

# New Policy Proposal:

## Recharging the economy

Accelerating electric vehicle adoption



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# Research Partners



## Electric Vehicle Council

The Electric Vehicle Council is the national body representing the electric vehicle industry in Australia. Representing companies involved in providing, powering and supporting electric vehicles, our mission is to accelerate the electrification of road transport for a sustainable and prosperous Australia.

As the world's largest vehicle markets and companies set their course for a future where road transport is powered by zero emissions vehicles, the Electric Vehicle Council works to highlight the important role and opportunities for Australia in this global transition.

Working to overcome the current challenges in Australia's electric vehicle market through policy and industry development, the Electric Vehicle Council recognises electrification is a milestone in the future mobility ecosystem, enabling advances in sharing, connectivity and autonomy.

By bringing the Australian market up to speed with the global transition in road transport, we firmly believe Australian consumers and industry can be leaders in the future of mobility.



## The NRMA

Better transport infrastructure has been a core focus of the NRMA since 1920 when our founders lobbied for improvements to the condition of Parramatta Road in Sydney. Independent advocacy was the foundation activity of the organisation and remains critical to who we are as we approach our first centenary.

The NRMA has grown to one of the largest tourism and transport companies in Australia, representing over 2.6 million Australians principally from NSW and the ACT. The NRMA provides motoring, transport and tourism services to our Members and the community.

Today, the NRMA works with policy makers and industry leaders to advocate for transport solutions that help solve key pain points such as congestion, access and affordability and connect people and communities. The NRMA is passionate about facilitating travel across Australia, recognising the vital role tourism plays in supporting regional communities.

By working together with all levels of government to deliver integrated transport and tourism options we can provide for the future growth of our communities and continue to keep people moving for generations to come.

# 1. Name of Proposal

**Recharging the economy** – accelerating electric vehicle adoption.

## 2. Priority Reforms

**In light of extensive research, motorist surveys, public feedback and PwC economic modelling, the NRMA and the Electric Vehicle Council (EVC) have identified six priority reforms to help progress the electrification of the vehicle fleet to support Australian consumers and the economy:**

### 2.1. Prioritise the rollout of charging infrastructure

Close to two-thirds of motorists point to charging infrastructure as the single greatest barrier to electric vehicle adoption. Through NRMA Member surveys, motorists have identified visible roadside charging and regional town chargers as a primary consideration when deciding whether to purchase an electric vehicle.

Charging infrastructure requirements are broadly segmented into three groups: home charging, public charging, and rapid/fast charging. Home and public charging provide for **'destination charging'** – a relatively slow speed charge undertaken while motorists are at their destination.

The average Australian commute is approximately 30km, with work or home at either end of the journey – this means that destination charging will be suitable for most metropolitan car owners.

Rapid/fast charging provides for **'journey charging'** – a fast speed charge undertaken mid-journey. While many petrol cars have a single tank range of around 650km, electric vehicles have a charge range of closer to 400km. In place of motorway service centres, electric vehicles require mid-journey charging at appropriate intervals to allow long distance journeys.

In order for electric vehicles to be widely attractive, charging sites must be conveniently located to allow efficient travel. High quality sites would provide access to amenities such as toilets, entertainment for children, WiFi, food and beverage options and vehicle cleaning equipment.

To encourage consumers to adopt electric vehicles, government intervention is necessary in all three types of charging infrastructure.

In order for electric vehicles to be attractive, charging sites must be conveniently located to allow efficient travel.

### Home chargers

- **Cost: \$1500**
- **Capacity: 3.3-6.6kW**
- **Projected need: Between one charger per home and one charger per vehicle**
- **Commitment: Low interest loans for households**

While the short term network demands to facilitate electric vehicle charging are expected to be low (less than four per cent of the National Electricity Market), over the longer term, high electric vehicle uptake and charging convenience could result in additional network demands, potentially necessitating additional investment in electricity generation and distribution networks.

