Australian Electric Vehicle Association
www.aeva.asn.au

Submission to the 2022
Inquiry into Electric Vehicle Adoption in the ACT

The ACT branch of the Australian Electric Vehicle Association (AEVA-ACT) welcomes the opportunity to comment on measures to promote the adoption of electric vehicles in the ACT. AEVA represents users of EVs and aims to promote the electrification of transport in all its diverse forms. Carbon emissions from transport are a major contributor to the ACT's total emissions. With 100% renewable electricity (net), electrification of transport is particularly beneficial in the ACT.

A Summary of Recommendations, below, is followed by more detailed Discussion addressing each of the terms of reference.

We can be contacted via secretary@act.aeva.asn.au. We would welcome the opportunity to discuss any of the issues with the inquiry committee.

Summary of Recommendations

Recommendation 1. That the qualification process for the trade certificate in Automotive Electric Vehicle Technology be modified to recognise the knowledge and skills of companies that already perform work on EVs.

Recommendation 2. That the ACT Government require adherence to maintenance and reliability standards as a condition of providing funding support for EV infrastructure projects.

Recommendation 3. That companies which receive ACT Government funding support for EV infrastructure projects be required to demonstrate a substantial component of local training and employment.

Recommendation 3. That, in order to ensure universal, equitable EV-readiness in new apartment blocks, the ACT Government adopt the AEVA recommendations to revise the National Construction Code (NCC) which can be found at aeva.asn.au/news/national-building-code/.

Recommendation 4. That the AEVA recommendations to revise the National Construction Code also be applied to other strata-like building types such as retirement villages.

Recommendation 5. That the ACT Government and electricity providers undertake an education campaign to encourage EV owners to shift charging away from the evening peak.

Recommendation 6. That the proposed $2000 grant to existing Owners Corporations be reviewed in order to better assist Owners Corporations to provide

the ‘spine’ of cabling and load management equipment required to support charging by EV owners (or other charging configuration to suit the particular scheme’s layout).

Recommendation 7. That eligibility for the Owners Corporation grant be clarified to include any Owners Corporation where straightforward wiring from the meters of each individual unit is impractical.

Recommendation 8. That ACT and regional charging stations should generally support charging at a range of speeds such as 350kW DC, 50kW DC, and AC charging at 7 to 11kW.

Recommendation 9. That, in order to support apartment dwellers and renters who do not have an easy way to charge at home and to shift more charging to the daytime, the ACT government makes government-owned long-stay carparks, especially ‘Park and Ride’ carparks, available to EV charging providers to provide slow, all-day charging.

Recommendation 10. That the Inquiry take note of the detailed recommendations of the ACT Branch of AEVA concerning the desirable locations and characteristics of public charging in the ACT, which can be found at aeva.asn.au/files/1268/

Recommendation 11. That new petrol stations in the ACT be required to include EV charging, and that existing petrol stations be encouraged to add fast DC charging facilities.

Recommendation 12. That the ACT Government encourage Tesla to conduct a pilot program in the ACT region to open some of its Superchargers to non-Tesla vehicles.

Recommendation 13. That the ACT Government continue to make power purchase agreements to maintain the ACT’s 100% net renewable electricity capability.

Recommendation 14. That the ACT Government examine the development of “district batteries” as part of a plan to add storage to its 100% renewable electricity capability.

Recommendation 15. That, in order to facilitate progress towards the use of EV batteries as home batteries, the ACT Government encourage companies and utilities to continue to develop the Virtual Power Plant model.

Recommendation 16. That, since a high proportion of the Commonwealth car fleet is registered in the ACT, the ACT Government ask the Commonwealth to maximise the acquisition of EVs for its ACT-based fleet.

Recommendation 17. That, in order to increase the range and decrease the cost of EVs available for purchase in Australia, the ACT Government encourage the Federal government to exempt all new and used EV imports from the 5% import duty.

Recommendation 18. That the ACT Government urge the Federal Government to permit an earlier build date for the FBT exemption that applies to EVs.

Recommendation 19. That, in order to address EV supply barriers, the ACT Government urge the Federal Government to introduce a mandatory national fuel efficiency standard, ideally matching that which applies in Europe.

Recommendation 20. That, in order to increase the supply of used EVs, the ACT Government urge the Federal Government to modify those parts of the *Road Vehicle Standards Act 2018* and the *Road Vehicle Standards Rules 2019* which currently prevent the importation of previously imported vehicle models.

Recommendation 21. That, in order to introduce more EVs into the used car market and enable people on lower incomes to purchase EVs, the ACT Government consider using shorter lease periods for EVs in the ACT government fleet.

