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### **Executive Summary**

Globally, transport systems are rapidly transforming and electric vehicles (EVs) are a major part of this transformation. Although the uptake of EVs has been slower in Australia than in many other countries, it is expected that the number of EVs in Australia will accelerate rapidly in the next five to ten years.

There was a 200 per cent jump in Australian EV sales in 2019. A total of 6 718 EVs were sold in Australia in 2019, up from 2 216 in 2018. In the same period, combustion engine vehicle sales dropped by 7.8 per cent. In the Northern Territory, there were 12 electric cars in March 2019 and 38 in December 2020. However, EVs still only represent 0.6 per cent of all vehicle sales in Australia compared to 3.8 per cent of sales in Europe and 4.7 per cent of sales in China<sup>1</sup>.

Several new, lower cost EV models are arriving, or are scheduled for release in Australia.

With the introduction of lower cost EVs into Australia there will be increased use of EVs and greater demand for supporting infrastructure.

EVs provide a number of benefits compared to conventional vehicles including lower greenhouse gas emissions and reduced operational costs. The Northern Territory Government has explored options to support the uptake of EVs in the Northern Territory.

Most Australian States and
Territories are implementing
policies and programs to encourage
the uptake of EVs. In addition, at
the national level, jurisdictions
are collaborating through a
Low and Zero Emission Vehicles
working group to manage the
introduction of EVs and other
vehicles in Australia. However, the
Northern Territory's characteristics
including long distances, a small
and widely dispersed population
and extreme climatic conditions

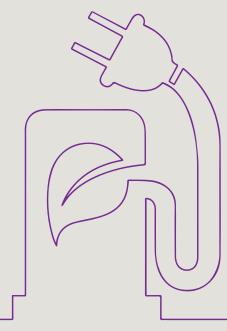
present unique challenges for the introduction of EVs.

Supporting the uptake of EVs will generate jobs and economic benefits for the Northern Territory. EVs will bring new skills and new business opportunities and open up potential for EV research and innovation. Increasing the number of EVs will support local power generation, the local solar industry and there will be increased demand for the installation of EV charging facilities. Government support is needed to ensure that the Northern Territory is not left behind as Australia transitions to electric mobility.

This Electric Vehicle Strategy and Implementation Plan has been developed to support the increased uptake of EVs in the Northern Territory. Following industry and community feedback on the 2019 NT EV Discussion Paper, four priority areas for action have been identified:

- Vehicle costs and availability,
- Vehicle charging,
- Knowledge, skills and innovation, and
- Consumer information.

Actions for the Northern Territory Government to implement have been identified for each of these priority areas in the EV Implementation Plan. The EV Implementation Plan will be reviewed annually to monitor progress and actions will be updated where required to respond to changing policy and technology developments.



#### Strategy Scope

This Strategy focusses on battery EVs (BEVs) which are powered by an electric motor and plug-in hybrid EVs (PHEVs) which also include a conventional engine. BEVs and PHEVs are likely to represent the most significant change in Australia's vehicle fleet in the short to medium term

Community feedback on the 2019 NT EV Discussion Paper highlighted that a broad range of EVs should be included in this Strategy including e-motorbikes, e-bikes, e-scooters and other electric personal mobility devices (PMDs) as these produce even less emissions than electric cars. Although the City of Darwin is currently trialling the use of shared e-bikes and e-scooters in Darwin, an exemption applies to the e-scooter trial and privately owned e-scooters (with a power output greater than 200W) cannot legally be used in the Northern Territory at present. Further investigation

is required regarding the role and potential of e-scooters and other PMDs and potential legislative reform in the Northern Territory.

Unlike PHEVs, Hybrid EVs cannot be plugged in to recharge. Consequently Hybrid EVs are excluded from the Strategy scope as they do not represent a significant shift from conventional vehicles and don't have the potential to operate as zero emission vehicles. Hybrid EVs are also lower cost and a greater number of hybrids are available in the second hand market and so are already more accessible.

While hydrogen fuel cell EVs operate as zero emission vehicles, refuelling infrastructure and hydrogen supply are very limited at present in Australia, particularly in the Northern Territory and fuel cell vehicle technology is at an earlier stage of development than plug-in EVs. In at least the

short term, hydrogen fuel cell vehicles are likely to be restricted to more densely populated areas in large cities or commercial heavy vehicle and bus fleets, which return regularly to refuelling hubs. Additionally, the potential for fuel cell vehicles is being considered at the national level through the National Hydrogen Strategy and locally through a Northern Territory Hydrogen Strategy.



