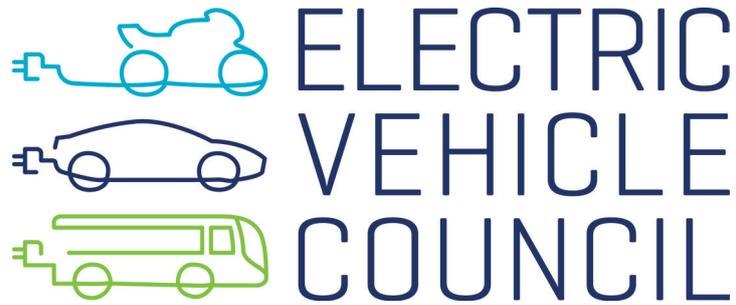


ELECTRIC VEHICLE COUNCIL

Submission to Ministerial Forum on Vehicle Emissions

10 March 2017



The Electric Vehicle Council is the national body representing the electric vehicle industry in Australia.

Representing members involved in providing, powering and supporting electric vehicles, our mission is to accelerate the electrification of road transport for a more sustainable and prosperous Australia.

We welcome the opportunity to make this submission in response to the three consultation papers - Draft Regulation Impact Statement Improving the Efficiency of New Light Vehicles; Draft Regulation Impact Statement on Noxious Emissions Standards for Light and Heavy Vehicles; and Discussion Paper on Improving Fuel Quality Standards.

In order to support the continued uptake of electric vehicle adoption in Australia, this submission outlines a series of recommendations:

1. Treatment of Electric Vehicles under CO2 and noxious emission standards

1.1 Implementation of Target A as outlined in the draft Regulation Impact Statement, over the 2020-2025 timeframe

1.2 That the Ministerial Forum work with the Electric Vehicle Council as an input to industry insight and information, in order to update their cost benefit analysis to better reflect advancements in electric vehicle technology, both from an uptake and cost perspective

2. Increasing demand, awareness and value

2.1 Funding and support for the Electric Vehicle Council to implement information, education and awareness initiatives aimed at increasing the adoption of electric vehicles

2.2 That the Ministerial Forum works with the Electric Vehicle Council to develop a government fleet target for electric vehicles

2.3 That the Ministerial Forum works with the Electric Vehicle Council to develop a proposal for the implementation of tax incentives for electric vehicles

2.4 That the Ministerial Forum works with the Electric Vehicle Council to develop its consideration of complementary measures

GPO Box 1823, Canberra, ACT, 2601

ABN: 34 112 235 651

Disclaimer: This submission represents the views of the Electric Vehicle Council, however it may not necessarily represent the views of individual Council members. Where members of the Electric Vehicle Council have supplied individual submissions, this submission does not supersede these.