Recommendation 22. That the ACT Government undertake comprehensive monitoring and reporting of the transition to zero emission vehicles, including registration data for EVs vs ICE vehicles; number of EVs in the ACT Government fleet, quantity of petrol sold in the ACT, and data on the times and levels of use of the EV chargers in the ACT.

Recommendation 23. That the ACT Government permit riders of sit-on electric scooters with a maximum speed of 50 kph to use their car licence following a safety course, rather than needing a motorbike licence and that stand-up scooters be permitted on local (50kph) roads.

Discussion on the Terms of Reference

a. Skills development needs to support an expanding EV uptake

Entry to the EV training that is proposed for next year at the Canberra Institute of Technology (CIT) requires employment with a mechanic that is currently EV qualified and has a sufficient quantity of work to ensure the apprentice gets appropriate work experience. Details of the Certificate III in Automotive Electric Vehicle Technology is available at training.gov.au/Training/Details/AUR32721. It is a complete qualification and requires a 4 year apprenticeship. This employer must also hold an equivalent motor trades qualification.

There are few mechanics at the moment that are interested in EVs and those that have the qualification probably work for car dealerships. As EVs require less maintenance and dealers aren't really interested in servicing old EVs we are concerned that insufficient work experience is available through the conventional routes. Instead, we suggest this deficiency could be filled, at least in the short-term, by recognition of prior work and knowledge. Companies that already do work on EVs could have their knowledge and skills assessed and be authorised to complete any gap training required to finish the qualification process. This would allow shorter training periods to get people qualified for a demand that is already here for older EVs.

b. Industry development opportunities

There are many opportunities for industry development in the design, installation and maintenance of charging facilities for individual homes, car parks and apartment blocks, both new builds and retrofitting in existing buildings. One of our members has a local business in this area and also supplies and fits new batteries to early model electric vehicles and converted vehicles (electricvehiclescanberra.com). Another member has a business importing electric vehicles from other right-hand drive countries (iondna.com.au). Rule changes at a Federal level, noted below, would enable a wider range of vehicle offerings.

Maintenance of public charging infrastructure is seriously lacking. We would welcome government investigation into whether this is due to a lack of on the ground support or component supplies. We strongly encourage the government to include reliability standards as a criterion when providing support for EV infrastructure projects.

We also note that EV charging provides opportunities outside of the industry from the changes in habits of EV owners filling in the wait time for charging with other activities. As an example, Ikea provides AC charging that is fast enough to be worthwhile for customers to plug in for a free top up but slow enough to not cost much to Ikea and to encourage customers to linger.

Long-stay car parks providing free AC charging have a competitive advantage. For example, a multi-story car park near Canberra airport has a bank of six AC chargers and the Canberra Centre carpark has four AC chargers that are free to use. You just pay the normal parking fee. Providing free AC charging at a pay car park costs little and there is plenty of room to add extra chargers.

Tendering for the ACT's power purchase agreements for renewable generation included a criterion to do with providing further benefits to the ACT such as setting up some part of the business in Canberra. Similarly, we suggest that a company that gets support to (say) fit out charging to the Park and Ride carparks should be required to show a substantial component of local training and employment.

c. Planning laws and regulations and education and promotions in relation to charging infrastructure requirements in a variety of residential, public and commercial configurations and precincts

Planning Laws and Regulations AEVA's national body made recommendations to the review of draft amendments to the National Construction Code (NCC) in late 2021. It is available here: aeva.asn.au/news/national-building-code/. We would like this inquiry to consider those recommendations as part of this submission.

The AEVA submission particularly covered class 2 buildings (apartment blocks) but other building classes should also include 'EV readiness' in their associated parking. The draft NCC proposed provisions for only a fraction of parking spaces. Our submission warned that this would lead to an inequitable situation of 'haves' and 'have-nots' within an Owners Corporations as some allocated parking spaces had provision for charging while other allocated parking spaces could only get charging at considerably greater cost or might be locked out of retrofitted charging.

We encourage the ACT government to adopt our NCC recommendations as an ACT-specific variation to ensure universal, equitable EV-readiness in new apartment blocks, even if they are not adopted in the final NCC2022, which is expected to be published in September 2022 or later.

Key concepts in our NCC submission included the following points:

- Charging does not need to be fast where cars are parked all day or night.
- Charging can be set up to avoid adding to a building's peak demand.
- Load management equipment can slow or pause charging at times of high demand.

- When many cars are plugged in and charging (eg. earlier at night but after the evening peak), the available capacity for charging can be shared (eg. just 6A/1.5kW each).
- When fewer cars are charging (eg. later at night or by day), charging rates for each vehicle can be increased automatically by the load management equipment. A gradual increase to a 7kW (32A single phase) maximum would provide ample charging – 5 hours at 7kW would provide over 200km of range for most cars.

