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Select Committee on Electric Vehicles

Department of the Senate

Parliament of Australia

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Parliament House

Canberra ACT 2600

Submitted online: www.aph.gov.au

27 July 2018

Dear Committee Secretary,

Commonwealth Parliament Senate Select Committee on Electric Vehicles, 2018

AGL Energy (**AGL**) welcomes the opportunity to respond to the Commonwealth Parliament Senate Select Committee on Electric Vehicles inquiry into the use and manufacture of electric vehicles in Australia (**Inquiry**), 2018**.**

AGL is one of Australia's largest integrated energy companies and the largest ASX-listed owner, operator and developer of renewable generation. AGL is also a significant retailer of energy, providing energy solutions to over 3.5 million customers throughout Australia. In addition, AGL is continually innovating our suite of distributed energy services and solutions for customers of all sizes (residential, business and networks). These 'behind the meter' energy solutions involve new and emerging technologies, including electric vehicles (**EVs**).

We believe that innovative technologies will play a crucial role in improving the efficient use of infrastructure, placing downward pressure on prices and bills, reducing greenhouse gas emissions, and delivering value for Australian homes and businesses. EVs have the potential to deliver on these objectives based on their use of cost-efficient and low-emissions electricity and will play a pivotal role in Australia's transportation and energy future. Accordingly, AGL wants to improve uptake of EVs in the Australian market, by removing the obstacles to ownership and enhancing the ownership experience.

AGL recognises the wide range of societal benefits that vehicle electrification can deliver to the Australian economy, including the following:

- Increased EVs uptake will stimulate investment in the local economy and provide important opportunities for job creation.
- In the electricity system context, EVs are a flexible resource that have the potential to deliver benefits that will increase with scale.
- A faster shift towards vehicle electrification will increase the benefits from decarbonisation of our electricity system.

- The wider societal benefits resulting from advanced mobility systems will be brought forward through policies that support vehicle electrification.

AGL is invested in the development of the Australian EV market through our Electric Car Plan, which allows customers to charge their electric car, whenever they like and as often as they like for $1 per day. As part of our Electric Car Plan, we also offset emissions associated with our customers' EVs at home through our Future Forests Program. We have also committed to transitioning 10 per cent of AGL's business vehicle fleet to EVs by mid-2018.

We have given careful consideration to the Inquiry's terms of reference, which we elaborate further in the Attachment to this submission. Whilst the Inquiry's terms of reference encompass a broad range of matters, our submission addresses the following terms of reference in particular:

a) the potential economic, environmental and social benefits of widespread electric vehicle uptake in Australia;

c) measures to support the acceleration of electric vehicle uptake; and

e) how federal, state and territory Governments could work together to support electric vehicle uptake and manufacturing, supply, and value chain activities.

AGL considers that public policy settings at both the State and Federal levels can also play a crucial role in accelerating the uptake of EVs in Australia.

We would welcome coordinated cross-government leadership through the COAG Energy Council to develop a robust EV roadmap that establishes a nationally agreed target and supporting policy initiatives. This would provide the optimal policy platform to support businesses operating across the Australian economy. We would also urge Commonwealth and State governments to implement the following policy measures:

1. A national EV target;
2. A Government fleet EV target;
3. Tax treatment consideration within any broader review of tax policy;
4. Network tariff reform;
5. Vehicle efficiency standards; and
6. Charging infrastructure planning and support.

Should you have any questions in relation to this submission, please contact Kristian Handberg, Electric Vehicle Lead, on 0402 955 013, or Kurt Winter, Manager, Policy and Research, on 03 8633 7204.

Yours sincerely,

Associate Professor Tim Nelson

Chief Economist

ATTACHMENT

a) The potential economic, environmental and social benefits of widespread electric vehicle uptake in Australia

AGL recognises a wide range of economic, environmental and social benefits that vehicle electrification can deliver to the Australian economy.

We refer the Committee to the PwC report, *Recharging the economy: the economic impact of accelerating electric vehicle adoption* (**PwC Analysis**)[1], that was commissioned by the Electric Vehicle Council, the NRMA and the St Baker Energy Innovation Fund. The PwC entails an economic assessment of an EV growth scenario. The scenario assumes Australia achieves a battery electric vehicle (**BEV**) growth rate similar to that of Norway. The scenario is referred to as AU 50@30 and assumes that by 2030, 57 per cent of new car sales will be BEV. As a result, the number of new BEV sales is assumed to reach 576,000 in Australia by 2030 from a baseline of 2,500 in 2017.