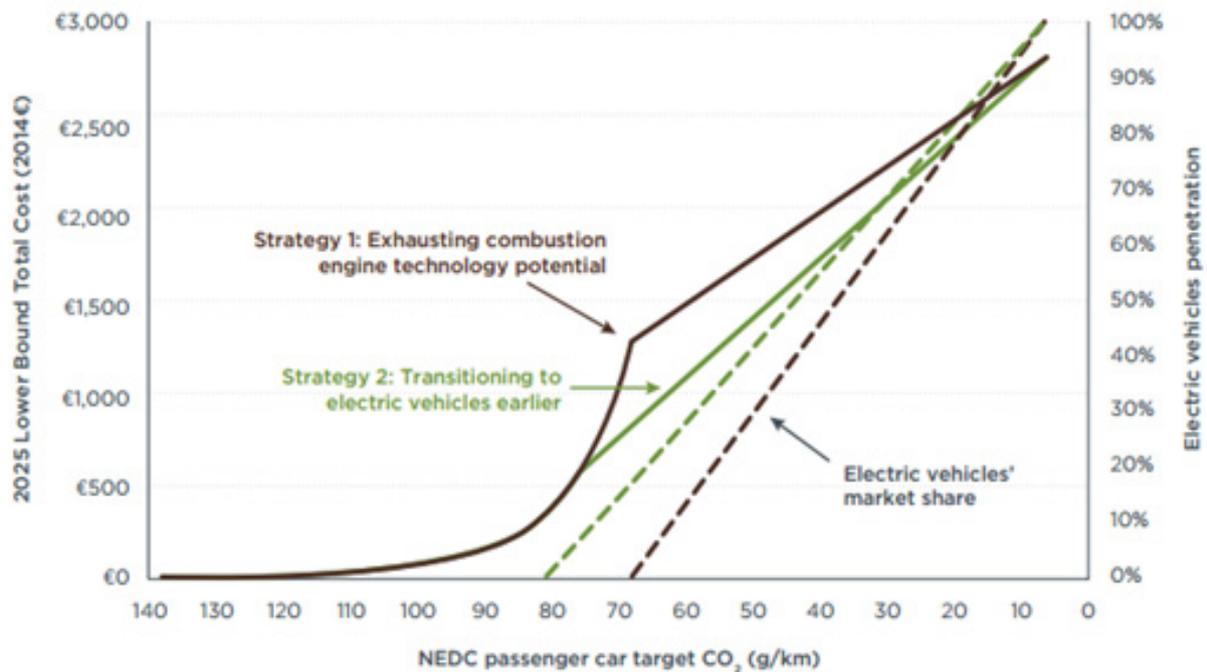
1. The Role of Electric Vehicles in Meeting Emission Reduction Targets

As a signatory to the Paris Agreement which aims to limit global warming to less than 2°C above pre-industrial levels with efforts to be made to limit warming to 1.5°C, Australia has now committed to the global transition to net zero emissions. The implementation of standards aimed to improve the fuel efficiency of conventional internal combustion engines will only go so far in achieving the Australian Government’s greenhouse gas emissions reduction targets, air quality objectives, and improvements in energy productivity.

in subsequent periods and low and zero emission vehicles will play a larger role in achieving these.³

The experience in the European market has demonstrated that the short term target of 95gCO₂/km can be reached through improvements in internal combustion engines alone. However, possible targets by the EU for the 2025-2030 timeframe are expected to fall in the range of 68-78gCO₂e/km by 2025 and 42-60gCO₂e/km by 2030, NEDC. Recent research from the International Council on Clean

Figure 1: Total incremental cost of reducing CO₂ emissions of average passenger car in EU in 2025²



Whilst the draft Regulation Impact Statement considers the implementation of standards over a 2020-2025 timeframe, on improving the efficiency of new light vehicles, it is important to note that this is the first step in decarbonising Australia’s light vehicle sector. If Australia is to meet its commitments under the Paris Agreement, it can be expected that more stringent standards will be implemented

Transportation³ (ICCT) shows that early adoption of electric vehicles will provide the lowest cost opportunity to meet these standards. This is compared to the cost of the alternative scenario, which involves exhausting the full technical potential of internal combustion engines before ultimately switching to electric vehicles at a later point.

1 ClimateWorks (2014)

2 ICCT (2016)

3 International Council on Clean Transportation (2016)

Therefore, the priority for policy setting to reduce vehicle emissions should have a focus on driving short term uptake of electric vehicles to ensure that the marketplace, infrastructure and regulatory settings are ready for greater deployment in subsequent years. This will ensure that emission reductions can be achieved at least cost.

Electric vehicles, when powered by renewable energy, are zero emission vehicles both from a greenhouse gas perspective and a noxious emission perspective. As outlined in *The Path Forward for Electric Vehicles in Australia*⁴, even when powered from grid electricity, electric vehicles provide emission reductions in comparison to average performing internal combustion engines vehicles. Since this analysis was conducted, a number of states⁵ have announced ambitious renewable energy targets and there is \$5.6 billion of investment to be generated from the wind and solar projects that will go to construction in 2017⁶. This will further reduce the grid's emissions intensity and hence further improve emissions performance of electric vehicles charged via the grid.