We also recommend that such requirements be extended to other strata-like building types such as retirement villages. These can resemble apartments or individual townhouses with shared or attached garaging, respectively. In either case they are governed by a site-wide management and occupants of the village do not own their unit. New strata-like developments should also have charging facilities included and existing developments could be assisted with retrofitting.

Infrastructure requirements The key concept here is to pick appropriate charger types and numbers for different locations. In some places, a few fast DC chargers are appropriate; in other places a larger number of relatively slow AC charging outlets are appropriate. Another key concept is that EV drivers usually just want a useful partial top up and rarely need to do an 'empty to full' charge.

Residential charging rarely needs to be fast as the cars spend a long time parked. As battery capacities get larger, the need for faster charging at home is reduced, not increased. A large battery might be charged for a week of local driving from home solar over the course of a few days at home. An ordinary 10A power point, where one usually parks, with a portable Electric Vehicle Supply Equipment (EVSE) charge cord (2.3kW), often supplied with a car, is the lowest common denominator and this is often sufficient. This can add around 150 to 200km of range overnight. Single phase 32A (7kW) or 15A three phase (11kW) with a portable or wall-mounted EVSE allows more charging in a narrower time window to make use of off-peak periods or peak solar output. Some home charging equipment can track home solar output and vary a car's charging rate to maximise solar charging and minimise imports from the grid.

Concerns for increasing demand on the grid can be addressed by existing measures to discourage charging during the evening peak. In the case of apartment blocks, measures to avoid adding to a building's peak demand would incidentally provide the same benefit to the grid as a whole since their times of peak demand generally coincide. However, strata systems can also include management software and hardware to take time of use tariffs and demand response signals into account (eg. thedriven.io/2022/06/10/evos-marks-milestone-install-of-australian-made-ev-charger-gears-up-for-more/).

In the case of charging in the suburbs, incentives such as Time of Use tariffs should encourage people to shift charging away from the evening peak, particularly if there is education about the financial benefits of doing so. Most cars can be set to automatically pause their charging to prefer off-peak periods or avoid peak periods. This enables a driver to plug in whenever it is convenient without adding to the evening peak. Education for awareness of this facility would be beneficial as a campaign by the ACT government and/or by electricity providers. Sellers of EVs (both manufacturers and dealers) could also have savings guides on their websites,

including how to set up timed charges on the cars, as a source of competitive advantage. Perhaps such a guide ("quick start") could be given out with new and dealer-used BEVs.

The biggest barrier to private charging in Owners Corporations (OCs) is the cost of retrofitting charging infrastructure to existing apartment blocks. We are receiving increasing numbers of queries from executive committees of OCs trying to come to grips with the technical and financial requirements.

A key concept for OCs is that it is often possible to have a staged introduction of charging facilities without requiring substantial costs at first when the demand might be low and the costs hard to justify. The first few EVs in a building can sometimes be accommodated without problems by ad hoc arrangements such as allowing the use of one or several common property power points. Some OCs choose to provide or allow a wall-mounted EVSE charging outlet in a shared parking space for the first few to share while explicitly acknowledging that this can only be an interim arrangement. Very useful resources for OCs have been produced by WattBlock (wattblock.com/ev-charging).

The proposed $2000 grant to OCs from 2023 could help towards an early interim arrangement such as a shared wall-mounted EVSE charging outlet but it won't go far towards a comprehensive solution. We understand from a conversation with an ACT government officer at the recent AEVA EV Conference and Expo that the detail is yet to be worked out for the grant. We would welcome the opportunity to discuss options as that policy is being more fully developed. It was suggested that the $2000 might be 'per charger' rather than per OC. If so, that would be very helpful in getting over the financial hump of installing a 'spine' as described below.

Ultimately, the usual arrangement is for the OC to provide a 'spine' of cabling and load management equipment to which individual unit owners may connect at their own expense via an approved management-compatible wall-mounted EVSE outlet. More substantial grant assistance for providing that 'spine' from government and/or the electricity network provider (which could expect to eventually recoup its costs via the network component of electricity tariffs) would strongly encourage uptake.

It is also unclear which OCs would be eligible for the $2000 grant. Various statements about this grant refer interchangeably to apartments, townhouses and multi-unit dwellings. Most townhouse developments include individual car accommodation that is part of the title of and adjacent to each townhouse. Those unit owner could generally install their own charging outlet wired to their individual electricity meter just like the owner of an ordinary suburban house would do. However, some townhouse developments have parking facilities that are consolidated at some distance from the units and/or on common property in ways that make wiring back to the meters of individual units impractical. We recommend that the policy be clarified to include any owners corporation where wiring from the meters of each individual unit is impractical.

