



Bioenergy Australia (Forum) Pty Ltd
ABN 14 155 856 821
Renewables Innovation Hub
19/23 Moore street, Turner ACT 2612

BIOENERGY AUSTRALIA SUBMISSION

Inquiry into Jobs for the Future in Regional Areas

September 2019

The purpose of this submission from Bioenergy Australia is to highlight how the development of a bioeconomy in Australia would deliver significant economic and employment outcomes in regional areas.

About Bioenergy Australia

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.

Bioenergy Australia's objectives are to:

Advocate - With our members, we anticipate and develop leading positions on issues of concern to the advancement and growth of bioenergy in Australia.

Campaign - We raise the profile of the industry within the media and broader community to achieve a greater level of understanding about bioenergy and the vital role it must play to achieve carbon neutrality by 2050.

Inform - We publish reports, webinars and articles to help our members keep ahead of industry trends and opportunities. We also manage the Biomass Producer website, an AgriFutures Australia resource showcasing Australian bioenergy projects, expertise, and identifying opportunities for primary producers.

Connect - We facilitate knowledge exchange and networking for members through task-specific meetings, our Annual Conference, and Webinars. We link investors with emerging businesses; researchers with technology developers; government with innovators. We also administer Australia's participation in IEA Bioenergy. Our Industry groups bring together specialists in specific fields

The Global Bioeconomy is growing

The [International Energy Agency's \(IEA\) market analysis and forecast report](#) has identified that globally bioenergy was the source of half of all renewable energy used in 2017 and it is forecast to see the biggest growth in renewable consumption over the period 2018 to 2023. Bioenergy – as solid, liquid or gaseous fuels – will account for 30% of the growth in renewable consumption in this period.

The world's bioeconomy currently consists of biofuels, biochemicals, biomass power, and bio-based products and sustainable bioenergy is expected to play a key role in the future low-carbon economy. In particular, with the decarbonisation of the energy sector, the growth of a global bioeconomy can contribute to an increased energy security and the achievement of ambitious emissions reduction targets. This is particularly relevant in sectors where there are limited options to reduce emissions. Key examples are aviation and marine.

As part of the global decarbonisation process, the international aviation industry has committed to reducing its greenhouse gas emissions. In 2009 the International Air Transport Association set the following ambitious targets of carbon neutral growth from 2020 and a 50 per cent reduction in net emissions by 2050 compared to 2005 levels. Unlike the land transport sector, airlines have limited options to materially reduce emissions other than through the use of aviation biofuels. Biofuels can decrease the carbon footprint of jet fuel by 80 per cent, based on full life cycle assessment. An overall reduction in CO₂ emissions of 5 per cent can be expected if biofuel replaces 6 per cent of jet fuel by 2020. Therefore, the use of biofuels in the aviation sector is increasing rapidly. From one flight in 2008, the threshold of 100,000 flights has been passed in 2017. A number of airlines, including Cathay Pacific, FedEx Express, JetBlue, Lufthansa, Qantas, and United, have made investments by forward purchasing 1.5 billion gallons of Sustainable Aviation Fuel (SAF). Airports in Oslo, Stockholm, Brisbane and Los Angeles are currently mixing SAF with the general fuel supply.

The maritime industry is facing a similar transformation. LSF2020 refers to the new 'Low Sulphur Fuel' regulations, which will come into effect on 1 January 2020. These regulations are the biggest of a series of steps by the International Maritime Organisation to reduce marine pollution (MARPOL) in response to the threat of climate change. The LSF2020 emission regulations mean ships will have to significantly reduce emissions on the high seas as well as in coastal areas. Low sulphur fuels derived from biomass and wastes are an attractive solution to combat climate change and reduce emissions in the marine sector. A global transition towards biofuels in the shipping sector is underway and marine biofuels presents a large market opportunity. Today, marine fuel consumption is estimated to run at about 330 million metric tonnes each year, of which 80 percent to 85 percent is thought to be residual fuel oils. And, with the forecast growth in seaborne trade, that volume of consumption could double. Global demand for marine biofuels could reach more than 83 million metric tons a year, according to the "Paris Process On Mobility And Climate," a group that collaborates to create action on transport and climate change.

