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BIOENERGY AUSTRALIA SUBMISSION

Inquiry into a sustainable Queensland intrastate shipping industry

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The purpose of this submission from Bioenergy Australia is to highlight the future role of biofuels in the development of a sustainable Queensland intrastate shipping industry.

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 role of biofuels in the development of a sustainable shipping industry

The combined effects of decreasing availability of light crude oil, increased demand for global merchant shipping, and stricter marine fuel regulations have caused a search for competitively produced marine fuel alternatives with low sulphur content and low carbon footprint. Alternative fossil-based fuels such as the Liquefied Natural Gas (LNG) have low sulphur and nitrogen oxide emissions, but have a limited contribution to reducing greenhouse gas (GHG) emissions.

Liquid transport biofuels produced from biomass or waste organic residues, have a much larger potential to combat climate change and reduce emissions over their full life cycle. As biomass is a renewable resource and contains very little or no sulphur, biofuels have the potential to become an important part of the fuel mix in the shipping sector, by reducing its GHG emissions.

In addition, biofuels must be considered as part of the solution to improve the national fuel security. Latest figures produced by the Department of Energy show stockpiles at the end of October 2018 were 27 days total petroleum products, 22 days of petrol and 17 days of diesel. With the decline in domestic refining in Australia, and the closure of 3 refineries in the last decade Australia has been left with 4 refineries in operation and the majority of fuel being imported. Australia would be exposed to catastrophic challenges should there be disruptions to the main shipping line to Australia. The production of biofuels in Australia can help diversify the sources of transportation fuels, including marine fuels, and decrease Australia's reliance on petroleum imports.

A global transition towards biofuels in the shipping sector is underway, however the absence of well-directed policy has seen Australia lagging behind other major countries who are investing heavily in the production of these sustainable products. Although states like New South Wales and Queensland have introduced policy measures to support the growth of the biofuels and bio-based products sectors, a national directed policy would deliver stronger benefits across the country, including:

- Improved national fuel security;
- Jobs and investment, particularly in regional areas;
- New investment in refining infrastructure and skills;
- Improved community health outcomes; and
- A significant reduction in greenhouse gas emissions.

While there are challenges, it certainly is possible for biofuels to significantly displace traditional mineral hydrocarbons with positive economic and health outcomes In Australia.

The country, in fact, has several comparative advantages that increase its potential to develop a sustainable and competitive biofuel industry, including:

- an abundance of sunlight, flat land and strong agricultural industry with significant underutilised waste residues;
- world-class expertise in agricultural science;
- a strength in natural resources and infrastructure industry development; and
- a first world economy with rule of law and low political risk.

Biofuels for the shipping sector

The volumes of biofuels required to supply the shipping sector are large and this presents a fantastic opportunity for the development of a new industry in Australia that would drive local jobs and economic development.

Of the current biofuels commercially available in Australia, only biodiesel and bioethanol are currently produced at a level where they can supply significant volumes of fuel.

Biodiesel, also commonly known as fatty acid methyl ester (FAME), is obtained from vegetable oil or animal fat. One of the main advantages of biodiesel is that it restores lubricity of the engine and reduces smoke, soot, and burnt diesel odour from engine exhaust, at the same time protecting against wear in fuel and injector pumps.

Renewable diesel is created by the thermal and hydro processing of renewable biomass and waste lignocellulosic feedstocks. The current renewable diesel type fuels are mainly produced from plant-based oils or products thereof e.g. used cooking oil (UCO). These fuels must meet Australian Fuel Quality Standards Acts and Regulation. Renewable diesel is considered a drop-in fuel and requires no blending with traditional diesel.

The highest GHG emissions reduction can be achieved by using residual or waste feedstock streams, such as agricultural residues, waste cooking oil, or municipal waste. Based on this principle, technologies are constantly under development to optimise the conversion of waste biomass into biofuels. As an example, the Australian technology developer Licella has recently teamed up with Neste, the world's leading producer of renewable diesel and UK-based chemical recycling company ReNew ELP in a development project to explore the potential of using mixed waste plastic as a raw material for fuels, chemicals, and new plastics.

The potential contribution of biofuels to different aspects of the inquiry terms of reference

- *The regional economic development and labour market benefits of a sustainable intrastate shipping industry in Queensland*

With the current fuel volumes demanded by the merchant shipping industry and new regulatory fuel requirements, there is a strong market potential for biofuels in the intrastate shipping industry in Queensland and, more broadly, in Australia. Biofuels are currently bringing jobs, investment and revenue overseas and could do the same for regional communities in Australia and in Queensland.

Around the world, biofuels industries have created jobs and investment in regional and rural communities. As an example, the EU bio-economy generates revenue of nearly €2 trillion and employs more than 22 million people, accounting for 9 per cent of total employment.

The discussion Paper "Biofuels to bioproducts: a growth industry for Australia" recently published by Queensland University of Technology (QUT) estimates that the production of ethanol at 10 per cent of Australia's total domestic gasoline consumption would create 2080 direct jobs and up to 6570 indirect jobs, require A$1.56 billion of investment, and create more than A$1.1 billion of revenue per year in regional communities.