This scenario could affect household budgets by putting upward pressure on retail prices. To avoid negative impacts and bolster network reliability and efficiency, households should be technology-enabled to ensure that vehicle charging occurs when demand for electricity is at its lowest level.

Roof-top solar, home battery storage, smart meters and bi-directional inverters and chargers work in harmony to capture, store and optimise locally-produced energy, only drawing from the grid when necessary at periods of low demand to keep electricity prices at a minimum.

Depending on household energy usage, these technologies can negate the need for grid consumption altogether. In some cases using bi-directional inverters and chargers, excess energy could even be returned to the grid to further bolster the overall network.

Roof-top solar, home battery storage, smart meters and bi-directional inverters and chargers work in harmony to capture, store and optimise locally-produced energy.

Locally produced energy limits the need for generational capacity by reducing transmission loss, which can account for up to 15 per cent of generated electricity. If production is in close proximity to demand, there is also less of a requirement for electricity network upgrades, resulting in a benefit for government and electricity providers through the deferral of investment.

To support the National Electricity Market and the rollout of home energy technologies, the Clean Energy Finance Corporation's existing low interest loan scheme – which currently targets the purchase of electric vehicles for fleet customers – should be extended to individuals and households via several financial institutions to improve accessibility.

While electric vehicles offer meaningful reductions in operating and maintenance costs, these savings can be amplified through enabling the home to capture, store and distribute energy. The required technology to maximise these cost savings, however, presents a high upfront cost to the consumer, especially alongside the price of a new or used electric vehicle.






The Australian Government, through the Clean Energy Finance Corporation (CEFC) or alternative body, should provide long-term, low interest loans to all consumers seeking to enable their home for electric vehicles, and offer a \$1000 rebate per household for demonstrating the adoption of an approved energy efficiency 'smart home' bundle – home solar, home battery, smart meter and vehicle charger. Low interest loans should include these technologies, as well as consumer-funded local distribution grid enhancements.

While current CEFC loans provide a discount of around 70 basis points from commercial interest rates, consumer-focused loans should include repayment periods of up to 10 years to maximise accessibility.

Statistics suggest that around 40 per cent of current electric vehicle owners also have home solar. On that basis, the total cost of the \$1000 rebate to government would be \$66 million by FY2021/22 under a neutral uptake rate, or \$145 million under a strong uptake rate.

The provision of low interest loans could be accommodated through existing CEFC funding.

**Detailed breakdown of potential savings**

	 <b>Electric Vehicle Savings</b>				 <b>Home Electricity Savings</b>				 <b>Total Savings (1 Car)</b>	 <b>Total Savings (2 Cars)</b>	 <b>Total Savings (3 Cars)</b>
	Maintenance	Fuel	Efficiency	Total	Solar	Battery	Smart Meter	Total			
Annual Savings (\$)	370	966	730	<b>2,066</b>	1,000	200	200	<b>1,400</b>	<b>3,466</b>	<b>5,532</b>	<b>7,598</b>
10-Year Savings (\$)	3,700	9,660	7,300	<b>20,660</b>	10,000	2,000	2,000	<b>14,000</b>	<b>34,660</b>	<b>55,320</b>	<b>75,980</b>

## SMART HOME CASE STUDY

### Enabling access to the cost benefits of electric vehicles

Transport and electricity costs represent a significant portion of the household budget. The average household spends more than \$17,500 per annum on transport (87 per cent of which is associated with private vehicles), and more than \$1,750 per annum on electricity.

By combining the purchase of an electric vehicle with the adoption of the proposed ‘Smart Home’ package, the savings generated by reduced vehicle and electricity costs could be used to reduce average household cost of living by \$5,119 per annum (\$3,466 for a single car household). This represents a saving of more than 25 per cent in average household transport and electricity costs.