EV Charging station at Darwin Waterfront





#### **Lower Operational Costs**

Running costs of EVs are around 60 per cent to 90 per cent cheaper than fuel costs for a conventional vehicle and with fewer moving parts, maintenance and servicing costs are lower<sup>2</sup>.



#### Reducing greenhouse gas emissions

Transport is responsible for 19 per cent of Australia's total greenhouse gas emissions and eight per cent of the Northern Territory's emissions<sup>3</sup>.



#### Supporting the Northern Territory's 50% by 2030 renewable energy target and managing electricity demand

Managing electricity demand by charging vehicles at peak solar energy production during the day and lower energy demand periods during the middle of the day and at night.



#### Improved fuel security

Reduced reliance on imported liquid fuels.

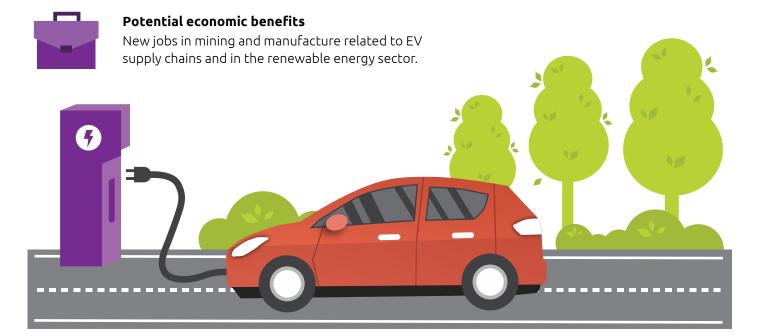


#### Improving urban amenity

Reduced road traffic noise and improved air quality.



The main benefit [of EVs] to the NT is the fuel is local, made locally and locally owned instead of foreign imported oil.



# Developing an EV Stategy for the Northern Territory

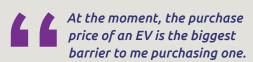
At the national level, the Australian Government is developing a Future Fuels Strategy and most States and Territories are implementing a range of policies to support the uptake of EVs. The Northern Territory Government is collaborating with other jurisdictions through a Low and Zero Emission Vehicles (LZEVs) working group to address the barriers and challenges affecting the uptake of LZEVs in Australia.

This Strategy aligns with other relevant Northern Territory Government policies and programs, both existing and in development, including the Roadmap to Renewables and the Northern Territory's renewable energy target of 50% renewable by 2030, the Climate Change Response and the Digital Territory Strategy.

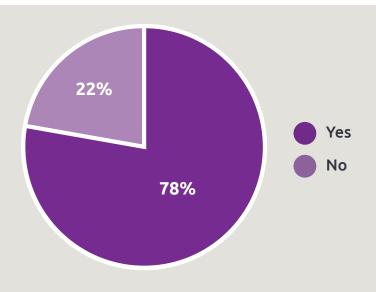
In 2019 the Northern Territory Government released an EV Discussion Paper to assist in developing this EV Strategy and Implementation Plan. A wide range of comments were received from industry, businesses and the community. A total of 195 surveys were completed and over 200 comments and submissions were received. Submissions highlighted key barriers to EV uptake including cost of vehicles, range anxiety, charging infrastructure and battery life. Key benefits identified were environmental benefits, lower transport costs and vehicle performance.

There was significant support for the Northern Territory Government encouraging the use of EVs (79 per cent of respondents) and setting a target for the Northern Territory Government vehicle fleet (82 per cent of respondents).

Feedback received through consultation has been incorporated in the development of this Strategy and Implementation Plan.



Would you consider buying an EV in the next 5 years?



Response to 2019 NT EV Discussion Paper Survey

# Feedback received through the 2019 NT EV Discussion Paper Survey

Position	Адгее	Disagree	Neutral
The Northern Territory Government should encourage EV use in the NT	79%	11%	10%
Now is the right time to encourage EV use	77%	12%	11%
The Northern Territory Government should invest in public charging infrastructure	78%	14%	8%
The Northern Territory Government should provide grants for home and workplace EV charging	69%	19%	12%
The Northern Territory Government should encourage EV use by subsidising reduced stamp duty and registration costs	76%	17%	7%
Private industry should invest in public charging infrastructure	80%	6%	14%
The Northern Territory Government should set an EV target for its own vehicle fleet	82%	13%	5%
The Northern Territory Government should encourage EV tourism through public infrastructure and other initiatives	71%	12%	17%

### What is the potential for EV uptake in the Northern Territory?

The Northern Territory covers a large land area and has a small, widely dispersed population, with many remote and very remote communities. In addition, the Northern Territory's major urban centres are geographically isolated from the rest of Australia and experience extreme climatic conditions. These unique characteristics will present challenges for the increasing use of EVs across the Northern Territory.