Looking more specifically at Queensland's scenario, in 2014, a Deloitte Access Economics and Corelli Consulting report commissioned by QUT investigated the potential impact of the establishment of biorefinery industries in Queensland. The study identified that the growth of biorefinery industries in Queensland alone could result in an increase to the Gross State Product of more than A$1.8 billion per year, and the creation of around 6640 jobs, most of which would be in regional communities. The corresponding benefits resulting from growth in biorefinery industries across Australia would be greater.

- *Current intrastate coastal shipping task and identify any barriers and options to strengthen the intrastate shipping industry*
- *Queensland's contribution to, and the need for, an Australian inter-state shipping industry, and identify ways in which Queensland could contribute to improving the Australian inter-state shipping industry*

As part of the global decarbonisation process, the international maritime industry is looking at options to reduce its greenhouse gas emissions. 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 will require ships to significantly reduce emissions on the high seas as well as in coastal areas, meaning that intra- and inter-state shipping industry in Queensland will strongly be affected. Within this scenario, biofuels, having very low sulphur levels and low CO_2 emissions, are a technically viable solution to meet the requirements and can therefore strongly support the Australian and Queensland marine sector.

- *Opportunities for future common user port infrastructure, and any adjustments to the provision of port services, to support the viability of a regular intrastate freight shipping service*

The advantage of producing a marine fuel is that the fuel can be of a lower quality, have higher viscosity, and be less refined than fuels used for aviation or road transport. Thus, marine biofuels may be produced with lower processing costs, eliminating the need for secondary refining.

The established shipping operational procedures make customizing marine engines to run on new compatible fuels a costly process. Thus, it is practical to take advantage of the existing infrastructure (marine engines, fuel transport pipelines, bunkering) and produce a fuel compatible with what is already in place. Such drop-in fuels fit existing infrastructure and do not require a high investment in ship engine or infrastructure changes.

Despite the fact that biofuels are not yet abundantly used in the maritime sector, it is possible that based on existing biofuel technologies, marine biofuels can be designed and produced to be technically compatible with marine engines. Thus, they can be integrated in shipping vessels as drop-in fuels. Furthermore, the very high fuel flexibility of marine diesel engines open for the development of new biofuel processes combining different grades and types of biofuels.

Several companies and research institutes are working worldwide on both the production of marine biofuels, and testing of their compatibility with current infrastructure, of which the US Navy has been a major player. As an initiative of the US Federal government, the US Navy developed a scheme to establish the Great Green Fleet in 2016. The program was created to provide the Navy half of its fuel and power from clean, fossil-alternative sources by 2020, with biofuels having a significant portion of the alternative fuel mix in addition to solar, wind, and nuclear energy. The production technologies for marine biofuels have been commercialized for feedstocks from plant oils, and animal fats. With minor retrofitting, the infrastructure required for refining these lipid feedstocks are already in place, and the production facilities are technically simple compared with other feedstock types.

- *Working conditions and safety practices on current coastal shipping vessels, comparing international vessels to Australian vessels*

n/a

- *Any practices that are being used to erode working conditions, such as entitlements and legislative protections that currently apply to employees in the industry*

n/a

- *Options for legislative, regulatory or policy reform that could strengthen the intrastate shipping industry, and ensure that Queensland's labour market would benefit from this expanded industry, considering current Commonwealth legislation, reviews and constitutional limitations*

At a Federal level steps have been taken to support the bio-economy of the country.

As an example, a new demonstration project is being built in Gladstone, aiming to turn biosolids from wastewater treatment sewage into renewable crude oil, thanks to $4 million in funding provided by the Australian Renewable Energy Agency (ARENA). The renewable crude oil will be upgraded to renewable diesel, which could potentially fuel the shipping vessels in Queensland.

ARENA and Boral have funded a feasibility study into the conversion of hardwood sawmill residues into renewable diesel which could also potentially provide a low sulphur renewable alternative.

The Queensland Government is committed to meeting the challenges of the future head-on and is driving innovation to secure Queensland's future. In particular, the Queensland Biofutures 10-Year Roadmap and Action Plan has set defined policy objectives that align to the bioenergy industry having a vision for $1 billion sustainable and export-oriented industrial biotechnology and bioproducts sector attracting significant international investment, and creating regional, high-value and knowledge-intensive jobs. Bioenergy Australia acknowledges that the Queensland Government is actively engaging with national and international partners to make that vision a reality. Therefore, we encourage the Queensland Government to closely work with the Federal Government to develop a strong and consistent bio-economy across the country, which would strengthen the intra- and inter-state shipping industry.

- *Options for legislative, regulatory or policy reform to maintain the safety, rights and protections of workers in Queensland ports and maritime industry*

n/a

- *Options to minimise any potential impacts on the Great Barrier Reef from a strengthened intrastate shipping industry*

New aerial surveys show 95 per cent of the northern Great Barrier Reef is suffering from severe coral bleaching, which is caused by abnormally high sea temperatures that kill the tiny marine algae essential to coral health. Emissions from Australia's transport sector are growing, increasing by 22% from 2005 to 2017, and are responsible of the climate change that is killing the Great Barrier Reef.

Australia has ambitious targets under the Paris agreement and, in order for the country to meet the obligations, a consistent decarbonisation process needs to be undertaken. Queensland is committed to slowing the pace of global warming and the employment of biofuels in the shipping industry can contribute to the achievement of that goal.

Thank you for the opportunity to provide this submission.

Yours sincerely

Shahana Mckenzie, CEO Bioenergy Australia