



SENATE INQUIRY INTO ELECTRIC VEHICLES
SUBMISSION BY THE ACT BRANCH OF THE AUSTRALIAN ELECTRIC
VEHICLE ASSOCIATION (AEVA)
24 JULY 2018

INTRODUCTION

The Australian Electric Vehicle Association (AEVA) is a volunteer run, not-for-profit organisation dedicated to promoting electric vehicle (EV) technology¹. Our members include early adopters and DIY enthusiasts who have converted petrol cars to EVs. Our key motivations include abating emissions and decreasing Australia's dependence on imported fossil fuels. We celebrate the fact that EVs are cleaner, quieter, safer and more reliable.

AEVA is structured as a federation of state branches, overseen by a national executive. This submission conveys the views of the ACT Branch, also known informally as "Canberra EV".

Our submission deals with four of the Terms of Reference (A, B, C and E).

KEY POINTS AND SUMMARY OF RECOMMENDATIONS

Electric vehicles (EVs) offer a greatly improved driving experience for the motorist, as well as significant savings in fuel and maintenance costs. The national benefits of faster EV uptake include the abatement of greenhouse gas emissions, the abatement of other pollutants which adversely affect human health, and improved national fuel security. We would like to see a stronger acknowledgement of these benefits by the Federal Government.

Our proposals to accelerate the uptake of EVs are set out in **Recommendations C1-C10** below.

While Australian manufacture of petrol and diesel vehicles ultimately failed to be internationally competitive, we consider that EVs are technically easier to build and that Australia has the skills needed to manufacture EVs and their components. We call for a fresh examination of the prospects for local EV manufacturing and value chain services, and we give some examples of companies which are testing this potential.

We call for an improved dialogue between the Federal and the State/Territory Governments concerning the uptake of EVs, and we urge COAG to determine the most effective process for such collaboration.

Our recommendations

Recommendation A1. That the Federal Government publicly acknowledge the benefits to the Australian community of electric vehicle uptake, including abatement of greenhouse gas emissions, public health benefits through abatement of other emissions, and increased national fuel security.

¹ AEVA website: <http://www.aeva.asn.au/>

Recommendation A2. That the Federal Government develop a medium term plan to migrate the existing fuel excise to a mixture of a reduced fuel excise and a per-kilometre levy applied to all vehicles.

Recommendation B1. That the Federal Government maintain and strengthen the capability of the Clean Energy Finance Corporation to provide investment support to companies involved in electric vehicle manufacturing and supply chain activities.

Recommendation B2. That state and territory governments provide funding to the TAFE sector to develop programs for retraining auto mechanics and related trades to work in the electric vehicle sector.

Recommendation C1. That the Ministerial Forum on Vehicle Emissions discuss the development of an EV roadmap for Australia, similar to that developed in New Zealand.

Recommendation C2. That the Federal Government announce and implement a target of no greater than 105g/km, arising from its 2016 examination of fuel efficiency standards.

Recommendation C3. That the Federal Government exempt new EV purchases from GST for defined period, or until EVs reach a defined percentage of the national car fleet.

Recommendation C4. That other state and territory governments emulate the ACT policy of exempting all new EV sales from stamp duty.

Recommendation C5. That the Federal Government either exempt EVs from the Luxury Car Tax, or restore the level of preference to low emission vehicles which prevailed in 2009.

Recommendation C6. That other state and territory governments emulate the ACT policy of reducing annual registration fees for low emission vehicles, and ensure that EV drivers are not penalised by the greater tare weight of their vehicles.

Recommendation C7. That the COAG Transport and Infrastructure Council discuss a range of financial incentive options for encouraging the uptake of EVs, with a view to determining a nationally consistent approach.

Recommendation C8. That the Federal Government, and the other State and Territory Governments, emulate the ACT policy of setting a target date for newly leased government car fleet vehicles to be zero-emission vehicles.

Recommendation C9. That state and territory governments develop plans to fill any gaps in EV charging infrastructure, to ensure that all major highways feeding regional and remote towns are covered.

Recommendation C10. That state and territory governments consult with relevant stakeholders (such as the AEVA, NRMA, the EV Council, and the Strata Community Association) to develop solutions to the home charging needs of EV-owning apartment dwellers.

Recommendation C11. That the Ministerial Forum on Vehicle Emissions discuss the sunset dates for petrol and diesel vehicles announced by France, the UK, the Netherlands and China, and their implications for Australia.

Recommendation E1. That COAG determine the most appropriate process for future collaboration on national policies to accelerate the uptake of EVs, including possible roles for the Transport and Infrastructure Council, and the Ministerial Forum on Vehicle Emissions.

TERM OF REFERENCE A "THE POTENTIAL ECONOMIC, ENVIRONMENTAL AND SOCIAL BENEFITS OF WIDESPREAD ELECTRIC VEHICLE UPTAKE IN AUSTRALIA"

Key benefits of EV uptake, for the motorist and for the wider community², are as follows.

