

South Australia's Electric Vehicle Action Plan

Lowering energy costs
whilst cutting pollution

Acknowledgements

We acknowledge that work undertaken to develop this Electric Vehicle Action Plan took place predominantly on the traditional lands of the Kaurna people, and we respect their spiritual relationship with their country.

We also acknowledge the Kaurna people as the custodians of the Adelaide region and that their cultural and heritage beliefs are still as important to the living Kaurna people today.

We also pay respects to the cultural authority of Traditional Owners from other areas across Australia, where work was undertaken by a number of stakeholders to provide input into this Action Plan.

We acknowledge Elders past and present, and remain humbled by the ancient knowledge systems from which we can all learn

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Table of contents

Acknowledgements	1
Table of contents	2
Foreword	3
Transition to zero emissions transport	5
Vision	9
Executive summary	11
Definitions	13
Strengthening our electricity system	15
Benefits of electric vehicles	17
Action Themes	
Action Theme 1 — Statewide public charging network	19
Action Theme 2 — Leading by example	23
Action Theme 3 — Catalyse fleet and private uptake	25
Action Theme 4 — Framework to speed up transition	27
A history of early adopters	29

To help drive our recovery from the impacts of COVID-19, the South Australian Government will build what matters by delivering an historic shift from fossil fuel combustion engines to electric transport.

The South Australian Government is committed to delivering a cleaner environment and more productive power grid by bringing forward the adoption of electric vehicles (EVs). To achieve this, the Government will steer a smarter and faster transition – replacing polluting fuels with local, clean power to provide future generations with cleaner air, an improved urban environment, and further comprehensive action on climate change.

This transformation will see significant improvements in both private and public transportation. Electric vehicles will deliver the biggest step change in transport since Henry Ford mass-produced the Model T last century, delivering across the board increases in multi-factor productivity, and the opportunity to integrate with a digitised power grid.

By 2030, we want EVs to be mainstream, and the common choice for new car purchases. We want the government's fleet, and public taxi and rideshare fleets to be fully electric. As vehicle manufacturers and technology developers around the world pivot to electric transport, we want all new passenger vehicles sold in South Australia to be fully electric by 2035.

That's why at the centre of this Action Plan, is a roll-out of a statewide electric vehicle charging network to make consumers confident that with an electric vehicle they can go the distance.

Nearly 60 per cent of electricity generated in South Australia is from zero emissions renewable sources, and we aspire to become a net exporter of renewable energy, generating net-100 per cent renewables by 2030. South Australians will be able to charge their EVs from zero or low emissions electricity, and our Action Plan will make sure that EVs reduce the cost of power for households by sharing the costs of our electricity network.

As transport emissions accounted for 30 per cent of South Australia's greenhouse gas emissions in 2018-19, electrification of transport is a priority to our target of reducing greenhouse gas emissions by at least 50 per cent by 2030, and net zero emissions by 2050.

Our leadership in energy storage, demand management and hydrogen have shown that early preparation and a focus on private investment brings jobs, training opportunities, and more competitive electricity costs for all South Australians.

We want to take our global leadership in distributed energy resources such as solar and batteries, and incorporate EVs into the growing number of virtual power plants that are helping to power and balance our grid, whilst rewarding consumers.

To encourage manufacturers to increase the range of vehicles in South Australia, we will use our procurement power and gather a network of likeminded fleets to commit to zero emission transport. We aspire to a transition by 2030, where all taxi and rideshare vehicles in metropolitan Adelaide are electric, and fully electric vehicle fleets are a normal part of doing business.

Transport and land use planning will identify how our roads and built environment will need to adapt to the differing needs of EVs. This includes the development of roadside and home charging infrastructure to meet growing transport demands across South Australia.

Importantly, EVs will bring health, amenity and environmental benefits, – but these need to be comprehensive. So we will advocate for a national extended producer responsibility scheme for batteries, and pursue battery reuse and recycling industries in South Australia to service the Asia-Pacific Region.

The transition to EVs supports our climate change and economic development ambitions for South Australia. Our transition will encompass the public sector, business and the broader community embracing new technologies to build what matters for our economy, and increase prosperity for South Australians.

With strong leadership and investment from industry, households and businesses, we will deliver our electric vehicle vision for all South Australians.



**Hon Steven Marshall
MP**

Premier of South Australia
Government of South Australia



**Hon Dan van Holst
Pellekaan MP**

Minister for Energy and Mining
Government of South Australia

A white car is shown from the side, driving on a dark asphalt road. In the background, there are rolling green hills and several white wind turbines under a clear blue sky with some light clouds. A large blue rectangular box is overlaid on the right side of the image, containing white text. The text is enclosed in large quotation marks.

“We want to take our global leadership in distributed energy resources such as solar and batteries, and incorporate EVs into the growing number of virtual power plants that are helping to power and balance our grid, whilst rewarding consumers.”

Transition to zero emissions transport

Year	2020	2025
Framework	Establish a framework that accelerates the transition to EVs	
Charging Network	Construct a statewide EV charging network	Statewide charging network fully operational
VPP	Electric Vehicle Virtual Power Plant (EV VPP) demonstration	EV VPPs contributing to electricity grid reliability
Fleets	Catalyse fleet uptake of cost effective EVs	EVs the default choice for business fleets, in particular, taxi and ride share
Government vehicles	Government lead by example with cost effective EVs	Government procurement and sponsorship encouraging business uptake of EVs
Passenger vehicles	Limited models and availability	EV uptake accelerating and range of cost effective models increasing rapidly
Commercial vehicles		Range of cost effective commercial EV models available
Heavy vehicles		

2030

2035

2040

EVs reducing electricity costs for all SA consumers

New metropolitan taxi and ride share fleets are 100% EV

Government passenger fleet now 100% EV, EV fleets are a normal part of doing business with the government