Public charging should include a mix of types:

Long highway trips are facilitated by regularly spaced fast DC charging. The roll-out of fast DC charging (50kW or more) needs to keep pace with the uptake of EVs. Multiple partial top ups, generally stopping at 80%, enables a faster trip than charging to 100% because charging slows down substantially past 80%. A common media

comment is that ‘charging anxiety’ (finding a queue or an out-of-order charger) is replacing ‘range anxiety’.

If the ACT government is contributing to regional charging facilities (eg. Braidwood), we recommend preferring proposals that include charging at a range of speeds such as 350kW DC charger(s), 50kW DC charger(s) and AC charging at 7 to 11kW. Including a slower charger adds little proportionately to the cost of installing and operating a faster charger. A person finding the faster chargers occupied could plug in to a slower option. A person planning a longer break can choose a slower charger, which can have a lower per kWh tariff, leaving the faster charger available for others to use. Alternatively, multiple DC chargers that share the available supply at a site between multiple vehicles enables a higher throughput of vehicles as described here by Finnish company Kempower: thedriven.io/2022/06/07/the-driven-podcast-the-end-of-queue-anxiety/. Such systems would be highly desirable for the efficient use of charging resources such as the finite electrical supply capacity at a site.

Within the city, many slower AC EVSE outlets can be provided for the cost of a few fast DC chargers from the same network capacity. Slower AC charging is ideal for locations such as ‘Park and Ride’ and shopping centre carparks. A car that is left in such locations for many hours through the day can have slow charging that provides a sink for solar generation in the grid. As with an apartment block carpark, inexpensive EVSEs can be networked to share a limited supply. We recommend that the ACT government makes government-owned long stay carparks, especially Park and Ride carparks, available to EV charging providers to tender for the installation and management of charging. Such slow, all-day charging, could provide a stop-gap for apartment dwellers and renters who do not have an easy way to charge at home.

Businesses could be encouraged to install solar generation on their premises and to offer free charging to their employees (since their solar generation could be very low cost). The ACT government could assist with advice about how to avoid this being regarded as a fringe benefit subject to fringe benefits tax.

Commercial configurations and precincts. In early 2022, AEVA-ACT prepared detailed recommendations on the desirable locations and characteristics of additional public charging in the ACT. We would like this to be read as part of our current submission. It is available here: aeva.asn.au/files/1268/

Any agreements with charging providers should include on-going reliability guarantees. Chargers left out-of-order for extended times is a cause of considerable frustration among EV drivers and could erode public confidence in EVs (thedriven.io/2022/03/28/why-are-so-many-ev-charging-stations-out-of-order-are-they-reliable/).

Planning rule amendments (eg. amending original height restrictions) might be needed to enable the retro-fitting of solar PV shading canopies on the top levels of multi-story carparks with EV charging facilities with the benefit of combining greater amenity with renewable electricity generation.

In appropriate cases, consideration could be given to combining some or all of EV charging, ‘neighbourhood battery’ energy storage, electric scooter hire/return and bicycle storage lockups as consolidated facilities.

Existing petrol stations could be encouraged to add fast DC charging and new petrol stations could be required to include charging. Petrol stations generally include a small shop and could expand to include a café. Ampol is already adding chargers in

association with Evie (ampol.com.au/about-ampol/sustainability/future-energy/ev-charging-network).

d. ACT Government's role in providing charging infrastructure

The ACT Government can assist by:

- Making land it controls available for charging facilities.
- Providing grants that are tied to reliability guarantees.
- Requiring a reliability guarantee with any other form of assistance it offers.
- Giving consideration to innovative models such as provided by Jolt (jolt.com.au). Jolt offers charging at moderate speed directly from pre-existing substations adjacent to parking areas. The first 7kWh, enough for about 50km of city driving, are free (20 minutes at 22kW) but subsequent charging is billed at a higher rate. Part of their revenue model requires advertising placed around the substation. We don't know how this would sit with Canberra's limitations on roadside advertising.
- Requiring Connected Kerb-style charging (eg. lamp posts with a charge socket) for any new subdivision that does not include allocated off-street parking for each residence (www.connectedkerb.com). Lamp posts in places such as Wright, Coombs and Denman Prospect could be retro-fitted to support residents of unit complexes that lack allocated parking. Similarly, lamp posts around shopping, café and other commercial precincts that depend on street parking could be retro-fitted.
- An alternative approach to public kerbside charging is described here (www.theage.com.au/national/victoria/all-charged-up-councils-push-for-kerbside-car-charging-20220802-p5b6i1.html) whereby households are given permission to have a powerline and charger installed that will run from their private meter, underneath their garden and the footpath and come up next to the kerb. The ACT could provide the relevant planning permissions where off-street parking is unavailable.
- Facilitating changes to planning regulation as described above.

e. Regional charging infrastructure and whether this is a barrier to local uptake, end-of- life battery disposal, and impact of EVs on ACT power supply requirements and vehicle-to-grid issues

Regional charging - barrier to local uptake? Whether regional charging is a barrier to EV uptake depends on the person's intended use for their EV. Some people are buying an EV as their 'second car' or 'the car that never leaves town', while retaining an ICE vehicle for longer trips, so they don't need charging out of town and may not need charging within Canberra if they have access to home charging.

