



RACQ SUBMISSION

HOUSE STANDING COMMITTEE ON CLIMATE CHANGE, ENERGY, ENVIRONMENT AND WATER: INQUIRY INTO THE TRANSITION TO ELECTRIC VEHICLES

22 March 2024



Image: RACQ EV Experience Day 2023 held at the RACQ Mobility Centre, Mount Cotton, Queensland

INTRODUCTION

The Royal Automobile Club of Queensland (RACQ) is Queensland's largest member-owned mutual, and we exist solely for the benefit of our over 1.7 million members. Throughout our 119-year history, we have actively engaged with Government in the interests of our members, sharing our expertise and recommendations on a wide range of policy areas including road safety, transport and infrastructure, natural hazard resilience, and disaster recovery.

RACQ is well qualified to comment on all matters of road safety and mobility, and we bring a unique insight into how the laws, regulations and policies that are in place could be improved for the benefit of road users, industries, and the broader community. Accordingly, we make this submission to the inquiry by the Standing Committee on Climate Change, Energy, Environment and Water into the Transition to Electric Vehicles, to assist motorists in taking advantage of technological developments while meeting the needs of people in various locations with different vehicle requirements.

Queensland is the most decentralised mainland state with large populations residing in dispersed towns and cities and in many remote communities. Queensland is also Australia's favourite long-distance road and adventure tourism state. RACQ advocates for practical and affordable ways to address decarbonisation while maximising benefit to Queenslanders and their diverse needs. The transition to electric vehicles (EVs) is essentially a leap in energy efficiency providing for a major reduction in transport energy costs for motorists. However, the transition needs to occur in a fair and balanced way, or risk disenfranchising significant cohorts of the population, be they income-based, industry-influenced, age, socio-economic or geographic.

A robust vehicle efficiency standard (on which the Government has conducted consultation recently) should be the cornerstone of any vehicle decarbonisation framework. The standard should set an ambitious target for the reduction in CO₂ emissions per kilometre, with a gradual but significant decline in the target level in the coming years to align with comparable countries' standards. A well-designed standard that boosts new efficient and safer vehicle supply will deliver a lower total cost of ownership for motorists. RACQ's submission on the proposed New Vehicle Emissions Standard sets out our position in more detail.

In addition to efficiency standards, it is important to maintain well-targeted Federal and State government purchase/lease incentives and charging infrastructure support to encourage the uptake of EVs and other Zero and Low Emission Vehicles (ZLEVs) through improving affordability and availability of charging infrastructure.

There is sufficient global EV supply capacity for Australia. The issue is that EV capacity is not being allocated to the Australian market. The International Energy Agency¹ estimated 14 million plug-in EVs and Plug-in Hybrid EVs (PHEVs) were manufactured in 2023 out of 86 million vehicles worldwide. Just over 1.2 million vehicles were sold in Australia in 2023, making Australia 1.4% of the global market. If this translated to EV sales, then EV sales in Australia should be 195,000 rather than actual sales of 87,000 in 2023.

ALL RACQ'S RECOMMENDATIONS related to the Committee's terms of reference are:

1. That the Federal Government implements a robust fuel efficiency standard for passenger cars and SUVs in line with the proposed Option B of the New Vehicle Efficiency Standard consultation paper with changes to the LCV and 4WD emission targets as per the RACQ NVES² submission to provide more time those vehicle segments to transition.
2. Federal and State Governments coordinate incentives for purchasing electric vehicles, ensuring that incentives remain in place until electric vehicles achieve a significant market share, such as 30% of new vehicle sales.
3. Federal and State Governments coordinate and provide financial support, including for electrical network upgrades, for well-placed EV charging infrastructure on regional highways and to help with fatigue management.

¹ <https://www.iea.org/reports/global-ev-outlook-2023>

² <https://www.racq.com.au/-/media/project/racqgroup/racq/pdf/advocacy/future-mobility/racq-submission---new-vehicle-efficiency-standard---consultation-impact-analysis---final.pdf?rev=dce58d20704d4888b4c47fbb8c618e37&hash=09FE7C7A3AF0C1486EE893CF8386B63F>

4. That all levels of government ensure planning and project approval processes support installation of vehicle charging facilities in commercial and residential buildings and provide targeted grants to include charging infrastructure in existing buildings.
5. That Federal and State Governments agree to progress development of a road user charge system to replace fuel excise eventually and seek expert input on the design of this system.
6. That Federal and State Governments support research and development and industry policies to support the electrification transition required to deliver a globally competitive electric transport industry, including the production electric powered commercial vehicles, recreational vehicles (caravans), public transport and military vehicles.
7. That the Federal and State Governments develop a consistent approach to the type of financial support they provide to home solar and battery systems.
8. That Federal Government support research and development into the use of ethanol as a liquid fuel for electric range extender technologies for regional/remote Australia, particularly for heavier vehicles.
9. That Federal and State Ministers for energy work with the Australian Energy Market Operator and energy companies to develop a plan to meet the likely demand from charging growing numbers of EVs.
10. That the Federal Government undertake an overarching national electric transport and battery industries policy strategy – to identify to communities, industry, and all levels of government where the opportunities are and what needs to be done to get there.
11. That the Federal Government invest in integrated university-industry battery and electric transport innovation hubs and testing facilities – supporting innovation in the laboratory and on the factory floor.
12. That Federal and State Governments expand innovation financing with a specific allocation in the National Reconstruction Fund for battery and electric transport innovation.
13. That Federal and State Governments expand education, vocational training and upskilling of workers and researchers to transition workforces to new economy manufacturing and research jobs.
14. That the Federal Government undertake a full analysis of the auto skills shortages and workforce capability required to appropriately accommodate for the implementation of the EV Strategy.
15. That the Federal Government work with State Governments and the education sector to provide research, education and training qualification programs (including for the existing workforce) and apprenticeship opportunities to service, maintain and repair Australia's growing fleet of EVs.
16. That the Federal Government implement a robust and ambitious New Vehicle Efficiency Standard.
17. That the Federal Government ensure that Australian design rules do not exclude new electric vehicles which are sold in other markets but do so without compromising road safety objectives.

