

Submission to the Senate Select Committee on Electric Vehicles by the Tesla Owners Club of Australia



26 July 2018

"Tessie", a Tesla Model S electric car is pictured at Uluru, NT, during an unassisted journey around Australia by a TOCA member using the Round Australia Electric Highway. (Photo Credit Dave Cann)



INTRODUCTION

This document forms a submission to the Senate Select Committee on Electric Vehicles and is made on behalf of the members of the Tesla Owners Club of Australia (TOCA). It responds to the stated terms of reference for the committee, being to inquire into and report on the following matters:

- a) the potential economic, environmental and social benefits of widespread electric vehicle uptake in Australia;
- b) opportunities for electric vehicle manufacturing and electric vehicle supply and value chain services in Australia, and related economic benefits;
- c) measures to support the acceleration of electric vehicle uptake;
- d) measures to attract electric vehicle manufacturing and electric vehicle supply and value chain manufacturing to Australia;
- e) how federal, state and territory Governments could work together to support electric vehicle uptake and manufacturing, supply, and value chain activities; and
- f) any other related matters.

Globally electric vehicles will grow to form a significant proportion of the vehicle fleet over the next couple of decades. The majority of traditional car manufacturers are launching electric vehicle programs and there are a number of disruptive newcomers entering the market. The current uptake of electric vehicles in Australia lags much of the developed world and it is encouraging to see steps, such as the Senate Select Committee, being taken to understand and address this shortfall compared to our peers. The opportunity remains for Australia to be a leader, rather than the follower, if decisive action is taken.

Whilst this submission is focused on the adoption of electric vehicles it is important that the impacts of parallel disruptive technologies such as autonomous vehicle control are considered when determining the future shape of personal, public and commercial transportation in Australia.

ABOUT TOCA

The Tesla Owners Club of Australia (TOCA) (www.teslaowners.org.au) is a not for profit organisation incorporated under ACT law in 2016. It is a growing nationwide club with approximately 400 members from all Australia states. TOCA has a strong relationship with Tesla and is part of the official owners club program. Whilst focused on ownership and support of Tesla products the club's objects and purpose include promoting the wider adoption of electric vehicles in general.

The club has an active facebook page allowing discussion on matters of interest to prospective and current owners of Tesla vehicles, a charging adaptor loan program, periodic social events in each state, and provides a platform for raising issues of importance to our members with Tesla or other organisations. TOCA has recently been a key partner in rolling out the Round Australia Electric Highway (RAEH). The RAEH provides 3 phase charging locations for electric vehicles at an average spacing of 300kms around the perimeter and through the centre of Australia.



THE POTENTIAL ECONOMIC, ENVIRONMENTAL AND SOCIAL BENEFITS OF WIDESPREAD ELECTRIC VEHICLE UPTAKE IN AUSTRALIA

A reduction in health care costs – Air pollution from motor vehicles is a significant cause of respiratory and related health problems, particularly in urban areas. A study completed by NSW Department of Environment and Conservation in 2005 [Ref 1] estimated the health costs related to air pollution for the Greater Sydney region alone to be around \$4.8 billion per annum. The study calculated that 58% of nitrogen oxides, 38% of volatile organic compounds and 9% of fine particulate matter emissions in the Greater Sydney region were attributable to motor vehicles.

A reduction in urban noise disturbance – One only has to try and have a conversation on a busy street to understand the level of noise associated with traditional vehicles, particularly commercial vehicles and public transport vehicles when accelerating. EPA Victoria state that road traffic is the most common source of noise in Victoria. It is heard by 70 per cent of residents, and significantly 'bothers, annoys or disturbs' 20 per cent of the population annually [Ref 2]. Whilst electric vehicles do not eliminate all sources of road noise they can significantly reduce it's overall impact.

Improved National Energy Security -The Federal Government has recently announced an enquiry in to national energy security, particularly around the number of days reserve of automotive fuels. A major political shift or natural disaster overseas could see our transport system, which is almost solely dependent upon the import of overseas oil products, crippled in a matter of days. In contrast our domestic electricity is generated from locally sourced coal and gas or increasingly renewable resources.