The PwC Analysis projects the following key economic benefits to the Australian economy:

- Direct economic impact with real GDP estimated to increase by $2.9 billion and net employment estimated to increase by 13,400 jobs;
- An investment impact of $3.2 billion in cumulative net investment in charging infrastructure from 2018 to 2030;
- Improvements in national fuel security by eliminating 16 million barrels of imported oil per annum by 2030;
- Environmental benefits with cumulative CO2e emissions reduced by 18 Mt by 2030 (the equivalent to taking 8 million petrol vehicles off the road and the lowest cost option to achieve the Paris Agreement targets for the transport sector); and
- Savings to consumers, estimated in the order of $1,700 per annum in ownership costs by 2030.

We also note that the PwC Analysis does not account for the additional upstream benefits from EV uptake in the electricity market which include local jobs in energy generation and flow-on benefits from flexible distributed energy resources arising from intelligent management of EV charging. We elaborate further on these matters below.

The economic imperative of decarbonisation and the need for sectoral equity

The widespread uptake of electric vehicles, when coupled with the decarbonisation of the electricity grid, presents a substantial opportunity to deliver emissions reductions consistent with Australia's long-term commitments under the Paris Agreement. EV's also provide opportunities for improving affordability and system reliability. The increased uptake of electric vehicles also has the potential to contributed towards improved air quality, delivering significant health benefits to communities. These benefits stem from the fact that electric vehicles emit zero tailpipe emissions.

[1] See PwC, *Recharging the economy: the economic impact of accelerating electric vehicle adoption,* available at http://electricvehiclecouncil.com.au/wp-content/uploads/2015/05/Recharging-the-economy.pdf.

We developed our Electric Car Plan with a strategic focus on its economic and environmental impacts, as the energy grid transitions towards full decarbonisation. AGL's Electric Car Plan for EV charging at home is 100 per cent carbon offset through our Future Forest Program, effectively delivering zero emission charging to our EV customers. Our Future Forests Program enables customers to offset the carbon emissions associated with their electricity usage through Australian forestry carbon credits.

AGL is also committed to ensuring robust product stewardship and recycling of batteries, as their use becomes more widespread in both the electricity and transport sectors. In particular, AGL is a member of the Australian Battery Recycling Initiative (**ABRI**), a not-for-profit association established in 2008 to promote responsible environmental management of batteries at end of life. AGL has been working closely with ABRI and other stakeholders to develop robust product stewardship and recycling processes and standards for the Australian market.

The broader economic benefits of increased electric vehicle uptake

Beyond the opportunity to deliver emissions reductions, AGL recognises a wide range of economic and social benefits that vehicle electrification can deliver to the Australian economy.

Increased EVs uptake will stimulate investment in the local economy and provide important opportunities for job creation. Whilst Australia is currently on a trajectory towards complete oil import dependency[2], the entire electricity supply-chain in Australia is domestic[3]. In 2016-17, 14,820 people were directly employed in renewable energy activities in Australia[4]. The local economy of regions such as the Latrobe Valley in Victoria and the Hunter Valley in NSW is inextricably linked to the electricity sector. Supporting the shift toward vehicle electrification will increase demand for electricity, greatly enhancing employment opportunities for Australians.

As AGL's own experience illustrates, the emerging EV market continues to provide new opportunities for business development and job creation. AGL's EV capability includes staff with previous experience in the automotive industry. We continue to partner with a range of businesses to develop innovative projects that provide new solutions for the EV market.[5] Moreover, direct investment in related products and services include electrical subcontracting, renewable energy generation, carbon offsetting and management consulting.

In the electricity system context, EVs are a flexible resource that have the potential to deliver benefits that will increase with scale. AGL appreciates that the transition towards automated and zero emission technology vehicles will have substantial implications for the electricity grid with flow-on effects for infrastructure. In particular, we consider that the transition will require careful consideration of charging management and system optimisation in order to address the risks and realise the full benefits of EV uptake.

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[2] ABC News, *Defence White Paper 2016: Dependency on fuel imports 'a risk' amid South China Sea tensions*, 24 February 2016, Available at http://www.abc.net.au/news/2016-02-24/fuel-imports-a-risk-amid-south-china-sea-tensions-nrma-advisor/7149648

[3] Australian Energy Regulator, *State of the Energy Market*, May 2017, Available at https://www.aer.gov.au/system/files/AER%20State%20of%20the%20energy%20market%202017%20-%20A4.pdf

[4] Australian Bureau of Statistics, *Employment in Renewable Energy Activities, Australia, 2016-17*, 17 March, 2017, Available at http://www.abs.gov.au/ausstats/abs@.nsf/mf/4631.0.