Through combined savings, the proposed package, which consists of a home charger, solar kit, smart meter and home battery, could be repaid in just over three years by an average household (just over four and a half years by a single car household). Using only the savings from the package (i.e. excluding electric vehicle maintenance and fuel savings) over a 10-year loan period, the upfront package cost would be negated.

#### Potential costs of ‘smart home’ energy package

Home charger	\$1,500
Home solar (5kw)	\$6,000
Smart meter	\$600
Home battery	\$8,000
<b>TOTAL CAPITAL COST</b>	<b>\$16,100</b>

#### Package cost to household

Total Cost with Commercial Loan (6.7% for 7 years)	\$20,694
<b>Total Cost with CEFC loan (6% for 7 years)</b>	<b>\$20,189</b>
Annual repayments (CEFC loan)	\$2,884

#### Package cost to household with \$1000 rebate

Total Cost with Commercial Loan (6.7% for 7 years)	\$19,408
<b>Total Cost with CEFC loan (6% for 7 years)</b>	<b>\$18,935</b>
Annual repayments (CEFC loan)	\$2,705

#### Package cost to household with \$1000 rebate and 10-year loan

Total Cost with Commercial Loan (6.7% for 10 years)	\$21,202
<b>Total Cost with CEFC loan (6% for 10 years)</b>	<b>\$20,516</b>
Annual repayments (CEFC loan)	\$2,052

### **Public chargers**

- **Cost: \$3500**
- **Capacity: 3.3-6.6kW**
- **Projected need: One charger for every 19 electric vehicles**

The prospect of off-street charging is not practical for the millions of people that live in accommodation with no parking. In order for electric vehicles to be practical in all scenarios, mechanisms to receive, assess and support the establishment of charging infrastructure on public assets should be given consideration by road owners (principally councils and state governments).

Precedents exist for the establishment of third party assets in similar locations, including container recycling scheme facilities, vending machines and billboards. Using these as a model, governments should develop consistent, transparent and effective processes for assessing proposals for privately-funded charging infrastructure on public assets for use by the public.

Similarly, retail high streets often rely on on-street parking to service their customers. While major property developers and shopping centres are investing in electric vehicle charging, this investment is out of reach, or beyond the knowledge of many small businesses.

Major government buildings such as hospitals, transport hubs, offices and car parks represent end-of-journey destinations requiring direct government investment in charging facilities.

Transport for NSW provides more than 35,000 commuter car parks that will eventually require the establishment of electric vehicle charging facilities. The direct cost of chargers for Transport for NSW car parks would conservatively be estimated at around \$120 million without accounting for changes to the local electricity distribution network.



The Australian Government should work with state and local governments to support the establishment of kerbside charging. This should consist of:

- Low interest loans – Through the CEFC, councils and small and medium enterprises (SMEs) should be eligible to apply for low interest loans to deliver electric vehicle charging. Additionally, strata bodies, tenancy groups and individual occupants of terraced housing should be eligible to seek low interest loans to establish chargers on public land for use by the public.
- Grants – Provision of grants to regional communities to support the establishment of high-street and community building charging infrastructure for use by the public.

Grants should be eligible for open use charging infrastructure using non-propriety plugs and adaptors.

Assuming a neutral uptake rate, Australia would require 8,663 public chargers at a cost of \$30 million by FY2021/22. With a strong uptake rate, 19,114 chargers would be required at a cost of \$70 million.

The Australian Government should set aside a \$35 million grant fund to match industry proposals to establish non-proprietary public chargers, particularly in rural and regional Australia to encourage the swift transition to electric vehicles.



While electric vehicle battery technology is continuing to develop, the vast distances of the Australian continent will necessitate the need for mid-journey charging for the foreseeable future.

### **Fast chargers**

- **Cost: \$70,000 to \$180,000**
- **Capacity: 50-350 kW**
- **Projected need: Up to 1000 by 2030**

While electric vehicle battery technology is continuing to develop, the vast distances of the Australian continent will necessitate the need for mid-journey charging for the foreseeable future.