Improved national balance of payments – In 2017 approximately \$24B of fuel and lubricants were imported to Australia. Even if the vehicles themselves were not manufactured in Australia a move to locally produced energy for transportation would significantly improve Australia's balance of trade.

More efficient use of energy – Electric vehicles are typically 3-4 times more efficient in their energy use than internal combustion engines, where a large proportion of the available energy is wasted as heat and noise. In times of increasing cost and demand for energy it is prudent to use it as efficiently as possible. This is particularly true when considering the finite, non-renewable, nature of oil reserves.

A reduction in life cycle carbon emissions – Studies which have been undertaken using scientifically robust approaches have generally concluded that the life cycle carbon emissions for an electric vehicle (including manufacture, use and end of life disposal) are approximately half that of a traditional vehicle [Ref 3]. Those figures will only improve as the carbon intensity of electricity generation reduces.

An ongoing reduction in transport related emissions per km travelled – Australian electricity generation is becoming cleaner over time. The retirement of older coal power stations and the growing investment by industry in renewable energy generation is progressively reducing the air pollution and carbon emissions associated with electricity generation. In direct contrast with a traditional vehicle whose emissions increase as it gets older, the emissions associated with use of an electric vehicle will reduce over time as the grid becomes cleaner.



Potential for stabilisation of the electricity grid – Whilst it may appear initially perverse that a new demand for electricity would help stabilise the electricity grid, there is ample opportunity to influence when electric vehicles charge either through pricing or by direct grid control of charging points which could shed or throttle vehicle charging loads at times of peak demand or grid instability. A logical extension is to make a small proportion of any battery connected to the grid available for discharge when called upon. When spread across the fleet that resource would be equivalent to many tens of times the capacity of the Tesla battery at Hornsdale wind farm which has successfully stabilised the South Australian electricity grid. The concept of a distributed battery is already being tested in South Australia using Tesla domestic battery systems and is proving very successful.

A reduction in environmental damage from oil extraction and processing – There is significant environmental harm caused during the exploration for, drilling, extraction, transport, processing, further transport, storage and disposal of oil products. Whilst a transition to electric vehicles will not remove the need for oil products, the scale of demand and associated damage would be significantly reduced.

A reduction in transport energy costs – The energy to “fuel” an electric vehicle per km currently costs between a third and a quarter of the cost to fuel an equivalent internal combustion engine vehicle. This is significant benefit to those that need to travel greater distances per day, such as those that live in the country or have a long commute to their place of work.

More predictable transport energy costs – Whilst electricity prices for domestic customers do fluctuate these changes typically occur over an annual or longer timeframe and come with advanced warning. In addition many electric vehicle owners choose to invest in solar power systems and hence can have much greater control over the cost of the energy they consume for transport. This is in direct contrast to volatile petrol and diesel fuel prices which can fluctuate widely day to day and are highly sensitive to overseas conflict or other supply chain interference outside the control of the Australian Government.

Looking forward the reducing availability of crude oil associated with the concept of “peak oil” can only lead to an increase in the pricing of fuel products currently used for most transportation. Whilst there is much debate over when “peak oil” will occur, it is generally accepted that there will come a time where production rates will peak and start to reduce, despite growing demand.

Reliability – An electric vehicle has around 20 moving parts. A modern internal combustion engine vehicle has closer to 2000. Put simply there is less complexity in the drivetrain of an electric vehicle which leads to greater reliability.

Employment – There is potential for significant job creation in areas of Australia which have been hit by the closure of automotive and other manufacturing industries if local electric vehicle manufacturing and supply chain industries can be established. There is also significant opportunity for employment growth in mining of raw materials for electric vehicle and stationary batteries. This is likely to offset any losses from a downturn in coal mining associated with a global shift away from carbon intensive electricity production.