[5] Our business partners include EV market participants such as Jetcharge/ Chargefox, ChargePoint, Lumen, Delta, Relectrify, Automotive OEMs including BMW, Renault, Ford, Toyota, Holden as well as distribution network businesses including CitiPower-Powercor, Ausnet Services, United Energy and Jemena.

Much like electricity, demand in the transport system is likely to remain peaky due to the way in which demand reflects human activity, especially work and sleep patterns. Nevertheless, AGL considers that with managed charging, the increased penetration of EVs could play an important role in improving the reliability of the grid. We refer the Committee to Smart Electric Power Alliance's 2017 report, *Utilities and Vehicles: The Case for Managed Charging* (**SEPA Report**)[6]. As the SEPA Report highlights, managed charging could deliver a range of benefits, including:

- Improving grid economics by achieving higher utilization rates, and therefore capacity factor, of generation assets;
- Reducing emissions by aligning charging with surplus renewable generation;
- Reducing grid stress and maintain grid stability by minimizing charging ramp rates and reducing the strain on distribution transformers; and
- Reducing the need for new peak generation and distribution capacity resulting from EVs charging during peak hours.

AGL is currently trialling remote EV charging management during peak events for a number of privately-owned EVs in New South Wales (**NSW**) through our Managed for You program.[7] Our Managed for You program is part of a nationwide initiative administered by the Australian Renewable Energy Agency (**ARENA**) and the Australian Energy Market Operator (**AEMO**) to deliver a three-year demand response pilot project. The NSW Government has provided additional funding to the initiative for projects that are based in NSW, such as AGL's EV trial. Demand Response (DR) contributes to the stability for the electricity system by reducing discretionary energy use at times when demand spikes, such as during summer heatwaves. Notably, the technical solution for AGL's EV trial has been developed by Australian start-up business Chargefox[8].

In order to promote a coordinated approach to the electricity system that properly harnesses the potential of EVs, we consider that further analysis should be undertaken on network tariff regulatory reform to enable intelligent management of EV charging. In this regard, we refer the Committee to the UK Office of Gas and Electricity Markets' (**Ofgem**) proposals to take forward structural network tariff reforms to facilitate flexible charging, thereby enabling more efficient charging and accommodating more renewable generation and other new technologies.[9]

The electricity grid is undergoing a rapid transformation, driven in part by customers' increasing desire to exert more control over their energy supply arrangements. Smart appliances, smart inverters and intelligent control systems are also entering the market. In combination with solar PV and battery systems, these technologies enable the creation of small-scale electricity ecosystems 'behind-the-meter' - that is, on the customer side of the meter, with a single connection to the grid. These systems and their interaction with the

[6] Erika Myers, (2017) *Utilities and Vehicles: The Case for Managed Charging.* Smart Electric Power Alliance.
[7] See further AGL's Managed for You program at https://aglsolar.com.au/managedforyou-ev/. For further information about the national initiative see Dan Silkstone, 'Keeping the lights on in NSW, one smart meter at a time' (16 October 2017), Available at https://arena.gov.au/blog/demand-response-agl/.
[8] https://chargefox.com/
[9] See further 'Ofgem proposed system reforms to support electric vehicle revolution' (23 July 2018), Available at https://www.ofgem.gov.uk/publications-and-updates/ofgem-proposes-system-reforms-support-electric-vehicle-revolution.

electricity distribution network can be closely monitored and intelligently controlled. They can be dispatched individually or as a fleet to respond to changing network conditions or conditions in the wholesale market.

c) Measures to support the acceleration of electric vehicle uptake

In AGL's view, increasing the uptake of privately owned EVs requires concerted efforts towards easing consumer access to EVs. Indeed, as the recent consumer survey undertaken by the Royal Automotive Club of Victoria (**RACV**) revealed[10], while many people are willing to consider purchasing an electric vehicle, purchase cost and access to charging infrastructure remain key barriers to uptake. In the development of our own Electric Car Plan, AGL has sought to make access to EVs easy for our customers by removing the obstacles to ownership and enhancing the ownership experience.

