Australian Electric Vehicle Association Ltd.
ABN 71 660 748 318
PO Box 5285
Clayton, VIC 3168
Email: secretary@aeva.asn.au

To: Chair of the National Electric Vehicle Strategy

Dear Sir/Madam,

The Australian Electric Vehicle Association Ltd (AEVA) is a volunteer-run, not-for-profit organisation dedicated to switching Australia's transport networks to electric drive as quickly as possible. Formed in 1973, AEVA continues to serve as a vital public forum for Australians to learn about electric vehicles (EVs) and the enormous benefits the technology provides. Our membership consists of end-users of EV technology – the drivers and riders, as well as many businesses involved in all aspects of electrified transport. Our lived experience with EVs provides an important consumer perspective in this consultation.

We thank the Commonwealth Government for the opportunity to provide comment. We hope our contributions will ultimately lead to an effective, fair and rapid transition to decarbonisation of transport and advance electro-mobility.

EXECUTIVE SUMMARY

AEVA's views are summarised in the following points. These views are explained, with references to relevant evidence, in our answers to the 20 questions asked by the Consultation Paper, following this Summary.

Objectives

- The Government's highest priority objective should be to reduce greenhouse gas emissions in the transport sector.
- The next priority objective should be to substantially reduce Australia's reliance on imported fuels.

Policy framework

- The Government should work with the States and Territories to establish a nationally consistent framework for EV policy settings.
- This framework should include a decision to cease the sale and registration of new Internal Combustion Engine (ICE) vehicles in all States and Territories, by 2035.
- The sale of new ICE vehicles should be discouraged in the interim.
- Incentives should not be extended to conventional hybrid and plug-in hybrid (PHEV) vehicles.
- The framework must take account of passenger vehicles other than cars – such as motorcycles, bicycles and scooters.

- Hydrogen has no practical role for light vehicles and has a very limited role for heavy vehicles. Financing of H_2 infrastructure should be decoupled from this EV Strategy.
- To ensure that emission reductions are achieved across all land transport sectors, the framework must include substantive investments in electric mass transit, electric heavy haulage, electric light and heavy rail, and electric buses and trucks.

Emission standards

- The framework should include the introduction of mandatory vehicle emissions standards.
- These standards should be tightened annually, with stringency and timing that, at a minimum, matches major markets such as Europe or USA.
- In applying these standards, vehicle categories should be sufficiently broad so that weaker standards are not applied to SUVs or light commercial vehicles.
- These standards should also apply to heavy vehicles.

Other measures

- The Fringe Benefits Tax (FBT) exemption should be widened to include vehicles with earlier build dates.
- The exemption from the 5% import duty should be extended to second-hand vehicles.
- To support the uptake of more affordable EVs, current impediments to the importation of second-hand EVs should be removed.
- The importation of electric motorcycles and mopeds should be less onerous.
- State electricity regulatory legislation should be harmonised, so that working on EVs is excluded from the definition of 'electrical work', but that a specific level of competency be expected for those doing such work.
- Vocational training in the automotive sector should be expanded and resourced appropriately.

Charging infrastructure

- Grants for public rapid charging infrastructure should be planned with State/Territory and Local Governments.
- These grants should be tied to an obligation to achieve a defined level of availability and rapid response to outages.

Road User Charge

- Once EVs reach a defined proportion of registered vehicles, a federally collected, state-administered, universal Road User Charge should be applied to all road vehicles (EV and ICE). It should be introduced at a modest rate and should increase only in line with falls in revenue from fuel excise.
- The Road User Charge should be based on vehicle mass as well as distance travelled.
- Fuel excise should be retained for ICE vehicles, in addition to a Road User Charge, as a disincentive.

Manufacturing opportunities

- There are opportunities for small and medium size enterprises to play a role in services such as converting ICE vehicles to EVs, and in refreshing batteries in used EVs, as part of a "value chain" which includes domestic battery manufacture.
- The Government should examine incentives and the provision of start-up financing for local assembly and manufacture of whole EVs in Australia.

RESPONSES TO THE CONSULTATION PAPER'S QUESTIONS

QUESTION 1

1. Do you agree with the objectives, and do you think they will achieve our proposed goals? Are there other objectives we should consider?

The proposed objectives are to:

- Encourage rapid increase in demand for EVs
- Increase supply of affordable and accessible EVs to meet demand across all segments
- Establish the systems and infrastructure to enable the rapid uptake of EVs.

Positioned above your objectives are five goals:

- Make EVs more affordable
- Expand EV uptake and choice
- Reduce emissions
- Save Australians money on fuel
- Increase local manufacturing.

AEVA agrees that the objectives and goals are sound, but we propose that a hierarchy of importance be applied. Of the listed goals, **the number one priority must be to reduce emissions in the transport sector**. This implies giving priority to initiatives that will deliver the greatest emissions reductions as soon as possible, across all transport sectors including rail freight.

We suggest two further objectives:

- Significantly decreasing Australia's reliance on imported fuels
- Creating harmony between the policies of the Federal Government and those of the State and Territory Governments, especially with respect to taxation and financial regulation of EVs.

Australia is perilously close to exhausting its strategic fuel reserves[1]. Electrification of all our transport networks, including roads, rail and shipping will extend our safety margin, and make the nation more resilient to energy price shocks like the current one.

AEVA urges the establishment of a nationally consistent framework between the Federal Government and States/Territories for EV policy settings. In our response to Question 19 we list suggested roles for these levels of Government. The current situation involves a

[1] The Guardian, 23 August 2022. https://www.theguardian.com/australia-news/2022/aug/23/australias-emergency-fuel-storage-down-to-only-58-days-as-labor-looks-at-increasing-reserves

confusing mismatch of approaches, resulting from a lack of Commonwealth leadership in recent years.

These approaches include the misguided Victorian EV Road User Charge, which has led to administrative problems for EV drivers and VicRoads[2] and has triggered a legal challenge in the High Court of Australia[3]. We comment further on Road User Charges in our response to Question 18.

In achieving the objective of "encourage a rapid increase in demand", AEVA urges Australia's governments to lead by example. We have in mind the electrification of public vehicles such as Commonwealth, State and Local government fleet cars, public transport buses, council garbage trucks, and law enforcement vehicles. Such a transition would also contribute to the supply of more second-hand EVs over time.

We are concerned about the frequent mentions of hydrogen in the Consultation Paper. **In our view, hydrogen should be completely de-coupled from this EV strategy**. As a fuel and energy storage medium, H_2 is expensive, inefficient, and so inferior to battery EVs that diverting resources to hydrogen refuelling stations would constitute poor use of public money.