We are seeing commercial offerings which provide low cost renewable energy to electric vehicle owners, which will help increase the proportion of vehicles charged with renewable or fully carbon offset electricity supply. AGL's Electric Car Plan provides \$1 per day unlimited charging, which will not only reduce emissions but also provide significant fuel cost reductions for electric vehicle owners.⁷

The most stringent target in the draft Regulation Impact Statement (Target A) is aiming for a 33% improvement in overall fleet vehicle fuel efficiency by 2025. For illustrative purposes, if this task was to be

achieved by electric vehicles powered by renewable energy, this would mean that this objective could be met with no change to the rest of the sales mix or performance if 33% of new vehicle sales were electric vehicles powered by renewable energy.

Whilst this is a significant increase from the current state of the Australian market, where electric vehicles made up approximately 0.1% of new vehicle sales in 2015, we are seeing this type of uptake being targeted in leading markets such as Norway and the Netherlands which had a 23 per cent and 10 per cent market share respectively in 2015.⁸ This hypothetical scenario illustrates the dramatic impact that can be gained from attainable electrification of the fleet.

Developments in electric vehicles have advanced significantly in recent years, rapidly outpacing previous assumptions on range, affordability and uptake.⁹ The cost of electric vehicles has been falling faster than previous forecast and Bloomberg New Energy Finance estimated that they could reach parity with conventional internal combustion engines vehicles as early as 2025. This will result in uptake rates much greater than anticipated and lower costs to achieve the standard.

It is unclear as to whether the draft Regulation Impact Statement considered the role of electric vehicles in meeting a standard, as Table B7 specifically looks at estimated additional capital and compliance costs for 'non-electric' fleet only. If electric vehicles have not been considered, then it is possible that these vehicles may drive down average additional capital costs for standard compliance during the 2020-2025 timeframe due in large part to the continued reductions in battery costs forecast through this period.¹⁰

4 ClimateWorks Australia (2016)

5 Including Queensland, Victoria and New South Wales

6 Clean Energy Council (2017)

7 AGL (2016)

8 International Energy Agency (2015)

9 Bloomberg New Energy Finance (2016)

10 AEMO (2016)

Research conducted by ClimateWorks for the UNFCCC Taskforce investigating Australia's post 2020 emission reduction target identified that uptake of electric vehicles, in tandem with decarbonisation of the electricity grid or sourcing electricity from low carbon sources, could provide emission reductions of 9Mt CO₂e in 2030, and 27 Mt CO₂e in 2050.¹¹ The opportunity will be even larger if electric vehicles are powered from 100% renewable energy sources. For the critical Passenger and Light Commercial vehicle segments, this represents reductions of 16% and 47% compared to 2013-14. This is roughly equivalent to delivering 14% of the 65 Mt CO₂e of abatement by 2030 under Target A in the draft Regulation Impact Statement.

Recent analysis by CSIRO for the Energy Network Association's Network Transformation Roadmap¹², finds that electric vehicles could reduce emissions by 22 Mt CO₂e per year by 2050. Through this work, CSIRO also found that electric vehicles, with appropriate electricity retail tariffs in place, can provide additional benefits to consumers outside of standard fuel saving analysis:

By 2050, electric vehicle adoption significantly improves capacity utilisation. If electric vehicles are adopted using large (7.2kW) chargers and around half of customers charge in an unmanaged way, average residential electricity bills will decrease by \$86 by 2050 (in real terms). However, if customers are given appropriate incentives faster, the electricity sector gets the benefit of increased consumption without as much additional peak demand. In this case, the improved capacity utilisation results in a \$162 or an 8 percent decrease in residential electricity bills by 2050.

From a noxious emissions perspective, whilst national scale modelling has not been undertaken on the benefit of electric vehicles, modelling by AECOM for Victoria highlights the air quality benefits arising from electric vehicle adoption.¹³ Under a supportive policy scenario, electric vehicle adoption in 2030 was forecast to deliver air pollutant reductions of almost 10,000 tonnes of NO_x and 2,000 tonnes of PM₁₀. According to EPA Victoria¹⁴, these figures represent around 10% of the 2006 inventories for these pollutants in the Port Phillip region. CSIRO modelling from 2012 found that electric vehicle adoption will be concentrated in metropolitan areas of Victoria, where population densities are at their highest. When it is considered that the impact of air pollution on human health depends on where the pollution is in relation to where people are located, electric vehicle uptake has the potential to deliver meaningful benefits to community health.