For the motorist:

- significant reductions in running and maintenance costs;
- good vehicle performance, including responsiveness and high torque; and
- ability to charge in a variety of locations, including at home.

For the community:

- abatement of greenhouse gas emissions;
- elimination of other emissions which impact public health;
- ability to contribute to "demand response" in the national electricity grid;
- a boost to GDP, according to some analysts³; and
- diversification of national energy sources, with associated greater fuel security.

However, we recognise that there are some disadvantages or issues with EVs:

- significantly higher purchase prices currently;
- limitations in range, with a significantly longer time to charge an EV than to refuel a petrol vehicle; and
- a potential future impact on government revenue from fuel excise.

We make the following comments on the economic, environmental and social benefits.

Economic benefits – for motorists

Before noting the economic benefits for the motorist, we acknowledge that a new EV costs considerably more than a comparable new Internal Combustion Engine (ICE) vehicle. Currently this price premium is likely to be in the range \$10,000 to \$15,000⁴. This is due to lower economies of scale and significant battery costs. However, battery costs are declining (they fell by 73% between 2010 and 2016⁵) and economies of scale are shifting (global annual sales of plug-in vehicles increased six-fold from 2013 to 2017⁶). A respected forecaster has predicted that "the upfront cost of EVs will become competitive on an unsubsidised basis starting in 2024 ... as battery prices continue to fall"⁷.

The motorist of 2018 who is willing to buy a new EV will experience vastly lower fuel and maintenance costs. The fuel for a petrol car typically costs about \$12-15 per 100km while the electricity to charge an EV typically costs about \$4 per 100km, and less if it is charged at off-peak times or from domestic solar PV. In addition, maintenance costs of an EV are significantly lower because an EV has fewer moving parts, no exhaust system, less need for cooling, less brake wear due to regenerative braking, and no need to change engine oil, fan belts, air filters, timing belts, head gaskets, cylinder heads and spark plugs^{8 9}.

² Electric vehicle benefits. <https://www.energy.gov/eere/electricvehicles/electric-vehicle-benefits>

³ Renew economy, 29 March 2018. <https://reneweconomy.com.au/evs-account-half-australia-new-car-sales-2030/>

⁴ For example, a new Hyundai Ioniq EV has a projected price of \$43,000 while a new Hyundai i30 petrol car is priced around \$30,000

⁵ Batteries keep on getting cheaper. Clean Technica, 11 December 2017. <https://cleantechnica.com/2017/12/11/batteries-keep-getting-cheaper/>

⁶ <http://www.ev-volumes.com/>

⁷ Bloomberg New Energy Finance. Electric vehicle outlook 2018. <https://about.bnef.com/electric-vehicle-outlook/>

⁸ FleetCarma, 30 April 2018. <https://www.fleetcarma.com/electric-vehicles-lower-maintenance-costs/>

Partly offsetting these maintenance savings are battery replacement costs. Depending on the warranty offered by the car maker, and the country, motorists may be faced with a substantial cost to replace the batteries¹⁰.

Economic benefits – for the nation

According to a report by PricewaterhouseCoopers, doubling Australia's EV uptake would increase real GDP by \$2.9 billion, increase net employment by 13,400 jobs, and reduce the cost of fuel imports by \$15 billion¹¹.

EVs offer a fuel security benefit. The Federal Government recently announced a review of Australia's transport fuel security, citing Australia's failure to maintain international standards, and our vulnerability to supply shortfalls¹². There is an obligation to store at least 90 days of liquid fuels under the International Energy Program, but Australia is storing well below this requirement. EVs will improve national fuel security by reducing demand for imported fuels¹³, and a shift from imported fuel to locally generated electricity would significantly improve Australia's balance of payments¹⁴.

EVs can play a positive role in "demand response" strategies to reduce peak loads on the national electricity grid, thus reducing electricity costs for all consumers¹⁵.

The existing fuel excise raises about \$10 billion per year, but is declining due to improvements in the fuel efficiency of vehicles¹⁶. This trend will be reinforced by the uptake of EVs. Effectively, the fuel excise is a preference to EV drivers, but we accept that these drivers must also contribute to the costs of Australia's roads. We favour continuing a fuel excise at a lower level, and supplementing it through a per-kilometre levy applied to all vehicles. This would simultaneously discourage people from purchasing petrol and diesel vehicles which have negative environmental and health impacts, while also fairly charging all road users for the maintenance of the national road system.

Environmental benefits

As Australia's electricity sector is progressively transformed, the decarbonisation of the transport sector (which already accounts for 18% of Australia's emissions) will become a priority for meeting our Paris Agreement commitments and for ensuring that Australia contributes its fair share to limiting global warming to 2°C and preferably less.