OPPORTUNITIES FOR ELECTRIC VEHICLE MANUFACTURING AND ELECTRIC VEHICLE SUPPLY AND VALUE CHAIN SERVICES IN AUSTRALIA, AND RELATED ECONOMIC BENEFITS

Australia would appear to have four key areas of opportunity in electric vehicle manufacturing and supply chain services:

1. Raw material supply and processing
2. Experienced workforce
3. Existing facilities
4. Intellectual Property bank

Raw material supply and processing - With a rapid global growth in the demand for batteries, both for use in electric vehicles and stationary storage solutions, there is significant and growing demand for raw materials which include Lithium, Nickel, Copper, Aluminium and Cobalt. Australia has significant proven or emerging deposits of these key raw materials. Rather than just selling the raw materials to the highest overseas bidder there is a significant opportunity for Australia to value add (and share in the employment benefits and profits) through the processing of the raw materials, the production of battery units and ultimately the manufacture of entire vehicles within a politically stable country with minimal natural or political supply chain risk. The battery units used in cars are very similar to those being deployed in the stationary energy storage market. By increasing capacity in this area costs can be lowered for electric vehicle and stationary energy storage solutions.

Experienced workforce - Australia has until recently had a domestic car manufacturing industry with the associated workforce and supply chain with experience in the design, engineering, assembly and modification of vehicles. There is opportunity both in the attraction of existing global manufacturers, but also in supporting new startup companies, if automotive centres of excellence could be established to capitalise and develop the existing resource and experience base.

It is important to note that modern manufacturing facilities of any scale are likely to be highly automated. Tesla's success with their factory in the US has shown that manufacturing facilities can still be commercially viable in countries with high labour costs. What will be required is re-training and upskilling of the workforce to support modern manufacturing techniques and new technologies.

Existing facilities - Associated with the prior automotive industry there are physical facilities associated with manufacture as well as the development and testing of vehicles which could be upgraded and updated to suit the new wave of electric vehicles.

Intellectual Property bank - Australia has had, and continues to have, a significant bank of intellectual property in the development and design of vehicles. There is a real opportunity to retain this skill set in Australia and inspire the next generation to follow a path in vehicle engineering, development and design.



MEASURES TO SUPPORT THE ACCELERATION OF ELECTRIC VEHICLE UPTAKE

Education of the public - Whilst much focus is placed upon the green credentials of electric vehicles, we see a surprisingly diverse set of drivers from TOCA members in choosing a Tesla electric vehicle. These include outright performance of the vehicle, the technology, freedom from the oil supply chain, reduced running costs, disruptive change to the automotive industry and the overall superior driving experience. Much of the public resistance to electric vehicles relates to outdated concepts regarding the range, charging times, cost of electricity and a reduction in the fun of driving.

Whilst car companies can address some of these through their advertising (if they are truly committed to electric vehicles) there is a need for a wider education program to address the historical views of much of the population. It is noted that traditional car dealerships have generally not been good at promoting electric vehicles either due to lack of staff education or a conscious decision to not promote the new technology which needs less after sales service support (which drives their profitability).

Experience and familiarity - Once most people have experienced a modern electric vehicle for themselves they do not want to go back. One way to normalise electric vehicles and provide the general public with experience with them is to encourage uptake by government, private fleet, taxi, hire car and similar services. This might be achieved through specific tax or other incentives or a tightening of overall fleet emission standards.

Cost of entry – Currently many electric vehicles are more expensive to purchase than an equivalent Internal Combustion Engine (ICE) vehicle. However, at the higher ends of the market when comparing against a vehicle offering equivalent performance and technology, pricing can be very similar or even favour the electric vehicle (for example a Tesla Model S vs a Mercedes E class or BMW 5 series). One area which should be addressed immediately is raising the Luxury Car Tax threshold for pure electric vehicles as this tax disproportionately penalises longer range electric vehicles due to the higher purchase price associated with a larger battery.

With the expected local release of the Tesla Model 3 in 2019 a high performance long range electric vehicle will be within reach of an increased proportion of the population. It is also encouraging to see the anticipated release of competing electric vehicles from more traditional manufacturers. If the goal is to positively discriminate in favour of electric vehicles then the government may want to consider short to medium term reductions in costs such as stamp duty or initial registration for electric vehicles.