The Electric Vehicle Council strongly supports the implementation Target A as outlined in the draft Regulation Impact Statement and recommends the Ministerial Forum update their cost benefit analysis to better reflect advancements in electric vehicle technology, both from an uptake and cost perspective. The Electric Vehicle Council welcomes the opportunity to work with the Ministerial Forum to provide access to the relevant data and information needed to update this analysis.

11 ClimateWorks (2014)

12 Energy Network Australia (2016)

13 AECOM (2011)

14 EPA Victoria (2011)

2. The Role of Standards in Driving Uptake and Availability of Electric Vehicles

Whilst an overall emissions standard is critical in lowering the environmental impact of light vehicles, they are better at driving incremental efficiency improvements than at stimulating supply of advanced technologies, such as electric vehicles, especially in a market that sees a minimal supply of ultra-low emissions vehicles like Australia.

In the *Path Forward for Electric Vehicles in Australia*, the key barriers to electric vehicle uptake were discussed. Key barriers include:

- Vehicle ownership cost;
- Vehicle range;
- Vehicle recharge time;
- Consumer knowledge and awareness; and
- Model availability.

In regards to model availability, there are a range of electric vehicles Australia is currently missing out on, due to lack of standards and other incentives. For example, the Renault ZOE and the second generation Nissan LEAF make up around 22% of European electric vehicle sales, but are not available in Australia. Nissan Australia, having previously expressed frustration with the lack of government support for importers of zero-emission cars¹⁵, have held back on local market introduction of the second-generation Nissan LEAF.¹⁶ The Volkswagen e-Golf was made available in markets which adopted California's approach to zero-emissions vehicle regulation¹⁷, but is not currently scheduled for Australian market introduction.¹⁸

The GM/Chevrolet Volt, the Ford Fusion Energi and the Ford C-Max Energi are also not available here, and together made up more than 30% of US electric vehicle sales in 2016. There are also no plans to introduce models like the Chevrolet Bolt, the first mass market pure electric vehicle, which will be marketed into Europe under the Opel brand. Finally, whilst there have been some movement on the introduction of the Hyundai Ioniq range, another mass market electric vehicle, we understand the business case would be even stronger with the introduction of appropriately designed standards.

The Electric Vehicle Council believes that light vehicle CO₂ emission standards, and to a lesser extent noxious emission standards, can influence three of these key barriers; vehicle ownership cost, consumer knowledge and awareness, and model availability. CO₂ emission standards applied via a sales weighted average for manufacturers, and as outlined by the Climate Change Authority¹⁹, are able to improve the availability of highly efficient vehicles, such as electric vehicles:

Standards would not ban any particular models from sale; a supplier could sell vehicles above the limit curve provided they were offset by sufficient sales of vehicles under the curve. A supplier could improve the efficiency of all vehicles in its fleet, or sell more of its highly efficient vehicles and fewer less efficient vehicles.

15 Motoring (2015)

16 GoAuto News (2015)

17AutoBlog (2014)

18 Motor Report (2015)

19 Climate Change Authority (2014)

By putting the onus on the manufacturer, CO2 standards could incentivise manufacturers to address a range of electric vehicle related barriers as electric vehicles can help them meet their requirements under the standard. This includes:

- Increasing the number of electric vehicles models available in the Australian market;
- Reducing the upfront cost of electric vehicles;
- Providing incentives for dealers to promote electric vehicles to consumers.

The ability of standards to address these barriers is influenced by three key elements of standard design; stringency, timing and super-credits. As previously stated, the Electric Vehicle Council supports the most stringent standard presented in the draft Regulation Impact Statement, Target A, and supports its implementation over the 2020-2025 timeframe.