RACQ RESPONSE TO COMMITTEE TERMS OF REFERENCE

The response by RACQ to the issues in the Committee's seven Terms of Reference are set out below.

Term of Reference 1: The establishment of resources, systems and infrastructure required to support transition to EVs

The most important government policy actions to support the transition to EVs cover the following areas:

- A robust and ambitious fuel efficiency standard (like the proposed New Vehicle Efficiency Standard).
- Making EV purchase by private owners and fleets more attractive through affordability measures.
- Facilitating the electrification of public transport and government vehicle fleets.
- Supporting increased access to affordable charging facilities at multi-residential, destinations and on major traffic routes

Support for the New Vehicle Efficiency Standard

The NVES will overall, be good for Australia and good for Queensland. It will help enable more cleaner cars, safer cars and cars that are cheaper to run coming to Australia. In a current state where land transport represents 10% of national emissions, we need a well-designed system that encourages supply of both affordable electric vehicles (EVs) and lower emission internal combustion engine (ICE) vehicles to the Australian market, providing for a lower total cost of ownership to motorists.

RACQ principles are:

1. The NVES should recognise the different transport and mobility needs of differing states and regions; it must work for the bush and for the inner city.
2. The NVES must be properly tuned to Australia's new and second-hand vehicle needs. In some vehicle segments moving too slow will see us limit supply of efficient vehicles and lead Australia to be a dumping ground for inefficient, less safe, higher-cost vehicles; moving too fast in some segments will unnecessarily result in higher vehicle costs where no higher efficiency options exist.
3. The NVES should be technology agnostic, recognising that, while there will be a range of technology solutions, electrification will be the main driver of emissions reduction and affordability.

RACQ conditionally supports the Government's preferred option (Option B) for the New Vehicle Efficiency Standard. We have requested that the headline standards for Light Commercial Vehicles (LCVs) are made more lenient in Year 2, Year 3 and Year 4 while still bringing Year 5 into line with the U.S. standard. Additionally, we have requested that the vehicle group "MC" (larger 4WD vehicles) be considered as part of the Light Commercial Vehicle standard, rather than the Passenger Car standard.

Despite improving battery technology there is likely to always be a need for fuel for heavier vehicles in regional and remote parts of Australia. RACQ believes that ethanol and biofuels can play a part in decarbonisation and boosting regional economies. RACQ calls on the Federal Government to support research innovation in utility vehicle ("utes") and 4WD technology and the biofuels industry development.

A relatively small number of vehicle models dominate the ute market, featuring a number of global OEMs (Original Equipment Manufacturer) whose manufacturing plants are in Thailand. The majority of utes manufactured in Thailand are sold across countries in the tropics and Australia, most of which have no fuel efficiency standards.

The issue with the LCV is not whether electric vehicles can reduce emissions or increase vehicle efficiency and operating costs (they can), but whether electric utes can meet the needs of consumers in performing the tasks required. The evidence from the U.S. is that electric pickups, which have been in the market for 18 months, have limited range capacity, particularly when towing³.

The purely electric utes that are currently available in the global market and that are likely to become available in the near future will not sufficiently meet the needs of many of Australia's regional and remote drivers. While electric drivetrains deliver better performance than ICE drivetrains in terms of emissions reduction, torque, efficiency and lower maintenance costs, current battery energy density is not sufficient for longer range trips and towing tasks. Furthermore, electrical and charging infrastructure in regional and remote locations is inadequate and lacking resilience to manage a high uptake of electric utes.

The utes, whether partly electric or not, that can meet towing and longer range trips essentially all use some level of fuel. Liquid or gaseous fuel, due to its much higher energy density than batteries, will continue to be required for a number of ute tasks, such as towing and longer trips where charging infrastructure is limited. Several vehicles being brought to market use electric motors with fuel generators (i.e. Nissan X Trail E-Power and the high-capacity towing Ram Ramcharger). The use of fuel negatively impacts on both efficiency and emissions. The key to resolving these issues is to use biofuel instead of fossil fuel and to maximise the use of the electric battery and drivetrain.

In the Light Commercial Vehicle Technology Continuum diagram below, we have set out the varying ute technologies in the global market today. The technologies increasingly lower emissions as you move towards

³ [How Well Can an Electric Pickup Truck Tow? - Consumer Reports](#) and [We Towed With Our Ford F-150 Lightning So You Won't Have To \(motortrend.com\)](#)

the right of the continuum.

