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Australia is well placed to benefit from the widespread uptake of electric vehicles

Response to the Senate Select Committee on Electric Vehicles

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1 Summary

- Widespread electric vehicle uptake in Australia would deliver environmental benefits through reduced greenhouse gas emissions and air pollution and would reduce Australia's dependence on imported transport fuels and our breach status under the International Energy Agency's strategic reserve obligation. Government actions should support the cost-effective delivery of these benefits.
- Electric vehicles are expected to be cost-competitive by around 2030. Actions by Australian governments to accelerate this outcome are unlikely to be cost effective and should be avoided.
- The Australian Government should support electric vehicle uptake using emissions standards initially with inclusion in a wider emissions pricing mechanism when such a policy is implemented.
- The COAG Energy Council should prioritise the take-up of cost reflective electricity network pricing to support the efficient adoption of electric vehicles and reflect their impact on the cost and reliability of the system.

2 Introduction

This submission responds to the Terms of Reference released by the Senate Select Committee on Electric Vehicles.

Grattan Institute is an independent think-tank focused on Australian domestic public policy. It aims to improve policy outcomes by engaging with both decision-makers and the community.

We understand that the Committee is seeking comment on the Terms of Reference of the Inquiry. In doing so, this submission focuses on those elements of the Terms of Reference where we have specific and relevant views and knowledge. Accordingly, we have not attempted to address all the matters raised in the Terms of Reference.

3 Specific Issues

3.1 Potential economic, environmental and social benefits of widespread electric vehicle uptake in Australia

Australians widely utilise vehicles for private and public transport with a highly urbanised society concentrated in a small number of moderate size cities across a relatively large country. Today, these vehicles overwhelmingly feature internal combustion engines (ICE) fuelled by petrol, diesel and, to a small and declining degree, automotive LPG. In addition, some city bus fleets are driven on compressed natural gas or are trialling electric buses. Adoption of electric vehicles is very small although hybrid vehicles are gaining slowly in popularity. The barriers to widespread electric vehicle uptake are relative vehicle cost, range, the availability of vehicle charging facilities and the time taken for such charging.

The widespread uptake of electric vehicles would deliver substantial benefits:

- Australia is committed to reduce greenhouse gas emissions and is a signatory to the 2015 International Paris Agreement under which we have committed to reduce total emissions by 26-28 per cent below 2005 levels by 2030. This means reducing emissions to around 146 million tonnes (mt) of CO₂-e by 2030, a reduction target that is projected to be 128 mt or 22 per cent below

the most recent projection for 2030 of 570 mt¹. Vehicle emissions in 2017 were 97 mt, or 17.5 per cent of the total. If the vehicle sector was to have a proportional target of 26 per cent below the 2005 level by 2030, that would mean a 46 per cent reduction target against the most recent 2030 projection of 112 mt. This difference is because vehicle emissions have been rising and projected to continue, while emissions from electricity have been falling. While a move to a variety of lower emissions fuels would contribute to and likely achieve the target, a move to electric vehicles, if electricity emissions are falling, would do the same and provide a platform for effectively zero emissions over time. Similar reductions could be achieved through other means such as hydrogen, fuel cells and bio-fuels. However, electric vehicles seem to be the most likely pathway given the current state of technologies and their development.

- Beyond climate change mitigation benefits, a widespread electric vehicle uptake would have a direct impact on general air pollution through the elimination of exhaust emissions. We do not have expertise to comment further on the nature and extent of the related health benefits.
- Over the last several years, there has been a shift away from local manufacturing of transport fuels from a mix of domestic and imported oil/petroleum. The availability of domestic oil of appropriate chemical constitution and the steady loss of competitiveness of local refineries against

¹ Department of Environment and Energy, *Australia's emissions projections 2017*, V1.0 19 December 2017

imports have meant we have become increasingly dependent on imported fuels. Although these come from diverse geographic sources, this move has led to a significant risk if these supply chains were to be disrupted due to any cause. In some cases, the impact on personal and freight transport would be very disruptive and emerge within weeks. Further, Australia has been in breach of its strategic reserves obligation as a member of the International Energy Association, and this breach will only widen unless corrective action is taken. Widespread adoption of electric vehicles would reduce both adverse consequences.

3.2 Opportunities for electric vehicle manufacturing and electric vehicle supply and value chain services in Australia, and related economic benefits

This is an issue of industry or manufacturing policy on which we have nothing to add.

² Graham, P., Wang, D., Braslavsky, J., and Reedman, L. (2018). Projections for small-scale embedded technologies. CSIRO report prepared for AEMO, published as supplementary material to the 2018 ES00. <https://protect->

3.3 Measures to support the acceleration of electric vehicle uptake

CSIRO has recently published its updated overview of the future of electricity vehicles² in a supplementary report to the 2018 Electricity Statement of Opportunities recently published by the Australian Energy Market Operator³. That analysis anticipates that passenger electric vehicles will be cost competitive with ICE vehicles between 2025 and 2035, with a slower rate of change for heavy vehicles and plug-in hybrid electric vehicles.

Decisions that will drive the economics of electric vehicles will be taken by global vehicle manufacturers, influenced by moves in some countries to provide subsidies for electric vehicles and to legislate for the phase-out of ICE vehicles. Actions by Australian governments along similar lines are unlikely to have a material impact on these underlying economic outcomes.

Beyond the underlying economics, the uptake of electric vehicles in Australia will be influenced by changes to emissions standards that increase the cost of ICE vehicles relative to lower-emission vehicles, constraints on greenhouse emissions however applied, the range of vehicles and the availability of charging infrastructure (see below). There are actions that Australian governments can

[au.mimecast.com/s/wYQRCD1jmrSY35glCWxUIB?domain=aemo.com.au](https://www.aemo.com.au/au.mimecast.com/s/wYQRCD1jmrSY35glCWxUIB?domain=aemo.com.au)

³ https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/NEM_ES00/2018/2018-Electricity-Statement-of-Opportunities.pdf

and should take in these areas to support the effective and efficient uptake of electric vehicles.