Australia's future Bioeconomy should be a key strategy for Regional Australia.

The International Renewable Energy Agency (IRENA) reviews renewable energy and jobs on an annual basis. Its [latest review](#) states that renewable energy employment worldwide has continued to grow since IRENA's first annual assessment in 2012. Global renewable energy employment reached 10.3 million jobs in 2017, an increase of 5.3% compared with the number reported in the previous year. The strongest expansion took place in the bioenergy and solar photovoltaic (PV) industries.

An increasing number of countries derive socio-economic benefits from renewable energy. Brazil, the United States, the European Union and SE Asian countries were among the largest employers.

Globally, biofuels employment (at close to 2 million jobs) increased by 12%, as production of ethanol and biodiesel expanded in most of the major producers.

In Brazil, most renewables employment is in liquid biofuels and large hydropower. Total biofuel employment rose by 1% in 2017 to 593 400 jobs. Ethanol jobs declined due to the steady automation of feedstock supply and a decline of ethanol production (USDA-FAS, 2017c)¹⁴. While ethanol-related employment fell in Brazil, it was more than offset by gains in biodiesel jobs. IRENA estimates that Brazil employed 202,000 people in biodiesel in 2017, up more than 30, 000 from the previous year.

The European solid biomass and wind power industries provide the most jobs, at about 389,000 and 344 000, respectively. Biomass use is receiving growing policy support, but half of Europe's jobs in this sector are in six countries: Germany, France, Spain, Italy, Poland and Finland.

A U.S. Department of Agriculture (USDA) report *An Economic Impact Analysis of the U.S. Bio-based Products Industry (2018)* analyses the economic impact of the biobased products industry on the U.S. economy. Results show that growing bioeconomy leads to higher revenues, more jobs, innovative partnerships, and key environmental benefits. The total contribution of the bio-based products industry to the U.S. economy in 2016 was \$459 billion, a 17% increase from 2014, and it was employing 4.65 million workers an increase of more than 10% from 2014. This includes the 1.68 million people directly employed within the industry, plus 2.98 million employed in jobs supported by the industry. It was further estimated that each job in the bio-based industry supported 1.78 jobs in other sectors of the economy.

Socio-economic advantages of international bio-economies in different sectors

Socio-economic advantages of the development of a potential bio-economy are widely demonstrated by the results achieved in the international scenario. These benefits are particularly evident in the following sectors:

Biofuels

The report [“An Economic Impact Analysis of the U.S. Bio-based Products Industry”](#) commissioned by the U.S. Department of Agriculture's (USDA's) BioPreferred® Program in 2018, highlights that in the United States, the total contribution of the bio-based products industry to the U.S. economy in 2016 was \$459 billion and it was employing 4.65 million workers. It was further estimated that each job in the bio-based industry supported 1.78 jobs in other sectors of the economy.

Waste to energy (WtE)

WtE facilities bring significant benefits in terms of employment and educational opportunities. According to the World Energy Council report [“World Energy Resources - Waste to Energy”](#), typical employment for a waste incineration plant of 50,000 tonnes per annum capacity would be 2 to 6 workers per shift. For a 24-hour operation, a typical plant would work on a three shifts system. For example, the WtE industry in the United States employed around 5,350 people nationwide in 2014, working at 85 specific sites. There were also additional 8,600 jobs created outside the sector. The jobs generated by the sector are usually well paid, stable and support the local economy.

Biogas

According to the [International Renewable Energy Agency \(IRENA\)](#), the biogas sector represented about 333,000 jobs globally in 2016. China accounted for slightly less than half of these jobs, with 145,000 estimated direct and indirect jobs in the biogas industry. In the United States, the construction and operation of biogas plants in 2016 may have supported around 7,000 jobs according to the American Biogas Council.