RACQ Light Commercial Vehicle Technology Continuum



The Federal Government's transport emission reduction strategy is missing a key pillar of innovation and industry development, notably in encouraging innovation in the LCV segment and in biofuel policy development. In our submission to the first consultation (May 2023), RACQ argued that supporting innovation is the most appropriate pathway to emission reduction in the LCV segment. While the current emission reduction strategy includes the NVES, incentives to purchase/own vehicles (state subsidies and Federal Government Fringe Benefit Tax exemptions), and funding for charging infrastructure, it needs a fourth strategy pillar – Industry and Innovation.

RACQ believes this fourth pillar should focus on innovative vehicle technology in the LCV market. Specifically, RACQ sees the combined use of electrification and Australian-grown and processed biofuels (most likely ethanol) as the best solution for decarbonising the LCV segment. This pairing, if designed well to our conditions, has great potential in meeting the needs of regional and remote Queenslanders who rely heavily on this type of vehicle for economic and recreational activity.

Supporting and encouraging OEMs in the ASEAN region to develop an electric ute with an additional biofuel/ethanol-powered range extender generator could address the key range and towing shortfall with electric utes. Such a vehicle would ideally be designed to have a moderate to large battery and a small biofuel/ethanol generator that provides additional electricity for towing or for longer and multi-day trips. A vehicle with this composition would provide the decarbonisation and cost saving benefits required to meet the NVES, while better serving the needs of regional and remote Queenslanders.

Affordability

While the sales of EVs has increased and the availability of more affordable models has improved, the relatively higher purchase price of EVs remains an obstacle to achieving higher take-up rates. Part of achieving higher-take-up involves educating motorists about the relative total costs of owning and operating electric vehicles compared with internal combustion vehicles.

Considering the total cost of ownership for new vehicles purchased in 2023, many new BEVs (plug-in Battery Electric Vehicles) are increasingly competitive with their ICE (Internal Combustion Engine) equivalent, where they are purchased with a conventional finance model of a vehicle loan from a bank and often cheaper when purchased on a novated lease. In the small car category, RACQ's annual vehicle ownership cost report found the GWM Ora (Standard Range) in the small car range, the MG ZS Excite (Standard Range) in the small SUV category and the BYD Atto 3 (Standard Range) in the medium SUV category were all cost competitive with their ICE equivalent using a conventional finance model. The overall cost competitiveness of EVs is due to lower fuel and maintenance costs offsetting the higher purchase price, and the availability of State Government rebates which reduce the purchase price of some EVs.

The other measures which make the ownership of EVs more attractive are the incentives by the Federal Government through exempting EVs below the Luxury Car Tax Threshold from customs duty and from Fringe Benefits Tax, where they are provided as part of salary packaging.

RACQ has also estimated the benefits of the fringe benefits tax exemption for EVs, showing that the cost over five years of several of the more popular electric models purchased with a Novated Lease is equal to or lower than a comparable internal combustion or hybrid vehicle:

Novated Lease Expenses for Selected Models 2023

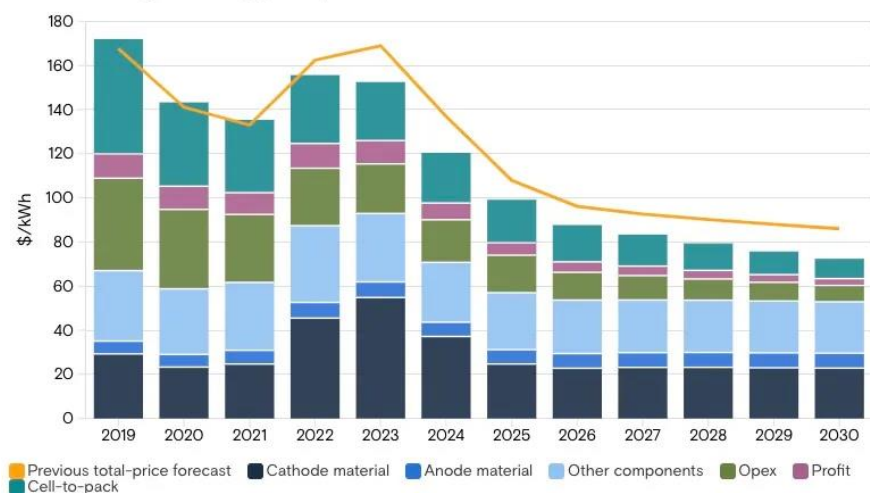
Vehicle	Post-tax monthly cost	Post-tax annual cost
BYD Atto 3 Standard Range Wagon - BEV	\$807.12	\$9,685.44
Toyota Corolla Cross GXL 2.0 Hybrid CVT FWD Wagon	\$971.37	\$11,656.43
Kia Niro S Pure Electric Wagon – BEV	\$1,002.36	\$12,028.27
Kia Niro S 1.6 Hybrid 6spd DCT Wagon	\$1,085.99	\$13,031.88
Tesla Model 3 RWD Standard Range Sedan - BEV	\$879.82	\$10,557.78
Honda Accord Vti-LX 1.5T CVT Sedan	\$1,299.53	\$15,594.32

State and Territory Governments also offer a range of incentives for purchase of electric vehicles. Since the beginning of January 2024, only Queensland and Western Australia continue to offer rebates for the purchase of new EVs, while most States and Territories offer discounts or exemptions from vehicle registration and stamp duty. The recent closure of State EV rebate programs in Victoria, New South Wales and South Australia illustrates that EV incentives are at risk of premature cessation by governments under Budget pressure and that the Federal and State Governments could work together to better coordinate EV incentives to maintain momentum for growth in EV sales.