For others who intend their EV to be their primary or only motor vehicle, confidence that charging will be available at regular intervals along major intercity routes and country towns is essential. For these people, lack of confidence in charging out of town is a major

barrier to the purchase of an EV, even if it will mostly be used within Canberra. Most people want confidence that they will be able to use their car for infrequent longer trips.

A frequently asked question at events hosted by AEVA-ACT is ‘Can I drive to Sydney / the coast / Melbourne?’ While these trips are all possible, increasing uptake of EVs runs the risk that increased provision of chargers will not keep pace. A single 50kW DC charger in Murrumbateman, Jugiong and Yass, two in Bateman’s Bay and three in Goulburn will soon be insufficient. Cooma has two 350kW chargers and a 50kW. Jindabyne has two 50kW chargers. Additional chargers in locations such as Braidwood would not just be useful for EVs of relatively short range. Chargers in Braidwood would also enable longer range EVs returning from the coast to skip charging in Bateman’s Bay if there is a queue.

Please note that the chargers mentioned above are those that are usable by any electric car. The DC chargers installed by Tesla are currently only usable by Tesla-branded vehicles. Tesla has a stated policy to gradually open up its DC charger (‘Supercharger’) network to non-Tesla vehicles (tesla.com/en_AU/support/non-tesla-supercharging) with pilots in specified districts and countries. In Australia, the Tesla DC chargers are fitted with CCS2 plugs, which are compatible with most vehicles sold here, so only a software update would be required to enable charging of most non-Tesla vehicles. The ACT government could encourage Tesla to conduct a pilot program in the ACT region. Tesla have an excellent reputation for the reliability of their chargers and the addition of Tesla as a further supplier of charging services would be a valuable broadening of competition.

The NRMA has done an excellent job installing usually single 50kW DC chargers in many towns throughout regional NSW and this gave confidence to the early adopters of several years ago. However, we are now moving into the mass adoption phase. Many more chargers will be needed to give confidence to the larger numbers of less adventurous mass adopters and to support regional travel. That said, public charging will never need to support as many vehicle-kms as petrol stations because most people, most of the time, charge at home. The NRMA were always clear that their early role was to address the ‘chicken and egg’ problem. They wanted their chargers in regional towns to remain useful but did not want to inhibit the commercial suppliers that would follow them. So, they generally avoided installing at highway service centres where they anticipated that banks of faster chargers would be provided by commercial suppliers.

We note that Australian Motoring Services, the umbrella body for Australia's mobility clubs, NRMA, RACV, RACQ, RAA, RAC, RACT, has recently bought out other investors in Chargefox, a major provider of fast public regional DC charging (mynrma.com.au/media/press-releases/2022/nrma-expands-investment-in-australias-ev-future-with-chargefox). So, perhaps the NRMA is now seeing a more commercial role for itself than its original role as just an early catalyst.

We expect that support from the ACT government for fast DC charging facilities in the capital region would encourage the uptake of EVs that will be mostly used within the ACT. AEVA-ACT agrees that we are now moving into the phase where busy routes need more than just single DC chargers.

Battery disposal We note first up that ‘disposal’ should only happen after ‘reuse’. A battery that may no longer perform sufficiently in a vehicle can remain sufficient for stationary applications. See here www.youtube.com/watch?v=JqlOlqK_ot8, for example using original model Leaf batteries. Even a 24kWh Leaf battery with 40% loss of capacity is more capable than most home batteries. Assistance for the addition of home batteries could be expanded to include repurposed vehicle batteries if a suitable business can be found to reconfigure and install.

We think battery disposal issues will develop only slowly. We think the commonly quoted battery life of 5-15 years is unduly pessimistic. Most manufacturers have battery warranties of around 7-8 years. We do not think it is reasonable to expect current EVs to have such short battery lives as the original Nissan Leaf and Mitsubishi iMiEV from 2012 had.

Those decade-old vehicles have now lost significant range but this is because 1) they did little or no battery cooling, 2) they were routinely charged to 100% and often deeply discharged (For the most commonly used chemistries, most of the capacity-losing reactions happen at the extreme states of charge), 3) they had small capacities and so used more charge cycles for a given distance driven, and 4) they had less robust chemistry than is available now.