The government's recent on-line information session suggested that hydrogen is really only being considered for heavy transport, not light vehicles. However, even for heavy, long-distance trucking it is not at all clear that hydrogen offers compelling advantages over battery-electric. For example, battery swap systems along major highway routes could eliminate any advantage in refuelling speed[4]. Moreover, batteries charging on the grid are a potential source of energy demand management – something H_2 would struggle to compete with.

Further comments on hydrogen fuel cell EVs may be found in Appendix 1.

QUESTION 2

2. What are the implications if other countries accelerate EV uptake faster than Australia?

Perhaps the most significant implication of operating our transport networks on imported petroleum, rather than on electricity generated in Australia, is that it undermines Australia's energy security. Households can play a leading role in this energy security situation, by choosing the timing and speed of EV charging. This will contribute to the ongoing stability and reliability of the grid, particularly as variable renewable energy reaches a higher proportion of total electricity generation.

Many other countries are already accelerating EV uptake faster than Australia. The consequence is that many models are not allocated to Australia or are sent in very small quantities. This limited choice and availability has contributed to depressed uptake in Australia relative to other countries. This in turn has dampened the business case for

[2] The Driven, 28 July 2022. https://thedriven.io/2022/07/28/the-victoria-electric-vehicle-road-tax-is-emerging-as-a-new-robodebt-fiasco/
[3] Equity Generation Lawyers. Vanderstock & Davies vs Victoria. https://equitygenerationlawyers.com/cases/vanderstock-v-victoria/
[4] Big rigs, 2 October 2022. https://bigrigs.com.au/index.php/2022/10/02/janus-electric-trucks-given-go-ahead-to-start-commercial-trials/

investment in charging infrastructure, which further suppresses interest and confidence in EV uptake.

In the short term (2-3 years) EV manufacturing globally will continue to face constrained supply. Demand for EVs will remain high and prices will be slow to fall. To compete for the supply of EVs, Australia must create an attractive environment to sell EVs. This can be done via a suite of policies including **setting a date to cease the sale of new ICE passenger vehicles by 2035**, and in the intervening 13 years, set ambitious vehicle emissions standards to prevent polluting vehicles from dominating the market.

Vehicles are purchased with the expectation that they will be used for decades, even if not by the first purchaser, so any new ICE vehicles bought in the 2020s are likely to continue to emit well into the 2030s and 2040s. Used vehicles represent the majority of all vehicle purchases, so it follows that lower income households could benefit from access to lower and more predictable running costs of an EV. A reliable supply of affordable used EVs will not materialise unless new EVs are brought into the country via fleet purchasing arrangements, particularly through business and government fleets.

As many manufacturers[5] and other countries[6] plan to phase out the sale of new ICE vehicles around 2030-2035, Australia could find itself in a situation in the 2030s where we still have many relatively new ICE vehicles, we have insufficiently developed charging networks, and we are not properly prepared when there is little available to buy except EVs.

So long as Australia remains an attractive market for ICE vehicles, and any fuel efficiency standard is less stringent than those applied in major markets, manufacturers will continue dumping ICE vehicles in Australia, as it will be cheaper for them to use their existing tooling for longer, rather than move more of their production to EVs.

Because of the above considerations, it is AEVA's view that **disincentives to adding internal combustion vehicles to Australia's car fleet are needed immediately**. Furthermore, so long as these ICE vehicles continue to be sold in Australia, they must be as efficient as possible.

One way to create such a disincentive would be for State and Territory Governments to restructure annual vehicle registration charges such that they are based on the vehicle's emission rating. Such a change has already been raised for debate in the Australian Capital Territory[7]. Similarly, New Zealand has introduced a purchase disincentive in its "feebate" scheme[8], which imposes a fee on high-emitting vehicles while subsidising the purchase of EVs. This scheme is already having a significant impact[9]. We note that New Zealand is well ahead of Australia in its take-up of EVs, and suggest that the Australian Government seeks to collaborate with them, and learn from their experience.

[5] See Appendix 2 for a listing of manufacturer announcements

[6] Noting the most recent announcement from the European Union: https://www.abc.net.au/news/2022-10-29/eu-ban-new-fossil-fuel-cars-boost-ev-uptake/101593696

[7] See page 21 of the ACT Zero Emission Vehicles Strategy. https://www.climatechoices.act.gov.au/__data/assets/pdf_file/0006/2038497/2022_ZEV_Strategy.pdf

[8] NZ Transport Agency. https://www.nzta.govt.nz/vehicles/clean-car-programme/clean-car-discount/overview/

[9] The NZ Minister for Transport told the National EV Summit (August 2022) that in recent months, sales of EVs in NZ have been close to 20% of total vehicle sales

The acceleration of EV take-up in other countries will have strategic implications for Australia. To take an obvious current example, the war in Ukraine is motivating Europe to accelerate the transition away from fossil fuels imported from Russia. Such a trend will have enormous economic and security implications for Australia.

QUESTION 3

3. What are suitable indicators to measure if we are on track to achieve our goals and objectives?

The only measure which counts is emissions. Because transport emissions are the product of passenger-kilometres (PK) travelled or freight-ton-kilometres (FTK) moved, pathways to emissions reduction must be broad and supported proportionally to the challenges they present. Concurrent investment in electric rail freight and supporting infrastructure is essential to make big emissions cuts over the medium term. Electrification of passenger vehicles may be the "path of least resistance" to emissions cuts, but deep emission cuts in other land transport sectors (rail, freight, public transport) will be needed, and these should not be left to rely on questionable carbon offsets.

Other ways of approaching this measure are to verify that:

- The emission ratings of newly sold vehicles follow a steadily contracting gCO_2/km trajectory (grams of CO_2 emitted per kilometre of travel) towards zero at 2035, and
- The sale of ICE vehicles contracts via the expected magnitude considering the steadily improving fuel efficiency ratings of new vehicles and their proportion in the overall fleet.

Secondary measures

There are useful secondary measures. The *VFACTS*[10] sales data published by the Federal Chamber of Automotive Industries is useful for tracking sales trends and learning which EV models are most popular. This data needs to be supplemented by data on the imports of used EVs.

Suitable targets could be that:

- EVs are available in most vehicle categories by 2025
- Sales in the light vehicle category (ordinary cars) are at least 20% electric by 2025, 50% by 2030 and 100% electric by 2035. As the consultation paper notes, sales of EVs tripled in one year from 2020 to 2021, so doubling every five years is not excessively optimistic.

States and Territories should continue to maintain key registration data which captures all EVs, including grey imports and even conversions. In our experience the quality of this data needs to be improved. It may also be useful to maintain statistics on the number and types of public vehicles which are transitioned to electric.