In the ACT, transport will represent 62% of all greenhouse gas emissions once electricity emissions fall to zero due to the ACT's 2020 renewable energy target¹⁷.

⁹ Forbes, 14 January 2018, <https://www.forbes.com/sites/jeffmcMahon/2018/01/14/electric-vehicles-cost-less-than-half-as-much-to-drive/>

¹⁰ In the US a first generation Nissan LEAF has a warranty of 5 years (or 100,000 km) against battery capacity loss, with a cost of about US \$5500 to replace the batteries. This option is not available in Australia. Clean Technica, 4 October 2017. <https://cleantechnica.com/2017/10/04/nissan-leaf-replacement-battery-will-cost-5499/>

¹¹ Prepared for the Electric Vehicle Council, the NRMA and the St Baker Energy Innovation Fund. Cited in *RenewEconomy*, 29 March 2018. <https://reneweconomy.com.au/evs-account-half-australia-new-car-sales-2030/>

¹² *RenewEconomy*, 7 May 2018. <https://reneweconomy.com.au/will-australia-turn-to-evs-to-address-poor-fuel-security-or-ignore-them-53143/>

¹³ NRMA. The future is electric. October 2017. <https://www.mynrma.com.au/-/media/documents/the-future-is-electric.pdf?la=en>

¹⁴ Tesla Owners Club of Australia. Submission to this Inquiry.

¹⁵ EVAdoption, 18 February 2018. <http://evadoption.com/evs-as-demand-response-vehicles-for-the-power-grid-and-excess-clean-energy/>

¹⁶ Parliamentary Library. Revenue from road use.

https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BriefingBook45p/FundingRoads

¹⁷ ACT's Climate Strategy: to a Net Zero Emissions territory. Discussion paper, page 16. <https://www.yoursay.act.gov.au/zero->

When charged using electricity from renewable sources, EVs produce zero emissions. Even when charged from the grid, and when emissions from manufacture are included, EVs produce less emissions than an ICE vehicle¹⁸. EVs are thus key to driving down emissions and mitigating climate impacts in the transport sector. A 2016 report¹⁹ found that a shift to 100% EVs would eliminate at least 6% of Australia's total greenhouse emissions.

In the medium to long term future (say, after 2025) a convergence of EVs with autonomous (self-driving) technology, coupled with ride-sharing and a trend away from car ownership to "transport as a service", could deliver major environmental land use benefits, associated with dramatic reductions in the number of vehicles required to meet urban transport needs. For Canberra, such a change has been modelled by Kent Fitch²⁰.

Social benefits (with a focus on health)

EVs abate other emissions (such as nitrogen oxides, sulphur oxides and particulates) which have negative health impacts²¹. An analysis of the health impacts of transport emissions in Australia²² estimated that in the year 2000, motor vehicle-related ambient air pollution accounted for between 900 and 4500 morbidity cases—cardiovascular and respiratory diseases and bronchitis—and between 900 and 2000 early deaths.

These environmental, health and fuel security benefits are significant. The delivery of these benefits could be accelerated with encouragement from the Federal Government, similar to the encouragement that we see currently in New Zealand. Such encouragement could take the form of a Ministerial Statement or an aspirational target.

Recommendation A1. That the Federal Government publicly acknowledge the benefits to the Australian community of electric vehicle uptake, including abatement of greenhouse gas emissions, public health benefits through abatement of other emissions, and increased national fuel security.

Recommendation A2. That the Federal Government develop a medium term plan to migrate the existing fuel excise to a mixture of a reduced fuel excise and a per-kilometre levy applied to all vehicles.

TERM OF REFERENCE B

"OPPORTUNITIES FOR EV MANUFACTURING AND EV SUPPLY AND VALUE CHAIN SERVICES IN AUSTRALIA, AND RELATED ECONOMIC BENEFITS"

Any assessment of EV manufacturing opportunities in Australia must face the historical fact that Australia has struggled to develop viable, sustainable manufacturing industries, due to factors such as low economies of scale and relatively high labour costs. The closure of local car manufacturing and assembly in Australia during the past four years has underscored the challenges.

Nevertheless, the fact that Australia has significant resources in raw materials (including

[emissions](#)

¹⁸ Cleaner cars from cradle to grave.

https://www.researchgate.net/publication/283854561_Cleaner_Cars_from_Cradle_to_Grave_How_Electric_Cars_Beat_Gasoline_Cars_on_Lifetime_Global_Warming_Emissions

¹⁹ Beyond Zero Emissions. Electric vehicles report. August 2016. <http://bze.org.au/electric-vehicles-report/>

²⁰ Kent Fitch. Canberra autonomous car simulation. <http://canberraautonomouscars.info/>

²¹ Ministerial Forum on Vehicle Emissions. Better fuel for cleaner air: discussion paper. December 2016.