3.4 Measures to attract electric vehicle manufacturing and electric vehicle supply and value chain manufacturing to Australia

This is an issue of industry or manufacturing policy on which we have nothing to add.

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

There are two areas where Australian governments should consider policy and regulatory actions to support electric vehicle uptake.

The first addresses the issue of the environmental benefit of electric vehicle uptake. There has been considerable policy work over more than a decade in Australia to develop a comprehensive climate change policy, from economy-wide emissions trading schemes proposed in 2007 by the Howard Government and Rudd Opposition to the sector-based approach of 2018 primarily focused on electricity generation. The Gillard Government's Clean Energy Future package⁴ excluded transport fuels from the carbon pricing mechanism but sought to apply a carbon price to fuels for domestic aviation, marine and rail transport from 2012 and to

heavy on-road transport from 2014. Household and light commercial vehicles were excluded from any carbon price. Instead, the Government looked to apply a mandatory CO₂ emissions standard to set a national target for average CO₂ emissions per kilometre travelled.

All of these have failed, and all have had relatively little focus on vehicle emissions.

In a 2016 Grattan Institute Report⁵, we recommended a three-step roadmap for climate change policy that would include coverage of vehicle emissions. We remain of the view that this approach offers a practical way forward. In the first step, policy would combine an emissions intensity scheme for the electricity sector and a tightening of baselines for large emitters under the current Safeguard Mechanism. Allowing the use of Australian Carbon Credit Units (ACCUs) provides a cost buffer as well as extending the Emissions Reduction Fund's impact by making it self-funding. In the second step, baselines would be tightened with a shift to the auctioning of permits and the wider adoption of offsets. The third step would be a move to an economy-wide scheme. In this roadmap, we recognised the work of the Climate Change Authority that quantified the emissions reduction that could be delivered by emissions standards on light vehicles⁶, and proposed that they be introduced.

We recommend that governments support electric vehicle uptake using emissions standards initially with inclusion in a wider

⁴ *Securing a clean energy future: The Australian Government's Climate Change Plan.*, Commonwealth of Australia 2011

⁵ <https://grattan.edu.au/wp-content/uploads/2016/04/870-Climate-Phoenix.pdf>

⁶ Climate Change Authority (2014) *Light Vehicle Emissions Standards for Australia: Research report* (2014).

emissions pricing mechanism when such a policy is implemented. Like energy efficiency standards in other areas, vehicle emissions standard can co-exist with and complement a central policy to reduce emissions.

The second area for government actions to support electric vehicle uptake is charging infrastructure. As was illustrated by the demise of the company Better Place, business models will emerge to drive the efficient uptake of electric vehicles. One role for governments is to remove barriers to efficient technologies and commercial outcomes. Existing companies in the electricity retail, generation and network sectors are testing various models, and the impact of regulation and network pricing is integral to the outcomes and to managing the impact of widespread vehicle charging. Such an impact is being seen with the rapid adoption of rooftop solar PV in several Australian cities. AEMO's recent ES00⁷ highlights this impact in identifying the concurrent rise in maximum demand and fall in minimum demand that flow from this adoption and increasing temperatures. This impact will be exacerbated unless governments and agencies address the regulatory and planning issues.

We make three recommendations:

- In line with our 2104 report, *Fair pricing for power*⁸, and the recent ACCC report on electricity affordability⁹, we recommend the take-up of cost-reflective network pricing.

⁷ https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/NEM_ES00/2018/2018-Electricity-Statement-of-Opportunities.pdf

The widespread uptake of electric vehicles with their charging requirements will add to the diversity of demand on electric supply that has already emerged with large air-conditioners and rooftop solar PV systems. Cost-reflective pricing is a necessary step in ensuring that consumers pay their fair share of the cost of the power network and have the incentive to do so efficiently to help restore and maintain electricity affordability.

- Technology offers the opportunity for better management of the electricity network through load control. Commercial arrangements to encourage demand response is one element. It should be supported by ensuring that the system operator can work with the network companies to reduce demand through direct load control of non-critical demand such as pool pumps and vehicle charging devices.
- State and local governments are supporting various trials of electric and autonomous vehicles. The high level of uncertainty around how the infrastructure for electric vehicles should evolve, suggests these trials should be supported and coordinated.

⁸ Wood, T., Carter, L., and Harrison, C. (2014) *Fair pricing for power*, Grattan Institute

⁹ ACCC (2018) *Restoring electricity affordability and Australia's competitive advantage*, Retail Electricity Pricing Inquiry – Final Report. June 2018

3.6 Other related matters:

Emissions standards and carbon pricing should be indifferent to technology. While electric vehicles appear to be the most likely scenario for a transition of the transport sector with several accompanying benefits, alternatives such as hydrogen, fuel cells and renewable hydrocarbons are also attracting considerable investment. Government support via agencies such as the Australian Renewable Energy Agency can provide financial support for technology deployment where that is relevant to Australia, while leaving the core technology development to others better suited to that task.

There is considerable interest and debate over the future of autonomous vehicles. The widespread uptake of such vehicles, electric or otherwise, will have far reaching impacts on vehicle ownership, road congestion, the need for parking and the adoption and charging of electric vehicles. The social impacts will be far greater than those for electric vehicles alone. Therefore, the actions recommended in section 3.5 should be undertaken while including a watching brief on the evolution of autonomous vehicles to avoid unintended consequences.