[10] Get VFACTS. https://www.fcai.com.au/sales/get-vfacts

State and Territory Governments could also collect data on public charging infrastructure, including data on outages and on speed-of-response when outages occur.

QUESTION 4

4. Are there other measures by governments and industry that could increase affordability and accessibility of EVs to help drive demand?

Affordable EVs includes two-wheeled EVs. AEVA recommends that **all incentive programs include motorcycles and scooters, as well as e-bikes, as a low-cost and high impact way to shift more passenger-kilometres to electric power**.

Robust vehicle emissions standards will compel manufacturers to offer models which achieve better than 95g CO_2/km, meaning smaller, lighter vehicles are advantaged. Appropriate costing of road use should also favour lighter vehicles. Second-hand EVs are still cheaper than new EVs, despite the unusually high prices they are fetching currently, and efforts to bolster this market are required. Fleet arrangements will deliver cheaper passenger and light commercial vehicles when sold after their lease expires, however fleets may choose to hold onto the vehicles for longer to maximise the savings, thereby delaying the growth of this market.

Finally, **the importation of second-hand EVs should be far less onerous than it currently is** (see response to Question 14). While the number of vehicles imported through this parallel market is small, it is growing and they still represent the most affordable passenger EVs in the country. Likewise, electric motorcycles and scooters offer enormous potential to lower passenger-kilometre emissions while also reducing congestion in our cities through smaller footprints and parking demands. Dozens of makes and models of electric motorcycles are in use around the world, but ADR (Australian Design Rules) compliance[11] is both expensive and time consuming – **streamlining the e-motorcycle importation process should be a priority**.

AEVA commends many of the recommendations of the 2019 Report of the Senate Select Committee on Electric Vehicles[12], particularly the program of revenue-neutral measures outlined in the 'Chair's Additional Comments'. These are generally consistent with the current Federal government's stated policies.

QUESTION 5

5. Over what timeframe should we be incentivising low emission vehicles as we transition to zero emission vehicles?

Special measures (such as purchase rebates, stamp duty waivers and tax concessions) are a proven strategy for motivating prospective buyers to switch to an EV. **There should be a nationally consistent approach to these support measures**. We expand on this point under Question 19.

[11] Australian Design Rules. https://www.infrastructure.gov.au/infrastructure-transport-vehicles/vehicles/vehicle-design-regulation/australian-design-rules

[12] Senate Select Committee on Electric Vehicles. Report https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Electric_Vehicles/ElectricVehicles/Report

These measures should really only be required until EVs reach a "tipping point" in the market. Some analysts define this tipping point as 5% of new car sales[13]. On the other hand, Norway, where EVs already represent more than 80% of new car sales, will be retaining its subsidies until the end of 2022[14]. We suggest a threshold of about 15% of new car sales. But in any case, we accept that these subsidies should not be permanent as they can have inflationary impacts.

No additional incentives should be offered for non-zero-emission vehicles due to the risk that they will become wasted resources before they are worn out, or remain on the roads at a time when deep emission cuts are needed. **For this reason, we advise against any specific parallel incentives for plug-in hybrid (PHEV) designs**. In practice, the emission reductions from PHEVs have proven disappointing[15]. When their purchase was encouraged for fleets, it was found that despite education efforts, they were quite often used purely in ICE mode without ever being plugged in[16].

Another form of financial support is the **provision of grants for EV fast-charging infrastructure**. In our view, Federal support for such infrastructure must continue, and must be planned in collaboration with State/Territory and Local Governments. One fast charger installation makes electric road travel easier for every EV driver, every day. By contrast, a cash incentive to buy a new EV advances the transition for one person, once. Similarly, supporting workplace low-power charging is another excellent way to get the transition moving, and helps stabilise the electricity grid through better utilisation of abundant renewable energy.

In our experience, the frequency of outages in highway rapid chargers is unacceptably high, and the time to fix these outages is unacceptably long. It is AEVA's view that future grants for such infrastructure should be **tied to an obligation to achieve a defined level of availability and service** including rapid response to outages, or else should take into account the previous availability levels achieved by the suppliers concerned.

The most important part of the charging framework is charging at home; something which has been largely out of reach of apartment dwellers. For this reason we wish to express our appreciation for recent changes to the National Construction Code, which stipulate that new residential apartment buildings should provide core infrastructure to support EV charging in 100% of car parking spaces. AEVA made a submission[17] to the most recent review of the Code, and we were pleased to see that our recommendations were taken up. AEVA had previously provided public advice on EV charging facilities in new strata developments[18] and on retrofitting EV charging in existing strata properties[19].

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[13] Bloomberg Asia Edition, 9 July 2022. https://www.bloomberg.com/news/articles/2022-07-09/us-electric-car-sales-reach-key-milestone

[14] Norwegian EV Policy. https://elbil.no/english/norwegian-ev-policy/#:~:text=The%20current%20Government%20has%20decided,until%20the%20end%20of%202022.

[15] EU to end under-counting of Plug-In Hybrid emissions. Clean Technica, 5 July 2022. https://cleantechnica.com/2022/07/05/eu-to-end-undercounting-of-plug-in-hybrid-emissions/

[16] Real-world usage of Plug-In Hybrid vehicles in Europe. 8 June 2022. https://theicct.org/publication/real-world-phev-use-jun22/

[17] AEVA on the National Construction Code updates, 27 October 2021. https://www.aeva.asn.au/news/national-building-code/

[18] AEVA ACT Branch, 22 January 2019. https://www.aeva.asn.au/recommendations-on-ev-charging-facilities-in-new-strata-developments/

[19] AEVA ACT Branch, 13 July 2021. https://www.aeva.asn.au/retrofitting-electric-vehicle-charging-in-strata-properties/

QUESTION 6

6. What information could help increase demand and is Government or industry best placed to inform Australians about EVs?

The Australian Electric Vehicle Association has for decades organised and run EV experience events, Electrikhanas and try-drive events across Australia. We arrange displays highlighting the range of EV models on offer and answering questions from the public. Test-drives and rides have proven to be the most effective way of getting the public to understand the convenience, performance and efficiency of EVs. Other owner groups like the Tesla Owners Club run similar single-marquee events. We will continue to offer these services as long as necessary – by convincing the grassroots that electrification is a good idea, Australia has a solid foundation for change.

Written guides are available on the websites of AEVA[20], The Driven, the Electric Vehicle Council, motoring organisations, some vehicle manufacturers, charging providers, equipment sellers etc. The Federal Government could perhaps maintain a directory of such information sources wherever it provides information about its EV strategy.