Common choice for households

Default choice for all new passenger vehicle purchases

Common choice for leading operators

EV models gaining a dominant market share

Heavy EVs cost effective and gaining market momentum

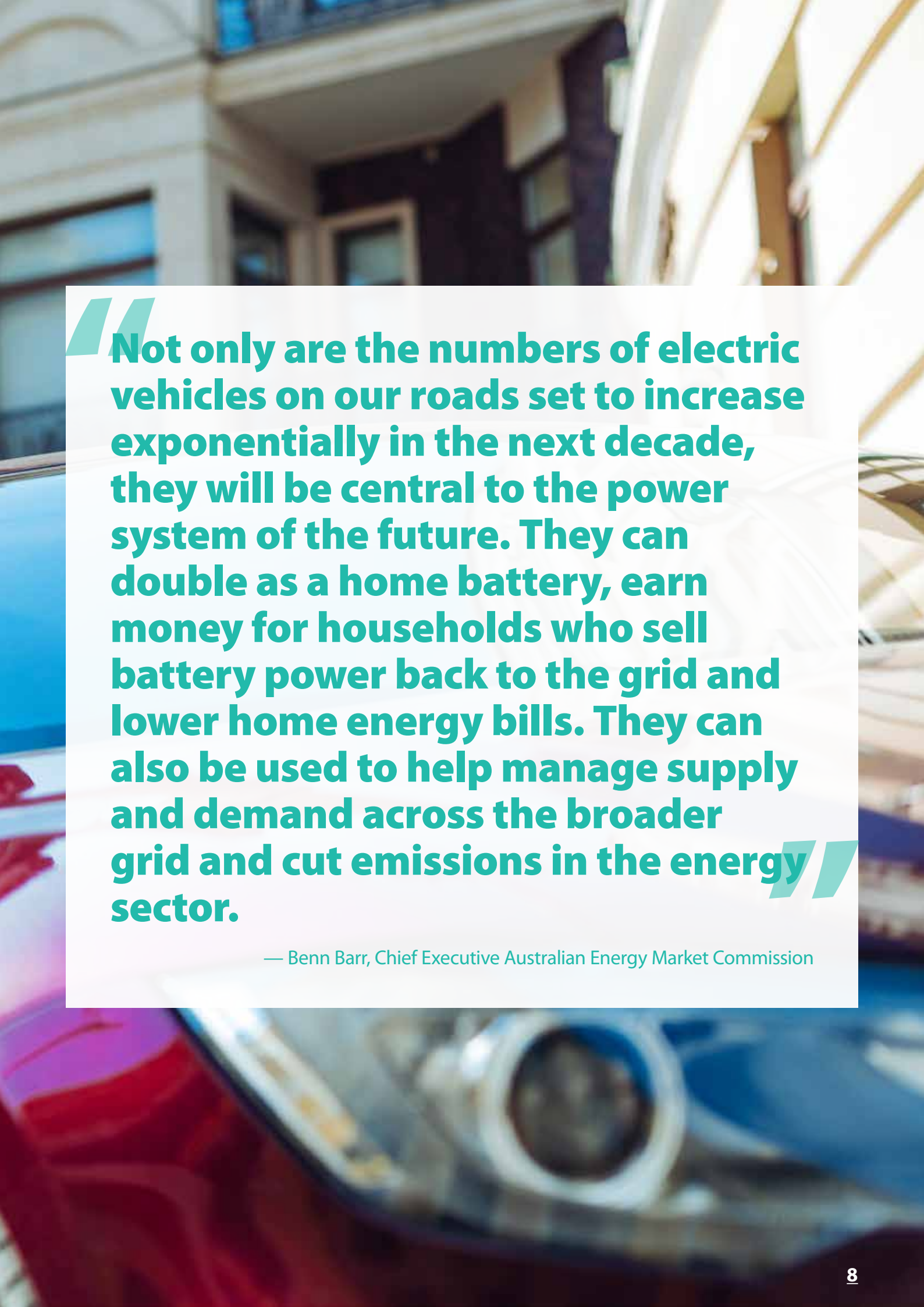
Cost effective and default choice for leading operators

EVs default choice for all new passenger, commercial and heavy vehicle purchases.

Fleet renewal accelerating due to upfront and ongoing cost advantages.

On track to net zero emission fleet by 2050.





“Not only are the numbers of electric vehicles on our roads set to increase exponentially in the next decade, they will be central to the power system of the future. They can double as a home battery, earn money for households who sell battery power back to the grid and lower home energy bills. They can also be used to help manage supply and demand across the broader grid and cut emissions in the energy sector.”

— Benn Barr, Chief Executive Australian Energy Market Commission

Vision

We will be a national leader in electric vehicle uptake and smart charging by 2025, harnessing renewable energy to lower motoring costs, air, noise and carbon pollution, and reduce electricity costs for all South Australians.

Objective

Prepare South Australia for electric vehicle uptake and remove barriers to bring forward the following benefits:

- Nationally competitive electricity costs
- \$25 million of private investment in public charging stations
- Statewide employment in charging network construction, innovation and commercialisation
- Lowered transport costs for business and households
- Reduced noise pollution and improved air quality with associated public health outcomes
- More than a 50 per cent reduction in state greenhouse gas emissions by 2030 from 2005 levels.

Action Theme 1

Statewide public charging network

1

Action 1

Develop a Public Charging Investor Prospectus

Action 2

Secure private investment in a statewide charging network

Action 3

Identify and develop smart charging and hydrogen refuelling hubs for heavy vehicles

Action Theme 2

Leading by example

2

Action 4

Require new government fleet vehicles to be plug-in electric models

Action 5

Deliver an electric bus grid integration study

Action Theme 3

Catalyse fleet and private uptake

3

Action 6

Support smart and two-way EV charging demonstrations

Action 7

Support EV uptake by private fleets

Action 8

Partner with local government and industry to deliver a Fleet Pledge Program

Action Theme 4

Framework to speed up transition

4

Action 9

Advocate nationally

Action 10

Establish a state framework that supports EV uptake

Executive summary

South Australia has rapidly transformed its electricity system from coal and gas powered to more than 50 per cent renewable generation.

We aspire to achieve net 100 per cent renewable electricity generation in the 2030s, and are already working towards being a world class renewable hydrogen supplier.

South Australia's national leadership in electric vehicle uptake will harness smart charging and renewable energy to make more efficient use of our electricity network to deliver nationally and internationally competitive electricity costs for all South Australians. As a key structural change to South Australia's energy market, transport electrification could deliver bill reductions of \$20 to \$84 per annum in 2025, increasing to \$95 to \$324 per annum in 2030, depending on rates of uptake.

While the benefits of electric vehicles (EVs) have been long recognised, Australian uptake has been slow due to limited model choice, high purchase price, restrictive driving range and a lack of visible public charging infrastructure.

With increasingly stringent vehicle emissions standards and changes in consumer preferences, the global automotive industry is investing heavily to scale-up and optimise EV manufacturing. This investment will support manufacturers to achieve upfront cost parity with conventional fossil fuel vehicles by the mid-2020s.