Production of pellets for energy

Pellets are a solid biomass fuel, mainly produced from wood residues but also from agricultural by-products such as straw. Pellets may be used for residential and industrial (power plants) energy generation purposes. The global industrial wood pellet market has grown dramatically in the last decade and is expected to grow significantly between the present and 2025. Between 2012 and 2017, the global wood pellet market has experienced growth rates averaging 10% annually, from about 19.5 million metric tonnes in 2012 to about 31.2 million metric tonnes in 2017. Much of the world's production of pellets is for export markets. It has been estimated that the number of jobs generated from the wood biomass industry in the US is approximately 30,000 (USDA 2018¹). However if the pellets are produced in the region that is using them, then a greater number of jobs are created by the pellet fuel supply chain. For example, for a modestly sized pellet factory producing 125,000 tonnes/year of pellets, the combined number of direct, indirect and induced employment is in the order of 144 jobs².

How can Bioenergy benefit Regional Australia?

The bio-economy is built upon the use of sustainably derived, low-value feedstocks and wastes to produce high-value bioproducts including biofuels, biomaterials, biochemicals and bioplastics. The feedstock used for bioenergy-related processes is often available from rural activities, especially agriculture and it can be associated with existing or new manufacturing processes.

With a technologically advanced agricultural sector and a large amount of biomass available, the bio-economy represents a significant jobs and economic growth opportunity for regional Australia in different sectors.

Biofuels

The [QUT report "Biofuels to bioproducts: a growth industry for Australia"](#) showed an increased use of 10 per cent ethanol-blended petrol (E10) in Australia could create 2080 direct jobs and up to 6570 indirect jobs and has the potential to attract A\$1.56 billion of investment and generate more than A\$1.1 billion of additional revenue per year in regional communities.

¹ USDA Indicators of the U.S. Biobased Economy. Office of the Chief Economist March 2018.
<https://www.usda.gov/oce/energy/files/BIOINDICATORS.pdf>

² Direct employment are jobs created by the pellet mill and workers that directly supply goods and services to the mill. Indirect employment refers to the changes in sales, income and jobs in sectors within the region that support the suppliers of goods and services to the pellet mill. Induced effects are then increased sales within the region from households and businesses spending the income earned from the direct and indirect job income and profits on commerce unrelated to the pellet mill.

In Australia, wheat starch, molasses and sorghum are used for bioethanol production, with facilities located in the regional communities of Nowra in New South Wales and Dalby and Sarina in Queensland. Manildra's facility in Nowra offers 350 jobs on the entire manufacturing site, while Wilmar's bioethanol distillery in Sarina directly employs 80 people in the bioethanol production process and a further 80 people in the distribution and sales of biofertilizer.

Locally-produced biodiesel can also support regional Australia by boosting national fuel security and offering employment opportunities. As an example, Just Biodiesel, in partnership with Refuelling Solutions, has reopened the Barnawartha plant after its closure in 2016, to produce biodiesel, a renewable, clean-burning diesel replacement that will reduce Australia's dependence on foreign petroleum, with the added benefit of creating jobs and improving the environment. The facility has re-employed 11 of the original staff and is on track to add a further 5 jobs. Through the support from many local suppliers, substantial economic benefits will be achieved for the region.

Waste to energy (WtE)

The conversion of residual wastes into energy delivers economic benefit to resources that would generally be considered as end-of-life products.

WtE technologies are therefore an attractive option to treat non-recyclable waste streams not only due to the challenges associated with landfill availability and related greenhouse gas emissions, but also their potential contribution to sustainable baseload power generation, heat recovery, metals and aggregates recycling, as well as regional development and jobs.

The potential utilization of a broad range of waste streams provides the opportunity to create new industries. For instance, technologies are constantly under development to optimise the conversion of waste into biofuels. In addition, new employment opportunities arise from growing and harvesting biomass, transport, handling, and through procurement, construction, operation and maintenance of bioenergy plants.

Some examples of employment opportunities of Australian WtE projects are listed below.

- Australian Paper is working with Suez on the construction of the first Victorian energy-from-waste project at the Latrobe Valley mill, east of Melbourne. A recent economic impact study from Western Research Institute has confirmed that the WtE facility would support an average of 1,046 Victorian jobs pa during the three-year construction period and more than 900 when operational.
- The construction of the Kwinana waste to energy plant, Australia's first large-scale project of its kind, has commenced and it is expected to be open by the end of 2021. More than 800 jobs will be created during construction and 60 positions once operational.
- World-leading German waste-to-energy company REMONDIS has announced plans to build a WtE facility in Swanbank, south of Ipswich. This project could create up to 200 jobs during construction and some 70 jobs during operations.