We consider that public policy settings at both the State and Federal levels can play a crucial role in supporting and accelerating the uptake of electric vehicles in the Australian market. In particular, AGL recommends consideration of the following policy measures:

1. A national EV target

Establishing a target for EV uptake is the centrepiece of most international government policy support frameworks for EVs, with other policies and their relative settings crafted to achieve that target – for example, the UK Government's recently released Road to Zero Strategy[11]. Just as State and Federal governments work towards establishing the National Energy Guarantee to reduce greenhouse gas emissions in the energy sector, we consider that a national EV target would act as the complementary driver for the transport sector's necessary transition towards a lower-carbon economy.

A national EV target would provide a powerful platform to drive coordinated whole-of-government policy initiatives across the Commonwealth Government. It would also establish a clear benchmark against which to measure ambition and progress, and provide a clear statement of support for the technology for vehicle buyers.

2. A Government fleet EV target

We also consider that the Commonwealth Government can play an important leadership role in the uptake of EVs through the establishment of a Government fleet EV target.

Around 4% of new cars sold each year are purchased for Government fleets, equating to around 40,000 vehicles per year. By mandating that new fleet purchases include EVs, the Commonwealth Government could substantially stimulate EV uptake in Australia. As well as socialising consumer appetite towards EVs, it would also create a second-hand market for depreciated EVs that would provide an additional avenue for private ownership. In the ACT, which has the highest EV market share of any State or Territory, the ACT Government requires government fleet managers to consider the environmental impact of a car in additional to functionality and cost. Nevertheless, the need for substantial infrastructure planning and deployment to support EV uptake necessitates a deviation from a pure environmental performance target, based on the fleet's CO2 tailpipe emissions. Accordingly, we consider that a government fleet target should be a quantitative target over a specified time period.

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[10] Cited in ClimateWorks Australia and Electric Vehicle Council, The State of Electric Vehicles in Australia (June 2017), Available at http://electricvehiclecouncil.com.au/wp-content/uploads/2015/05/State-of-EVs-in-Australia-2017.compressed.pdf.

[11] https://www.gov.uk/government/news/government-launches-road-to-zero-strategy-to-lead-the-world-in-zero-emission-vehicle-technology

3. Tax treatment

As part of any broader review of taxation policy, AGL would urge Commonwealth and State governments to undertake a review of policies along the supply chain of alternative transport vehicles, to identify and remove barriers and perverse incentives, including within the tax system.

Several taxes (and other charges) that are applied to motor vehicles are based upon the purchase price of the vehicle, including the Luxury Car Tax, Goods and Services Tax, stamp duties, and Fringe Benefits Tax. As for many new technologies, energy efficient and low/no emissions vehicles have higher upfront costs than conventional models. While concessions to some of these taxes are available for efficient vehicles, higher levels of tax, coupled with higher underlying vehicle prices, can create disincentives for potential EV purchasers.

4. Network tariff reform

As noted above, we consider that that further analysis should be undertaken on network tariff regulatory reform to enable intelligent management of EV charging. Ofgem's proposed network tariff reforms underscore the potential to enable more efficient charging of EVs whilst accommodating more renewable generation and other new technologies. Accordingly, we would urge the Australian Energy Market Commission to consider the potential to deliver similar reforms in the Australian context.

5. Vehicle efficiency standards

We consider that a strong vehicle fuel efficiency standard would play an important role in accelerating the uptake of EVs, as we elaborated in our submission in response to the Australian Government's proposed Model Fuel Efficiency Standard.[12]

AGL supports the Proposed Model, which is based on achieving a new light vehicle average equivalent to Target A (105 gCO2/km on the current test cycle) in 2025. We would urge the Commonwealth and Ministerial Forum on Vehicle Emissions to implement this reform in a timely manner.

6. Charging infrastructure planning and support

Given that transport infrastructure is substantially a matter for State jurisdictions, we consider that State policies will also play a fundamental role in supporting the uptake of EVs, particularly in the context of planning and deployment of EV charging infrastructure.

As we observed in our recent submissions to the Victorian Parliamentary Inquiry into Electric Vehicles[13] and Infrastructure Victoria,[14] concerted State policy on EV infrastructure planning and deployment would greatly assist in addressing (perceived) EV range limitations and extended zero emissions vehicle operation.

We would recommend that State governments consider designing an EV charging roadmap based on expected uptake scenarios with allocated tasks and responsibilities in partnership with the private sector.