This Plan prepares South Australia for achieving this milestone. As more and more vehicle owners and drivers realise the lower operating costs and quality driving experience of EVs, community-wide uptake will accelerate.

With pro-active government, industry and consumer support to prepare for this change, we believe significant advantages will be realised for our state by moving ahead to capture benefits and manage risks during the transition to EVs.

This Plan will address key barriers to EV uptake by securing private investment to construct a statewide public charging network, ensuring our community has access to knowledge and experience to make informed investment choices, and joining with other leading organisations to transition to electric fleets.

Managed well, EVs will integrate seamlessly within our homes and businesses. We aim to support the deployment of EV charging services across the road network to meet demand and provision for hydrogen refuelling as demand emerges. The planning system will consider the needs of future fleets at residential, commercial, community, public and regional planning levels. We must also ensure that the motor vehicle services sector is prepared for the different needs of electric vehicles.

The uptake of EVs has the potential to be a tremendous resource for the management of our electricity system and revitalisation of South Australia's economy.

With on-board batteries that are up to eight times larger than home energy storage systems, the convergence of sustainable energy, transport and smart charging technologies will enhance the intrinsic value of EVs in our community. Unlike conventional fossil fuel vehicles, which are parked and not delivering value for approximately 90 per cent of each day, smart and two-way charging will enable EVs to generate new revenue streams when they are parked and plugged into a virtual power plant (VPP).

South Australians' appetite for early adoption of sustainable practices and technologies requires that we prepare for this transition to EVs. As international leaders in renewable energy generation and VPPs, smart charging of EVs will make more efficient use of our electricity system, reducing electricity costs for all South Australians.

As transport contributes 30 per cent of total state greenhouse gas emissions, this Plan is an important next step to our goal of a low emissions economy and a 50 per cent reduction in state emissions by 2030 (from 2005 levels).

Managed well, EVs will integrate seamlessly onto our roads, and within our homes and businesses.



Benefits

By the mid-2020s, a broad range of consumer, social and environmental benefits will start to flow from South Australia's transition to EVs.

These benefits include:

- **Lower transport fuel costs**
Up to 50 per cent less per kilometre
- **Nationally competitive electricity costs**
Lower costs through more efficient use of the electricity network
- **Improved liveability**
Reduced air and noise pollution
- **Reduced greenhouse gas emissions**
Zero tailpipe emissions and zero emission fuel source when powered by renewable electricity
- **Improved transport energy security**
Australian renewable energy fuel sources
- **Electricity grid services**
Flexible charging supports intermittent renewable generation
- **Superior driving experiences**
High performance features

Definitions

What do we mean by electric vehicles?

Light passenger and commercial vehicles that are charged directly from South Australia's electricity grid are the primary focus of this Plan. This includes all on-road and off-road Battery Electric Vehicles (BEVs) and Plug-in Hybrid Electric Vehicles (PHEVs).

Hydrogen Fuel Cell Electric Vehicles (FCEV) enable zero emissions motoring using an electric drivetrain. As deployment of FCEVs in Australia is several years behind PHEVs and BEVs, they are a complementary focus within this Plan.

Hybrid electric vehicles, which do not require charging from an external electricity supply, are outside the scope of this Action Plan.


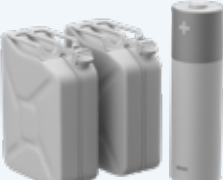






What is a smart charger?

Smart chargers include on board communications and electronic controls that enable remote management of EV charging. This enables electricity network operators, retailers and Home Energy Management Systems to interrupt or constrain charging during times of network stress, low renewable energy generation or high electricity prices, and resume charging when conditions ease.

What is a two-way or bi-directional vehicle-to-grid charger?

A two-way or bi-directional vehicle-to-grid (V2G) charger enables compatible EVs to both charge and discharge electricity to and from the connected power supply, just like a home battery.

This technology enables smart charging of vehicles during periods of surplus low-cost renewable electricity and then discharge to provide energy to the home, business or grid when prices are high.

	Conventional	Hybrid	Plug-in Hybrid	Battery Electric	Hydrogen Fuel cell
Energy sources	 Fuel only	 Fuel only	 Fuel + Electricity	 Electricity Only	 Hydrogen
Tailpipe emissions					
Examples		<ul style="list-style-type: none"> • Toyota Prius C • Honda Civic Hybrid • Honda Accord • Toyota Corolla Hybrid • Toyota Camry Hybrid • Lexus CT200h 	<ul style="list-style-type: none"> • Mitsubishi Outlander PHEV • BMW i8 • Volvo XC90 T8 • Audi A3 e-tron PHEV 	<ul style="list-style-type: none"> • Renault Zoe • BMW i3 • Tesla Model S • Nissan Leaf 	<ul style="list-style-type: none"> • Toyota Mirai • Hyundai ix35 Fuel Cell • Honda Clarity Fuel Cell

What is an electric vehicle virtual power plant?

A VPP is a network of centrally controlled home rooftop solar and battery systems working together to generate and store energy, and feed energy into the grid.

A VPP dispatches energy to meet the immediate requirements of the household and to provide additional energy to the grid to support the rest of the state when needed.

Electric Vehicle Virtual Power Plants (EV VPPs) will build upon the successful practice of VPPs, by centrally coordinating smart and two-way charging and discharging of EV batteries and demand management of smart home appliances to improve the affordability, reliability and security of our electricity grid. EV VPPs will consider a range of system designs, including houses with no rooftop solar or stationary home battery.