The key cost component for EVs is the battery and the price of batteries is now predicted to decrease again following a spike in costs related to COVID supply constraints⁴. Battery pack prices, according to Goldman Sachs, are now expected to fall by an average of 11% per year from 2023 to 2030.

Battery prices are forecast to fall 40% by 2025 (from 2022)

Global average battery pack prices



Source: Company data, Wood Mackenzie, SNE Research, BNEF, Goldman Sachs Research
Data from 2023 are forecasts

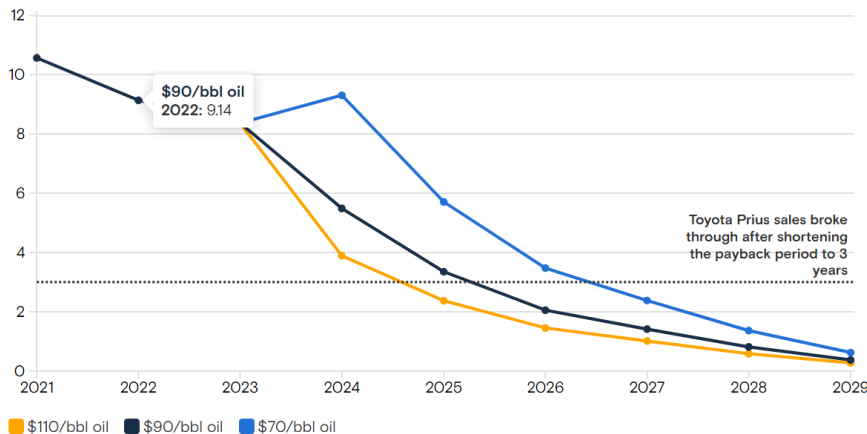
Goldman Sachs

⁴ [Electric vehicle battery prices are falling faster than expected \(goldmansachs.com\)](https://www.goldmansachs.com/insights/articles/electric-vehicle-battery-prices-are-falling-faster-than-expected) , [World's largest EV battery maker set to cut costs in half by mid 2024 \(thedrive.io\)](https://www.thedrive.com/news/100000/worlds-largest-ev-battery-maker-set-to-cut-costs-in-half-by-mid-2024)

According to Goldman Sachs, this means cost parity between EVs and ICE vehicles, without subsidies, will be achieved globally within this decade.

Lower battery prices could mean EV cost parity with ICE vehicles by mid-decade

EV cost premium payback period versus ICE in years



Goldman Sachs

In the light passenger segment, the openness of the Australian market means there are few impediments to entry of new OEMs. This means in Australia we have a competitive new vehicle market with consumers willing to adapt to new technologies and consider new brands and models. The openness of market acceptance of affordable and relatively good quality new entrants has long been a characteristic of the Australian market. Traditionally this was seen with the entry of Japanese (1960s-1970s), then Korean (1980s-1990s) and now Chinese OEMs.

Chinese vehicle sales in Australia have been increasing and in 2023 exceeded vehicles sales from South Korea, with China now in third position behind Japan and Thailand⁵. Chinese OEMs are among the market leaders in EV and battery technology globally^{6, 7}. The openness of the Australian vehicle market and lack of preferential policies means Australia is well placed to take advantage of the capacity of Chinese battery and vehicle manufacturing to deliver affordable EVs and lower emission vehicles. We are already observing this in the new EV passenger vehicle markets, with new entrants like BYD and MG offering quality, more affordable EVs, that are comparable in overall operating costs to their ICE equivalents. Elsewhere, Europe, U.S. and Japan governments need to ensure the protection and prioritisation of their local car manufacturing during the transition to low emission vehicles and this can result in policies and consumer preferences that limit the supply of Chinese vehicles.

It is also important to recognise that for the average household, the second-hand market is more important for vehicle purchase affordability. In 2023, private motorists bought four times as many second-hand vehicles than new vehicles. The key to affordability is ensuring a timely increase in supply of EVs and low emission/high efficiency vehicles to the second-hand market, while not inflating the price of new vehicles. Increasing supply of EVs and low emission/high efficiency vehicles into the new vehicle market and a rapid turnover to the second-hand market will be key to increase purchase affordability.

Supporting increased access to charging

A recent paper by Deloitte, *EV charging infrastructure: the next frontier*, suggests that by 2028 Australia will have a shortfall of 5,300 public electric vehicle chargers (including 800 in Queensland) based on the expected

⁵ [China topples Korea in 2023 Australian market production race: Hyundai and Kia overwhelmed by MG and GWM plus a little help from the Tesla Model 3 - Car News | CarsGuide](#)

⁶ [The-Global-Automaker-Rating-2022_final.pdf \(theicct.org\)](#)

⁷ [World's largest EV battery maker set to cut costs in half by mid 2024 \(thedriven.io\)](#) [Electric vehicle battery prices are falling faster than expected \(goldmansachs.com\)](#), [Investigating the U.S. battery supply chain and its impact on electric vehicle costs through 2032 and International Council on Clean Transportation \(theicct.org\)](#)

growth of electric vehicles in use and the amount of charging vehicle owners would carry out in their homes. This estimate would overstate the shortfall because it does not assume an increase in the number of chargers in use from the 2023 level, even though many suppliers have plans to instal additional chargers. Nevertheless, it is likely that strong growth in EV usage would lead to charging demand exceeding the existing plans for extra charging sites.