<http://www.environment.gov.au/system/files/consultations/f3f4acc3-f9e6-4cc3-8a1e-a59a6490cfd/files/better-fuel-cleaner-air.pdf>

²² BITRE Working paper 63. The health impacts of transport emissions in Australia (2005).

https://bitre.gov.au/publications/2005/files/wp_063.pdf

materials required for EV batteries) and significant potential to exploit automated manufacturing processes, should encourage a fresh examination of the prospects for local EV manufacturing and value chain services. In **Appendix 1** we cite some examples of companies and university researchers which are demonstrating this potential.

Governments can stimulate such business initiatives. For example, the Clean Energy Finance Corporation (CEFC) invests in “accelerated electrification and fuel switching, especially in the transport sector”²³ and has provided investment support to SEA Electric.

The likely growth of EV uptake in Australia during the 2020s has the potential to disrupt existing businesses based on internal combustion engine vehicles. There will be a significant challenge in retraining some categories of workers (such as auto mechanics) to service and maintain EVs. Governments can play a part in encouraging TAFE to support this transition.

Recommendation B1. That the Federal Government maintain and strengthen the capability of the Clean Energy Finance Corporation to provide investment support to companies involved in electric vehicle manufacturing and supply chain activities.

Recommendation B2. That state and territory governments provide funding to the TAFE sector to develop programs for retraining auto mechanics and related trades to work in the electric vehicle sector.

Mining of lithium and other relevant minerals

Observers have noted that Australia has an opportunity to capitalise on increased demand for lithium and other high value metals and minerals, driven by the global shift to EVs.

Bloomberg New Energy Finance has forecast that demand for copper, high-purity nickel, cobalt and lithium used in the manufacture of EV battery packs will rise by a factor of 20-40 times by 2030, as sales of EVs rise to 30 million. It estimates that the supply of these materials for batteries would be worth \$US75 billion in the year 2030.

In discussing this opportunity, *RenewEconomy* noted²⁴ that Australia must act decisively to take advantage of its leading position in the global lithium resources market, or risk missing out on what could be a \$2 trillion value supply chain.

Western Australia is expected to produce more than half of the world’s lithium supply by the end of 2018²⁵. While much of this may be exported to China given its potentially dominant role in lithium-ion battery manufacturing, there is surely an imperative for Australia to examine the prospects for domestic battery manufacture, especially if this were coupled with EV manufacturing or assembly.

TERM OF REFERENCE C

“MEASURES TO SUPPORT THE ACCELERATION OF EV UPTAKE”

Given the benefits discussed above, it is desirable to “kick-start” the market for EVs in Australia, and to influence the growth curve for EV uptake, by bending it upwards in its early stages.

Many other countries, and sub-national jurisdictions, are taking action to do just this. For example, they are:

²³ Clean Energy Finance Corporation. Where we invest. <https://www.cefc.com.au/where-we-invest.aspx>

²⁴ Australia on cusp of new mining boom, driven by electric vehicles. <https://reneweconomy.com.au/australia-on-cusp-of-new-mining-boom-driven-by-electric-vehicles-11868/>

²⁵ Sydney Morning Herald, 29 April 2018. <https://www.smh.com.au/business/companies/australia-tipped-to-soon-produce-more-than-half-of-the-world-s-lithium-20180427-p4zc5h.html>

- establishing roadmaps and targets for the take-up of EVs;
- implementing and strengthening fuel efficiency standards;
- offering purchase and registration incentives for EVs;
- setting procurement targets, especially for government car fleets;
- funding or otherwise encouraging the rollout of charging infrastructure; and
- announcing sunset dates for petrol and diesel vehicles.

In Australia, both levels of Government (State/Territory and Federal) should collaborate to implement such measures. We will address each of these measures in turn.

Roadmaps and targets

Many countries have targets or "roadmaps" for the uptake of EVs. For example, the New Zealand Electric Vehicles Programme²⁶, in addition to economic incentives, includes:

- a target to double the number of EVs in NZ every year to reach approximately 64,000 by 2021;
- a nation-wide EV information and promotion campaign; and
- an EV leadership group across business, local and central government.

The results can be seen in the wider range of EV models that are currently available in New Zealand compared to Australia, and the higher levels of EV sales in New Zealand²⁷.

Ideally the Federal Government should lead the development of a similar roadmap for Australia. In the absence of such action, states and territories should consider establishing their own roadmaps.

Recommendation C1. That the Ministerial Forum on Vehicle Emissions discuss the development of an EV roadmap for Australia, similar to that developed in New Zealand.

We note that the New Zealand roadmap includes provision for a national "EV information and promotion campaign". We consider that local governments can play a useful role by facilitating "EV expos" and by underwriting the public liability insurance costs for such informational events.