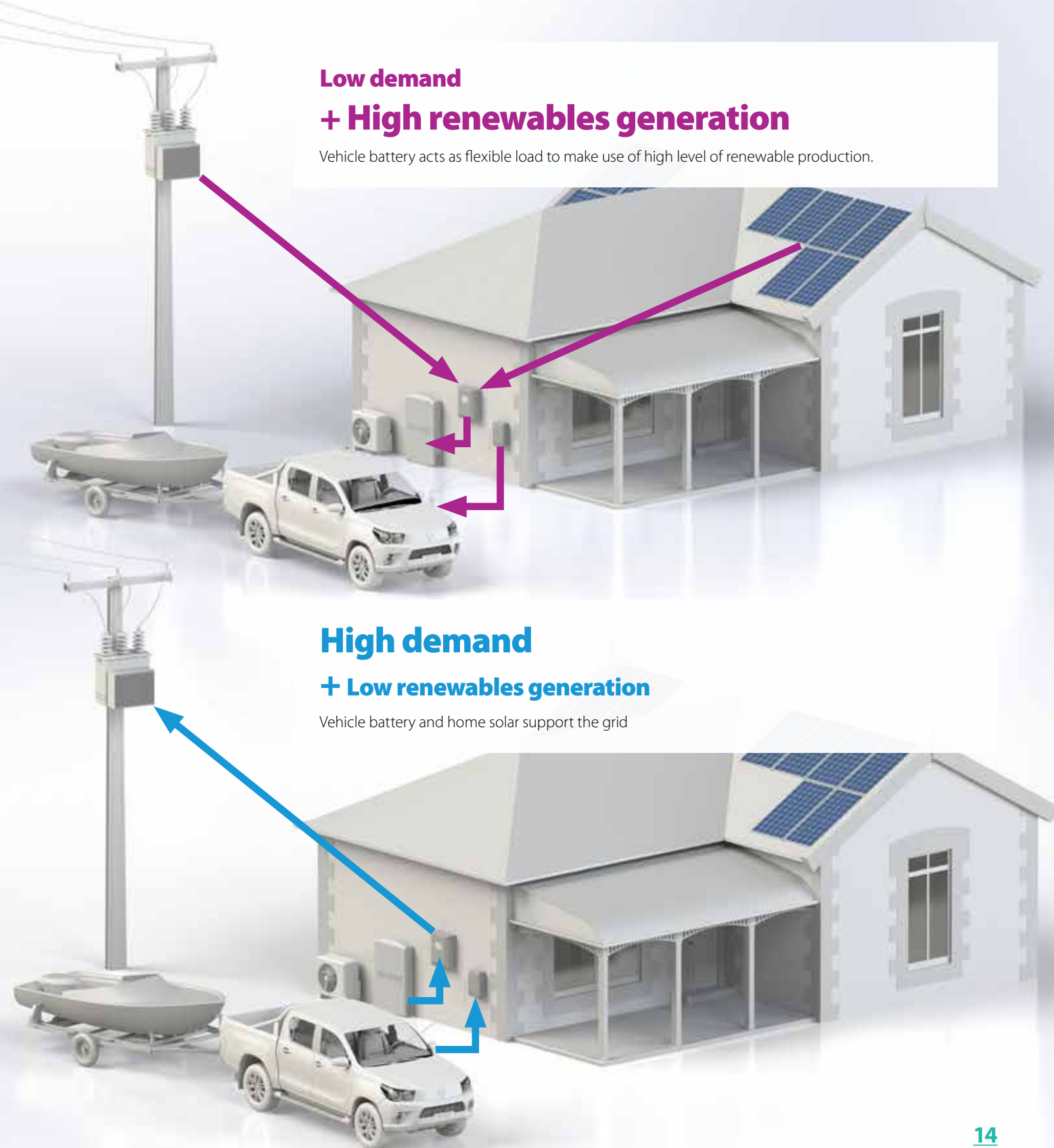
Once established, EV VPPs could generate new revenue streams that enable electricity retailers and VPP operators to provide incentive payments that support household and business EV purchase.

Low demand + High renewables generation

Vehicle battery acts as flexible load to make use of high level of renewable production.

High demand + Low renewables generation

Vehicle battery and home solar support the grid



Strengthening our electricity system

The Australian Energy Market Operator's (AEMO) 2020 *Integrated System Plan* highlights that as old generation assets retire in the coming decades they will need to be replaced.

Replacement will be with a combination of upgraded transmission links and new dispatchable resources such as utility-scale pumped hydro or battery storage, demand response and distributed batteries participating as virtual power plants.

Our electricity grid has one of the highest levels of variable wind and solar generation in the world. These daily fluctuations in electricity generation do not typically match customer demand.

We need energy storage that can take electricity from the grid during excess supply periods and send electricity back to the grid when needed to help balance supply and demand, and maintain our current infrastructure.

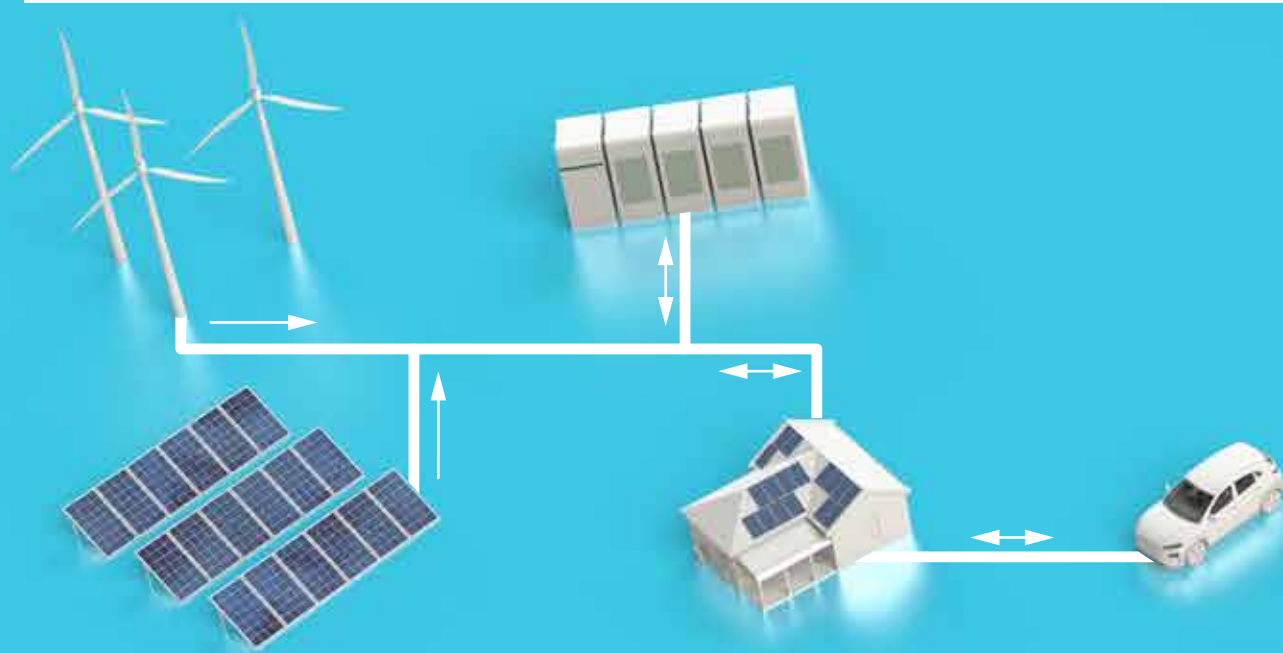
The large batteries in EVs could add substantial new storage capacity to our electricity network. For example, bringing forward 5 per cent light passenger vehicles sales,

or 3,500 new battery EVs per year, could add 175 MWh of energy storage to the electricity grid every year. With smart charging, as part of a virtual power plant, this storage could support the electricity grid and further reduce electricity costs for all South Australians, like the Hornsdale Power Reserve (193.5 MWh) near Jamestown, otherwise known as the Tesla Big Battery.