Federal and State Governments in Australia have supported installation of public electric vehicle charging. However, the lack of charging infrastructure and concerns about vehicle range are, according to RACQ community surveys, the main reasons why regional Queenslanders are reluctant to transition to electric vehicles. While the range of EVs is increasing, charging infrastructure in regional Australia needs specific action.

Queensland Electric Super Highway (QESH) that RACQ sponsors is a network of fast EV charging sites on major highways throughout Queensland, located with visitor facilities such as cafes, restaurants and shops. These charging facilities are important for residents taking longer trips and address anxiety about vehicle range, but the current and planned facilities only meet part of the demand for public charging. The QESH needs upgrading as nearly all sites only have one DC charger, many of which are still 50kW DC chargers.

The Queensland Government QRIDA program is adding 46 multi-charger ultra-fast charging sites across more than 30 locations across Queensland, with RACQ to deliver seven stations. This co-investment does not take away from the reality that the QESH needs upgrading, and more support is needed for more ultra-fast charging infrastructure especially along regional major highway locations across Australia as the EV uptake continues to increase. Many ultra-fast EV charging stations are being placed in regional town centres such as retail centres due to their existing higher electrical network capacity. In regional highway services station play a role in helping to manage driver fatigue by being well placed to meet rest, coffee/tea, food, and other amenities. However, many service stations have not been established with sufficient electrical network capacity to support ultra-fast charging infrastructure. Financial support for well-placed EV charging infrastructure on regional highways to help with fatigue management should be a consideration in Federal funding support for regional EV charging infrastructure.

The locations in which additional chargers are required are multi-residence dwellings, workplaces, retail centres and on streets in urban areas. Employers and building owners may have an incentive to provide charging on a commercial basis, and the role for governments would be to ensure planning and approval processes facilitate the inclusion of charging facilities in residential and commercial developments, and to provide targeted subsidies to residential building owners to instal charging points in current buildings. The New South Wales Government is providing \$10 million in grants to instal EV chargers in existing strata title buildings as an initial program, and this type of measure could be adopted in other jurisdictions.

Recommendations:

- That the Federal Government implements a robust fuel efficiency standard for passenger cars and SUVs in line with the proposed Option B of the New Vehicle Efficiency Standard consultation paper with changes to the LCV and 4WD emission targets as per the RACQ NVES to provide more time those vehicle segments to transition.
- Federal and State Governments coordinate incentives for purchasing electric vehicles, ensuring that incentives remain in place until electric vehicles achieve a significant market share, such as 30% of new vehicle sales.
- Federal and State Governments coordinate and provide financial support, including for electrical network upgrades, for well-placed EV charging infrastructure on regional highways and to help with fatigue management.
- That all levels of government ensure planning and project approval processes support installation of vehicle charging facilities in commercial and residential buildings and provide targeted grants to include charging infrastructure in existing buildings.

Term of Reference 2: The impact of moving from internal combustion engine vehicles, including fuel excise loss, existing auto industry component manufacturers and the environment

The adoption of new technologies creates both opportunities for new industries and employment and costs from the decline of existing products and technology. In the case of the movement to electric vehicles, even if new EV sales grow rapidly and account for nearly all vehicle sales by the late 2030s, the rate of change in the stock of vehicles in use will occur more gradually.

For example, if electric vehicles account for 50% of new vehicle sales (or approximately 600,000 annual sales) by 2030, the total number of electric vehicles in use in 2030 would be approximately 2.5 million, or 11.5% of vehicles in use. The number of internal combustion or hybrid vehicles in use would decline fractionally from current levels. By 2040, if new EV sales are 1 million per year on average between 2030 and 2040, EVs will account for approximately 50% of vehicles in use.

When EVs account for at least half of the national vehicle fleet, the impacts on revenue from fuel excise, and reduced demand for components and repair and servicing for internal combustion vehicles will become much more significant. By planning for this change now, these impacts can be managed.

Replacing fuel excise

The recent High Court decision that the Victorian road user charge levied on zero and low emission vehicles was invalid makes Federal and State cooperation on the development of a national user charge more urgent. The RACQ calls on the Federal and State Governments to agree to progress development of a road user charge system and seek expert input on the design of this system.

RACQ believes a national road user charge which would raise the same level of revenue as the current fuel excise in a more equitable and sustainable manner should be the aim of this process.

Any road user charge model should apply to all vehicles rather than only electric vehicles, and it would be phased in, applying initially to new electric vehicles and subsequently to all new vehicles.

Manufacturing opportunities

RACQ believes Queensland has strong potential for globally competitive electric transport industries including batteries and vehicle manufacturing. Queensland is abundant in critical minerals essential to battery production while also having globally leading battery researchers and small-scale battery manufacturing.

Supporting the need for support and development and the opportunities for Australia to revitalise industry RACQ has worked with Queensland University of Technology (QUT) and University of Queensland to agree the joint position statement attached as Annex 1.

Queensland already has significant existing transport manufacturing including Australia's largest truck manufacturer, bus manufacturers (including electric buses), rail manufacturers (passenger and freight locomotive), defence vehicle manufacturers and manufacturers of caravans, chassis, and truck trailers. RACQ believes beyond support for battery manufacturing that the Federal and State Governments should establish and fund a national network of industry-based innovation hubs focusing on battery manufacturing and electric transport in regions with significant manufacturing capacity.