As is occurring elsewhere in Australia, the number of EVs in the Northern Territory is expected to increase, potentially quite rapidly, particularly as price parity with conventional vehicles is expected to occur in Australia around

2025. While several Territorians responding to consultation indicated that the limited range and towing capacity of EVs would not suit their transport needs and lifestyle, many people commented that the urban areas of the Northern Territory were ideal for EV use.

In 2019 there were 146 000 light vehicles registered in the Northern Territory and of these, approximately a quarter are smaller, light vehicles (with an engine size less than 2000 cc).

These 36 000 smaller light vehicles could potentially be replaced by lower priced EVs which are currently available in Australia. With Territorians driving on average 36 km per day, the range of BEVs

currently available in Australia (around 300 km) is more than sufficient for average daily trips.

By investing in EV charging infrastructure and supporting EV uptake now, the Northern Territory Government can ensure that the Northern Territory is prepared for the transition to EVs and is well placed to harness the potential benefits which EVs can provide.

When charged with grid power in Darwin a Nissan Leaf EV produces around 40 per cent less gCO<sub>2</sub>/ km than a conventional Tovota Corolla4. If charged with renewable energy, EV driving is emission free.



Due to distances involved, (EV) technology isn't there yet for many living and working remote, but no reason why 70 per cent of metro users can't have at least one (electric) vehicle per family.

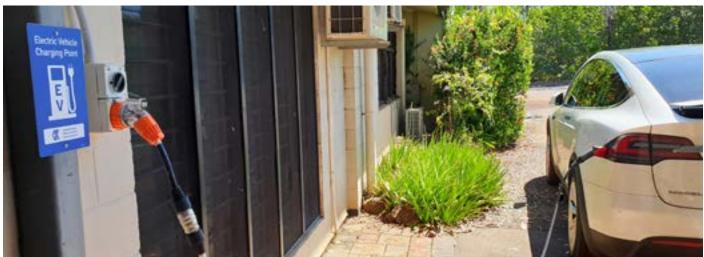


EV Charging point at Katherine



EV Charging station at Darwin Airport





Top: EV Charging point at Dunmarra; above: EV Charging point at Emerald Springs







Bottom left: EV Charging point at Alice Springs; middle left: EV Charging station at State Square Car Park Darwin; bottom right: Charles Darwin University EV Charging Station

### **Priority Areas**

Four key priority areas for Northern Territory Government action to support EV uptake have been identified. The Northern Territory Government will work with local government, industry and the community in the delivery of these actions.

#### Vehicle costs and availability

The high upfront cost of EVs is driven by the battery cost (up to one-third of the total cost of manufacturing an EV) and smaller manufacturing volumes<sup>2</sup>, however, prices are decreasing. A total of 28 models of EVs are now available in Australia and some are priced under \$50 000<sup>1</sup>. Research in Australia has found that people would be willing to pay more for an EV than a petrol or diesel vehicle, however only if there is more support and incentives<sup>5</sup>.

The Northern Territory Government fleet currently includes four leased PHEVs. By including EVs in the vehicle fleet and setting a fleet target for EVs, the Northern Territory Government can show leadership and assist in providing certainty for investment in charging infrastructure and services. With low numbers of EVs in the Northern Territory, there is a very limited second hand market. Increasing the number of EVs in the Northern Territory Government Fleet will also increase the number of second hand EVs in the Northern Territory.

Implementation of the Commonwealth Road Vehicles Standard Act 2018 in mid-2021 and existing transitional arrangements allow for the importation of certain vehicles meeting environmental criteria. This allows for the importation of new or used EVs not otherwise available in Australia and provides an alternative pathway

for the increased uptake of EVs.

Feedback during consultation highlighted that the high cost of EVs is likely to be prohibitive for many in the Northern Territory and the equity of government support for EVs was questioned. Early EV uptake has been restricted to Territorians who have been in a position to buy a new vehicle. However, the introduction of EVs into the Northern Territory through new vehicle sales and imported vehicles through the Commonwealth scheme, will in turn, increase the availability of EVs in the local second hand market, increasing EV affordability for others.