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[12] See AGL, Submission in response to the Proposed Model Fuel Efficiency Standard for Light Vehicles (1 August 2017), Available at https://thehub.agl.com.au/articles/2017/08/submission-in-response-to-the-proposed-model-fuel-efficiency-standard-for-light-vehicles.
[13] See AGL, Submissions to the Victorian Parliamentary Inquiry into Electric Vehicles 2017 (11 December 2017), Available at https://thehub.agl.com.au/articles/2017/12/submission-to-the-victorian-parliamentary-inquiry-into-electric-vehicles-2017.
[14] See AGL, Submission in response to Infrastructure Victoria on automated and zero emission vehicle infrastructure (7 March 2018), Available at https://thehub.agl.com.au/articles/2018/03/submission-to-infrastructure-victoria-on-automated-and-zero-emission-vehicle-infrastructure.

AGL recognises that at the early stages of the EV market in Australia, fast charging infrastructure is likely to present a challenging business model for private sector investment. This is because fast charging infrastructure addresses only an occasional need for EV owners, without necessarily capturing the indirect value of EV charging services. Accordingly, we would urge Commonwealth and State governments to consider way in which to facilitate private sector infrastructure investment.

We refer the Committee to the Centre for Climate and Energy Solutions' 2015 report, Business Models for Financially Sustainable EV Charging Networks (**C2ES Report**).[15] The Washington State Legislature's Joint Transportation Committee commissioned the C2ES Report in 2014 to develop new business models that would foster private sector commercialisation of publicly available EV charging services and expand the role of private sector investment in EV charging throughout Washington State. As the final report concluded, charging station business models that rely solely on direct revenue from EV charging services are not currently financially feasible. The C2ES Report presents a range of potential business models that could be applied to improve the financial performance of charging stations projects. Given that these findings were focused on Washington State, we consider that further analysis would assist in understanding how private sector investment could be best facilitated in the Australian context.

Planning and support for charging infrastructure will help to ensure an economically efficient approach to EV uptake. We refer the Committee to AECOM's 2011 report, Forecast Uptake and Economic Evaluation of Electric Vehicles in Victoria (**AECOM Report**), that was commissioned by the Victorian Government Department of Transport. The AECOM Report forecast that EVs are likely to reach cost parity with ICEVs in 2025. Accordingly, the economic benefit to Australia would be maximised through an approach that encourages rapid adoption of EVs by that time. EV adoption still relies upon the provision of charging infrastructure. Infrastructure planning and support should begin now, in recognition of the lead time for deployment and the approaching EV cost parity.

We would also urge governments to implement a coordinated cross-government approach to charging infrastructure planning that also includes consideration of vehicle automation. In our view, the uptake of EVs and vehicle automation are inextricably linked. The wider societal benefits resulting from advanced mobility systems will be brought forward through the adoption of policies that supports vehicle electrification. Autonomous vehicle technologies are advancing at a rapid rate. By acting as an enabler for improved asset utilisation, they favour lower operating cost vehicle powertrains. Australian cities, characterised by high household incomes and suburban sprawl, are forecast to adopt autonomous vehicles ahead of global averages[16]. Measures which promote EV adoption will have a synergistic effect for the adoption of autonomous vehicles, improving road safety and reducing transport costs for households. AGL recognises this relationship through its involvement in the Australian Driverless Vehicle Initiative[17], and is working with a variety of stakeholders to advance connected electric autonomous vehicle adoption.

[15] Climate and Energy Solutions, *Business Models for Financially Sustainable EV Charging Networks* (2015), Available at https://www.c2es.org/site/assets/uploads/2015/03/business-models-ev-charging-infrastructure-03-15.pdf.
[16] Bloomberg New Energy Finance and McKinsey & Company, *An Integrated Perspective on the Future of Mobility*, October 2016, Available at https://www.bbhub.io/bnef/sites/4/2016/10/BNEF_McKinsey_The-Future-of-Mobility_11-10-16.pdf .
[17] Australian Driverless Vehicle Initiative, *About the Australian Driverless Vehicle Initiative*, Available at http://advi.org.au/australia/ .

e) **How federal, state and territory Governments could work together to support electric vehicle uptake and manufacturing, supply, and value chain activities**

We would also welcome coordinated cross-government leadership through the COAG Energy Council to develop a robust EV roadmap that establishes a nationally agreed target and supporting policy initiatives. In our view, this would provide the optimal policy platform to support businesses operating across the Australian economy.