Fuel efficiency standards

Fuel efficiency standards have been introduced in many countries to encourage the uptake of lower-emitting petrol vehicles, as well as hybrid vehicles and EVs. In Australia, such standards have been under consideration since 2016 by the MFVE, which proposed three options for emissions targets, and called for submissions²⁸. The strongest target option (105 grams of CO₂ emitted per km travelled) is weaker than measures planned by the EU and South Korea for the same timeframe²⁹. For example, the EU target will be 95g/km by 2021, to be phased in from 2020³⁰.

The *Australian electric vehicle market study*³¹ found that "implementation of 105g/km fuel efficiency standard would underpin a significant increase in [plug-in] EVs in Australia".

²⁶ New Zealand Ministry of Transport. Electric vehicles. <http://www.transport.govt.nz/ourwork/climatechange/electric-vehicles/>

²⁷ Go Auto News, 19 July 2018. <https://premium.goauto.com.au/nz-evs-powering-on/>

²⁸ Ministerial Forum on Vehicle Emissions. <https://infrastructure.gov.au/vehicles/environment/forum/index.aspx>

²⁹ For more detail on this point, and further citations, see the 350 Australia submission to the MFVE: <http://world.350.org/canberra/ministerial-forum-on-vehicle-emissions-submission-march-2017/>

³⁰ European Commission: climate action. Reducing CO₂ emissions from passenger cars. https://ec.europa.eu/clima/policies/transport/vehicles/cars_en

³¹ Energeia. Australian electric vehicle market study: prepared for ARENA and CEFC. <https://arena.gov.au/assets/2018/06/australian-ev-market-study-report.pdf>

There is a risk that Australia will become a “dumping ground” for inefficient petrol and diesel vehicles if such efficiency standards are not implemented³².

Since that call for submissions in late 2016, no outcome has been announced. We urge the Federal Government to announce an outcome from this process, and preferably support a target no weaker than 105g/km.

Recommendation C2. That the Federal Government announce and implement a target of no greater than 105g/km, arising from its 2016 examination of fuel efficiency standards.

We emphasise that implementation of these standards will also encourage the uptake of hybrid (including plug-in hybrid) vehicles which, due to their long range, are well suited to the needs of drivers in rural, remote and regional areas. The targets would also result in significant fuel savings for motorists in rural areas that frequently drive long distances. The reported opposition to these targets from some members of Parliament³³ may not have taken account of this.

Purchase and registration incentives

Many countries and sub-national jurisdictions have implemented purchase rebates to encourage the uptake of EVs. In most cases, rebates are offered only to the first cohort of applicants, with the aim of stimulating the initial uptake of EVs. For example, the United States has a federal tax credit of US\$7500, which begins to phase out once a particular car maker has sold 200,000 EVs, and there are additional local incentives in many states. The United Kingdom has a Plug-in Car grant, capped at £5000, subject to the vehicle meeting certain criteria. Many other examples can be cited³⁴.

In Australia, few incentives are available. The ACT has a scheme under which all vehicles emitting less than 130g/km are exempt from purchase stamp duty³⁵. In the ACT, EVs also attract a 20% discount on the annual registration fee, but this discount is often cancelled out by the greater tare weight compared to a conventional vehicle.

The *Australian electric vehicle market study* found that “any increase in direct Australian financial incentives for [plug-in] EV adoption will drive improved [plug-in] EV model availability, which in turn will drive demand”. There are several EV models which can be purchased in many countries overseas (including New Zealand), but are not available to the public in Australia, because the absence of meaningful purchase incentives sends a negative signal to the manufacturers. As the CEO of BMW Australia said: “we need, urgently, a set of short and medium term support options to kick-start our market: things like strong electric vehicle targets, CO₂ emission targets, extended infrastructure and tax incentives”³⁶.

The *Australian electric vehicle market study* found that a purchase rebate of \$4000 would increase EV model availability by 20%, based on UK experience.

We note that the Federal Government's Luxury Car Tax imposes a lower tax burden on the purchasers of fuel efficient vehicles. This difference in tax levels has been eroded over the

³² The Conversation, 10 April 2015. <http://theconversation.com/could-australia-become-a-dumping-ground-for-high-emission-vehicles-38299>

³³ For example, see The Australian, 31 May 2018. <https://www.theaustralian.com.au/national-affairs/carbon-laws-to-hit-carmakers-with-2bn-bill/news-story/e6d1173abb8ea8b1d401cb5eeb38a58f>

³⁴ Government incentives for plug-in electric vehicles (Wikipedia article).

http://en.wikipedia.org/wiki/Government_incentives_for_plug-in_electric_vehicles

³⁵ ACT Government. Vehicle Emission Reduction Scheme.

https://www.accesscanberra.act.gov.au/app/answers/detail/a_id/2928/~/_/duty-payable-upon-registration-or-transfer-of-a-motor-vehicle#!tabs-2

³⁶ Nissan, Tesla and BMW urge Australia to up EV support. Inside EVs, 12 March 2018. <https://insideevs.com/nissan-tesla-bmw-urge-australia-to-up-ev-support/>

past decade: it was 31% higher for less efficient vehicles in 2009, and is now only 16% higher, thus diminishing whatever encouragement there has been to prefer a luxury EV over a luxury petrol or diesel vehicle.