Supporting early adopters of EVs is similar to the government support provided to early adopters of solar panels in Australia. Even with government support, early adopters paid a much higher price for solar panels and prices have subsequently dropped significantly.



EV Charging station at Darwin Waterfront

As a result of this initial support from governments and investment in solar panels by early adopters, the broader community is now benefiting from significantly lower cost solar panels and lower power costs. A similar pattern of uptake is anticipated for EVs, with the broader community benefitting over time from government support and the actions of early adopters.

Although EVs provide fuel savings for consumers, there will be revenue implications for governments. Increased EV uptake will reduce Commonwealth fuel excise and options for how EVs will be charged fairly for their use of the road network will need to be developed. This issue is being progressed at the national level and the Northern Territory Government will be considering options for EV road user charging in the Northern Territory.

#### To address vehicle costs and availability key actions include:

- Reducing vehicle registration stamp duty costs to encourage EV uptake,
- Setting targets to increase EVs in the Northern Territory Government fleet

There is a need to plan ahead for charging infrastructure in residential and commercial buildings and public facilities. Government has a role in developing relevant charging standards and guidance at both the national and local level and also increasing the availability of EV charging locations.

#### Vehicle charging

Consumer concern regarding the range of EV batteries, often referred to as 'range anxiety' and the availability of charging infrastructure is a significant barrier to EV adoption in Australia and convenient charging infrastructure will be essential to encouraging EV uptake⁵. Charging options are needed including home charging, public charging and fast charging and there is a role for government in supporting the development of charging networks, particularly where there may be a marginal commercial case for private investment in charging infrastructure.







## **Priority Areas** (continued)

Increased demand for electricity as a result of vehicle charging will need to be carefully managed. Power and Water Corporation is developing network strategies in response to developments in grid-connected technology, power use, dynamic charging and other emerging technologies to accommodate future energy demand. EV and grid interaction is likely to be dynamic, so policies will need to be flexible to allow for changing circumstances. Contingencies will be required for significant power outages due to cyclones and other unexpected events.

Abundant day-time solar power in the Northern Territory presents an enormous opportunity to reduce transport emissions. To maximise the use of renewable energy for EV charging during high solar generation times, daytime EV charging will need to be encouraged. EV charging at peak times should be discouraged to reduce the impact on the grid and the impacts of EV charging from non-renewable energy.

There is potential to use EVs to manage energy demand and supply through vehicle to grid (V2G) technology and dynamic charging infrastructure (where this capability is not managed by the vehicle) and Power and Water is keen to explore options for the Northern Territory. Currently the Nissan Leaf is the only EV available in Australia with V2G capacity, however capacity for V2G is likely to increase with the arrival of a wider range of EV models in Australia. As the availability of

V2G technology increases, EVs could potentially provide an option for integration with renewable energy supply and management in remote communities.

If managed appropriately, a significant number of EVs could assist with managing the reduction of demand during the middle of the day and act on a 'solar sponge'. As EVs are effectively a 'battery on wheels' they have significant potential to provide grid stability services throughout V2G technology.

#### To address vehicle charging kev actions include:

- Collaboration with other jurisdictions on charging standards and principles,
- Developing guidelines for EV charging infrastructure, and
- Increasing EV charging stations.

#### Knowledge, skills and innovation

EV maintenance and installation of charging infrastructure will require specialised servicing and maintenance skills. Although some servicing requirements may be undertaken remotely, there are opportunities for local providers to service and maintain EVs and install and maintain EV recharging facilities.

Feedback on the 2019 NT EV Discussion Paper highlighted that EV servicing and repair is likely to require a more complex range of skill sets than traditional mechanical skills, including an increased level of IT and technology skills. Training

in the service and repair of EVs and charging infrastructure is likely to be required and the Northern Territory Government will liaise with industry and other jurisdictions regarding skill development. There is potential for innovation and development of specialised skills in relation to EVs and renewable recharging. With the Northern Territory's climatic extremes there is potential to position the Northern Territory as a specialised test environment for EVs and related technology.