2.1 Other incentives to encourage supply of more efficient vehicles under a standard

The Electric Vehicle Council believes that super credits should be applied for ultra-low emissions vehicles with the aim of encouraging vehicle availability and supply in Australia, whilst minimising any effect on overall increases in emissions. Whilst we appreciate that super-credits may in fact reduce efficiency gains in non-electric vehicles, we believe the benefit of early uptake of electric vehicles, which are ultimately required to decarbonise the passenger vehicle transport sector, outweighs this.

In the EU and the US, the introduction of ultra-low emissions vehicles is encouraged by the adoption of super credits; they are also supported by a much larger market, federal and state complementary measures and localised efficiencies in logistics, marketing and regulatory compliance.

In Australia with a relatively modest market by world standards, there are minimal complementary measures and country specific regulatory compliance requirements. As a result, automotive manufacturers need to justify the supply of ultra-low emissions vehicles to Australia in the short term and the introduction of super-credits for these vehicles could support this justification.

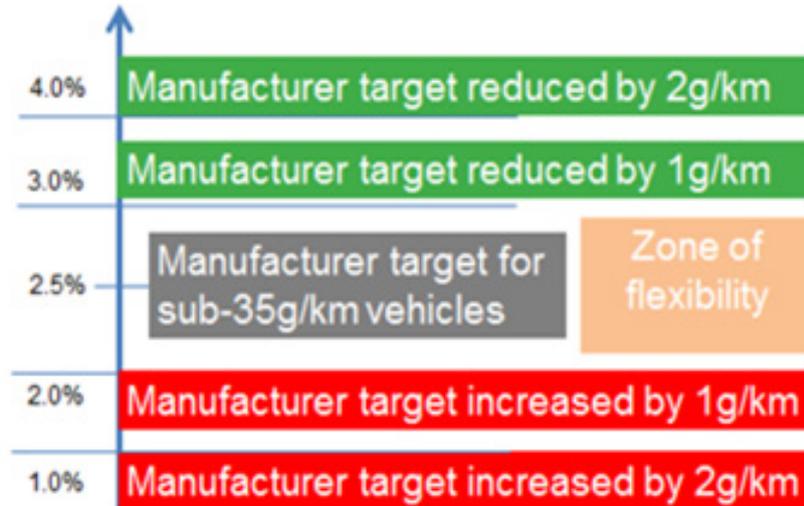
A traditional super-credit structure has proven to be relatively ineffective at driving overall supply into the market. However, due to the factors stated above, this conclusion may not be replicated in Australia to the same extent.

Regardless of its forecast efficacy in Australia, we believe that a Flexible Ultra Low Carbon Vehicle mandate would be more effective at increasing model availability in Australia, as well as reduce the impact on overall fleet emissions outcomes.

The flexible mandate was introduced by MEP Fiona Hall, rapporteur of the European Parliament's Industry Committee, as part of the discussion around the EU emissions standards. This system, illustrated below, encourages all car makers to make available a range of ultra-low emissions vehicles, and rewards those that do more.²⁰

20 Transport and Environment (2013)

Figure 2: Flexible Ultra-Low Carbon Vehicle mandate



Modelling has been done of the effective weakening of the overall fleet emissions standards through the use of super-credits, and has shown that the Flexible super credits approach in fact strengthens the overall fleet emissions target.²¹ This system only impacts the effectiveness of standards when the electric vehicle market share reaches 5%, at which point, having achieved its objective of driving the initial uptake of electric vehicles, it may be reviewed or phased out.

Importantly, the flexible mandate is technology neutral. So automakers can choose to invest in the supply of ultra-low emissions vehicles (whether it be battery electric vehicles or otherwise), and thereby achieve an advantage in overall required emissions targets, or they can invest more in overall fleet emissions reductions, taking into account the “penalties” for not supplying enough, or not having available, ultra-low emissions vehicles in the market.

As more ultra-low emissions vehicles are sold in the market, the business case becomes easier to justify due to the cost efficiencies that come with higher volumes. Super credits are extremely important to the Australian market because it will encourage model availability and supply in a relatively low volume market.

With a lack of complementary measures and financial incentives, we must help auto manufacturers improve their business case for the introduction of low emissions vehicles, and super credits will help them do that.