Some commentators have called for the Luxury Car Tax to be abolished for EVs. We support this call, but if it is not heeded, we would alternatively support a restoration of the difference in tax levels which prevailed in 2009.

Instead of outright purchase rebates, we consider that sufficient financial incentives can be generated through a short term exemption from GST, a waiver of purchase stamp duty, changes to the Luxury Car Tax, and registration discounts.

Recommendation C3. That the Federal Government exempt new EV purchases from GST for defined period, or until EVs reach a defined percentage of the national car fleet.

Recommendation C4. That other state and territory governments emulate the ACT policy of exempting all new EV sales from stamp duty.

Recommendation C5. That the Federal Government either exempt EVs from the Luxury Car Tax, or restore the level of preference to low emission vehicles which prevailed in 2009.

Recommendation C6. That other state and territory governments emulate the ACT policy of reducing annual registration fees for low emission vehicles, and ensure that EV drivers are not penalised by the greater tare weight of their vehicles.

Measures such as those recommended above should be implemented only after discussion between relevant Federal and state/territory Ministers and officials. Therefore, we recommend as follows.

Recommendation C7. That the COAG Transport and Infrastructure Council discuss a range of financial incentive options for encouraging the uptake of EVs, with a view to determining a nationally consistent approach.

Procurement targets

The *Australian electric vehicle market study* found that limited numbers of EVs (300-500 cars per year) bought via a co-ordinated fleet buying program “would be sufficient to attract Original Equipment Manufacturer (OEM) interest to import new right-hand drive models not yet made available in Australia”³⁷. In this context, the ACT Government announced in April 2018 that all of its newly leased government vehicles will be zero-emission vehicles by 2021, where fit for purpose. The switch will be phased in from 2019³⁸.

We commend this approach to the other states and territories, and to the Federal Government. Private sector companies with significant car fleets should be encouraged to emulate this example. We consider that the wide-scale use of EVs in government fleets offers an attractive mechanism for bringing more EVs into the second-hand market, without distorting the market.

Recommendation C8. That the Federal Government, and the other State and Territory Governments, emulate the ACT policy of setting a target date for newly leased government car fleet vehicles to be zero-emission vehicles.

Charging infrastructure

EV owners will generally charge their vehicles at home unless they are touring, or live in an

³⁷ Energeia. Australian electric vehicle market study: prepared for ARENA and CEFC. <https://arena.gov.au/assets/2018/06/australian-ev-market-study-report.pdf>

³⁸ Renew economy, 16 April 2018. <https://reneweconomy.com.au/act-takes-lead-on-evs-all-new-government-cars-to-be-zero-emissions-78922/>

apartment which lacks access to electricity at their designated parking space.

Charging infrastructure is being rolled out by EV companies (most notably Tesla) and by motoring organisations, such as the NRMA in New South Wales and the RAC in Western Australia. The Round Australia Electric Highway³⁹, established by AEVA and the Tesla Owners Club of Australia, is an example of an initiative at the grassroots level, though it needs to be upgraded with DC fast chargers to render it practical for long distance motoring.

Some governments are funding the enhancement of charging infrastructure. For example, the UK announced in July 2018 that it had established a fund of £400M to support companies that produce and install charging points⁴⁰. In Australia, the Queensland Government announced in 2017 that it will roll out the “Queensland Electric Super Highway” (from the Gold Coast to Cairns, and from Brisbane to Toowoomba) in collaboration with local councils and other partners⁴¹. And in May 2018, the ACT Government announced that it will fund 50 new EV public charging stations in Canberra⁴².

The *Australian electric vehicle market study* found that wide-scale deployment of charging infrastructure “increases market size by 20% [and] increases rate of adoption by 50%, based on UK data and Dutch experience, respectively”.

In our view, given that it is early days for EV uptake, development of EV charging infrastructure in Australia is proceeding in a satisfactory manner. However, we urge state and territory governments to develop plans to ensure coverage of existing gaps, and to ensure that all major highways feeding regional and remote towns are covered.

One important gap involves apartment dwellers, who are usually faced with significant challenges in installing EV chargers at their overnight parking spaces, and attributing the cost to their own electricity account. We note that in April 2018 the ACT Government announced that it would require all new multi-unit and mixed use residential developments to install vehicle charging infrastructure⁴³. This is a welcome development, but there is still a need to address the needs of EV owners in existing apartments.