Support for businesses - Businesses running ICE powered vehicles are permitted to claim fuel and maintenance costs as well as depreciation up to a set threshold. Fuel and maintenance costs will be lower for an electric vehicle, however given the higher cost of entry an increased limit for depreciation should be considered for electric vehicles to provide a level playing field for business use. An associated review should also be made of Fringe Benefits Tax to ensure that there is not a disincentive to employers or employees in selecting an electric vehicle over an ICE powered vehicle.



Additionally measures to encourage businesses to install charging infrastructure for use by employees, customers and visitors should be considered which may include being able to charge a nominal fee or a per kWh charge for their use.

Availability of high speed DC charging infrastructure - One of the greatest barriers to more widespread consideration of electric vehicles is the available range and associated time taken to recharge when on a long distance trip. Whilst many Australians would never, or perhaps rarely, drive between Sydney and Melbourne in one day it is the yard stick by which any potential vehicle is measured. Tesla has made this trip easily achievable in around 11 hours, including charging stops, through it's Supercharger network. Arguably a charging stop for 20-30 minutes every 2-3 hours is a significant safety benefit on a long journey as it forces the driver to "Stop, Revive, Survive". In order to promote adoption of electric vehicles the government should consider investment in high speed charging infrastructure that is available to all makes of electric vehicle, potentially via grants for sites meeting set criteria.

Support for "Outback" charging infrastructure - While DC charging stations are the future for long distance routes, the current de-facto standard for less heavily trafficked routes is the Australian 3 phase 32 amp outlet. This type of outlet has been employed by TOCA and the Australian Electric Vehicle Association, with the support of councils, state owned utilities, showgrounds and property owners to create the Round Australia Electric Highway [Ref4]. Costing less than \$200 where a suitable electricity supply is available, this is by far the most economical charging infrastructure capable of charging at up to 100km of range per hour. This compares with several thousand dollars for dedicated EV chargers.

Recognition of the 3 phase Round Australia Electric Highway, including support from state or regional tourist organisations until sufficient public DC infrastructure is available, will assist with EV uptake.

Availability of domestic charging infrastructure – One of the potential benefits of owning an electric vehicle is having a full "tank" of fuel every time you start your journey. The day to day requirement does not require high speed charging, with vehicles typically sitting idle for ten or more hours overnight or for a similar period during the day whilst the owner is at work. The key is availability, particularly for those who live in apartments. This can be addressed through building codes for new residential and commercial properties. As long as the electricity supply to the premises is appropriate the charging facilities do not need to be anything more complex than a standard 15A or 3 phase outlet which can be used with a suitable lead or adaptor.

This will not immediately address the demand in existing buildings and it may be appropriate to make grants available to local councils or other authorities to provide publicly accessible charging points on street, in car parks and places of work. This can include initiatives such as providing charging points in street light poles which is already being trialled overseas.

Ability to bill energy usage to home account – The vast majority of people who own a car would also have a home electricity account. The ability to bill their electricity use when charging away from home back to their home account would allow greater control and potentially avoid unreasonable pricing by providers. This is likely to need adjustment to state based electricity retail laws.



MEASURES TO ATTRACT ELECTRIC VEHICLE MANUFACTURING AND ELECTRIC VEHICLE SUPPLY AND VALUE CHAIN MANUFACTURING TO AUSTRALIA

Investment in research – In order for Australia to be seen as a leader in electric vehicle development and manufacturing it will be important to support research both in Universities and Industry. This could be achieved through grants or loans provided by government at a Federal or State level.

Funding for industry hubs – Seed funding for development of knowledge hubs and centres of excellence will support the establishment and growth of new companies within the electric vehicle supply chain.

Investment in training – Funding for targeted re-training and upskilling of the workforce should be provided in association with TAFE or similar organisations. An example of what can be achieved are the Infrastructure Skills Centres established in NSW to sustainably support the boom in infrastructure construction in the state. These have attracted funding from Federal and State government as well as individual infrastructure projects and provide a lasting legacy for those that are able to benefit from the program [Ref 5].