Implemented poorly however, super credits can have a negative effect on overall fleet emissions standards²², which the Electric Vehicle Council does not support. With a Flexible super credits scheme, the overall fleet emissions profile strengthens in the medium term, before needing review when electric vehicle penetration is higher.

The Electric Vehicle Council welcomes the opportunity to work with the Ministerial Forum to assess the possible design of a Flexible Super Credits scheme which will help deliver short term emission reductions, and ensure barriers to uptake of electric vehicles, and other zero emission vehicles, is achieved.

21 Ricardo AEA (2013)

22 Ricardo AEA (2013)

3. The Need for Complementary Measures

As highlighted above, emission standards alone won't drive uptake of electric vehicles and other zero emission vehicles alone, and need to be supported by a range of complementary measures. *The Path Forward for Electric Vehicles in Australia* has outlined a range of these measures, which are further detailed below. The Electric Vehicle Council recommends the Ministerial Forum consider these complementary measures in tandem with development of a standard, and welcomes the opportunity to work with the Ministerial Forum to provide further information on this front.

Based on the results of various government actions promoting electric vehicles and recent research on effective policies, some basic principles are emerging regarding electric vehicle policy. Complementary measures and electric vehicle policies are ideally targeted at helping overcome known potential barriers to prospective electric vehicle users; including incremental vehicle cost, vehicle range, lower residual values, vehicle recharge time, and consumer awareness regarding electric vehicle ownership benefits. Many countries are seeking to overcome these barriers and promote electric vehicle technology, mobility, and sales.²³

While complementary measures are outside the scope of the draft Regulation Impact Statement of light vehicle CO₂ emission standards, their importance to overall policy development warrants inclusion and discussion. It is hard to assess some of the technical features of standard design (such as super credits etc.), without fully understanding the complementary measures that will be introduced.

3.1 Information and Education

3.1.1 Measures to increase demand and to strengthen current understanding of the value proposition of lower emission vehicles and fuels

There are a number of potential government actions that could assist in increasing market demand and in overcoming the barrier of prospective consumers' knowledge of the value proposition of lower emission vehicles and fuels.

Several basic design principles appear important in policy implementation. Consumer interest could be motivated by setting incentives for the purchase of fuel efficient and lower emission vehicles including both financial and nonfinancial mechanisms.

Financial incentives could be in the form of annual incentives (including tax rebates, annual registration and stamp duty reductions, parking fee deductions and vehicle emission taxes) or punctual incentives (including differential road tolls and pricing, free parking, higher fuel prices).²⁴

Non-financial incentives could include benefits such as priority lanes and reserved parking spaces. These types of initiatives have been utilised by both State and Local governments in Australia and internationally with varying degrees of success.

3.1.2 Measures to encourage the supply of supporting infrastructure

Another key question being posed in international markets is how fast to install electric vehicle charging infrastructure. This includes basic electrical provisioning

²³ International Council on Clean Transportation (2015)

²⁴ ClimateWorks Australia (2015)

in new buildings and refurbishments, commuter charging facilities in workplaces, and publicly-accessible charging facilities of varying charging speeds and capacities.

Interviews with government officials in a variety of jurisdictions generally revealed that most believe that the majority of charging (90% or more) will take place at home. Evidence from The EV Project in the United States found that despite installation of extensive public charging infrastructure, the vast majority of charging was done at home and work.²⁵ Given the relatively higher cost of retrofitting electric vehicle charging infrastructure, there should be consideration going forward to ensure that all new multi dwelling buildings, apartments and office buildings have electric vehicle charging planned and built in from construction.

To develop the right infrastructure including charging stations for plug-in vehicles, federal, state and local governments could utilise urban planning powers coupled with grant programs towards businesses to stimulate the installation of infrastructure dedicated to lower emission vehicles. An example of this is the EV Infrastructure Rebate Program in Illinois, which covers 50% of the cost of equipment and installation of electric vehicle charging stations, with a cap based on the type of station; more than \$350,000 was awarded in 2013, funding a total of 130 stations.²⁶

There are currently multiple plug standards for both AC and DC charging. Picking a standard for AC, and a standard for DC charging, would streamline infrastructure deployment, reduce costs, avoid legacy and redundant charging stations, and reduce confusion in the market. Car manufacturers currently incorporate different plug standards for different regions, so the implementation of a single standard would not be a commercial burden. A standard should be set before

the mass rollout of public electric vehicle charging infrastructure, as replacement and retrofitting is expensive.