Schools will continue to be an important channel for conveying information about electrification of transport. Opportunities for inspiring science, technology, engineering and mathematics (STEM) pathways in young minds are abundant in transport electrification. As examples, we note the secondary school classroom resource for EVs developed in Canada[21] and the Greenpower Education Trust developed in the United Kingdom[22].

Turning to Government sources, the Federal Government's Green Vehicle Guide (GVG)[23] is a useful source of information about EVs, but it could be regularly improved and updated. The GVG correctly notes the zero tailpipe emissions of each listed electric model but also refers to the 'fuel lifecycle CO_2' emissions of EVs based on an outdated national average for the emission intensity of electricity generation. This misleadingly overstates the emissions from an EV, and gives the impression that this number is static.

While an ICE vehicle never improves, an EV has continually lowered emissions as the grid incorporates more renewable generation. Since the federal government's own 2030 target is 82% renewable electricity generation, it would be more accurate for the GVG to present the likely emissions intensity over the life of the vehicle (which would be a far lower number). At the very least, the GVG should prominently note that this number is an upper limit that will fall dramatically during the life of the EV.

In addition to overstating the emissions from an EV, the GVG also understates the emissions from an internal combustion vehicle by 24% to 30%. Whereas upstream emissions are included in the electricity emissions intensity, the additional 'well to tank'

[20] For example, see https://www.aeva.asn.au/aeva-act-information-leaflets/
[21] Resources for Rethinking. https://resources4rethinking.ca/en/resource/electric-vehicle
[22] Greenpower Education Trust. https://www.greenpower.co.uk/about
[23] Green Vehicle Guide: an Australian Government Initiative. https://www.greenvehicleguide.gov.au/

emissions resulting from the extraction, transport and refining of petroleum fuels (up to 720 g CO_2/litre in the case of petrol) have not been included[24] .

The GVG is also misleading where it lists the fuel type for non-plug-in hybrids as 'electric/petrol' or 'electric/diesel'. Since all of the hybrid vehicle's energy is unavoidably derived from petrol or diesel, they should be simply described as conventional hybrids, in order to avoid confusion with vehicles which can derive some or all of their energy from non-fossil fuel sources.

EV awareness campaigns might prove a productive avenue for the government. Currently, affluent but uninformed buyers continue to buy expensive new ICE sedans and soft-road 4WDs when there are already good EV offerings available in this market segment. The worldwide rapid uptake of EVs and the anticipated rapid depreciation and decline of ICE vehicles could also be highlighted.

QUESTION 7

7. Are vehicle fuel efficiency standards an effective mechanism to reduce passenger and light commercial fleet emissions?

AEVA strongly supports and encourages the introduction of a mandatory vehicle emissions standard as a means to address EV supply problems, and thereby reduce fleet emissions. There is a substantial disincentive for carmakers to sell low emission vehicles in Australia because they are sacrificing significant financial credits (up to $18,000 per vehicle) that they would otherwise receive by selling into countries with emissions standards. Thus, implementation of equivalent standards is crucial for improving the supply of EVs to Australia.

The fact that Australia remains a low-priority market for EV manufacturers is reinforced by the most recent EV Outlook report from Bloomberg New Energy Finance[25]. The report suggests that if no emissions standard or equivalent policy is introduced, EVs could represent just 66% of sales by 2040, making up just 32% of the total fleet. It recommends an efficient emissions standard which would give consumers and infrastructure time to adjust in the short term, before rapidly ramping up to meet solid zero emissions targets.

The Federal Chamber of Automotive Industries (FCAI) states that it supports such standards[26], although it would appear to support only a weak standard[27] which will fail to reduce emissions at a sufficiently rapid rate. The FCAI proposal will fall short of a 50% reduction by 2030, which is the bare minimum required if we are to reach essentially zero gCO_2/km for new vehicles in 2035 and zero emissions for the entire fleet in 2050.

A strong emissions standard would make the sale of polluting vehicles impossible, or at least financially reckless. The standard should be tightened annually, until a complete

[24] Innovation Origins, 16 February 2020. https://innovationorigins.com/en/producing-gasoline-and-diesel-emits-more-co2-than-we-thought/

[25] Cited in The Driven, 20 October 2022. https://thedriven.io/2022/10/20/australia-stuck-as-low-priority-market-for-evs-without-emissions-standards-says-bnef/

[26] Federal Chamber of Automotive Industries. Media release, 29 March 2022. https://www.fcai.com.au/news/index/view/news/757

[27] Sydney Morning Herald, 8 August 2022. https://www.smh.com.au/national/revealed-car-industry-s-secret-emissions-plan-would-slow-electric-vehicle-uptake-20220805-p5b7pe.html

phase out of internal combustion vehicles by 2035. **AEVA recommends starting at 95 g CO_2/km and reducing this steadily until 2035, when all new vehicles should be emissions-free**.

It is worth noting the New Zealand policy which requires all new light-duty vehicles imported into New Zealand to meet a standard of 145g CO_2e/km in 2023, but tightens this standard considerably to 63.3g CO_2e/km by 2027 [28].

Finally, as electric motorcycles and scooters have not seen the same level of technological investment as passenger cars, they would benefit from a less ambitious initial standard of say, 130 g CO_2/km. The target should also be tightened over time so as to incentivise more electric motorcycles into the Australian market over the coming years. This will further increase the diversity of makes and models, and put competitive downward pressure on prices.

QUESTION 8

8. Would vehicle fuel efficiency standards incentivise global manufacturers to send EVs and lower emission vehicles to Australia?

For Australia, the nature and magnitude of the incentives and disincentives should closely match those of the most stringent markets. If a manufacturer has even slightly less to lose by sending a high emission vehicle to Australia, and/or slightly less to gain by sending a low/zero emission vehicle, then Australia will miss out relative to those other markets that have more stringent vehicle emission standards. In other words, the standard would be the same as US and Europe: no more, and no less.

The current lack of supply is clearly a larger problem than lack of demand for EVs. The head of VW Group in Australia has recently said: "*If we had standards today, we could start bringing in (electric cars) tomorrow … That's a game changer. It really is. Not just for Volkswagen but for all car makers. It will open up the door for more affordable EVs, there's no doubt about that … The supply issue is entirely from the lack of policy leadership*" [29].

QUESTION 9

9. In addition to vehicle fuel efficiency standards for passenger and light commercial vehicles, would vehicle fuel efficiency standards be an appropriate mechanism to increase the supply of heavy vehicle classes to Australia?

