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BIOENERGY AUSTRALIA SUBMISSION

Transport technology — the challenges and opportunities which technology will bring to the transport sector in coming years.

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The purpose of this submission from Bioenergy Australia is to provide comment on the terms of reference for the inquiry into Transport Technology conducted by the Transport and Public Works Committee established by the Queensland Legislative Assembly.

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.

Identifying trends and changes in fuel type usage in the sectors of personal transport, freight transport and public transport, such as the increasing uptake of hybrid and electric vehicles

Among other energy sectors, transport has drawn much attention over the last few years and the transition to renewable energy sources is essential to move towards better fuels. Emissions from Australia's transport sector are growing, increasing by 22% from 2005 to 2017. For Australia to meet our Paris obligations, as well as the UN Sustainable Development Goals commitments, a consistent decarbonisation process needs to be undertaken.

Biofuels, defined as solid, liquid or gaseous fuels produced from biomass, can play a major role in meeting the Australia's renewable energy target. In particular, first generation biofuels, produced with leftover starches and sugars sourced from wheat, sorghum, barley, sugarcane and other agricultural waste, are gaining traction in the Australian transport sector. There are currently three commercial producers of bioethanol in Australia, with five more proposed facilities at varying stages of development. There are several small producers of biodiesel in Victoria, New South Wales, Queensland and Western Australia. Second generation biofuels deriving from lignocellulosic crops, organic municipal wastes and agriculture residues and third generation biofuels, coming from algae, are also under development, but require different technologies, which are currently maturing in Australia. Recent announcements, such as funds being granted for a new demonstration plant in Gladstone turning biosolids from wastewater treatment sewage into renewable crude oil, are clear evidence of the industry growing across the country.

Australia has several comparative advantages that increase its potential to develop a sustainable and competitive biofuel industry, including:

- an abundance of sunlight, flat land and a climate suitable for growing dedicated energy crops;
- world-class expertise in agricultural science;
- a strength in natural resources and infrastructure industry development;
- a first world economy with rule of law and low political risk.

However, Australia currently lags well behind other nations in production and consumption of biofuels. Global biofuels production in 2014 was 126 billion litres and has grown at an annual rate of 15 per cent since 2000. In particular, The United States of America and Brazil account for 70% of the total amount of biofuels produced globally and supply both domestic and export markets. In these countries, biofuel producers operate in established markets, supplying more than 95 billion litres per year. In the US, federal and state government programs have promoted biofuels to address issues of energy security, sustainability and regional jobs creation. In 2005, the European Union (EU) mandated that renewable fuels (including biofuels) make up 10 per cent of total transportation fuels by 2020. Sweden leads the EU countries in renewable energy, particularly in the transport sector, where biofuels make up about 20 per cent of the total fuel market. Many countries in Asia are implementing mandates for biofuels and other policy measures to encourage development of the industry. China has mandated E10 and this policy is accelerating the transition to biofuels. Beijing is expecting to complete implementation of this target by 2020. India is proposing to replace 10 per cent to 20 per cent of its petrol with bioethanol.

A global transition towards biofuels is underway and Australia is currently lagging. While there are challenges, it certainly is possible for biofuels to significantly displace traditional mineral hydrocarbons with positive economic and health outcomes. This is best demonstrated by Brazil where all gasoline fuel contains at least 28% bioethanol and many cars run on effectively 100% bioethanol. Through the InnovaBio program, Brazil is targeting a doubling of biofuel utilisation by 2030.

Learning from the successful overseas scenarios, Australia needs to look at low carbon technologies which can enable the industry to decarbonise rapidly, including biofuels, as well as electric vehicles. While electric and hybrid vehicles have great potential in the passenger road transportation sector, aviation, shipping and long-haul heavy haulage will rely on alternate fuel sources to meet emissions reductions.

At a global level, the aviation industry has committed to reducing its greenhouse gas emissions and has set a target of carbon neutral growth from 2020. The use of sustainable aviation fuels will play a critical role towards achieving this target. For instance, technology has been developed for the conversion of first-generation biofuels into jet fuels, and the production route for this has been recently certified for use in commercial aviation. To achieve the CORSIA targets all sustainable fuels will need to be assessed against a robust and consistent Life-cycle analysis (LCA) framework. In addition, the global aviation industry is seeking to implement a strict set of sustainability criteria to ensure the production of these fuels does not have unintended environmental, social or economic consequences. The international aviation industry will be complying with the global framework and relevant LCA criteria, with many key States having sustainable aviation fuels readily available (e.g. United States and Europe), backed by significant policy mechanisms encouraging the development of this important industry. In the absence of a functioning sustainable alternative fuels industry in Australia, the Australian airlines will be at a significant competitive disadvantage.

Together with the aviation, the merchant shipping sector is one of the major players in world trade. More than 80% of all goods are transported via international shipping routes. The sector consumes more than 330 Mt of fuel a year and accounts for 2-3% of the global CO₂, 4-9% of SO_x, and 10-15% of NO_x emissions. Being international in its operation and organization, the maritime sector is regulated by the International Maritime Organization (IMO) under the UN. IMO handles issues regarding safety, security and pollution associated with international shipping. A major issue of pollution from shipping are the particles emitted due to the high levels of sulphur in the fuels. The IMO has put forward strict regulation of the fuel sulphur levels. The low sulphur fuels currently introduced are labelled Very low Sulphur Fuel Oil (VLSFO) having between 0.1 to 0.5% sulphur and Ultralow Sulphur Fuel Oil (ULSFO) having below 0.1% sulphur content. Biofuels have very low sulphur levels and low CO₂ emissions, as such they are a technically viable solution to low-sulphur fuels meeting either the VLSFO or ULSFO requirements.

In addition to the just mentioned opportunities in the aviation and shipping sector, biofuels, in particular bioethanol, are proven to be a market-ready and cost-competitive alternative to fossil fuels heavy haulage as well. International truck companies are already embracing bioenergy as low-carbon fuel for their vehicles and there is no reason to prevent the same trend in Australia. As an example, Scania, a world leading provider of transport solutions, has demonstrated that it is possible to operate trucks and buses in Sweden on biofuels and reduce environmental impact cost-effectively. Their strategy involves supplying engines running on all commercially available fuel alternatives, including compressed and liquefied biogas and natural gas, biodiesel and ethanol. The company has recently released an alternative fuel engine option for the new truck generation and Euro 6 emissions standard. The new bioethanol engine delivers 2,150 Nm, equal to that of its diesel counterpart. The fuel consumption is also on a par with a conventional diesel engine.

Biofuels are therefore a viable low-carbon technology for heavy transport, freight, aviation, defence and shipping applications.

Examining the readiness of the transport network for increasing electrification of vehicles in coming years

In the next several decades, an increase of electric vehicles into the global passenger vehicle fleet is expected. However, even with increasing demand, electric vehicles are projected to account for only 8 per cent of the global vehicle fleet by 2040.

On the other hand, biofuels are a proven technology, therefore they can play an important role in the short-term climate-change mitigation scenario.

The two technologies are likely to co-exist to improve the vehicle performances. For instance, ethanol could be used as a liquid fuel to power fuel cells, resulting in vehicles with similar environmental and health benefits to battery electric vehicles but with a comparable driving range and refuelling time to conventional petrol-fuelled vehicles. Nissan is planning to launch this technology to the market in 2020 to power electric vehicles.

Thank you for the opportunity to provide this submission.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Jm Kenzi', written in a cursive style.

CEO Bioenergy Australia