Biogas

By using waste locally produced, the biogas industry supports local economies and regional communities, creating jobs, and offering new income sources, particularly for farmers.

The biogas plant itself is not labor intensive, but it can create new business opportunities in rural areas which otherwise suffer from depopulation. Through collaboration with different farms, the biogas plant can create different job opportunities along the process chain, such as raw material cultivation and collection. By increasing local energy production, income stays in the local area instead of going to global energy markets.

Production of pellets for energy

Production of pellets for energy generation represents a significant opportunity for regional Australia. Pellets may be used to supply export markets, or alternatively they may be used to produce much needed dispatchable power in Australia as we gradually transition from coal-fired generation. Production of pellets results in long-term jobs for the regions, as the production and supply of biomass to processing facilities takes place all year round. There are substantial volumes of biomass currently under-utilised and which would be suitable feedstock for pellet production (the [AREMI national map](#) provides more information on the availability of biomass across key regions nationally). There are a range of opportunities for job creation along the biomass supply chain, including the ability to grow biomass crops in marginal, unproductive land in farms or land in need of rehabilitation as a result of extractive activities such as mining.

As an example, one medium sized pellet mill with a production capacity of 100,000 Tonnes p.a. works 7600 hours p.a., involving about 20 FTE employees. In addition, extra employment is required in the construction on the plant for the prior 12 months. Upstream jobs involved in the harvesting and downstream jobs involved in the transport and distribution logistics for the route to market for pellets also create additional jobs. A very high percentage of this labour is locally sourced providing a solid stimulus for regional areas.

In terms of export opportunities, the Asian region is the primary market for Australia. Considering that the worldwide pellet production is largely driven by Japanese and Korean demand, utilising our sawmill waste residues and our forestry harvesting residues to produce pellets would generate significant commercial opportunities. The single largest impediment in the route to market is the infrastructure required for ship loading. This requires port storage and loading facilities. Correctly sited pellet production facilities in regional areas and correctly sited port storage & loading facilities will enable regional processors to cost effectively service the growing Asian markets well into the future. This is one of main drivers of being able to provide cost effective product to market.

What can Federal Government do?

Around the world, government policies have been instrumental in supporting and securing feedstock supply, infrastructure and logistics; promoting access to technology and early-stage investment support; and improving demand. National strategies have been developed to provide stable political environments and guidance for investors and other relevant stakeholders in the bio-economy.

Bioenergy and bioproducts have the potential to be a significant growth sector for the Australian economy whilst growing the agricultural sector and regional communities. As with any emerging sector, government support plays an important role in removing barriers, setting targets and accelerating the development of the industry.

The Australian Government, in conjunction with the states and territories, can help grow the Australian bio-economy through:

- establishing a national vision for the bio sector in Australia, with a corresponding set of policy objectives and targets informed by cost benefit analyses;
- developing a national roadmap to achieve the vision, including recommended policy levers for all levels of government to implement; and
- monitoring performance of achieving the roadmap through regular reporting.

A national roadmap reflecting the unique attributes of each state and territory will allow the identification of their respective needs and comparative advantages. Some jurisdictions may have feedstock that allows them to become a leader in biofuel refining or generating dispatchable electricity from biomass or producing biochemicals.

With regards to the transport sector, Bioenergy Australia is proposing a Federal Clean Fuel Target to maintain strong economic growth through securing fuel supplies, creating jobs in regional areas and developing new opportunities to strengthen Australian agriculture.

A Clean Fuel Target would decrease reliance on imported fuels and deliver investment across the value chain, from crop and forest residues along with speciality energy crops for feedstock, to new sustainable alternative fuel production, refining and supply infrastructure. The agricultural and forestry sectors are in fact of fundamental importance to the Australian economy and underpin much of the social fabric of our nation. The majority of economic benefits generated by sustainable alternative fuels occur in rural and regional areas. This is through improving productivity and diversifying revenue streams, retaining existing jobs and creating new ones.