Although knowledge and experience of EVs and associated infrastructure is expanding, there is a need for further investigation of new technologies and systems. Participating in technology trials and research projects will support the successful introduction of EVs in the Northern Territory. A key area for investigation and potential innovation is battery disposal, reuse and recycling. In order to reduce EV life-cycle environmental impacts, battery recycling can be considered as an alternative to battery disposal. Once an EV battery is no longer functional for EV use, the battery still retains 75 per cent of its original capacity to store energy<sup>6</sup>. Batteries can be reused for energy storage or recycled and there is a need to investigate battery recycling options. EV batteries are included in the scope of the national product stewardship scheme for batteries due to commerce in mid 2021.

Feedback from consultation highlighted the ongoing potential for the Northern Territory to leverage the international expertise



I have a Hyundai Ioniq EV. I find never having to stop at a petrol station convenient. a petrol station convenient. Charging at home is easy. I never need to charge elsewhere. I am able to run out to Howard Springs or Darwin River and back easily without range anxiety. I only need to charge twice a week.

Feedback to the 2019 NT EV Discussion Paper.

associated with the biennial World Solar Car Challenge. Solar cars are effectively EVs, however, their batteries are powered primarily by solar power rather than mains electricity. The World Solar Car Challenge traverses Australia from Darwin to Adelaide and attracts global expertise in solar and EV technology to the Northern Territory. In recent years, the Challenge has evolved from purely experimental vehicles to include a cruising class which encourages solar cars designed for practicality and aims to change consumer perceptions regarding vehicles and fuels. There is potential for the Northern Territory to further engage with this major international event and foster local skills and expertise in EV technology.

#### Key actions to develop knowledge and skills and foster innovation include:

- Planning for power supply,
- Supporting local innovation in EV technology and battery recycling
- Skills development for EV and charging infrastructure servicing and repair, and
- Continuing to support the World Solar Car Challenge.

#### Consumer information

Limited availability of convenient and accessible information regarding EVs and EV charging infrastructure is frequently raised by consumers⁵. Responses to the 2019 NT EV Discussion Paper survey highlighted the need for information on the benefits of EVs and the practicality of using EVs in the Northern Territory. The Northern Territory Government will work with other jurisdictions and industry to provide easily available, consistent and reliable information on EVs and associated technologies. There is also potential to develop guidance and support for organisations and businesses considering the provision of EV charging services.

Range anxiety was frequently raised as an issue during consultation, however, many daily trips in the Northern Territory's urban centres are well within the range of EVs. The compact size of Darwin and Alice Springs make them particularly suitable for EV use. Providing information to consumers regarding range and recharging times will assist in reducing range anxiety.

There is national agreement on a requirement for number plate labelling of EVs (and also hybrid and hydrogen fuelled vehicles) and the Northern Territory intends to implement national model legislation. EV labelling will increase awareness of EVs and also assist emergency responders in identifying EVs and implementing appropriate safety procedures.

Feedback from consultation highlighted the potential to support and attract EV tourism in the Northern Territory. Promoting EV routes such as Darwin, Jabiru and Katherine, and Alice Springs and Uluru were highlighted as potential options. Supporting activities may include installation of charging infrastructure and engaging with key stakeholders to increase availability of EVs.

#### Key actions to increase consumer information include:

- Providing practical information to consumers,
- Promoting information on EV charging facilities, and
- Promoting EV tourism opportunities.



EV Charging point at Timber Creek

## **EV Implementation Plan**

EV uptake in Australia has lagged behind the rest of the world, however EVs are coming. The rate of EV uptake is expected to soar as the price difference between EVs and conventional vehicles narrows.

As a small jurisdiction, with a low and widely dispersed population, the Northern Territory is unlikely to have a lead role in supporting EV uptake in Australia. Any policies or programs implemented by the Northern Territory Government to encourage the uptake of EVs are likely to have limited impact nationally. However, now is the time to position the Northern Territory in relation to the introduction of EVs. The Northern Territory needs to be prepared for the transition to EVs and harness the benefits which EVs can provide.

For each of the priority areas outlined in this strategy, actions have been identified and costed for implementation over five years 2021 – 2026. Potential actions were assessed against the following criteria:

- Relevance to the Northern Territory,
- Actions within Northern Territory Government control,
- Time limited (as the Strategy covers a five year period),
- Impact,
- · Equity, and
- Level of community and industry support.

The EV Implementation Plan will be reviewed annually to monitor progress and vehicle uptake and actions will be updated, where required, to respond to changing policy and technology developments.



EV's are the way of the future, by not supporting the industry and adapting with this change the NT would only be giving itself and its people a disadvantage. Darwin itself also has a unique layout where the 'in-town' driving habits of people are usually within the metro area and for fairly short trips - perfect for EV use. With any technological infrastructure upgrade, it brings technical minds and bright people to the area which can only be a good thing as well.