Possible solutions include removing the power of bodies corporate to prevent owners from installing charging facilities, or requiring bodies corporate to allow EV owners to “piggyback” onto any existing common power supply⁴⁴. In any case, we urge state and territory governments to consult with relevant stakeholders (for example, the NRMA, the EV Council, and the Strata Community Association, the peak industry body for Body Corporate and Community Title Management in Australia and New Zealand) to develop a nationally-consistent solution to this issue.

Recommendation C9. That state and territory governments develop plans to fill any gaps in EV charging infrastructure, to ensure that all major highways feeding regional and remote towns are covered.

Recommendation C10. That state and territory governments consult with relevant stakeholders (such as the AEVA, NRMA, the EV Council, and the Strata Community

³⁹ Around Australia Electric Highway - now complete. <http://www.aeva.asn.au/Electric%20Highway>

⁴⁰ UK plans investment boost for EV charging. Automotive news Europe, 9 July 2018. <http://europe.autonews.com/article/20180709/ANE/180709769/uk-plans-investment-boost-for-ev-charging>

⁴¹ Queensland Electric Super Highway. <https://www.qld.gov.au/transport/projects/electricvehicles/super-highway>

⁴² ACT Government to fund 50 new electric vehicle charging stations. Canberra Times, 29 May 2018. <https://www.canberratimes.com.au/politics/act/act-government-to-fund-50-new-electric-vehicle-charging-stations-20180528-p4zhzw.html>

⁴³ New action plan to drive growth in electric vehicles. http://www.cmd.act.gov.au/open_government/inform/act_government_media_releases/rattenbury/2018/new-action-plan-to-drive-growth-in-electric-vehicles

⁴⁴ Greg Walpole. Submission in response to the ACT’s Climate Strategy Discussion Paper, December 2017.

Association) to develop solutions to the home charging needs of EV-owning apartment dwellers.

Transit lanes

The ACT's Zero Emission Vehicle Action Plan⁴⁵ includes a measure to "permit zero emissions vehicles to drive in transit lanes until 2023". Other states and territories could consider emulating this measure.

Sunset dates for petrol and diesel vehicles

In July 2017 both France and the UK announced that they would end sales of petrol and diesel cars by 2040. The Scottish Government has announced that it is aiming to do this by 2032 and the Netherlands has set a target date of 2025. In September 2017, China announced that it was considering a similar ban⁴⁶.

We recognise that any such measure would provoke significant political opposition in Australia. However, we suggest that the MFVE discuss these international developments after obtaining expert advice on their implications for Australia, given Australia's near-total reliance on vehicle imports.

Recommendation C11. That the Ministerial Forum on Vehicle Emissions discuss the sunset dates for petrol and diesel vehicles announced by France, the UK, the Netherlands and China, and their implications for Australia.

TERM OF REFERENCE E

"HOW FEDERAL, STATE AND TERRITORY GOVERNMENTS COULD WORK TOGETHER TO SUPPORT EV UPTAKE AND MANUFACTURING, SUPPLY AND VALUE CHAIN ACTIVITIES"

This submission has already referred to actions which could be taken by the Federal Government on the one hand, and by State and Territory governments, on the other. Effective action to drive the uptake of EVs in Australia will require collaboration between these two levels of government.

It is important that there be an effective mechanism for dialogue between the Federal and the State/Territory Governments. COAG is best placed to ensure the establishment of such a mechanism. One possibility is the COAG Transport and Infrastructure Council. Another is the Ministerial Forum on Vehicle Emissions (MFVE).

However, the Terms of Reference for the MFVE⁴⁷ imply that this Forum is composed only of three Federal Ministers, supported by a Federal Interdepartmental working group. It is focussed largely on fuel efficiency standards, but it is also charged with examining "future infrastructure to support new vehicles".

Recommendation E1. That COAG determine the most appropriate process for future collaboration on national policies to accelerate the uptake of EVs, including possible roles for the Transport and Infrastructure Council, and the Ministerial Forum on Vehicle Emissions.

Below we summarise the actions which we see as useful within such a collaborative

⁴⁵ ACT Government. New action plan to drive growth in electric vehicles.

http://www.cmd.act.gov.au/open_government/inform/act_government_media_releases/rattenbury/2018/new-action-plan-to-drive-growth-in-electric-vehicles

⁴⁶ The Guardian, 11 September 2017. <https://www.theguardian.com/world/2017/sep/11/china-to-ban-production-of-petrol-and-diesel-cars-in-the-near-future>

⁴⁷ <https://infrastructure.gov.au/vehicles/environment/forum/tor.aspx>

framework.