Roadside rest areas, tourist information centres and other roadside locations should be assessed for ease of establishing electric vehicle fast chargers, including connections to the grid.

State governments must develop integrated processes for the consideration of the establishment of charging infrastructure at these sites. As with lower speed chargers, government should develop consistent, transparent and effective processes for assessing proposals for privately-funded charging infrastructure on public assets for use by the public.

A major barrier to privately-funded charging infrastructure is associated enabling works, which can add significant cost depending on location and local electricity grid conditions.

The Australian Government should set aside a \$15 million grant fund for enabling works to support industry rollout non-proprietary fast charging infrastructure along critical corridors to unlock Australia for electric vehicles.

In addition to supporting enabling works, funding for non-proprietary fast charging infrastructure is highly desirable as it will encourage further investment by the private sector.

Critically, consideration should also be given by governments to the appropriate electricity tariff for fast chargers that recognises their importance to electric vehicle uptake, while also considering the highly intermittent electricity demand requirements.



## 2.2. Set a government fleet target of 25 per cent of all new light passenger vehicles by 2025

Government fleets are among the largest and most regularly refreshed in the country.

All governments should demonstrate leadership by setting purchasing policies that mandate 10 per cent of light passenger vehicles acquired or leased by government should be electric by FY2020/21, and that 25 per cent should be electric by FY2025/26.

As electric vehicle costs fall, the rate of uptake is expected to grow exponentially. Government signals (such as setting fleet targets) provide the certainty required to deliver a greater variety of electric vehicle models to Australia, and ongoing investment in charging infrastructure and associated services.

Setting immediate, short and medium-term targets provides for a coordinated approach to integration.

Year	FY2020/21	FY2025/26
Target	10%	25%

Government leadership provides an important source of information to the private sector to encourage greater uptake of electric vehicles.

Government leadership provides an important source of information to the private sector to encourage greater uptake of electric vehicles. By working with industries and businesses to address questions such as total cost of ownership and residual values, more organisations can put in place fleet targets with confidence.

Lastly, the fleet procurement process provides an important feed-in to the second-hand car market. In addition to mandating the suggested minimum fleet targets, governments should prioritise the purchase of electric vehicles in all scenarios where possible.

A 10 per cent uptake rate by government fleet vehicles would deliver \$1.7 million in operational savings in FY2020/21. In FY2025/26, a 25 per cent uptake rate would deliver \$5.9 million in operational savings, providing cumulative operational savings of \$14.35 million over the period.

## 2.3. Short-term measures to reduce the upfront cost of purchasing electric vehicles

Ensuring that Australia's market is 'EV ready' will underpin the early adoption of connected and automated vehicle technology and allow new industries to establish.

As a relatively new technology, electric vehicles incur a premium compared to internal combustion engines, primarily due to the cost of manufacturing batteries.

While these costs continue to fall – and with projections estimating purchase price parity with internal combustion engines before 2025 – governments throughout the world are stimulating early demand by plugging the short-term price premium to ensure that their market can benefit from the technology today and be in a position for greater consumer uptake in the years ahead.

Ensuring that Australia's market is 'EV ready' will underpin the early adoption of connected and automated vehicle technology and allow new industries to establish. This is an important initiative directly associated with protecting and improving Australia's competitive position.

As major economies prepare their markets to accelerate the transition to electric vehicles, the cost of falling behind will mean that Australian businesses and households will continue to pay far higher prices for road transport than many of our trading partners.

With 92 per cent of our refined petroleum imported from overseas and 100 per cent of our electricity generated domestically, Australia has more to gain than most from the electrification of road transport.



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Federal taxes like the Luxury Car Tax (LCT), Fuel Excise, Fringe Benefits Tax (FBT) and Goods and Services Tax (GST); state charges like Stamp Duty, Registration and Compulsory Third-Party (CTP); and local fees including parking permits and charges add to vehicle ownership costs.