Vehicle emissions standards should also apply to heavy vehicles in the MR (Medium Rigid) to MC (Multi Combination) classes[30], as technology and models become available. This is important given that these vehicles stay on the roads for longer and have high

[28] TransportPolicy.net. https://www.transportpolicy.net/standard/new-zealand-ldv-ghg-emissions/
[29] The Driven, 19 August 2022. https://thedriven.io/2022/08/19/vw-if-we-had-fuel-standards-today-we-could-bring-in-electric-cars-tomorrow/
[30] See https://www.nsw.gov.au/driving-boating-and-transport/driver-and-rider-licences/heavy-vehicle-licences/getting-a-heavy-vehicle-licence#toc-heavy-vehicle-licence-classes

annual mileages. **Emissions standards should form the basis of a transition towards emissions-free heavy vehicles by a set date, feasibly by 2035.**

We recommend that the Australian Government examines relevant overseas practices such as the standards mandated by the California Air Resources Board[31].

While discussing heavy vehicles, we note that Australia imposes a maximum width of 2.5 metres, but some battery electric trucks on the market are 2.6 metres wide, making them illegal to use in Australia. On some routes, these trucks could still make a useful contribution to reducing transport emissions. The Government might like to consider reviewing these limitations, and which routes would be suitable.

Finally, AEVA also urges the Federal Government to ramp up investments in rail, and in particular electrified freight rail, as a means to reduce freight-ton-kilometre emissions. Even a train hauled by diesel locomotives is 3 to 4 times more efficient than moving the same mass of freight by articulated trucks. If the goal is to genuinely reduce transport emissions, then more goods should be moved by rail. Passenger transport by overhead electrified rail is an extremely efficient way to move people, and the Federal Government must continue to support state and territory governments with their own light and heavy passenger rail programs. This has the greatest potential to reduce passenger-kilometre emissions per dollar spent.

QUESTION 10

10. What design features should the Government consider in more detail for vehicle fuel efficiency standards, including level of ambition, who they should apply to, commencement date, penalties and enforcement?

While it is important to get the design of efficiency standards right, the crucial feature is to have sufficient ambition to match other markets[32].

Moving to the WLTP (Worldwide Harmonised Light Vehicle Test Procedure) standard, replacing the older NEDC (New European Driving Cycle) standard, would be helpful [33] but as was noted above, we should also follow the EU in ending the undercounting of PHEV emissions.

Broad, consistent coverage of all light vehicles would reduce complexity and the risk of manufacturers gaming the system. SUVs and light commercials must be included with other light vehicles, not counted as a separate class with less stringent emission standards.

Flexible compliance mechanisms, such as banking, borrowing and trading, can give car makers a range of options to comply with a given standard. However, a clear trajectory to zero gCO_2/km should be in place to provide a signal to all manufacturers that they need

[31] International Council on Clean Transportation. Policy update, 20 July 2020. https://theicct.org/publication/californias-advanced-clean-trucks-regulation-sales-requirements-for-zero-emission-heavy-duty-trucks/

[32] The Conversation, 23 August 2022. https://theconversation.com/the-road-to-new-fuel-efficiency-rules-is-filled-with-potholes-heres-how-australia-can-avoid-them-188814

[33] WLTP Facts. https://www.wltpfacts.eu/what-is-wltp-how-will-it-work/

to make genuine zero emission vehicles if they wish to remain in business for the long term.

'Supercredits' [34], if used, should only be available for purely zero emission vehicles (not conventional hybrids or PHEVs). The risk with supercredits is the potential to undermine the integrity of the scheme. With each EV counted more than once, it would not be possible to say that the claimed gCO_2/km target was truly achieved. On the other hand, supercredits limited to the first few years might be a reasonable inclusion to kickstart EV uptake.

An early commencement date for an emissions standard, preferably well before 2025, is important to minimise the continued addition of new ICE vehicles to the fleet, which will contribute to emissions into the 2030s and 2040s. The design of the scheme would ideally mirror that of Europe without novel Australian features. An internationally consistent design should assist manufacturers with compliance and minimise the risk of unintended loopholes that provide potential for gaming the scheme.

QUESTION 11

11. What policies and/or industry actions could complement vehicle fuel efficiency standards to help increase supply of EVs to Australia and electrify the Australian fleet?

We note that the Federal Government has recently adjusted the Luxury Car Tax (LCT) to increase the difference between the thresholds at which the LCT is applied to 'efficient' versus 'ordinary' vehicles. We would like to see this gap widened further, coupled with a tightening of the definition of 'efficient' so that only true zero-emission vehicles and exceptionally efficient hybrids are included, at least in the short term.

The Commonwealth could maximise its own acquisition of EVs for the Commonwealth fleet via an 'EV-first' procurement policy, whereby non-EV purchases would have to be justified. Many Commonwealth vehicles would then flow through into the affordable used car market.

We support the current policies of some states and territories that exempt EVs from stamp duty and registration charges. Anecdotally, the exemption from registration is seen as a considerable benefit even though the cost to state revenue would be small. The Commonwealth could encourage such policies at the state and territory level to complement its own policies.

We suggest that incentives should apply only below a particular vehicle price, so as to encourage manufacturers to develop offerings in the affordable end of the market. While not proposing a particular level for that cap, we suggest it should be high enough to cover a reasonable variety of practical vehicles, but not so high that very clearly luxury vehicles are being subsidised. This could encourage the importation of a greater variety of smaller, cheaper EVs such as the Renault Zoe, which is very popular in Europe and available in New Zealand. At the moment the restricted variety of EVs is unfortunately biased towards larger, less efficient and more expensive models.

[34] Euractive, 20 July 2012. https://www.euractiv.com/section/transport/news/carmakers-to-win-super-credits-from-low-emission-vehicles/

QUESTION 12

12. Do we need different measures to ensure all segments of the road transport sector are able to reduce emissions and, if so, what government and industry measures might well support the uptake of electric bikes, micro-mobility and motorbikes?

These measures are generally the responsibility of State and Territory governments. For example, the ACTs Zero Emissions Vehicles Strategy[35] includes a planned action to "expand the stamp duty exemption to include electric scooters, motorbikes and trikes".

The Federal Government can play a useful role in facilitating discussion between the State and Territory governments and to encourage the uptake of such incentives across all jurisdictions. Furthermore, relaxing the onerous ADR compliance requirements for electric motorcycles would allow this efficient and cost-effective mode share to flourish. Conditions such as anti-lock braking systems (ABS) on motorcycles of any power level is only going to make the bike more expensive, while offering minimal safety advantages.