EV Charging station at Alice Springs airport



EV Charging point at Mataranka

# EV Implementation Plan (cont.)

### Priority 1: Vehicle cost and availability

Action	Timing
1.1 Remove the registration component of registration fees for EVs in the NT for five years to encourage EV uptake.	July 2022
1.2 Reduce stamp duty for first time registration of new and second hand EVs in the Northern Territory by \$1 500 for five years (effectively removing stamp duty for EVs up to a purchase cost of \$50 000) to encourage EV uptake.	July 2022
1.3 Increase the number of EVs in the Northern Territory Government Fleet by 20 per year over 10 years, totalling 200 vehicles by 2030.	2021 to 2030
1.4 Modify the Northern Territory Government Vehicle Policy Framework to require agency pool vehicles to be EVs where fit for purpose.	2021
1.5 Investigate adjustment of contribution rates for Northern Territory Government Fleet EVs to incentivise uptake through lower rates.	2021
1.6 Investigate the potential for including EVs in Northern Territory Government contract arrangements for rental vehicles.	2021 to 2026
1.7 Participate in national forums investigating road user charging for EVs and consider future options for the Northern Territory.	2021 to 2026

Note: 'EV' includes BEV and PHEV.

### Priority 2: Vehicle charging

Action	Timing
2.1 Work with other jurisdictions and industry to coordinate EV charging standards and principles, including the development of charging guidelines (for businesses and major developments including car parks, workplaces, shopping centres and residential apartments.)	ongoing
2.2 Investigate amendments to the Northern Territory Planning Scheme to encourage provision of EV charging in new developments.	2022
2.3 Install EV charging infrastructure in suitable government capital works projects in major urban areas and regional centres, such as car parks and park and ride facilities.	ongoing
2.4 Include a requirement for EV charging facilities in Northern Territory Government standard lease agreements where appropriate.	ongoing
2.5 Implement a grant program to encourage provision of recharging infrastructure.	2021 to 2026
2.6 Install charging infrastructure on site at NT Fleet.	2021
2.7 Progress negotiations with building owners of NT Government leased buildings to install priority EV charging points.	2022
2.8 Install a minimum of 400 charging points at identified priority Northern Territory Government buildings.	ongoing

# EV Implementation Plan (cont.)

### Priority 3: Knowledge, skills and innovation

Action	Timing
3.1 Plan for power supply implications of increased EV uptake including V2G technology, renewable charging, dynamic charging electricity pricing and incentives to maximise day time EV recharging.	2021 to 2026
3.2 Investigate the feasibility of trialling low and zero emission buses in the Northern Territory urban fleet.	2021 to 2026
3.3 Investigate the need for developing guidelines on electrical safety issues associated with EV charging installations.	2022
3.4 Partnering with industry, tertiary institutions and training providers, investigate the need for skills development in servicing EVs and EV charging infrastructure.	2022
3.5 Foster innovation in solar EV technology through ongoing support of the World Solar Car Challenge.	ongoing
3.6 Implement changes to vehicle registration classes to allow for separate registration of BEVs, Hybrid, PHEVs and Hydrogen vehicles.	2022

### **Priority 4: Consumer information**

Action	Timing
4.1 Provide information to consumers on benefits of EVs and information on the costs of EVs, range, length of charging times, life of an EV and servicing.	2021 to 2026
4.2 Promote information on EV recharging locations.	2021 to 2026
4.3 Implement number plate labelling for EV, Hybrid and Hydrogen vehicles.	2022
4.4 Evaluate the emission reduction potential of EVs in the Northern Territory through the Climate Change Response 3 year Action Plan	2022

#### References

- 1. Electric Vehicle Council 2020, State of Electric Vehicles, Electric Vehicle Council, Sydney
- 2. Queensland Government 2017, The Future is Electric: Queensland's Electric Vehicle Strategy, Queensland Government, Brisbane
- 3. Australian Government, 2018, State and Territory Greenhouse Gas Inventories, Australian Government, Canberra
- 4. Australian Government 2021, Future Fuels Strategy Discussion Paper, Australian Government, Canberra
- 5. Climate Works Australia 2019, The State of Electric Vehicles in Australia 2018, Climate Works Australia, Melbourne
- 6. Electric Vehicle Council NRMA 2018, Recharging the economy accelerating electric vehicle adoption, Sydney, NSW





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