In contrast, some other car models from a decade ago have experienced little loss of range eg. from Tesla, BMW and GM, because they had better chemistry and/or better battery management. Now most electric cars have larger capacities and active battery cooling. With improved chemistry as well, it is reasonable to expect multi-decade longevity.

With good management, a modern lithium battery should be good for several thousand charge cycles. A modern EV with a range of (say) 400km, will have travelled around 400,000km after 1000 cycles. Even if such an EV were to eventually lose a third of its range, it would still have a range of 267km and it would remain a useful car for many people's needs. Consequently, we don't think there will be large numbers of EV batteries needing repurposing or recycling nearly as quickly as some suppose.

Nonetheless, battery recycling facilities are being developed in Australia with Envirostream (envirostream.com.au) and Relectrify (relectrify.com/newsblog/counties-energy-hits-its-revolve-second-life-ev-battery-system-milestone) in Melbourne being leading examples. A discussion paper on lithium battery reuse and recycling in Australia is here (https://fbicrc.com.au/wp-content/uploads/2021/03/CSIRO-Report-Australian-landscape-for-lithium-ion-battery-recycling-and-reuse-in-2020.pdf). We understand that Sweden has developed recycling facilities to not only reuse the batteries but also to avoid reliance on foreign manufacturers.

ACT power supply requirements The electricity grid as a whole (and down to the street level) has generation and transmission capacity that is sufficient to just meet the peak demand, which typically occurs in the evening from 5PM to 8PM. Electric cars are a nearly ideal discretionary load. Most people, most of the time can cover their driving needs with relatively slow AC charging at home that can be paused to avoid the evening peak. Most electric cars have settings to schedule when they charge, regardless of when they are plugged in.

Since there is ample transmission and generation capacity outside peak hours, we do not anticipate any problems arising from the uptake of EVs so long as most charging does avoid peak times. All new electricity meters and accounts have Time of Use or Peak Demand retail tariffs that provide a financial incentive to avoid charging during the evening peak. In addition, some retailers offer EV charging tariffs much like the old controlled load hot water tariffs. People go out of their way to save a few cents/litre on fuel so we expect such measures should be sufficient so long as they are well understood, so there could be a role for education.

> “Incentivising EV drivers to charge their cars in the middle of the day when there’s generally plenty of solar, or the middle of the night when there’s generally plenty of spare network capacity, is a pathway to improved network

performance and reduced energy costs for everyone" (reneweconomy.com.au/networks-test-time-of-use-appetite-with-zero-cost-daytime-electricity-offer/)

'Virtual transmission' with district batteries can also soak up excess solar generation in the suburbs and avoid the need to upgrade feeder transmission to cope with the general 'electrification of everything', not just vehicles. We support such batteries being part of ACT government plans for adding storage to its 100% renewable electricity policy.

As the total electricity demand increases from the replacement of both petrol/diesel and gas as energy sources, we support the continuation of power purchase agreements to maintain the ACT's 100% net renewable electricity. Improving the proportion of real-time renewable generation being used would be promoted by policies that encourage a steady load of daytime EV charging such as relatively slow AC charging across Park and Ride carparks and workplaces. The combination of a home battery and a BEV could enable a commuter who cannot charge at work to charge their home battery from solar PV during the day and then charge the car overnight.

Vehicle-to-Grid Issues Currently, CHAdeMO is capable of Vehicle to Grid (V2G) whilst Combo Charge System (CCS) will not support V2G until 2025. While CHAdeMO has been the Japanese standard, CCS type 2 (CCS2) is rapidly becoming the standard for Australia. This article provides good technical background: (gses.com.au/what-are-the-vehicle-to-grid-implications-in-australia-electric-cars-and-the-grid/). With CCS (post-2025) or CHAdeMO, EV batteries could then act as a Distributed Energy Resource (DER) that can participate in demand response such as the frequency control ancillary service (FCAS) markets.

A V2G trial was announced in 2020 in Canberra involving the ANU and a consortium of others including the ACT government (arena.gov.au/news/world-leading-electric-vehicle-to-grid-trial-in-act/) so there should be easy access to expert local advice.

Before V2G becomes common, the simpler V2H (vehicle to home) is likely to provide homes with backup power or the option to disconnect from the grid at times of high prices, such as the evening peak. Some current models already provide vehicle to load (V2L) in the form of a simple 15A three pin mains socket.

We are certainly aware of a huge potential for V2H to change the value equation for people purchasing an EV. At our public events, the possibility of using an EV as a home battery is often raised demonstrating that this idea has caught the public imagination. If the interconnection and power management issues are resolved, people will obtain much more than just a car. Using EV and/or home batteries with home solar, aggregated and managed as a virtual power plant (VPP), could provide an additional reason to get an EV (onestepoffthegrid.com.au/ausgrid-launches-phase-two-of-nsw-vpp-trial-casts-net-to-thousands-of-participants/). The ACT government could encourage companies and utilities offering VPP access to individual consumers.