Finally, if a Road User Charge were to be applied, multiplying the vehicle tare by kilometres travelled would incentivise lighter and more efficient EVs such as motorcycles and scooters. Our cities would benefit from having fewer cars and more motorcycles and scooters through reduced parking demand, improved lane utilisation and reduced resource use through construction and operation of the bikes.

QUESTION 13

13. How could we best increase the number of affordable second-hand EVs?

AEVA recognises the need for the EV transition to include lower income households. Policies which promote EV fleet and private purchases will put more EVs into the used car market as the pool of new cars is on-sold.

The new Fringe Benefits Tax (FBT) exemption applies only to vehicles built after 1 July 2022. This strikes us as extraordinarily restrictive. An earlier date could enable the FBT policy to have more immediate effect. Deliberately shortening the lease period of government vehicles would be another way to increase the supply of used EVs.

State and Territory Governments could facilitate lease or loan arrangements for people on lower incomes, allowing them to benefit from the lower running costs of an EV. Such an arrangement is already in place in the ACT, involving an interest-free loan of up to $15,000. Governments could consider other options such as providing grants to community organisations for the purchase of used EVs.

As EVs enter Australia's second-hand market in greater numbers, they will initially still be relatively new vehicles commanding high prices. For a while during the transition, people on very low incomes may only be able to afford older used ICE cars but they should nonetheless see some benefit. Increasing the numbers of new and used EVs should tend to displace the poorest quality, oldest and most-expensive-to-run ICE vehicles out of the fleet to scrap.

[35] Australian Capital Territory. Zero Emissions Vehicles Strategy 2022-30. https://www.climatechoices.act.gov.au/__data/assets/pdf_file/0006/2038497/2022_ZEV_Strategy.pdf

While the Federal government has announced an exemption from the 5% import duty from Europe and the UK, it is only applied to new battery EVs (and PHEVs). Used EVs still have 5% duty applied. Furthermore, even though Australia has a free trade agreement with Japan, 5% duty is applied to a vehicle imported from Japan if it was built, for example, in France for sale in the Japanese domestic market. We suggest that all EV imports be exempted from import duty to increase the variety and decrease the cost of EVs available for purchase in Australia.

QUESTION 14

14. Should the Government consider ways to increase the supply of second-hand EVs independently imported to the Australian market? Could the safety and consumer risks of this approach be mitigated?

As stated above, AEVA believes that current limitations on the importation of second-hand EVs should be removed. The *Road Vehicle Standards Act 2018* (RVSA) and the subordinate *Road Vehicle Standards Rules 2019* (specifically clauses 129 and 129A) are currently restricting the trade and importation of used zero emission vehicles. These clauses prevent the importation of vehicles which have been previously imported into Australia by the manufacturer, even if only very small numbers (say 100 or so) were 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 the Specialist and Enthusiasts Vehicle Scheme (SEVS) already meet the Australian Design Rules as they have met equivalent standards in the source markets such as the UK and Japan.

We are aware that the FCAI has argued that independent imports should not be part of any National EV Strategy, on the grounds that

- SEVS was never intended to accommodate “common use vehicles”
- these vehicles are not supported by Original Equipment Manufacturers (OEMs) or the importers in Australia and therefore, they cannot provide ongoing support and service
- there are no guarantees these vehicles meet relevant Australian safety standards
- the charging equipment for these vehicles is designed to operate on different voltages and frequencies and that this represents a significant electrical risk
- Operators’ handbooks supplied with these vehicles are often only in the domestic language, such as Japanese.

AEVA rejects the claim that there are risks in such imports. Such vehicles meet Australian standards by default, because the European standards are acceptable standards under the Australian Design Rules. The Certificate of Conformity which the manufacturer must produce on the build of the vehicle is the proof that the vehicle has met our standards. Furthermore, the Japanese legislation is aligned with the European, which is now becoming the world standard.

To take a striking example, it is currently not permitted to import 2018 Hyundai Ioniq hatchbacks from the United Kingdom, even though

- Hyundai dealerships in Australia have been servicing this model since late 2018
- The operators handbook is in English
- Hyundai has announced that it has ceased production of this model
- The only changes needed for Australian roads are the substitution of an Australian mains plug on its portable charge cord and the substitution of Australian maps in the navigation system.

For other EV models such as the Nissan Leaf, there is now a growing number of independent mechanics (not affiliated with dealerships) who can properly service EVs and in some cases offer battery upgrade packages. It is essential that these workshops are able to continue their good work.

Finally, electric motorcycles and scooters are not encumbered with steering wheel location issues, and as such, ought to be easier to import than a car. However, despite there being dozens of makes and models of e-motorcycle in the international market, they remain very difficult and expensive to homologate into the Australian market. Reducing barriers to the parallel import of electric two-wheelers would deliver more lightweight, congestion-busting EVs for Australia.

QUESTION 15

15. What actions can governments and industry take to strengthen our competitiveness and innovate across the full lifecycle of the EV value chain?

Australian manufacturers will surely seek opportunities to establish an industry around the key components of the EV value chain. The Federal Government can offer low cost finance through the Clean Energy Finance Corporation. It could also provide access to land for factories developing EV components, while investing significantly in Australia's research capacity through ARC-Linkage grants to universities where advanced EV components may be researched and developed. We urge the Federal Government to maintain and strengthen the capability of the Clean Energy Finance Corporation to provide such investment support.

Whole EVs could also be made in Australia. Substantial talent and intellectual capital remains from our once-vibrant vehicle manufacturing plants. This talent must be nurtured and directed into these new industries. Tesla chair Robyn Denholm recently said that Australia should revive its auto industry by making batteries and electric vehicles to meet soaring global demand and help speed up the transition from ICE cars[36]. The Government should examine incentives and the provision of start-up financing for local assembly and manufacture of EVs in Australia.

Safe transport of high energy batteries introduces significant costs, but at the same time provides opportunities for Australian manufacturing through advanced recycling and resource recovery programs. In addition, the re-purposing of EV batteries for stationary energy storage is a popular and responsible way to keep valuable materials out of landfill while serving the electricity grid. High value chemicals and cathode materials for EVs represents a major export opportunity for Australia, and should be supported through

[36] Sydney Morning Herald, 14 September 2022. https://www.smh.com.au/politics/federal/australia-could-revive-its-car-industry-with-ev-says-tesla-chair-20220914-p5bi0z.html

finance and research support, including ongoing support for the likes of the Future Battery Industries CRC.