Proactive energy management is significantly bolstering the affordability, reliability and security of South Australia's energy system. Our growing system of smart renewable energy generation, virtual power plants and distributed energy resources are providing new flexible sources of electricity to balance supply and demand.

Smart charging of EVs will more efficiently utilise our electricity distribution network, renewable energy generating capacity and avoid costly network upgrades. Modelling has indicated that this could reduce annual household electricity costs by up to \$83 by 2025, potentially increasing to \$324 by 2030.

By fostering innovation and national leadership, we will reduce motoring costs, lower air, noise and carbon pollution, and deliver affordable electricity for all South Australians.



Balancing supply and demand



Large scale generation and storage

Variable renewable energy generation is on the rise in South Australia. In 2018-19, 51 per cent of South Australian electricity generation was from large-scale wind and solar farms, and rooftop solar panels, up almost 4 per cent from 2017-18.¹

1. AEMO's South Australian Electricity Report 2019

Flexible demand

Managed charging of home batteries and electric vehicles, and smart home appliances will play an important role in balancing electricity demand with our variable renewable energy supply as we progress to net 100 per cent renewable electricity by the 2030s. This is great news for the affordability, stability and reliability of our electricity system.

Benefits of electric vehicles

The Government of South Australia will collaborate with industry, local councils, and the community to bring forward the following benefits for all South Australians.

- **Nationally competitive electricity costs**
Accelerating EV and smart charging uptake will improve utilisation of the electricity network, bringing significant reductions in energy bills for all South Australians.
- **Electricity reliability and security**
With smart charging, the large storage capacity of EV batteries will help to stabilise the grid during peak demand and high renewable energy generation periods.
- **\$25 million of private charging investment**
By delivering a Public Charging Investor Prospectus, we aim to capture at least \$25 million of private investment in the construction of public EV charging infrastructure across South Australia.
- **Statewide employment**
In the construction and operation of charging and refuelling infrastructure, and potentially vehicle assembly or manufacture of charging products.
- **Lower transport costs for business and households**
Lower energy costs and maintenance requirements of electric motors coupled with better energy efficiency and durability deliver lower operating costs per kilometre than fossil fuel vehicles.
- **Better air quality and associated health outcomes**
EVs displace fossil fuel vehicles, which are a major source of air pollution in urban areas. This pollution contributes to significant rates of serious respiratory illness and death in Australia¹.
- **Reduced greenhouse gas emissions**
In 2017, transport accounted for 30 per cent of South Australia's greenhouse gas emissions. EVs powered with renewable energy are a primary pathway to achieve net-zero state emissions by 2050.
- **Secure transport fuel/energy**
Reducing our reliance on imported petrol and diesel fuels will improve energy security and protect our economy from disruptions to international supply chains.
- **Improved owner, driver and passenger experience**
Home and workplace charging will offer convenient refuelling. Performance that is quiet, clean and vibration-free will enhance driving experiences. Public transport passengers will benefit from a quieter and smoother ride.

¹For more information visit www.epa.sa.gov.au/environmental_info/air_quality

Transport Emissions: 30 per cent and rising

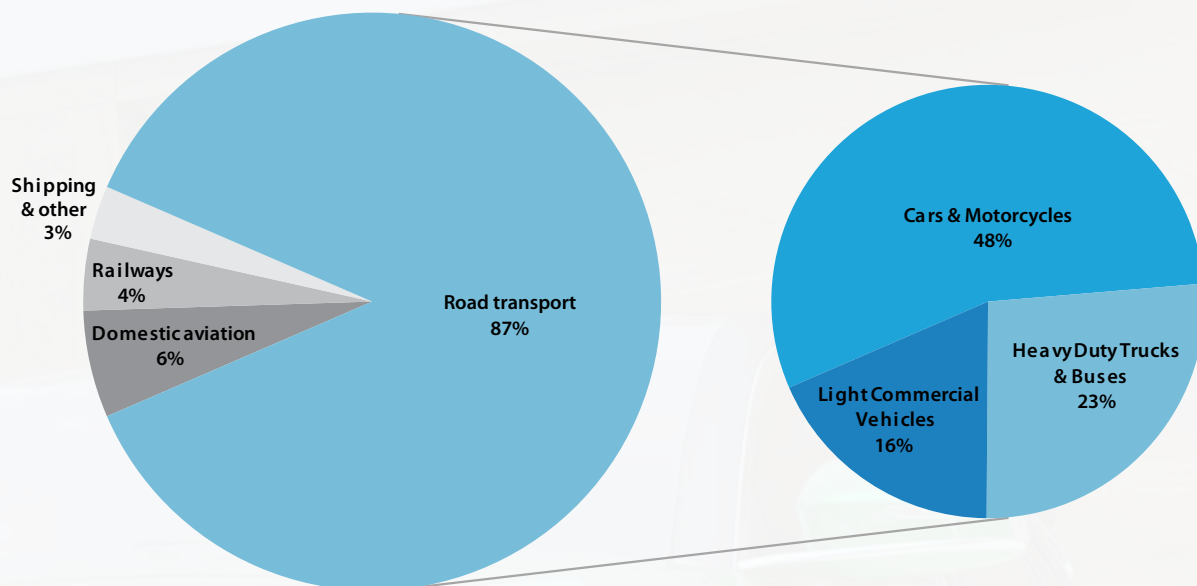


Figure 1 — South Australian transport sector greenhouse gas emissions and road transport emissions by source, 2017.
Source: Australian Greenhouse Emissions Information System, Department of the Environment and Energy 2018