On the part of the Federal Government:

- set a clear target for emissions reduction (greenhouse gas abatement) in the transport sector;
- define a clear policy framework to deliver on this target;
- ensure that the Clean Energy Finance Corporation is able to continue investing in EV manufacturing and supply chain activities;
- coordinate, through the Ministerial Forum on Vehicle Emissions, the development of an EV roadmap for Australia;
- complete the introduction of fuel efficiency standards;
- exempt new EV purchases from GST for a three year period;
- review the Luxury Car Tax, with the aim of giving greater encouragement to uptake of EVs;
- coordinate, through the COAG Transport and Infrastructure Council, a discussion of financial incentive options for encouraging the uptake of EVs, with a view to determining a nationally consistent approach;
- set targets for the electrification of the Federal Government car fleet; and
- develop a medium term plan to migrate the existing fuel excise to a mixture of a reduced fuel excise and a per-kilometre levy applied to all vehicles.

On the part of the State and Territory governments:

- contribute to the development of the national EV roadmap (or, in the absence of Federal action, develop their own roadmaps);
- contribute policy options to the discussion on financial incentives for EV uptake;
- emulate the ACT policy of reducing annual registration fees for low emission vehicles, and ensure that EV drivers are not penalised by the greater tare weight of their vehicles;
- set targets for the electrification of their government car fleets;
- develop plans to fill any gaps in EV charging infrastructure within their states or territories;
- consult with relevant stakeholders to develop solutions to the home EV charging needs of apartment dwellers; and
- provide encouragement and support to the TAFE sector in retraining auto mechanics and related trades to work in the EV sector.

APPENDIX 1

EXAMPLES OF AUSTRALIAN COMPANIES WHICH ARE DEMONSTRATING OPPORTUNITIES FOR EV MANUFACTURING AND VALUE CHAIN SERVICES

Australia was once a manufacturer of automobiles for our domestic market. While Australian manufacture of petrol and diesel vehicles ultimately failed to be internationally competitive, we consider that EVs are technically easier to build and require less resource intensive facilities. Australia has the skills needed to manufacture EVs and components like battery cells, motors and power electronics. We call for a fresh examination of the prospects for local EV manufacturing and value chain services. Below are some examples of companies which are testing this potential.

SEA Electric⁴⁸, based in Victoria, has developed three models of electric trucks and vans. It delivered its first truck in mid 2017. It received a grant of \$517,000 from the Victorian Government to develop its commercial EV manufacturing facility. ACE Electric Vehicles, based in Queensland, is developing two commercial EV models (a ute and a van) which will be assembled locally from carbon-fibre panels produced in China⁴⁹. Brighsun, a Victoria-based company, has developed an electric bus and aims to commence manufacturing in Australia⁵⁰.

Early in 2018 UK-based billionaire Sanjeev Gupta canvassed the idea of using part of the old Holden factory in South Australia to produce EVs⁵¹ and later canvassed Victoria as an alternative location. Gupta's company, GFG Alliance, had purchased OneSteel and aims to power the Whyalla and other steelworks with renewable energy and storage. An Australian EV manufacturing plant could source steel from these newly acquired operations.

In addition to the actual manufacture or assembly of EVs, there may be opportunities for Australian companies to develop and export EV charging products. As an example, Tritium (which has offices in Queensland, the United States and the Netherlands) has begun to market extremely fast chargers and has completed arrangements for 400 of these chargers to be deployed in Europe⁵². Tritium has also been awarded a contract by NRMA to roll out 40 of its previous generation (50 kW) chargers across NSW⁵³. Though competitive, this market segment has obvious growth prospects as the population of EVs grows rapidly during the 2020s, and as the charging capacity of EVs grows.

Research at Australian universities has the potential to contribute to the EV value chain. As an example, we cite the improved lithium/cobalt refining process developed by the University of Queensland, and now licensed to Pure Battery Technologies Pty Ltd⁵⁴. This will enable nickel and cobalt to be extracted from low grade ores more cheaply and effectively than through current methods.

⁴⁸ <http://www.sea-electric.com/home-page/>

⁴⁹ <https://www.motoring.com.au/local-production-going-ahead-for-commercial-evs-112154/>

⁵⁰ One step off the grid. 20 November 2015, <https://onestepoffthegrid.com.au/australian-all-electric-bus-drives-into-record-books-1018km-on-one-charge/>

⁵¹ Renew Economy, 22 January 2018. <https://reneweconomy.com.au/gupta-plans-ev-plant-australia-powered-solar-storage-94177/>

⁵² Australian Financial Review, 2 July 2018. <http://www.afr.com/business/energy/tritium-bids-to-solve-the-biggest-problem-for-electric-cars-20180702-h124t>

⁵³ Australian Financial Review, 14 June 2018. <https://www.afr.com/business/transport/automobile/nrma-to-rev-up-fastcharging-network-with-40-tritium-stations-in-nsw-20180613-h11cza>

⁵⁴ UQ news, 9 July 2018. <https://www.uq.edu.au/news/article/2018/07/queensland-spin-out-set-jump-start-electric-vehicle-battery-supply>