A nationally coordinated and consistent approach for short-term exemptions from some or all of these taxes, duties and fees will accelerate the uptake of electric vehicles as prices fall.

The Luxury Car Tax was put in place to protect domestic vehicle manufacturing and is an obvious cost that should be completely removed for electric vehicles at the very least.

With domestic vehicle manufacturing now ceased, there is an opportunity to lower the price of electric vehicles by removing the Luxury Car Tax or putting in place an exemption for new electric vehicle purchases. Due to Australia’s low electric vehicle numbers, the initial cost to government of this initiative would be minimal.

This policy would help to remove one of the greatest barriers to electric vehicles and put Australia’s market in a more competitive position with major markets around the world, where generation subsidy and rebate schemes are attracting technological accessibility and investment.

With lower purchase prices, manufacturers will be encouraged to reshape our market by providing a greater number of electric vehicle models to Australian consumers, increasing choice and affordability to better reflect international vehicle markets.

### Revenue impacts of removing the LCT for EVs

Australian EV Sales Forecast (AEMO)\*

Scenario	2018/19	2019/20	2020/21	2021/22
Weak	8,413	15,258	17,761	20,897
Neutral	21,709	37,845	45,527	59,510
Strong	45,228	80,947	100,274	136,725

\*[www.aemo.com.au/-/media/Files/Electricity/NEM/Planning\\_and\\_Forecasting/NEFR/2016/AEMO-insights\\_EV\\_24-Aug.pdf](http://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/NEFR/2016/AEMO-insights_EV_24-Aug.pdf)

Luxury Car Tax (\$m)\*

Scenario	2018/19	2019/20	2020/21	2021/22
WEAK	4.9	8.8	10.3	12.1
NEUTRAL	12.5	21.9	26.3	34.4
STRONG	26.1	46.8	57.9	79.0

\*Based on Australian Budget LCT revenues and AEMO sales forecasts

## 2.4. Reduce Australia's reliance on imported liquid fuels

Australia is moving towards a situation where by 2030 we could have no refineries, less than three weeks supply of liquid fuel and 100 per cent dependency on importation.

The Australian Government should make a clear policy statement of its preference for the benefits of energy security associated with domestic electricity generation and electric vehicles rather than imported fuel.

Australia's combined dependency on crude and fuel imports for transport has grown from around 60 per cent in 2000 to more than 90 per cent today. With the majority of product shipped via the South China Sea, this hazardous dependence for the supply of our road transport sector leaves our national security vulnerable to geopolitical instability.

Australia's fuel stockpiles are also dangerously low. If our fuel supplies were to become severely constrained, we do not have a viable contingency plan in place to provide adequate supplies for our essential everyday services.

A recent bi-partisan report from the Australian Parliamentary Joint Committee on Intelligence and Security identified supply chain vulnerabilities in the fuel sector requiring immediate attention.

Australia is moving towards a situation where by 2030 we could have no refineries, less than three weeks supply of liquid fuel and 100 per cent dependency on importation.

The good news is that we can do something to improve our fuel security. We do not need to accept our current trajectory.

An accelerated approach to electric vehicle uptake can eliminate the need for 16 million barrels of imported oil per year by 2030, bolstering national security by lowering our reliance on importation.

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Australian transport and security policy should focus on encouraging domestically generated electricity.

There is no cost to government to clarify a preference for supporting domestic electricity generation as opposed to importing liquid fuels for road transport.

## 2.5. Prioritise electric vehicles and establish an inter-governmental electric vehicle working group

Australian governments should collegially establish a working group, with representation from industry and consumers, to coordinate the transition to electric road transport. The Australian Government should task the working group with ensuring that Australia is 'EV ready' before 2025.

The role of the group would be to examine and manage the impacts of the transition on energy, transport, public health, infrastructure and industry development across borders.

In addition, there are urgent operational considerations that require attention such as the adoption of an official standard for charging.