Greater EV uptake results in greater household savings

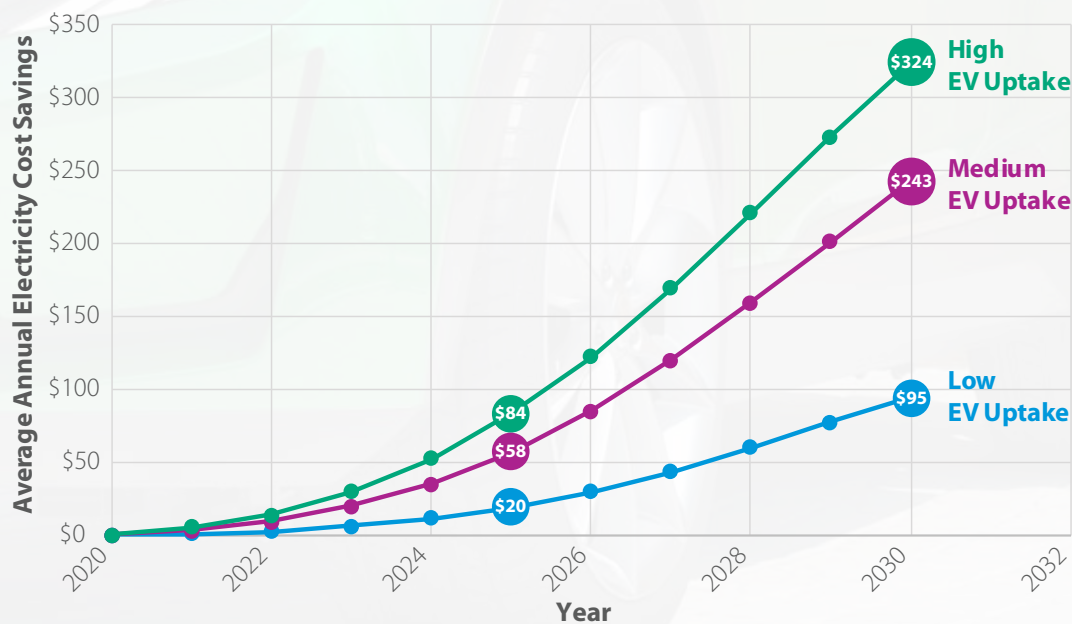


Figure 2 — Average Annual Electricity Cost Savings for South Australian Households from Accelerating Electric Vehicle Uptake
Source: Energeia 2020

Statewide public charging network

The primary focus of Action Theme 1 is to prepare South Australia for the arrival of EVs that are cost competitive with conventional fossil fuel vehicles.

As this could occur in Australia from 2022, our focus will be on bringing forward construction of a statewide public charging network for EVs.

This will send a clear signal to vehicle manufacturers that South Australia is ready for a greater range and choice of EVs, addressing barriers such as range anxiety, vehicle availability and the perception that EVs are not a mainstream technology.

We will ensure that private investment in a statewide public EV charging network prioritises highway destinations that are critical to long distance travel, interstate connectivity and tourism.

Our approach will encourage charging services at shopping centres, motels and other local destinations that are accessible for all. We will require compatibility with current vehicle models, national public charging networks and early provision of chargers in accessibility bays. Billing solutions that simplify and aggregate charging costs across different charging networks will be encouraged.

Customer convenience, route flexibility and choice of destinations will underpin the network design. Our approach will encourage 'Plug and Charge' technologies that enable customers to start charging without a mobile phone or membership card.

Action Theme 1

Action 1

Develop a Public Charging Investor Prospectus with statewide coverage of metro, regional and remote areas.

Action 2

Secure private investment in an accelerated rollout of a statewide public rapid charging network for EVs.

Action 3

Collaborate with industry to identify and develop smart charging and hydrogen refuelling hubs for heavy vehicles.

In parallel, South Australia's Hydrogen Action Plan aims to scale up renewable hydrogen production for export and domestic consumption. Hydrogen production could scale-up to commercial volumes over the first half of this decade. Deployment of the state's first hydrogen refuelling stations will most likely support heavy freight FCEVs. Sites may be co-located with highway EV charging stations on the statewide network.






Statewide Public EV Charging Network

To utilise our abundant renewable energy resources and current electricity network, smart EV charging services must encourage middle of the day and overnight charging to harness surplus, low cost renewable electricity.

Our Plan will foster industry provision of smart home, work and away charging options in a range of convenient locations to ensure EV drivers on our highways keep moving towards their final destination.

To secure lower electricity prices for all South Australians, our Plan will support developers to embrace smart charging, so that EV owners can use cheaper, surplus renewable energy to charge their vehicles. This will be enabled by time-of-use pricing and onsite demand management services.

Variety of charging speeds to fit with users' lifestyles and daily routines

Charging location	Charging speed	Benefits	Extra range from 10 minutes charging
 Highway roadside	 Ultra-rapid	Keeps you moving to your final destination.	 175 - 350 km
 Shopping centres, supermarkets and carparks	 Rapid	Integrates a 'top-up' charge into daily routine to multi-task and save time.	 50 - 125 km
 Tourist accommodation	 Fast	Overnight charging to keep days free for activities.	 7 - 11 km
 Home and work	 Fast	Flexible smart charging overnight or during the day.	 3 - 7 km

DISTANCE (KMS)



1,525

SA/WA Border Village
to Bordertown SA



1,210

Mount Gambier
to Ceduna



927

Victor Harbor
to Coober Pedy



778

Adelaide
to Port Lincoln

SURVEYED RAA MEMBERS SAY:



