efficient way to disperse gas to users.

### 3.3 Renewable gas incentives

In addition to using a potential gas reservation scheme to support the biomethane industry, as outlined above, it is vital that the government implement specific schemes to encourage the uptake of renewable gas. These should include changes to the National Greenhouse and Energy Reporting scheme (NGERs), the development of an Emissions Reduction Fund (ERF) methodology for biomethane, the development of a green gas certification scheme, as well as the eventual setting of domestic green gas targets. Broadly, these schemes should be designed to provide commercial incentives for biomethane projects, which will encourage significant investment in the growing industry.

#### 3.3.1 Changes to NGERs and Green Gas Certification

Currently, some types of bioenergy are categorised as zero-emissions sources of energy and thus are able to be used by consumers to decrease their reportable emissions, however this is not the case for biomethane which has been transported through a pipeline. The relevant legislation and policies should be amended to categorise this biomethane as zero-emission for the purposes of reporting under the NGERs, to increase its value and build the market. It is recommended these changes encompass biomethane that has been refined into other products, such as methanol, bioCNG or biodiesel, which can service the transportation and petrochemical industries.

This change would increase the market potential for biomethane as:

- 1) Natural gas consumers could replace natural gas with biomethane and reduce emissions.
- 2) Biomethane could be refined into transportation fuel and this would allow transportation entities to reduce their emissions.
- 3) Industrial and consumer materials (plastics etc) could also be recognised as carbon-free products where biomethane was utilised in their production.

Further it is recommended that green gas certification be developed, giving producers and consumers confidence that the renewable benefits (and carbon abatement) of the green gas is certified. A green gas register would provide a framework along with the necessary governance and assurance to the industry. This could help to create a tradeable commodity for the green gas market and dovetail into NGERs, which is similar to the RET for the electricity sector.

### 3.3.2 Changes to the ERF

Australian Carbon Credit Units ('ACCUs') have monetary value, derived from the ERF and the secondary ACCU market. If a project is an eligible offsets project (a project which reduces carbon emissions), participants can register it under an approved ERF methodology to create ACCUs and this provides revenue to a project. Currently, there is no dedicated ERF methodology for biomethane, and biomethane projects are also usually unable to generate ACCUs under other methodologies. It is vital that the development of an ERF methodology for biomethane is prioritised in order to encourage investment in the industry, and to allow developers to create economic, large scale projects which can contribute meaningfully to Australia's domestic gas mix.

### 3.3.3 Green gas targets

A mandatory target for the production and use of clean transportation fuels and clean gas should be considered as a longer-term policy mechanism to promote the bioenergy industry. A mandated target would promote biomethane usage for gas users and biofuel usage for liquid fuel consumers, in order to decarbonise the natural gas network. A similar mechanism was introduced in the electricity sector with the introduction of the MRET in 2001. This led to the active promotion of new renewable electricity technologies and the development of policy. Noting the request for comparison with overseas jurisdictions in question five of the *Issues Paper*, as an example of this type of mechanism being used for fuels, the US introduced the Renewable Fuel Standard ('RFS'), which mandates that oil refiners and blenders purchase 32 billion gallons of renewable fuel by 2022. In 2019, producers delivered 19.92 billion gallons of renewable fuel into the US transportation market.<sup>1</sup> Biomethane transported through a gas network and converted into bioLNG and bioCNG is an eligible renewable fuel under the RFS. In addition to gas targets, a similar fuel security scheme is implementable in Australia and would encourage biomethane producers to inject gas into the domestic gas system to be used in the production of bioCNG for the transport industry.

## 3.4 Creating a fuel security target

As mentioned above, a fuel security target provides national or state-level targets for the use of renewable fuels, including bioLNG and bioCNG, which are derived from biomethane. Such a target could deliver the following objectives in an Australian context:

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<sup>1</sup> More information on the RFS and the mandated targets can be found at <https://www.epa.gov/renewable-fuel-standard-program/overview-renewable-fuel-standard>.

- an increase in locally-produced fuel that would displace imported fuels, which are particularly risky in a COVID-19 context;
- the encouragement of new technologies, such as Natural Gas Vehicles, which could be fuelled with renewable gas such as biomethane and hydrogen;
- the replacement of imported diesel for use in remote power applications; and
- an increase the number of days of strategic fuel reserves by reducing imported fuels demand.

When biomethane is upgraded to bioCNG, bioLNG, methanol or biodiesel, it can be used as a replacement for petroleum or diesel in domestic applications. Technology is mature and the large majority of Original Equipment Manufacturers (OEMs) offer vehicles and equipment that can utilise this fuel.

With increasing demand for natural gas (or biomethane), there will additional throughput which will support additional infrastructure for gas transportation, processing and refuelling. This will help drive a domestic 'gas recovery' by giving a greater number of users access to natural gas.

As an example, the U.S. has introduced the RFS which has two primary objectives:

1. Reduce the reliance on imported fuels; and
2. Promote renewable fuels for the transport industry.

This federal policy, introduced in 2007, has helped deliver 1,600 CNG/LNG refuelling stations across the U.S. and more than 175,000 natural gas vehicles on the road today. The use of biomethane as a motor fuel, largely for heavy haulage vehicles, has increased 291% over the past 5 years, displacing close to 7.5 million tonnes of carbon dioxide equivalent (CO<sub>2</sub>-e). To put this into context, if a similar amount of bioCNG were produced in Australia, it would add 14 days to our domestic stocks of petroleum and crude oil.<sup>2</sup>

### 3.5 Encouraging biomethane exports

Finally, overall gas supply can be significantly increased by opening up Australia's export market to biomethane producers, as providing biomethane producers the opportunity to participate in higher value green and carbon markets will encourage investment in the industry. An important piece in ensuring that Australia's full bioenergy potential is reached is ensuring that it has access to overseas markets, which can be higher value than domestic markets. In addition to ensuring that gas exporters are able to work with the biomethane industry to transport and market Australia's gas overseas, it is important that the Australian government implement a green gas certification scheme in a collaborative way that creates an internationally tradeable commodity. This will allow biomethane to be traded at its full value, not just as a gas but as a zero-emissions gas, increasing demand for Australian biomethane which will promote investment.

As a first step, we recommend an assessment of potential biomethane supply development for export and domestic markets to bring more visibility to the market opportunities and encourage supply development. This could be integrated into the federal government's National Gas Infrastructure Plan, and would relate directly to AEMO's GSOO, ESOO and ISP work. Such an assessment will highlight any strategic advantages that Australia has, and could help to establish the international reputability of Australian biomethane, which will have a positive impact on export values.

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<sup>2</sup> Australia had 29 "days of consumption cover" according to the Australia Petroleum Statistics – Issue 281 December 2019.