The NRMA and the EVC support charging standards proposed by the Federal Chamber of Automotive Industries:

- **AC Charging** – IEC 62196-2 Configuration Type 2 socket, and
- **DC Charging** – Both IEC 62196-3 Configuration FF (CCS-2) with tethered cable and IEC 62196-3 Configuration AA (CHAdeMO).

Officially adopting these standards will harmonise the national charging network and enable government and industry to invest in inter-operable charging infrastructure.

Within the Australian Government alone, more than ten agencies have either policy or delivery responsibility for matters associated with electric vehicles. A further cadre of organisations have influence on either related transport (e.g. National Heavy Vehicle Regulator), energy (e.g. CEFC), planning (e.g. Infrastructure Australia) or research matters (e.g. CSIRO). In addition, state transport and energy departments, plus energy distributors and infrastructure agencies are stakeholders.

The Transport and Infrastructure Council should officially elevate electric vehicles as a priority area for investigation.

To ensure broad representation and input, a subcommittee under the Transport and Infrastructure Council should be tasked with leading the required workstream.

To support the formation of a subcommittee, the Transport and Infrastructure Council should officially elevate electric vehicles as a priority area for investigation.

The formation of a group dedicated to preparing Australia for the electric vehicle revolution will bring forward the technology and put Australia in a good position to capitalise on the future productivity benefits of connected and automated vehicles.

There is no cost to government to establish an inter-governmental working group.

## 2.6. Promote industries associated with electric vehicles

Australian governments should encourage research and development in electric vehicle batteries and other components and technologies associated with electric vehicles.

With one of the world's largest supplies of mineral resources required for battery production and an innovative, entrepreneurial and well-educated population, Australia is well suited to developing industries that support the global market for electric vehicles.

Connected and automated vehicles – the future of road transport – will rely on electric propulsion and therefore present a long-term opportunity for industry. In addition to mineral and battery supply, whole-of-life considerations suggest that the reuse, recycling and disposal of batteries will require significant oversight and labour inputs. In addition, electrical engineering and maintenance will play an ever increasing role as we move towards the future of mobility.

To enable growth and initial industry development associated with electric vehicles and key componentry, the establishment of a \$10 million grant fund would help to kick-start what could become globally competitive industries.

Our economy is underpinned by our successful industries and businesses – it is imperative that we prepare now for the future needs of the transport sector. With technology moving faster than ever before, it is essential we are not caught off-guard so that we can capitalise on the megatrends reshaping our transport landscape.

A \$10 million grant fund represents a small cost to government that could accelerate the establishment of key industries to support the future of mobility in Australia.

As we move forward and industry needs become more apparent, the capital underpinning this initiative should be adjusted to reflect and promote domestic industry development.

Our economy is underpinned by our successful industries and businesses – it is imperative that we prepare now for the future needs of the transport sector.



## 3. Purpose and Objectives

The direct and indirect economic benefits of accelerating electric vehicle adoption would be significant.

Support for electric vehicle adoption will improve economic competitiveness and national security while reducing environmentally damaging emissions and the cost of transport.

There are currently more than 12 million light passenger vehicles in Australia and around 9 million dwellings. Approximately 1.2 million new cars are sold each year.

Over the last five years, more than 7000 electric vehicles have been sold in Australia. According to the Australian Energy Market Operator's neutral forecast scenario, electric vehicle sales would rise to 12 per cent of new cars in 2025 (134,285 cars). Under the strong forecast scenario, sales would reach 30.5 per cent (339,932 cars). Even if the strong forecast is not achieved, we could still have between 600,000 and 1.5 million electric vehicles in the Australian fleet by 2025.

Achieving at least the neutral sales forecast by 2025 is important as this will enable the transport sector to meet its obligations under the Paris Agreement.

Exceeding the neutral sales forecast will further bolster the transport's contribution to reducing emissions, alleviating some of the pressures on other sectors.

In addition, encouraging greater sales numbers will bring forward the many consumer and societal advantages of transitioning the light vehicle fleet to electric propulsion.