88%

Public fast charging
is important in their
decision to buy an EV



41%

Would consider
buying an EV
as their next car



59%

Would be encouraged
to buy an EV if public
charging was provided

RENEWABLE ELECTRICITY



100%

SA will be
powered by net
100% renewable
electricity by
2030

CHARGER TECHNOLOGY



10 MINS

A 350kW charger
delivers up to
350km of extra
driving range in
only 10 minutes

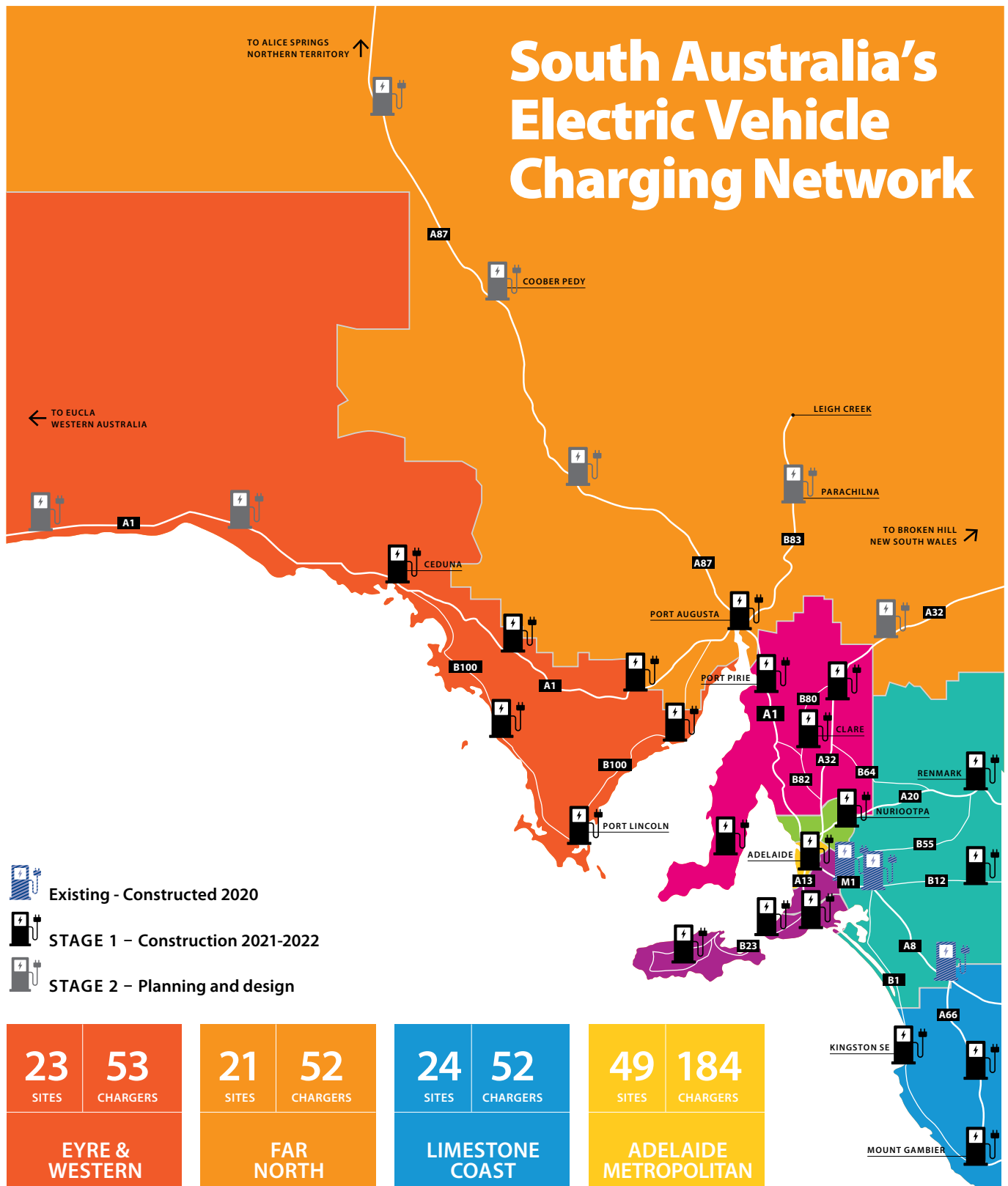
ELECTRIC VEHICLES ARE CHEAP TO RUN



UP
TO **75%** LESS

When comparing the
ongoing maintenance
and fuel costs of an
internal combustion
engine vehicle

South Australia's Electric Vehicle Charging Network



Leading by example

We envisage that full electrification of the South Australian government's passenger vehicle fleet will occur by 2030 or earlier.

To demonstrate our confidence in EVs as a safe, commercially proven and environmentally superior technology, Action Theme 2 commits government agencies to electrify their light vehicle fleets as cost effective plug-in EVs become available.

We will proactively transition the government's fleet of approximately 6,800 passenger vehicles to plug-in electric models. This will shift around \$80 million per year of government spending to EVs from internal combustion engine vehicles and fuels, and will significantly increase the number of affordable, second-hand EVs available for South Australians to buy as EV leases expire.

To opt-out of an EV integration opportunity, agencies will need to demonstrate that vehicles are not fit-for-purpose, cost effective or cannot be integrated through further fleet efficiencies

This approach is consistent with the government's view that once the cost of owning an EV equalises with internal combustion engine vehicles, our transition to a fully electric fleet will be rapid.

Investment in smart charging infrastructure on government premises and a commitment to utilise the public charging network will support an orderly transition. We will advance initiatives that consider a dual role for charging infrastructure in government premises, where it will address regional or remote area needs.

Integrating EVs into the state government fleet will empower private and other government fleets to follow and provide second-hand EVs into the South Australian market. This will bring forward a supply of lower cost EVs for households and businesses.

Action Theme 2

Action 4

Require new government fleet vehicles to be plug-in electric models where they are fit-for-purpose, and:

- cost effective on a total cost of ownership basis, or
- additional cost can be managed by improving utilisation of the vehicle fleet.

Action 5

Deliver an Electric Bus Grid Integration Study of battery and hydrogen fuel cell electric buses, to inform a transition to a zero emissions public bus fleet.

Due to the technical complexity and current significant additional investment requirements of transitioning the public bus fleet to EVs, further detailed exploration is required. Investigations, analysis and infrastructure planning will be undertaken to mitigate technology, service contracting and electricity network integration risks.

The broader benefits of an orderly transition to hydrogen or electric public buses will be quantified. An Electric Bus Grid Integration Study will assess opportunities and the benefits to government and all electricity consumers of charging these vehicles during the middle of the day and overnight, using low cost renewable electricity.



SAPOL leading by example

The South Australian Police (SAPOL) are forging towards a more sustainable future through environmental initiatives such as EV uptake and charging stations.

At their Angas Street Headquarters, five 7kW chargers have been installed and five Hyundai battery electric vehicles are being integrated into the fleet. This will assist SAPOL to monitor vehicle utilisation and charging requirements, with a view to expanding to a fully electric fleet.

Catalyse fleet and private uptake

South Australians are early adopters and national leaders in the uptake of sustainability initiatives and technologies.

Our leadership in renewable energy, rooftop solar, VPPs and home batteries makes South Australians uniquely placed to reap the significant benefits that EVs provide.

Action Theme 3 will build upon this global leadership by demonstrating smart and two-way charging technologies that deliver even greater cost savings for commercial fleet operators and private EV owners.

We seek to enable technologies and service providers that will deliver VPPs that incorporate smart and two-way charging of electric vehicles. Like current home battery VPPs, we envisage that individual and community benefits will be greatest if EV charging is two-way, centrally controlled and responsive to network tariffs and National Electricity Market pricing. Following successful demonstration, this could enable retailers to generate new revenue streams to support household and business EV purchasing.

