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Committee Secretary
Senate Rural and Regional Affairs and Transport References Committee
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Dear Committee Secretary

SUBMISSION ON IMPORTANCE OF A VIABLE, SAFE, SUSTAINABLE AND EFFICIENT ROAD TRANSPORT INDUSTRY

Woodside Energy Limited ('Woodside') thanks the Senate Rural and Regional Affairs and Transport References Committee ('the Committee') for the opportunity to provide comment on the "Importance of a viable, safe, sustainable and efficient road transport industry".

In offering our response, Woodside hopes to inform the Committee by drawing on our learnings as the pioneer of Australia's liquified natural gas (LNG) industry and largest Australian natural gas producer. Woodside's particular focus for our submission is primarily the Terms of Reference (TOR) (g) *the impact of new technologies... and alternative fuels*; and to a lesser extent the TOR (b) *the development and maintenance of road transport infrastructure to ensure as safe and efficient road transport industry*.

About Woodside: Woodside is recognised for its world-class capabilities as an integrated upstream supplier of energy. We deliver energy solutions domestically and internationally that provide sustainable value for our shareholders, partners and the communities where we are active. Our operated assets are renowned for their safety, reliability and efficiency and we have a strong track record in project development. As Australia's premier LNG operator, we produced 6% of global LNG supply in 2018. The natural gas we produce is a low-emissions and economically viable fuel for markets domestically and around the world.

As a proud Australian company, Woodside recognises the potential of alternative fuels for the transport industry, such as LNG fuel and hydrogen and encourages government to provide clear and stable policies from which these alternative fuel sources can develop for the transport industry

Based on the foundation of a stable supply of natural gas from existing and new projects Australia has the potential to further diversify from its reliance on liquid fuels by using natural gas for fuelling our transport sector.

Natural gas for trucks: Natural gas (LNG or CNG) is a feasible substitute for diesel use in heavy road vehicles. Across the USA, EU and China there are extensive fleets of trucks operating on LNG and CNG. For example, UPS (the world's largest delivery company) operates more than 5000 LNG and CNG fuelled trucks in the USA. The EU, via its 'TEN-T' initiative, is mandating and supporting the roll-out of alternative fuelling stations, including LNG and CNG, across core road transport routes in Europe. It aims to break the 'chicken-and-egg' infrastructure challenge and facilitate uptake of alternative fuels, with the stated aim of reducing the EU's dependence on imported oil and reducing emissions.

Australia does not offer the same support for LNG or CNG as a transport fuel and industry uptake has flagged accordingly. While there were a reported¹ 200 LNG-fuelled trucks in operation in Western Australia in 2010, today there are none. Despite the additional cost of developing suitable LNG-fuelled trucks for the Western Australian market, it was a viable proposition for transport operators given the tax settings at the time.

¹ <https://aogexpo.com.au/wp-content/uploads/2019/04/Session-2-Nick-Rea.pdf>

Woodside believes the introduction of federal excise on natural gas fuels in 2011 effectively ended a nascent industry by reducing the incentive for converting from diesel to natural gas. This action halted development of the LNG fuelling networks and investment in engine technology that could have supported further uptake of LNG-fuelled trucks in Australia.

Despite the challenges, Woodside is building its capability in new markets for LNG supply and offering integrated energy solutions across the entire supply chain. Woodside's newly commissioned LNG truck loading facility at Pluto LNG will make LNG available for distribution in north-west Australia, and thus provide an alternative to diesel for heavy transport, including on-road trucking and mining equipment, such as haul trucks and trains.

Hydrogen: Woodside views hydrogen production and export as a potential adjacent activity to our core LNG business and is exploring how our capabilities in the production and transport of gas could be used to support future hydrogen.

We support the development of a National Hydrogen Strategy by the COAG Energy Council Hydrogen Working Group. In July Woodside's submission to the COAG Energy Council National Hydrogen Strategy Working Group Issues Papers included remarks on hydrogen for transport:

https://consult.industry.gov.au/national-hydrogen-strategy-taskforce/national-hydrogen-strategy-issues-papers/consultation/view_respondent?_b_index=0&uuld=252386981

and in 2018 we provided a submission to Senate Select Committee on Electric Vehicles:

https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Electric_Vehicles/ElectricVehicles/Submissions

In both submissions we advocate building hydrogen infrastructure for transport, along with the adoption of Hydrogen Fuel Cell Electric Vehicles (HFCEVs).