For almost 50 years AEVA has helped many enthusiastic members to convert their own vehicles to electric drive. There are hundreds of converted EVs on Australia's roads, many of which have been driving for decades. Converting vehicles is not always cost effective, but there is a growing industry in custom and niche vehicle electrification. AEVA believes these industries and the skills they foster should continue unhindered. We are concerned that there is a trend towards restricting access to vehicle technical bulletins, despite an apparent supportive push for the 'right to repair'. Organisations like AEVA have played a leading role in ensuring vehicle conversions are done to a high standard, even helping with the development of the National Codes of Practice for EV builds, and are happy to continue to work with regulators to ensure these bulletins are up to date.

All states and territories have an Electricity Regulations Act which sets out the rules around licensing, regulatory bodies and the formal definition of what constitutes 'electrical work'. Some states have a specific exemption for working on EVs, while others don't mention it at all. AEVA believes these Acts should be harmonised to specifically exempt building and working on EVs from the definition of 'electrical work'. Requiring a mechanic to undergo years of formal electrical training would be counterproductive, but some definition of competency may be beneficial, particularly for the purposes of amateur vehicle modifications and repairs. We would be happy to work with Registered Training Organisations and the Australian Skills Quality Authority on enhancing vocational skills and training for this community.

More broadly, these technical and manufacturing opportunities have huge implications for skills development. Auto mechanics will need to be trained to service and maintain EVs, and there will be similar needs in sectors such as battery manufacture. Governments can play a part in encouraging TAFE and other education providers to support this transition. Many AEVA members have the experience and know-how to support this process, and could be encouraged to join the training workforce to fill this skills gap.

QUESTION 16

16. How can we expand our existing domestic heavy vehicle manufacturing and assembly capability?

Australia is well placed to manufacture electric heavy vehicles for the domestic and export markets. Several Australian businesses are either developing or already producing roll-in, drop-in electric drive train solutions for road-going heavy vehicles, but are constrained by the cost of importing components. Thus, initiatives to enhance advanced manufacturing technology on Australian shores would reduce costs, while a local battery production industry would ensure security of supply. Australia is also well placed to develop electric railway rolling stock, both overhead catenary and battery-electric. State Governments should be commended for ensuring passenger railway rolling stock is fabricated locally, and should be supported as they expand their suburban and inter-urban networks. **Investment into electric freight rail on key corridors along with key intermodal facilities is essential to reducing transport emissions from the heavy haulage sector.**

QUESTION 17

17. Is it viable to extend Australian domestic manufacturing and assembly capability to other vehicle classes?

Manufacturing has now become a security issue, with many major industries being held captive by global supply chain constraints. This presents an opportunity for electric transport industries to add value to their offerings; from resource extraction and recycling through to battery manufacturing and whole EVs, Australia should on-shore much of this activity and take advantage of our position.

Any industry is viable with the right support, and Australia has significant advantages when it comes to battery minerals and related processing. We should take advantage of this and value-add as far down the chain as possible. The quality and price of labour in Asia is increasing, while automation and mechanisation is commonplace, so it seems inconsistent to suggest Australia's operations would be uncompetitive – there is no reason a robot running on cheap Australian renewable energy should be any more expensive than a Chinese one.

QUESTION 18

18. Are there other proposals that could help drive demand for EVs and provide a revenue source to help fund road infrastructure?

Roads are financially and socially expensive pieces of infrastructure, and current taxation models fail to appropriately account for these costs. Be it health impacts from pollution, fragmentation of ecosystems or induced demand resulting from easier motoring, roads have substantial external costs which are paid for by the whole of society. Fuel excise has served as a proxy for road usage, despite not being linked to actual road expenditure since 1959, and only raising a fraction of the total roads budget. With the electrification of road traffic underway, fuel excise revenue will continue to contract, but demand on roads will remain unchanged.

For this reason, **AEVA recommends a federally collected, state administered, universal road user charge (RUC) which is applied to all road-going vehicles; electric, petrol or otherwise**[37]. This 'usage cost' should be multiplied by the vehicle mass – large SUVs and utilities will cost more, while motorcycles and scooters will cost less. The less you drive, and the smaller the vehicle, the less you pay. A 'parked cost' component, consisting of registration costs, compulsory third party insurance and administrative fees (also proportional to vehicle mass) would ensure the non-driving externalities are accounted for. The fuel excise should remain in place as a disincentive to purchase and drive ICE vehicles. The gradual introduction of a RUC from a very modest rate, coupled with transparent calculations and pathways to reduce costs for individuals should assist in its acceptance.

[37] The AEVA proposal is set out in greater detail at https://aeva.asn.au/files/476/

Finally, the federal government may wish to review its new road funding commitments in the forward estimates in an effort to break the cycle of induced traffic demand. The savings could easily fund many of the initiatives raised in this discussion paper.

QUESTION 19

19. What more needs to be done nationally to ensure we deliver a nationally comprehensive framework for EVs?

Accelerating the electrification of transport involves a complicated set of measures where both the Federal Government and the State and Territory governments will play important roles.

The Federal Government can:

- Coordinate the development of the National EV Strategy.
- Set a clear target for emissions reduction in the transport sector.
- Ensure that the Clean Energy Finance Corporation is able to continue investing in EV manufacturing and associated supply chain industries.
- Oversee the introduction of vehicle emissions standards.
- Define changes to relevant Federal legislation such as the FBT, Luxury Car Tax, GST and importation regulations.
- Facilitate, through an appropriate Ministerial Council, a discussion of financial incentive options for encouraging the uptake of EVs where appropriate, with a view to determining a nationally consistent approach
- Set targets for the electrification of the Commonwealth car fleet
- Allocate resources and funding for nationally significant freight rail corridors
- Develop a plan to appropriately cost roads infrastructure and maintenance through a universal, distance-based and mass multiplied Road User Charge, while retaining the fuel excise.

The State and Territory governments can:

- Contribute to the National EV Strategy.
- Contribute policy options for responsible financial incentives for EV uptake, based on recent experience.
- Adjust state duties and fees in order to create a balance of incentives for zero emission vehicles while penalising high emission vehicles.
- Set targets for the electrification of state government car fleets.
- Invest in state rail statutory authorities and expand rail freight intermodal facilities.
- Develop plans to fill any gaps in EV charging infrastructure within their states or territories.
- Ensure that the changes to the National Construction Code, to facilitate EV charging in new residential apartment buildings, are speedily implemented.
- Support the retrofitting of existing residential apartment buildings.

- Provide encouragement and support to the TAFE sector in retraining auto mechanics and related trades to work in the EV sector.

AEVA strongly supports collaboration between the Federal government and the State and Territory governments to **deliver an equitable, fair and responsible strategy for transport emissions reduction**. This should move beyond passenger EVs, and extend into electric freight railways, electric passenger rail, mass transit options like electric buses and light rail. Electric bicycles, motorcycles and scooters should be included in all schemes as their impact is significant for minimal financial outlay.