3.2 Awareness Raising and Fuel Consumption Labelling

International research suggests that a majority of prospective consumers are not well informed about the existing policy incentives or the potential fuel savings from replacing their conventional vehicles with electric vehicles.²⁷

Education and awareness activities would ideally involve state and local governments, consumer groups and utilities providing information about relevant purchasing and charging incentives at dealerships, on websites, and through advertising campaigns. Providing information to prospective electric vehicle consumers on total cost of ownership and vehicle fuel-saving benefits on websites and consumer labels is an important basic step.

Public events, including ride-and-drive with public officials and increased placement of electric vehicles in government fleets, increase awareness regarding the new technology. Finally, the placement of vehicles in company, rental, and car-sharing fleets can also help to overcome the basic foundational lack of awareness and comfort regarding available electric vehicle models.

3.3 Fleet Purchasing Policy

The importance of fleet sales is difficult to overemphasize. In 2015 46% of Australian new vehicle purchases went to fleets.²⁸ For vehicle sellers, fleet sales are often key to achieving corporate sales targets and thereby ensuring that their upstream investments in new product development and manufacture can be recouped. Furthermore, fleets typically turn vehicles over at 3-5 years, and

25 Idaho National Laboratory (2015)

26 Jin et al. (2014)

27 International Council on Clean Transportation (2015)

28 Federal Chamber of Automotive Industries (2015)

in doing so provide a large proportion of the second-hand vehicle market.

For electric vehicles the role of fleet sales is even more crucial. Fleets provide many would-be buyers with their first experience of electric vehicles, and in doing so greatly improve the likelihood of adoption.²⁹ Fleet operators generally have a better understanding of the total cost of ownership, duty cycle and are more understanding of issues stemming from the deployment of new technology.

Government fleets are perhaps the most important of all. In recognition of the broader societal benefits and economic rationale behind support for emerging technology, governments around the world are making significant commitments to electric vehicle adoption that reduce investment risk for providers and accelerate the market adoption.

3.4 Taxation and Other Policy Measures

Several basic design principles appear important in policy implementation. Consumer interest could be motivated by setting incentives for the purchase of fuel efficient and lower emission vehicles including both financial and nonfinancial mechanisms.

Financial incentives could be in the form of annual (including tax rebates, registration and stamp duty reductions, parking fee deductions and vehicle emission taxes) or punctual incentives (including differential road tolls and pricing, free or reduced parking fees, higher fuel prices). Non-financial incentives can include benefits such as priority lanes and reserved parking spaces.

Other taxation policies measures include: exemption of low or zero emission vehicles from Fringe Benefits Tax (FBT) to account for

their higher capital costs in the period through to their expected pricing parity with internal combustion engine vehicles; consideration for the extension of the FBT exemption to novated leasing arrangements and beyond the sunset period for the business fleet vehicle exemption; and exemption of low or zero emission vehicles from Luxury Car Tax (LCT) or the replacement of this scheme with an Emissions Tax for Luxury Vehicles

3.5 Other Measures

The electric vehicle market is often described as an 'ecosystem', reflecting the diverse range of participants that interact across it; including vehicle suppliers, charging infrastructure providers, electricity market participants, fleet operators and private users. As each of these participants evolves in their understanding of the technology, there must be a negotiation across issues characterised by uncertainty and risk. Due to the recent evolution of the market, there is an understandable absence of forums in which issues and opportunities can be tabled and addressed.

As a result, there is limited overarching coordination of electric vehicle deployment within Australia.

Establishing an overarching roadmap to assist in driving uptake of electric vehicles to help meet Australia's emission reduction, energy productivity and energy security targets can help ensure strategic deployment of electric vehicles to provide maximum benefits to consumers, by facilitating improved market coordination.

²⁹ Wikstrom (2014)

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