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7 December 2018

Mr Bill Pender
Inquiry Secretary
Standing Committee on Infrastructure, Transport and Cities
PO Box 6021
Parliament House
CANBERRA

Via email: itc.reps@aph.gov.au

Dear Mr Pender

Standing Committee on Infrastructure, Transport and Cities - Inquiry into automated mass transit

Thank you for the opportunity to make a submission to the inquiry into automated mass transit. In particular, we welcome the inclusion of new energy sources for land-based mass transit in the terms of reference which is complementary to the focus on automation.

Australian Gas Infrastructure Group (AGIG) is one of Australia's largest utility businesses. Our assets are in all mainland states of Australia and the Northern Territory, and include gas distribution networks, gas transmission pipelines and storage facilities. We serve almost 2 million customers, with 34,000km of distribution networks and over 3,500km of transmission pipelines.

AGIG is committed to being a leader in the decarbonisation of Australia's energy supply (including gas, transport and electricity). Decarbonisation of existing gas networks and the transport sector is an essential part of achieving emissions reduction targets across the entire Australian economy in an efficient and cost-effective manner.

The role for hydrogen powered vehicles

AGIG is a member of Hydrogen Mobility Australia (HMA) and we support the HMA submission to this inquiry.

In particular, the HMA submission highlights the key role hydrogen fuel cell electric vehicles (FCEVs) will play in achieving emissions reductions in land-based mass transit including trains, buses and trucks. HMA notes that hydrogen FCEVs provide long travel ranges, fast refuelling and heavy payload capability, all while achieving zero emissions, making them a better alternative to battery electric vehicles for many mass transit applications.

It is worth noting the recent report to the COAG Energy Council, *Hydrogen for Australia's Future*, prepared by the Hydrogen Strategy Group and chaired by Australia Chief Scientist — see Hydrogen for Australia's future. The report notes that:

> *Road transport is responsible for about 15% of carbon emissions, with rail, sea and air transport accounting for 3%. Ultralow*

emissions vehicles – battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) – are therefore key to reducing emissions.

Both BEVs and FCEVs use an electric drivetrain. In BEVs, electricity from an external supply charges a battery, which in turn supplies electricity for the motor. In FCEVs…electricity for the motor is generated by a fuel cell using hydrogen. Both vehicle types produce zero tailpipe emissions, making them ideal for combatting air-quality issues in urban environments. Overall 'well-to-wheel' carbon emissions depend on the source of electricity or hydrogen.

FCEVs and BEVs have complementary roles to play. FCEVs have longer ranges and faster refuelling and are particularly well-suited to long-distance heavy transport where the size and weight of the battery required becomes impractical. BEVs currently have greater model availability, are more than twice as efficient and rely on less expensive refuelling infrastructure. Both technologies face barriers to displacing internal combustion vehicles, including higher upfront costs, lack of trust in a new technology, lack of certainty around policies, incentives and taxes, and limited supporting infrastructure.

The report goes on to state that:

The greatest opportunity for FCEVs is in the heavy vehicle market, particularly for long–distance trucks. This is largely due to the weight advantages of hydrogen versus batteries. For example, a BEV truck with a gross weight of 20 tonnes and a range of 960 km currently needs a 14 tonne battery, restricting cargo weight and increasing the cost of transportation. For hydrogen vehicles, increasing the range only requires increasing the size of the hydrogen tank, which has less effect on total vehicle weight. Since overall size is typically less of a concern than in light vehicles, heavy FCEVs can store hydrogen in a bigger tank at a lower pressure (30 MPa compared with 70 MPa for light FCEVs), which costs less to compress and requires a lighter storage tank per kilogram of hydrogen.

Plans for hydrogen-powered semi-trailer trucks are already well-developed. The Nikola Motor Company in the US, for example, is looking to build the trucks and refuelling infrastructure, operating on a lease system that includes fuel. The Nikola One semi-trailer truck, due to be commercially available in 2020, will be able to travel up to 1,900 km on a single tank of hydrogen. It is a 'series hybrid' in which the fuel cell charges a battery that drives the electric motor. Brewing company Anheuser-Busch has ordered up to 800 of the trucks.

Developing enabling infrastructure for hydrogen vehicles

The application of hydrogen to mass transit will require a range of enabling technologies. In particular, we believe injecting hydrogen into existing gas networks will facilitate the transition. By enabling hydrogen to be transported through existing gas infrastructure, it can be moved throughout our cities to where it is most needed for refuelling trucks, trains and buses, as well as for use within homes and businesses.

In support of the transition to a hydrogen economy, at AGIG we are leading the development of Hydrogen Park SA (HyP SA). At HyP SA, we are building Australia's largest electrolyser which will produce hydrogen from water and renewable electricity for injection into the local gas network. The project is supported by the South Australian Government with close to $5 million in funding from the state's Renewable Technology Fund.

The first stage of HyP SA will see hydrogen injected into the gas network before the end of 2019, blending up to 5 per cent hydrogen with natural gas (predominantly methane).

After the first stage there are a range of likely expansion opportunities we are already considering. These include potential for a tube and trailer filling facility (to transport hydrogen to where it is needed, including refuelling stations) as well as a refuelling station

for buses, trucks and cars. These opportunities will be important if we are to develop and deploy the enabling infrastructure to support hydrogen powered FCEVs for mass transit applications.

Clarifying the roles for industry and government

Finally, it is important that this inquiry consider the mechanisms necessary to ensure hydrogen is able to play a role in reducing Australia's emissions. For hydrogen to play its full role in mass transit, supporting policy is required to enable the accompanying infrastructure, such as vehicle refuelling stations, to be deployed. This will ensure the anticipated uptake of hydrogen for mass transit will not be impinged by lack of available infrastructure.

In the short term this will require targeted investment from businesses and support from governments in the demonstration and deployment of hydrogen FCEV technologies and enabling infrastructure, expanding on existing opportunities like HyP SA. More broadly this will require clear targets for emission reductions across the Australian economy including hydrogen injection into gas networks.

The Hydrogen Strategy Group's report to COAG, as mentioned earlier in this letter, recommends as a critical first step the development of an overarching national hydrogen strategy, which can define the role for government and industry in:

- International agreements and regulations, including shipping, to position Australia as the world's leading hydrogen exporter;
- Standards to ensure safety in all aspects of the hydrogen sector;
- Regulations to enable the addition of hydrogen to existing domestic gas supplies;
- Refuelling infrastructure and regulations for hydrogen vehicles.

We are very confident in the important role that FCEV will play in the mass-transit sector going forward. We therefore strongly encourage the inquiry to focus on hydrogen FCEVs and develop plans to facilitate this transition.

Once again, I thank you for the opportunity to provide a submission to the inquiry. Should you require any additional information please contact Drew Pearman, Manager Policy and Government Relations

Yours sincerely

Craig de Laine

General Manager People & Strategy