While the possibilities of V2G are exciting, an alternative possibility is that batteries could become sufficiently cheap that home-installed batteries, which can be cheaper and less energy dense, are used for V2G functions without involving vehicles or that district batteries are used in preference to either of these for DER and FCAS-type functions.

f. Application of Territory taxes and charges for EV purchases including registration charges

We support the current policy of exempting EVs from stamp duty and registration charges and hope that ACT incentives match and keep pace with those of other states. Anecdotally, the exemption from registration is seen as a considerable benefit even though the cost to the ACT budget would be small.

We also welcome the recently announced extension of exemptions for used and imported EVs. As Japan particularly turns over vehicles more quickly, they can be a source of cheaper EVs for us and they will be replaced with new EVs in Japan. Consequently, this has the effect of boosting total EV production.

As is done by other states, we suggest that incentives should be capped to encourage manufacturers to keep their prices below the cap. We don't propose a particular level for that cap. We do suggest that the cap should be high enough to cover a reasonable range of practical vehicles but not so high that very clearly luxury vehicles are being subsidised.

A high proportion of the Commonwealth car fleet is registered in the ACT. The Commonwealth could be asked to take steps to maximise the acquisition of EVs for its ACT-based fleet.

g. Federal taxes and charges for EV purchases, including import taxes

AEVA-ACT commends many of the recommendations of the 2019 Report of the Senate Select Committee on Electric Vehicles (www.aph.gov.au/Parliamentary_Business/Committees/Senate/Electric_Vehicles/ElectricVehicles/Report), particularly a program of revenue-neutral measures outlined in the 'Chair's Additional Comments'. These are generally consistent with the current federal government's stated policies. In particular, we like the proposal to adjust the Luxury Car Tax (LCT) to increase the difference between the thresholds at which the LCT is applied to 'efficient' vs ordinary vehicles coupled with a tightening of the definition of 'efficient' so that only genuinely zero-emission vehicles and exceptionally efficient hybrids are included.

While the Federal government has announced an exemption from the 5% import duty from Europe and the UK, it is only applied to new BEVs (and PHEVs). Used EVs still have 5% duty applied. Furthermore, if a vehicle was built in, say, France for sale in the Japanese domestic market, 5% duty is applied, even though Australia has a free trade agreement with Japan. We suggest that the ACT government could encourage the Federal government to exempt all EV imports to increase the range and decrease the cost of EVs available for purchase in Australia. The new fringe benefits tax (FBT) exemption only applies to vehicles built after 1/7/2022. Many new and most used vehicles will for some time have been built before this date.

The ACT government could lobby the federal government for an earlier build date for the FBT exemption, the senate committee chair's LCT adjustments and wider application of the import duty exemptions.

h. Other Federal barriers to EV uptake, cost and availability of EVs, including fuel efficiency standards, impact of EV uptake on existing motor and service industry sectors including possible transition assistance, equity and just-transition issues for people on lower incomes

Fuel Efficiency Standards AEVA-ACT strongly supports and encourages the introduction of a fuel efficiency standard as the best way to address supply problems. There is a substantial disincentive for carmakers to sell EVs into Australia because they sacrifice significant credits (up to $18,000 per vehicle) that they would receive by selling into countries with fuel efficiency standards. Thus, implementation of these standards is crucial for improving the supply of EVs to Australia. A lack of supply is a bigger problem than lack of demand for EVs.

The Federal Chamber of Automotive Industries (FCAI) supports such standards (fcai.com.au/news/index/view/news/757) although, as noted by federal minister Chris Bowen (reneweconomy.com.au/energy-insiders-podcast-federal-climate-and-energy-minister-chris-bowen/), it is important to get the design of an efficiency standard right including sufficient ambition to drive the uptake of EVs.

The ACT government could encourage the Federal Government to introduce a steadily contracting fuel efficiency standard, ideally matching that of Europe. We note that federal minister Chris Bowen recently seems willing to consider the introduction of a fuel efficiency standard (thedriven.io/2022/06/30/labor-leaves-path-open-to-stricter-vehicle-efficiency-standards-to-support-ev-push/). We support the ACT's recently announced policy of basing registration costs on efficiency rather than weight as a valuable measure, although this is likely to have less effect than a federal fuel efficiency standard.