QUESTION 20

20. How can we best make sure all Australians get access to the opportunities and benefits from the transition?

Accounting for almost a fifth of Australia's greenhouse gas emissions, and similar proportions worldwide, the transport sector must make deep emissions cuts. If the Earth is to keep oceanic and atmospheric temperature rises within 1.5°C of pre-industrial levels, action must start today. The scale and urgency of these cuts requires leadership and hard decisions. It is imperative that all Australians, not just those who can afford a new EV, are able to benefit from electrified transport.

An old adage is that the cheapest joule of energy is the one you don't need, and it still holds true today – not only must we deploy technologies like EVs to replace ICE vehicles, we must also find ways to prevent induced demand for road transport. Causes of induced demand are often subtle. For example, growing demand for private schools means more children are being driven to schools outside their usual public education catchment. Outer suburban housing developments which are established long before public transport routes are set up only entrenches car-commuting, making decarbonisation harder and exacerbating road congestion.

Responsible use of public land, better urban planning and investments in electrified mass transit will result in lower demand for road transport, freeing up resources which can be better used elsewhere. It is clear that we need fewer cars[38], but all of them should be electric.

The subsidisation of the fossil fuel industry must stop. Not only is this financial support unnecessary, it creates a helpless co-dependency where governments are either unwilling or unable to give up the revenue streams they promise. Again, the savings created would be substantial, and easily cover the costs of solutions advocated in this document.

We can best make sure that all Australians get access to the opportunities and benefits from the transition by:

- Widely consulting and active listening.
- Establishing a fair and just transition plan.

[38] At the National EV Summit on 19 August 2022, Gabrielle Kuiper from the Smart Energy Council said that it would be "a bad outcome to convert all 15M of Australia's ICE cars to EVs". She advocated a significant reduction in car ownership combined with a shift to more active travel, public transport and shared use of cars.

- Regular monitoring and evaluation of actions and results with those people affected.
- Taking corrective actions where needed.
- Governing in the spirit of ‘best outcome for the many, not just for the few’.

Once again, the AEVA thanks the Commonwealth government for the opportunity to contribute to this extremely important conversation about decarbonising transport. It is long overdue, but there’s no time like the present to turn things around.

We look forward to continued dialogue with the relevant ministries and are happy to provide follow-up responses to any queries or concerns.

Yours sincerely,

Chris Jones
President
Australian Electric Vehicle Association

APPENDIX 1. OUR COMMENTS ON HYDROGEN FUEL CELL VEHICLES

For ordinary light vehicles, hydrogen fuel cell EVs (FCEVs) are in our view, a solution in search of a problem. The problem they purport to address is recharging speed, but most people, most of the time, charge at home or perhaps at work or while shopping where charging does not need to be fast. With the larger battery capacities of more recent vehicles, one rarely needs a 100% charge to have ample range for the vast majority of trips. During long trips, current models of many cars can add sufficient charge for several hundred kilometres of range in the time that is needed for short toilet or coffee or meal breaks. Charging manufacturers are finding ways to further increase charging speed, so it is expected that it won't be long before a car's battery can be filled within 10-15 minutes.

Assuming "green hydrogen" produced by electrolysis by electricity generated from renewable sources, hydrogen for a FCEV requires about three times more electricity compared with charging an equivalent battery EV directly. This is due to the energy losses at each step of electrolysis, and the energy required to compress the hydrogen and run the fuel cell. Furthermore, a battery is still required in a FCEV to buffer the output of the fuel cell against rapid changes in power demand. Other forms of energy storage such as stationary batteries and pumped hydro are more efficient ways to align electricity generation and demand. We already have an electricity grid that can be augmented as more renewable generation and demand is connected.

Hydrogen is dangerous to transport and weakens metals and other materials over time, resulting in very high maintenance.

Despite the above, we recognise that hydrogen is absolutely essential for some applications and quite likely for some other applications. We are not suggesting it should be ignored. It may be needed (directly or in a carrier form such as ammonia or synthetic hydrocarbons) for extremely heavy, extremely long-range vehicles such as intercontinental shipping and aircraft but it is very unlikely for light vehicles such as ordinary cars. This is well summarised in the "Clean Hydrogen Ladder" [39] where applications are ranked from 'unavoidable' to 'uncompetitive' (trains, buses, cars).

Finally, it has recently been recognised that hydrogen has a very considerable indirect Global Warming Potential (GWP) from its ability to increase the residence time of methane in the atmosphere[40] so it is very important to ensure that hydrogen leakage is avoided. Avoiding leakage is a difficult task since hydrogen is the smallest molecule that exists.

[39] Clean Hydrogen Ladder. https://www.linkedin.com/pulse/clean-hydrogen-ladder-v40-michael-liebreich/

[40] Euractiv, 14 October 2021. https://www.euractiv.com/section/energy/news/scientists-warn-against-global-warming-effect-of-hydrogen-leaks/

APPENDIX 2. SUMMARY OF ICE VEHICLE PHASE-OUT ANNOUNCEMENTS

Below is a compilation prepared from diverse sources by an AEVA member. Toyota is a stand-out and influential in seeking a weak standard.

Already 100% EV:

Lucid, NIO, Pininfarina, Rivian, Smart, Tesla, Xpeng.

Announced Targets:

Audi all electric by 2026
BAIC: no conventional ICE by 2025
Bentley: at least PHEV by 2026, all electric by 2030
BMW: 50% electric by 2030
Changan: 100% electric by 2025
Daimler: 130 EVs / hybrid models by 2022
Ferrari: 100% EV by 2035
Fiat: all electric 2025-30
Ford: all electric in Europe by 2026, 30% electric 2030, 100% by 2035
Genesis: 100% NEV by 2040
GM: all electric by 2035
Honda: hybrid/EV by 2025, all electric by 2040
Hyundai: 23 electric cars by 2025, 50% EVs in 2030
Jaguar: all electric by 2025
Kia: 7 electric cars by 2025, 50% EVs in 2030
Lamborghini: at least all hybrid by 2024
Land Rover: all electric in Europe 2030, globally 2036
Lotus: 100% electric by 2028
Mercedes: 100% electric by 2030
Mini: all electric by 2030
Nissan: 8 EVs by 2023
Opel: 100% electric in Europe by 2028
Peugeot: 100% EV by 2023
Porsche: 80% electric by 2030
Toyota: at least all hybrid by 2030.
Vauxhall: 100% EV by 2025
Volkswagen: all electric by 2025
Volvo Cars: 50% electric by 2025, all electric by 2030