A review of trade tariffs – Trade tariffs could be reviewed to encourage local value add in the supply chain (i.e. processing Australian raw materials in to batteries and other components and further assembly in to vehicles) and establishment of an export market for major components or entire electric vehicles.

Support for stationary battery systems – By encouraging greater deployment of stationary battery systems, at domestic, industrial and grid scale, a critical mass in local battery manufacturing could be reached sooner. This will support the electric vehicle supply chain through product development, greater availability and economies of scale. National and state energy policies should specifically encourage greater deployment of stationary storage which will also assist in grid stabilisation and balancing of network demand so that more efficient use of existing grid assets can be made.

National emissions standards – Australia currently lags both the EU and US for adoption of modern standards for vehicle emissions. In order to ensure a domestic market for electric vehicles and to demonstrate a commitment to the growth in electric vehicles it is vital that modern emission standards in line with overseas markets are adopted. This will also prevent the “dumping” of older, less efficient and more polluting ICE powered vehicles in Australia during the transition to electric vehicles.



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

In addition to the measures identified in the preceding sections the following steps could be taken by the government to support electric vehicle uptake and manufacturing.

Lead by example – Vehicle fleets at all levels of government should consist of an increasing proportion of electric vehicles. This will demonstrate the practicality of their use and assist government in understanding the charging needs of other users.

Considered approach to falling fuel excise revenue - While this is an emotive topic it is noted that for an average motorist in a fuel efficient conventional car (7l/100km) driving 15,000km the lost fuel excise would equate to \$429 p.a. This is currently more than offset by the increased stamp duty, GST and LCT charges associated with the higher cost of entry for electric vehicles.

TOCA do not object to development of alternative pricing mechanisms for road maintenance and development as long as the total social cost of different vehicles is accounted for. Given the significant health and environmental benefits of electric vehicles the pricing mechanism must reflect the true social cost and result in a higher charge per distance for conventional powered vehicles.

National standard for accessing charging infrastructure – In the UK there are a significant number of charging network providers each with their own requirements for sign up and billing. In Australia we are already seeing utility providers in some areas making it virtually impossible to access their infrastructure unless you are customer. This makes it useless for any interstate travellers. It is not suggested that charging should be free or that all charging infrastructure has to be of a single common type. What should be possible is for someone with a suitably equipped vehicle to easily make use of charging facilities with a common payment mechanism that doesn't require pre-registration ahead of time.

Legislation to protect electric vehicle charging bays - Parking any vehicle which isn't charging in an Electric Vehicle charging station should have the same penalty as parking in a disabled parking without the appropriate permit. This should include tow-away provisions and larger fines for repeat offenders.

Nationally accepted standards for signage of EV charging spots should be adopted as soon as possible. This would include signage at the parking space as well as directional signage to assist in their location. This could be similar to the widely recognised 'P' signs that we have for parking stations.

Review of electricity retail legislation – Electricity supply legislation should be amended or clarified to permit billing by charging station providers based upon power used (in kWh) without those organisations needing to be an energy utility.



CONTACT

If the Senate Select Committee would like to further discuss any of the items raised in our submission then please do not hesitate to contact the TOCA Secretary, James Hayward, by email Secretary@teslaowners.org.au

REFERENCES

Please find below references which support this submission and provide more detailed information on the specific subjects highlighted.

[Ref 1]

<http://www.environment.nsw.gov.au/~media/OEH/Corporate%20Site/Documents/Air/air-pollution-economics-health-costs-greater-sydney-metropolitan-region-050623.ashx>

[Ref 2]

<https://www.epa.vic.gov.au/your-environment/noise/motor-vehicle-train-and-tram-noise>

[Ref 3]

<https://www.ucsusa.org/sites/default/files/attach/2015/11/Cleaner-Cars-from-Cradle-to-Grave-exec-summary.pdf>

[Ref 4]

<https://www.teslaowners.org.au/round-australia>

[Ref 5]

<https://ministers.jobs.gov.au/cash/nsw-partnership-builds-skills-and-opportunities>