HFCEVs are a class of hybrid battery electric vehicle (BEV) which consume hydrogen in a fuel cell to produce electricity to either charge a battery or provide power for an electric motor. Hydrogen fuel cells emit purified air and steam and are free of harmful emissions.

Hydrogen can be produced from electricity or natural gas. Hydrogen vehicles have greater range than electric vehicles (between 600-800km for light vehicles, up to 1500km for heavy vehicles) and are well suited to Australia's sparse environment. Hydrogen can be used for multimodal transport across buses, trains, ferries and planes.

Refilling a HFCEV takes approximately three minutes, enabling high vehicle utilisation. HFCEV are especially suited in materials handling, return to base fleet, public transport and shared autonomous vehicle applications. This has resulted in adoption from companies like Amazon, Walmart, and Anheuser-Busch.

Fuel cells are more durable than batteries; performance does not decline with cycles, nor during the cycle. Because of this durability, vehicle manufacturers are signalling longer warranty periods. HFCEV have fewer batteries than a BEV and therefore less harmful hazardous waste for disposal.

Hydrogen can be manufactured domestically, which improves fuel security and options for disaster recovery.

Battery electric transport could have significant impact on local electrical grids, with a single truck charger drawing more than 1MW of power. Supporting multiple chargers will require additional power generation that could also be provided by hydrogen fuel cell power generation at the charging site, thereby minimising the amount of grid investment required as battery electric vehicle penetration increases.

Ensuring support for all types of electric vehicles allows users to make the choice that is appropriate for them. We advocate there would be considerable benefit from clear government mandates on zero emission vehicles and support for transport infrastructure.

Challenges facing the adoption of alternative fuels in road transport: While limited availability of alternative fuels such as LNG and hydrogen to end-users provides some challenge for uptake, a key consideration is the unique needs of the road transport industry in Australia where larger and heavier trucks that travel longer distances are commonplace. Trucks and engines designed for the USA and EU markets are often unsuitable for the demands of Australian transport operators.

For example, a Class 8 truck in the USA (the highest classification) has a gross vehicle mass limit of 80,000lb (36.3 tonnes), and such trucks would typically require engines with a capacity of 13 litres or less and 470hp output. In Australia many truck classifications have significantly higher gross vehicle mass limits, which can be up to 135.5 tonnes under National Heavy Vehicle Regulations. Such trucks can have engines of 16 litre capacity and nearly 700hp output. While gas-burning engines for trucks are widely available from leading manufacturers up to 13 litres / 460hp capacity in the USA and EU, there are no commercially

available options above this size, which would be necessary for much of the Australian road transport market. In discussions Woodside has held with leading manufacturers, they have quoted the limited size of the potential Australian market as a primary reason why they would not invest in developing suitable gas-burning engines.

In considering the opportunities for alternative fuels such as natural gas or hydrogen for heavy road transport in Australia, the Committee needs to consider the specific requirements of the Australian transport industry. In particular, despite that natural gas and hydrogen-fuelled trucks are or may be available for other markets, it may not be the case that developments in those markets results in suitable trucks being available in Australia, with the result being Australia significantly lagging in uptake of alternative fuels, as is already the case with natural gas.

It will require government support and policy settings to ensure that successes with alternative fuels in other jurisdictions translate into opportunities for their adoption in Australia.

Role for the Commonwealth Government: Woodside believes the government has an important role to play in signalling expectations to stimulate demand for natural gas and hydrogen for transport fuel. Specifically, the Committee could recommend further exploration of the following opportunities:

- Ensure that the development of LNG and hydrogen refuelling infrastructure has access to financial support through bodies such as the Northern Australia Infrastructure Facility or Clean Energy Finance Corporation;
- Develop consistent national hydrogen codes and standards;
- Use the Commonwealth procurement power to support hydrogen and LNG fleet purchasing and encourage the States and Territories to make commitments to low-emission fleets;
- Implement incentives to overcome new technology premiums;
- Provide direct support or appropriate policy settings to encourage the development of alternative fuel engines and trucks suitable for the Australian market, recognising that technology developed for international markets may not be suitable for ready adoption in Australia;
- Consider transitioning from Fuel Excise towards road user charging as a way of equalising treatment between traditional, BEV and HFCEVs, and LNG-fuelled road transport. In the meantime, consider temporary excise relief and/or infrastructure grants for these emerging technologies; and
- Provide general public and consumer education.

Woodside looks forward to the Committee's report in April 2020.

Yours faithfully

Michael Abbott
Senior Vice President, Corporate & Legal