Federal Government Import Restrictions Two major problems slowing EV adoption are price and availability. The *Road Vehicle Standards Act 2018* (RVSA) and the subordinate *Road Vehicle Standards Rules 2019* are currently restricting the trade and the importation of used zero emission vehicles, specifically clauses 129 and 129A. These clauses prevent the importation of vehicles that have been previously imported into Australia by the manufacturer, even when only very small numbers (say 100 or so) were ever imported. An amendment to allow independent importers to import previously imported vehicle models would allow a greater variety of cheaper EVs to be offered. Vehicles imported under this scheme meet the Australian Design Rules as they have met equivalent standards in the source markets such as the UK and Japan.

Motor Service Industry EVs should only impact existing motor and service industries very gradually. Even when nearly all new cars are electric (carsales.com.au/editorial/details/which-car-brands-are-going-all-electric-and-when-130728/), there will be a legacy fleet of ICE vehicles that will take quite a while to phase out. Many of the service requirements of EVs are the same as ICE vehicles. Both need tyres fitted, wheel alignments, trouble-shooting of low voltage systems for lights and accessories, fitting of accessories such as trailer hitches and bike racks, repairs and adjustments to steering and suspension systems and so on. EVs still have transmission, braking and cooling systems that eventually need fluids changed. Brake pads don't wear so quickly on an EV due to regenerative braking but they still need checking and eventual replacement.

Equity and Transition for Low Incomes AEVA recognises the need to ensure that the transition to electric vehicles does not disadvantage people on lower incomes.

Policies that promote EV fleet and private purchases will put more EVs into the used car market and will enable people on lower incomes to purchase EVs. We understand that the ACT government's fleet of electric vehicles are generally on 4-year leases. Deliberately shortening the lease period could be a way to increase the local supply of cheaper used EVs.

Facilitating the purchase of used EVs could make it easier for the government to have a shorter lease period for its fleet and allow a more rapid transition to the private market. Used EVs could be purchased for community organisations. Perhaps the ACT government could facilitate lease or loan arrangements for people on lower incomes to enable them to benefit from the lower running costs of an EV.

A local business (electricvehiclescanberra.com) operated by one of our members has successfully upgraded the battery of a 2012 Mitsubishi iMiEV doubling its original range to about 250km while updating some other features. An old EV can be updated to better-than-new as an option for people on lower incomes for a total cost of around $26k to $30k, including both the new battery and the purchase of the used vehicle.

There will likely be a period when people on very low incomes can't afford used EVs since these will be the newer used cars. Instead, as now, they will only afford the older used cars, which will be ICE cars. With the exception of a few collectable enthusiast ICE vehicles, this might be the last market for used ICE vehicles. As is the situation now, a person on a very low income will try to find the cheapest car that is likely to have fewest mechanical problems. If there is strong uptake of EVs and a strong preference for a used EVs over used ICE vehicles, people on very low incomes might even benefit from a temporary glut of better quality used ICE vehicles than they can afford now. Current policies to promote more efficient ICE vehicles over less efficient ICE vehicles will be a future benefit for the last purchasers of used ICE vehicles. However, if necessary, transport costs could be addressed by any of the measures available to governments to assist people on low incomes with cost-of-living pressures.

The transition to electric drive is likely to move more slowly for some specialised classes of vehicles, so fuel is likely to remain available for the last of the ordinary ICE cars.

Access should be considered in the siting of chargers, for example for wheelchair access to all locations of charge ports on cars (eg front on Nissan Leaf or Hyundai Kona vs left-rear on Tesla Model 3). There are prototypes of chargers with intelligent arms that can automate the connection process for drivers who are unable to handle the bulk and force required of a charger cable and connector. As more models with towing capability become available, some drive-through charging sites would be useful, particularly on routes favoured by people towing caravans and camper trailers.

Any other matter relevant to this issue.

Monitoring and Reporting We suggest that ACT Government should provide comprehensive monitoring/reporting of the transition since transparency is fundamental to community support. This could include regular publication (say every

six months) of data on a dedicated website of registrations of new private EVs vs ICE vehicles; numbers (and Departments) of ACT Government EVs; quantity of petrol sold in the ACT, etc.

It would be useful to also include data on the times and levels of use of the EV chargers in the ACT. This would provide an indication of areas where there is an emerging need to install more chargers. Real time data of charger availability would of course be extremely useful.

Personal Mobility Devices and Scooters AEVA-ACT strongly supports the uptake of all forms of electrified transport, not just cars. We encourage measures to increase cycling and note that bicycles with electric pedalling assistance greatly expand the range of cycling trips to include older or less fit cyclists, longer trips, commuting etc.

The ACT could follow Queensland's lead in allowing riders of sit-on electric scooters with a maximum speed of 50kph to use their car licence following a safety course rather than needing a motorbike licence. Stand-up scooters could be safer, more convenient and therefore used for many more trips if they were allowed to ride on local roads (50kph or less) as is permitted in Queensland.