A number of sustainable alternative fuel programs are successfully operating in other regions of the world, providing confidence that the adoption of similar policy settings in Australia will deliver substantive benefits. As an example, since 2011 the Low Carbon Fuel Standard (LCFS) in California has helped drive over US\$1.6 billion in investment in California's clean fuel economy and more than 300 companies operating in the clean transportation technology industry employ more than 20,000 workers in California.

We also want to highlight that taxation is one of the major hurdles of the development of a successful biofuel industry. In particular, the excise rate for domestic biodiesel was at more than 13 per cent this financial year and it will gradually rise to 50 per cent in the year 2030 and beyond. This excise regime does not make the fuel cost effective, making it less attractive for major suppliers. Therefore, Bioenergy Australia invites the Government to halt increases in the excise tax for biofuels and potentially consider a full excise rebate to encourage the use of more environmentally friendly fuel. In addition, we ask the Government to extend the same excise support given to ethanol and biodiesel to renewable diesel.

Aiming to advance Australia's biogas sector, the report "[Biogas opportunities for Australia](#)" presents the following recommendations for Australian Government and industry stakeholders:

1. Setting renewable gas target(s)
2. Launching industry stakeholder consultation for policy design
3. Introducing waste management strategies to support feedstock quality and quantity
4. Encouraging plant operators, especially landfill operators, to maximise biogas use
5. Exploring opportunities for the transport sector
6. Providing regulatory clarity for the digestate
7. Simplifying approval processes
8. Informing the community about biogas and its benefits

In particular, Bioenergy Australia supports the development of a ‘green gas’ retail product for gas users in Australia to encourage the use of biomethane and thus its production and injection into the gas grid. As an example, the Green Gas Certification Scheme project which is co-funded by the Department of Communications, Climate Action and Environment, Department of Jobs, Enterprise and Innovation as well as GNI and the Renewable Gas Forum of Ireland was launched in April 2017 and aims to develop a comprehensive methodology for a certification scheme that facilitates biomethane trading for both renewable heat and transport markets. It is anticipated that such certification and independent traceability of Guarantees of Origin and sustainability criteria will be mandated in the updated RED as well as demonstrating compliance with EU and national targets.

Global initiatives that Australia could embrace:

- Climate Solutions fund – to be utilised to create specific methods to support and drive certain sectors
- Investment support e.g. loan guarantees for biorefineries (United States)
- Renewable heat incentives
- Banning organic waste going to landfill (Sweden)
- Mandating fuel mix ratios
- Developing and supporting bio-chemical industry products:
 - Bio-based chemicals
 - Bioplastic bottles and packaging
 - Biorefining
 - Enzymes
 - Textiles
- Carbon credits

There are 17 GHG emissions trading schemes that have been established globally, operating in 35 countries, 12 states and seven cities. These trading schemes present a market-based approach to controlling GHG emissions and mitigating the effects of climate change by limiting the quantity of industrial discharges of GHGs, either through the allocation or purchase of emissions allowances from a central authority or the purchase of emissions credits from market participants. For example, a company that emits more GHGs than its permits allow can buy credits from others willing to sell them. GHG emissions credit units are often known as carbon credits or GHG emission-reduction credits.

In summary

Bioenergy Australia congratulates the Senate in establishing the Select Committee into the Jobs for the Future in Regional Areas.

As the organisation representing the bioenergy industry, Bioenergy Australia is committed to efforts to grow jobs in regional Australia in the renewable sector. The role of renewables in the global energy system keeps expanding. This is key to stabilising the global climate, avoiding environmental degradation and improving human health. As the global transition towards a more sustainable energy system unfolds, the world’s renewable energy workforce will continue to expand. [IRENA’s analysis](#) suggests that jobs in the sector could rise from 10.3 million in 2017 to 23.6 million in 2030 and 28.8 million in 2050, in line with IRENA’s more sustainable energy pathway.

Our submission highlights Australia’s potential for growth in bioenergy production and use.

Thank you for the opportunity to provide this submission.

Yours sincerely

Shahana McKenzie, CEO Bioenergy Australia