RACQ engaging with QUT and UQ believe there are four key actions required to deliver a globally competitive electric transport industry:

1. An overarching national electric transport and battery industries policy strategy – to identify to communities, industry, and all levels of government where the opportunities are and what needs to be done to get there.
2. Investment in integrated university-industry battery and electric transport innovation hubs and testing facilities – supporting innovation in the laboratory and on the factory floor.
3. Innovation financing – with a specific allocation in the National Reconstruction Fund for battery and electric transport innovation.
4. Education, vocational training and upskilling of workers and researchers to transition workforces to new economy manufacturing and research jobs.

The transition to EVs is likely to generate opportunities in several technologies where Queensland currently

has manufacturing and other interests. These include ferry/watercraft, caravans, trucking, bus manufacturing, defence vehicles and aviation.

Queensland has, relative to the rest of Australia, significant truck assembly and caravan/recreational vehicle manufacturing industries. Electric trucks and vans, for short (and into the future) medium haul logistics is taking off in the U.S. and in Europe as vehicle range and price requirements are being met. This is also being driven by environmental regulatory requirements but also public health (air pollution from diesel in cities) and cost efficiencies.

Annually, over 30,000 RVs (recreational vehicles/caravans and motorhomes) are assembled in Australia, with two-thirds built entirely in Australia. There are 190 local manufacturers of RVs, mostly in Queensland and Victoria. The Caravan Industry Association had called for the Federal Government to invest in research and development and support development of what they describe as a key remaining success of Australian automotive manufacturing.

Queensland has significant capability in defence heavy vehicle manufacturing and supply chain delivery. Queensland is home to Australia's first Defence Cooperative Research Centre, the Trusted Autonomous Systems Defence CRC, delivering world leading autonomous and robotic technologies. A large proportion of this activity takes place in Brisbane around the Wacol and Richlands areas where there is also concentration of companies manufacturing trucks and trailers. Defence land transport is a sector facing future electrification opportunities. Fuel supply chains are a strategic vulnerability in forward military operations. Reduction of fuel use in forward operation has military operational benefit. If Queensland is to be at the forefront of defence industry developments, then targeted biofuel-fuel-electrification strategies will be required. The U.S. military already has a number of research and development programs on reducing fuel needs through increasing electrification of its civilian and military fleet.

Recommendations:

- That Federal and State Governments agree to progress development of a road user charge system to replace fuel excise eventually and seek expert input on the design of this system.
- That Federal and State Governments support research and development and industry policies to support the electrification transition required to deliver a globally competitive electric transport industry, including the production electric powered commercial vehicles, recreational vehicles (caravans and motorhomes), public transport and military vehicles.

Term of Reference 3: The opportunities for fuel savings, such as by combining EVs with other consumer energy technologies and savings for outer suburban and regional motorists

Savings with other home energy changes: The majority of EV drivers who live in detached dwellings charge vehicles at home – a recent study by Deloitte on vehicle charging requirements uses an assumption that people in detached dwellings would carry out 95% of charging at home.

Vehicle owners carrying out home charging can achieve savings in charging through the following:

- Charging during off-peak periods when electricity charges are lower.
- Using solar panels to generate electricity for the home would further reduce the costs of home charging – more than 30% of Australian dwellings now have rooftop solar panels.
- For homes with larger capacity solar panel sets, combining the panels with a battery, which allows for storage of power when the solar photovoltaic system generates surplus power and use of the stored power in periods when solar generation is low, would lead to further savings. The initial costs of batteries for solar systems are high, and many households would obtain sufficient savings to offset the initial costs over 10 years or more.

Several State and Territory Governments provide financial assistance to property owners to instal batteries for solar systems – Queensland and the Northern Territory provide rebates to households installing solar batteries (up to \$4,000 in Queensland and \$5,000 in the Northern Territory) and Victoria and the ACT provide interest-free loans to low-income and middle-income households for battery installation. Financial institutions can also facilitate the purchase of batteries for solar systems – for example, RACQ Bank offers Green Home

Loans, providing an additional low-interest loan to customers with a mortgage to instal energy-saving features in their homes.

To make the most of opportunities for households to achieve savings during the transition to EVs, the Federal, State and Territory Governments should seek increased consistency in the type of support they provide to home solar systems.

Savings for outer suburban and regional drivers

Drivers in outer suburban and regional areas travel higher numbers of kilometres per year than motorists in urban areas and have less access to alternatives such as public transport services. Therefore, their current fuel costs per year are higher than for motorists in urban areas and potentially they could achieve larger savings with electrification.

The annual Vehicle Operating Costs survey by RACQ indicates that the annual cost of fuel for a petrol- or diesel-powered vehicle travelling 15,000 km per year is between \$1,500 and \$2,500 for most popular new cars and can reach \$3,000 to \$4000 for large four-wheel drive vehicles. The annual costs for charging current model electric vehicles at standard household electricity rates is \$600 to \$900, leading to a saving of \$1,000 to \$1,500 per year. An additional operating cost saving is from reduced vehicle maintenance costs. Annual servicing costs for electric vehicles are in the range of \$150 to \$400 for most models, about half the servicing costs of most petrol or diesel vehicles.