### **Economic Benefits**

The economic benefits of accelerating electric vehicle adoption could be significant. If Australia achieved the same level of electric vehicle uptake as Norway, the benefits would include:

- Increasing real GDP by \$2.9 billion and net employment by 13,400 jobs
- Saving owners \$1,700 per annum in costs by 2030
- Cumulative net investment of \$3.2 billion in charging infrastructure from 2018 to 2030, unlocking rural and regional Australia for electric vehicles
- Eliminating the need for 16 million barrels of imported oil per annum by 2030
- Reducing CO<sub>2</sub>e emissions cumulatively by 18 Mt by 2030

Recharging the economy will increase electric vehicle adoption by addressing the three most significant barriers to electric vehicle uptake as identified by motorists through the NRMA:

- Access to charging infrastructure (65%)
- Purchase cost (61%)
- Range anxiety (59%)

## 4. Rationale

Electric vehicles have moved from the fringe of the automotive sector to its core. Recent research indicates 40 per cent of motorists will consider purchasing an electric vehicle as their next car, while 58 per cent of those under 25 years will consider purchasing an electric vehicle.

Over the next two years, a range of cheaper models will hit Australian shores. Major manufacturers like Hyundai, Renault, Nissan and Tesla plan to shortly release new electric vehicle models priced between \$35,000 and \$50,000.

This comes at a time when many major automotive manufacturers have signaled their plans to phase out petrol and diesel vehicles. Among the most progressive, Volvo and Jaguar Land Rover have committed to fully electric fleets in 2019 and 2020 respectively, while other manufacturers have committed to ambitious targets from around 2022.

Supporting the transition of the passenger vehicle fleet to electric propulsion is sensible policy that will greatly benefit Australian motorists.

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Electric vehicles can assist with cost of living pressures by:

- Reducing costs of car ownership
- Reducing costs of fuel
- Improving energy efficiencies

However, in order to realise these benefits and maintain the efficiency of the Australian transport sector, investment and reform to support electrification will be necessary.

With the right incentives and policies aimed at promoting the uptake of electric vehicles, there is an opportunity to expedite the arrival of new mobility technology, bolster fuel security, and improve national health standards while achieving significant emissions reductions in Australia's transport sector.

Global surveys suggest that 28 to 40 per cent of electric vehicle owners have home solar installed to reduce the need for electricity purchased from the grid.

### **Electricity Demand**

The electrification of the automotive fleet over the next decade is expected to have a relatively minor impact on the electricity grid. The Finkel Review indicated that if 1.2 million cars were to electrify over that period, it would represent around four per cent of the generation capability of the National Energy Market.

However, if electric vehicles prove more popular, charging during peak demand times would put significant strain on residential distribution infrastructure.

To minimise unwanted impacts, new tariffs will be required to encourage electric vehicle charging during off-peak times.

In November 2017, Synergy (Western Australia) launched this type of tariff structure through its Electric Vehicle Home Plan, which puts in place incentives for owners of electric vehicles to charge between the hours of 11pm and 4am.

Smart meters can assist to maximise the benefits of off-peak tariffs by restricting charging to specified times, and can also optimise the incorporation of home electricity generation.

Global surveys suggest that 28 to 40 per cent of electric vehicle owners have home solar installed to reduce the need for electricity purchased from the grid.

Like the transport sector, the electricity sector is managing a major shift. The move from centralised power generation to a distributed generation network with new battery storage is altering the long-held industry paradigm and creating uncertainty.

Uncertainty undermines confidence and, in turn, reduces investment appetite. The convergence of generational change within the transport and electricity sectors set to occur over the next decade is unprecedented.

The investment required to facilitate this change has not yet been forthcoming.

Investment in electric vehicles should be accompanied by careful management of the electricity market, including generation capability, demand management and potential storage. This will be required to keep electricity prices low and ensure grid resilience as we move into the future.

## 5. Agencies and Stakeholders

An extensive number of government agencies and stakeholders have clear roles in managing policy, regulations and logistics relating to the transition of the vehicle fleet:

### **Australian Government**

#### **Responsible**

- Australian Energy Regulator
- Australian Government Department of Environment and Energy
- Australian Government Department of Jobs Industry and Science
- Australian Government Department of Transport and Infrastructure
- Australian Treasury
- National Transport Commission

#### **Consulted**

- Australian Government Department of Prime Minister and Cabinet
- Australian Renewable Energy Agency
- Australian Tax Office
- Infrastructure Australia

### **State and Territory Governments**

#### **Responsible**

- Departments of Energy
- Departments of Finance
- Departments of Planning
- Departments of Transport
- Roads agencies
- Treasuries

#### **Consulted**

- Department of Premier and Cabinet
- Infrastructure bodies

### **Stakeholders**

#### **Industry and Public Organisations:**

- Electric Vehicle Council
- Australian Driverless Vehicle Initiative
- ClimateWorks Australia
- Infrastructure Partnerships Australia
- Roads Australia
- Tourism and Transport Forum

#### **Motoring Clubs:**

- NRMA
- AAA
- AANT
- RACQ
- RAA
- RACT
- RACV
- RAC WA

#### **Automotive OEMs (leaders in EVs):**

- Audi
- BMW
- Ford
- Hyundai
- Jaguar Land Rover
- Kia
- Mercedes-Benz
- Mitsubishi
- Nissan
- Porsche
- Renault
- Tesla
- Volvo
- Volkswagen

#### **Electric Vehicle Charging Suppliers:**

- Tritium
- ABB
- Chargefox
- ChargePoint
- Fast Cities
- Schneider Electric

#### **Electricity Distributors:**

- Endeavour Energy
- Essential Energy
- Ausgrid
- Evoenergy
- Citipower
- Jemena
- Powercor Australia
- AusNet Services
- United Energy Distribution
- Energex
- Ergon Energy
- SA Power Networks
- TasNetworks
- PWC Networks
- Western Power
- Horizon Power

## 6. Net Cost of Proposal (\$m)

Measure	Description	EV Uptake	2018/19	2019/20	2020/21	2021/22	Total
Prioritise the Rollout of Charging Infrastructure	Fast chargers – enabling works for fast charging		3.75	3.75	3.75	3.75	15
	Public chargers – non-proprietary public chargers		8.75	8.75	8.75	8.75	35
	Home chargers – adoption of home energy package	WEAK	3.4	6.1	7.1	8.4	24.9
		NEUTRAL	8.7	15.1	18.2	23.8	65.8
	STRONG	18.1	32.4	40.1	54.7	145.3	
Government Fleet Target	10 per cent EVs in Australian Government fleet by FY2020/21		-	-	1.7	1.7	3.4
Short-term Measures to Increase EV Purchases	Luxury Car Tax exemptions	WEAK	4.9	8.8	10.3	12.1	36.01
		NEUTRAL	12.5	21.9	26.3	34.4	95.09
		STRONG	26.1	46.8	57.9	79.0	209.84
Reduce Australia’s Reliance on Imported Liquid Fuels	Statement on fuel security		-	-	-	-	-
Establish an Inter-governmental EV Working Group	Inter-governmental working group		-	-	-	-	-
Promote Industries Associated with EVs	Grant funding		2.5	2.5	2.5	2.5	10
TOTAL		<b>WEAK</b>	<b>23.23</b>	<b>29.92</b>	<b>30.66</b>	<b>33.73</b>	<b>117.54</b>
		<b>NEUTRAL</b>	<b>36.22</b>	<b>52.00</b>	<b>57.82</b>	<b>71.48</b>	<b>217.53</b>
		<b>STRONG</b>	<b>59.22</b>	<b>94.15</b>	<b>111.35</b>	<b>146.99</b>	<b>411.71</b>

# Comments and Queries

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