The introduction of a road user charge as we have outlined earlier has the potential to produce savings for drivers of both electric and internal combustion vehicles in regional areas. While electric vehicle owners would pay a low per kilometre charge (reflecting that they are driving a zero emissions vehicle with current safety standards, and in locations with low levels of traffic congestion), the combined cost of the road user charge and vehicle charging costs would be lower than the fuel costs for a petrol or diesel vehicle. The road user charge for an internal combustion vehicle in regional areas may also be lower than fuel excise if the vehicle has high safety and fuel-efficiency standards.

Educating motorists in regional areas about potential savings from electric vehicles and upgrading the electric vehicle charging network would be necessary to encourage motorists to take advantage of these potential savings.

Electrification-biofuel combination

While EVs will satisfy the transport needs of most Australians, especially those residing in metropolitan areas and adjacent hinterlands, motorists in rural and remote areas may require sustainable liquid fuel sources to supplement electric power, where the charging options are limited.

A promising option to encourage drivers in remote areas to use electric powered vehicles is the development of biofuel range extenders. The concept of an electric powered vehicle with a range extender is that the electric motor(s) drive the wheels, and an internal combustion engine can provide power to the electric motor when the vehicle batteries are low. This combination can allow a much longer range between refuelling or recharging than either a purely electric or purely internal combustion power source.

The internal combustion engine can have several fuel sources, and a low-emission option which takes advantage of Queensland existing agricultural production is to use E85 ethanol and petrol blended fuel (a mix of 85% ethanol and 15% unleaded petrol). E85 use provides environmental benefits such as improving urban air quality. Studies show an E85 blend emits less carbon monoxide and unburnt hydrocarbons compared to 100% mineral petroleum. The CO₂ produced in burning ethanol is offset by the CO₂ sequestered in the feedstock as it grows. In Australia, the feedstock is sugar cane or grain in most cases.

The fuel use would depend on the size and power of the internal combustion engine, but the E85 fuel should have a lower retail price, as the lower excise rate for ethanol means total excise would be less than half the excise for unleaded petrol.

RACQ recommends the Federal Government support research and development into the use of ethanol as an electric range extender for regional/remote Australia, particularly for heavy vehicles.

Recommendations:

- That the Federal, State and Territory Governments develop a consistent approach to the type of financial support they provide to home solar and battery systems.
- That the Federal Government support research and development into the use of ethanol as a liquid fuel for electric range extender technologies for regional/remote Australia, particularly for heavy vehicles.

Term of Reference 4: The impact on electricity consumption and demand

The growth in the number of EVs in use will create increased demand for electricity use for vehicle charging, although any demand for additional generation capacity depends on the timing of vehicle charging by owners and the offset from electric vehicles also being a source of power through vehicle to load and in the future vehicle to grid uses.

Deloitte has estimated that when the number of EVs in use reaches 2.5 million (which could occur by 2030), the annual demand for electricity for charging would be 3570 gigawatt hours per year, or 1.9% of Australia's total electricity use. If vehicle to load and vehicle to grid use partly offset this use, and vehicle owners regularly charge vehicles outside of peak demand periods, the net impact on electricity demand would not require any significant increase in electricity generation capacity.

When EVs reach approximately half of all vehicles in use, which could occur by 2040, the demand for electricity for charging vehicles could reach 9% of total electricity consumption. Even with off-peak charging and vehicle to load or vehicle to grid offsets, some additional generation capacity is likely to be required.

To plan for this increase in demand, Federal and State Ministers for energy would need to work with the Australian Energy Market Operator and energy companies to develop a plan to meet the likely demand from charging growing numbers of EVs.

Recommendation:

- That Federal and State Ministers for energy work with the Australian Energy Market Operator and energy companies to develop a plan to meet the likely demand from charging growing numbers of EVs.

Term of Reference 5: The opportunities for expanding EV battery manufacturing, recycling, disposal and safety, and other opportunities for Australia to support the ongoing maintenance of EVs

To decarbonise our economy and to meet emissions targets there must be a national shift to renewables and electrification, including in transport. For that transformation to occur there will need to be a re-industrialisation of the Australian economy. Queensland and Australia have advanced technological R&D and all the mineral resources (rare metals, lithium, aluminium, and nickel, etc.) to manufacture batteries. However, we lack local industry market demand of any scale for transport batteries unless we can grow and scale our electric transport manufacturing industry. This provides a choice for Australia – to either:

- simply export raw or semi-processed or refined battery minerals; or
- move our economy up the value chain, using our skills, ingenuity, and innovation to not only mine and refine, but also to research, develop, and manufacture at scale batteries and electric transport vehicles and technologies.

Supporting the need for support and development and the opportunities for Australia to revitalise industry, a joint policy statement from QUT (Queensland University of Technology), RACQ and UQ (University of Queensland) is attached as Annex 1.

If Australia is to oversee an increasingly large EV fleet and electric transport manufacturing industrial ecosystem, it needs to urgently address the technical skills gap as mechanical requirements decrease and electrical/software servicing increases. Service industries, including insurance repairs and Roadside Assistance as provided by RACQ and other groups, will require additional specialist skills, knowledge and specialist equipment (including high-voltage tools, computer diagnostics and safety gear).

In the National Electric Vehicle Strategy released in 2023, the Government referred to the New Energy Apprentices program, which provides up to \$10,000 in payments over four years and an industry mentor to apprentices in clean energy positions, and the New Energy Skills program. Additional measures may be required to meet the skills requirements of a growing EV fleet.

The Motor Trades Association of Australia recently commissioned research by Deloitte Access Economics on skills shortages in the automotive sector. The report noted the rate of filling vacant positions for electric vehicle technicians stands at 41%, highlighting a pressing need for skilled professionals to service Zero or Low Emission Vehicles.

The report identifies several key factors contributing to the shortage, including a lack of skilled/qualified workers, issues with the industry training pipeline, visa challenges, remuneration concerns, and stiff competition from other sectors.⁸

RACQ Insurance is seeing an uptick in EV repairs in line with increased EV ownership. RACQ recognises the work already completed by the Queensland Government in the education sector in training EV-capable motor mechanics and auto electricians.

Already, the global EV industry is employing engineers who specialise in mechanical, electronics, electrical, software and instrumentation disciplines, applying their skills to research and development and other roles that build out foundational technical knowledge for EV products. Translation of these skills across various technologies is critical to develop new products to meet growing consumer demand.

RACQ currently works with eight repairers in Queensland with the requisite capability to undertake insurance claim repairs on EVs, with several other repairers soon to be accredited. A significant expansion of this capability across Queensland and Australia will be required to meet the anticipated demand of the insurance sector alone. Additionally, new maintenance and aftermarket service capabilities will be required. There are also opportunities to design and manufacture batteries, EVs (starting with trucks, buses and caravans) and other related technologies, such as EV chargers. Reuse and recycling of batteries post vehicle will also be an opportunity.

RACQ recommends that the Federal Government undertake a full analysis of the skills shortages and workforce capability required to appropriately accommodate for the implementation of the EV Strategy.

RACQ also recommends the Federal Government work with State Governments and the education sector – especially TAFEs and universities – to provide research, education and training qualification programs (including for the existing workforce) and apprenticeship opportunities to service, maintain and repair Australia's growing fleet of EVs. Government sponsored internships, build and research projects, and “hackathons” are just some examples of how practical skills may be developed.

Recommendations:

- That the Federal Government undertake an overarching national electric transport and battery industries policy strategy – to identify to communities, industry, and all levels of government where the opportunities are and what needs to be done to get there.
- That the Federal Government invest in integrated university-industry battery and electric transport innovation hubs and testing facilities – supporting innovation in the laboratory and on the factory floor.
- That the Federal Government and State expand innovation financing – with a specific allocation in the National Reconstruction Fund for battery and electric transport innovation.
- That the Federal Government and State support education, vocational training and upskilling of workers and researchers to transition workforces to new economy manufacturing and research jobs.
- That the Federal Government undertake a full analysis of the auto skills shortages and workforce capability required to appropriately accommodate for the implementation of the EV Strategy.

⁸ Motor trades Association of Australia, Australia's Automotive Industry faces critical skills shortages: MTAA Report Reveals Urgent Need for Government Action, release 6 March 2024.

- That the Federal Government work with State Governments and the education sector to provide research, education and training qualification programs (including for the existing workforce) and apprenticeship opportunities to service, maintain and repair Australia's growing fleet of EVs.

Term of Reference 6: The impact of Australia's limited EV supply compared to peer countries

Australia is an importer of passenger and light commercial vehicles, with local vehicle construction concentrating on heavy and recreational vehicles, and assembly of right-hand drive versions of larger light commercial vehicles. Therefore, Australia relies on the decisions by international automotive companies on which vehicles from their ranges they supply to the Australian market. The factors affecting these decisions are:

- The relatively small size of the Australian market in aggregate and the level of demand for different vehicle types.
- The costs of modifying a vehicle to meet any unique regulatory requirements for the Australian market.
- Incentives or disincentives through government policies to sell different types of vehicles in Australia.

Globally, it appears that planned increases in EV production would be sufficient to meet demand from the Australian market. The International Energy Agency has projected that, based on the announced emissions reduction objectives of countries which produce or purchase significant numbers of vehicles, the global sale of EVs would reach 45 million by 2030, and the plans of major automotive manufacturer indicate global production would match the expected growth of sales.

Therefore, if vehicle manufacturers are confident about demand growth in Australia, they are likely to supply a sufficient range and volume of new vehicles. Demand is increasing, with the battery electric vehicle share of new vehicle sales rising from less than 2% to 10% in the last three years and the number of electric vehicle models also increasing.

Measures which would assist in increasing and sustaining demand for EVs in Australia are:

- Adoption of a New Vehicle Efficiency Standard.
- Maintenance of State financial incentives for EV purchase and operation until the market is more mature.
- Support for vehicle charging infrastructure to increase confidence in EV purchases.
- Ensuring any unique vehicle design standards for Australia would not exclude a significant proportion of electric models for the Australian market.

Recommendations:

- Implement a robust and ambitious New Vehicle Efficiency Standard.
- That the Federal Government ensure that Australian design rules do not exclude new electric vehicles which are sold in other markets but do so without compromising road safety objectives.

Term of Reference 7: Any other relevant matters

RACQ has no further comments.

AUTHORISATION STATEMENT

This submission was prepared by RACQ (The Royal Automobile Club of Queensland Limited, ABN 72 009 660 575) and is authorised by General Manager Advocacy Joshua Cooney.

ANNEX 1 - POSITION STATEMENT OF QUT, RACQ AND UQ ON TRANSPORT INDUSTRY ELECTRIFICATION OPPORTUNITIES FOR QUEENSLAND

This policy statement highlights the need to renew Australia's industrial capacity to meet to the needs of an electrified transport system.