Because vehicles currently spend most of their operational lives parked, most EV owners will do more than 80 per cent of their charging at home. Smart charging will enable customers to conveniently defer or schedule charging to times when surplus renewable electricity is available and prices are low.

To support taxi and rideshare EV fleets, we will secure private investment to construct charging services in major ride sourcing locations. We will investigate business models that could deliver new revenue streams and lower vehicle operating costs through smart and two-way charging, and demonstrate enabling technologies such as virtual queuing. We will consider ways to accelerate EV fleet adoption in this sector, where it enables participation in demonstration projects that could verify broader industry and electricity network benefits.

To highlight the benefits and growing demand for plug-in EVs, we will deliver a Fleet Pledge Program that will foster a business network that shares a commitment to transform

Action Theme 3

Action 6

Provide financial support for smart and two-way EV charging demonstrations including VPPs that can aggregate fleets.

Action 7

Support EV uptake by private fleets by securing private investment in smart charging in workplaces, over-night accommodation, and taxi and rideshare locations.

Action 8

Partner with local government and industry to deliver a Fleet Pledge Program.

its fleets to zero emission electric vehicles. The Program will celebrate leadership, foster knowledge development and exchange, and provide driving and operating experiences with EVs to empower and inform investment choices.

The Department for Energy and Mining (DEM) has been reviewing the Retailer Energy Efficiency Scheme (REES) and has proposed that the Retailer Energy Productivity Scheme (REPS) will replace REES from 1 January 2021.

DEM is currently consulting on potential inclusion of energy productivity improvement activities under REPS that involve demand shifting or new sources of managed electricity demand. This may include connection of demand-response enabled equipment such as a smart electric vehicle charger to a remote demand response system (residential or commercial).



Electric bus manufacturing in Adelaide

To assist our manufacturing industry, the Government of South Australia supported Adelaide's BusTech Group to develop and manufacture prototype electric buses.

The BusTech Group has grown to be the largest Australian-owned bus manufacturer, focussing on zero-emissions technology development and manufacturing with

local supplier partnerships. The BusTech Group recently announced a battery electric bus technology partnership with Silicon Valley-based Proterra, and a hydrogen fuel cell and electric bus technology partnership with US-based Cummins/Hydrogenics. The partnership with the BusTech Group will facilitate integration of the most advanced and energy dense battery technology, and industry-leading fuel-cell technology, into the Australian mass mobility sector. The BusTech Group are now preparing to deliver battery electric and fuel cell buses for government and private clients across Australia.

This partnerships will deliver battery electric and fuel cell city buses with market-leading range and operational performance. Following the rapid growth of zero-emissions buses across Europe, North America and China, the partnerships positions Adelaide as a major manufacturing centre for zero-emission buses.

Framework to speed up transition

To secure a smooth and timely transition to plug-in EVs, Action Theme 4 commits the South Australian Government to work across all levels of Australian government to ensure our community has access to the broadest range and most advanced vehicle technologies.

The Australian Government has primary responsibility over the entry of new motor vehicles into Australia through the development and implementation of vehicle and fuel standards, import duties and taxation.

EVs will bring benefits and new challenges that may require regulatory reform. We will advocate for a national policy and taxation framework calibrated to enable electrification of the transport sector.

Technology advances have realised incremental fuel efficiency improvements in conventional and hybrid vehicles. This has led to a steady decline in fuel excise and other transport related revenues. This will continue and accelerate with electrification of transport.

To improve road safety and address the increasing demands of road freight, there is a need to maintain transport-related revenues and investments. Our transition to EVs presents an opportunity for national collaboration to design better systems for all road users that aligns with commensurate costs and benefits of different vehicles types.

To ensure that electrification of the transport sector proceeds with the proactive environmental protections, we will advocate for a national extended producer responsibility program for battery reuse and recycling.

At a state and local government level, planning reforms will support the timely development of charging and hydrogen refuelling stations. To support future investments, consideration will be given to new residential and commercial developments incorporating appropriate infrastructure to be EV ready.

Action Theme 4

Action 9

Advocate nationally for vehicle fuel efficiency, fuel quality, smart charging standards, tax reform addressing fuel excise, fringe benefits taxes and road user charging, and extended producer responsibility for batteries.

Action 10

Establish a state framework that supports EV uptake by:

- Informing industry, including first responders and vehicle repairers about appropriate management, storage and recycling of batteries.
- Incorporating smart charging into the Retailer Energy Productivity Scheme.
- Integrating charging into the planning and development system reforms, including:
 - Charging stations in Regional Plans
 - Streamlined approval for charging stations
 - Consideration of emerging transport mobility technologies in future growth management strategies, and
 - Improved energy management in buildings.

A woman with dark hair tied back, wearing a blue uniform, is focused on a laptop. She is positioned in front of a car with its hood open, suggesting a technical or maintenance role. The background is slightly blurred, showing an outdoor setting.

IKEA and eleXsys: World first commercial microgrid

The South Australian Government has supported Planet Ark Power with a \$1.95 million grant to install 1.2 MW of solar panels and a 3.4 MWh battery at the IKEA site, to create the first grid-integrated commercial micro-grid in South Australia.

The IKEA eleXsys® Microgrid project in Adelaide is a world first. The project will provide low cost clean energy and community grid support with 3 MW of battery storage and a 700 kVAr eleXsys® dedicated grid support feature.

Planet Ark Power's new technology enables a two-way energy grid, so we can all benefit from lowering green energy costs and improve the capacity for Network EV charging in the future. The project will support IKEA to create the conditions for the electrification of their home-delivery fleet in South Australia and provide on-site recharging stations for customers and co-workers.

A history of early adopters

Rooftop Solar Uptake in South Australia

South Australians have a history of being early adopters in sustainable technologies.

In 2008, a scheme was introduced to lock in a 44c per kWh feed-in tariff for rooftop solar systems installed between 1 July 2008 and 31 August 2010. The rate was guaranteed until 30 June 2028, provided the system was not upgraded or altered. For systems installed between 1 September 2010 and 30 September 2011, the same rate was locked in until 30 June 2028, with some additional constraints. This helped spur a burgeoning rooftop solar industry in the state.

Over the past twelve years, South Australia has seen the growth of rooftop solar systems to some 35 per cent of households, the second highest in Australia behind Queensland, with 35.7 per cent.



South Australia's world leadership in renewables, energy storage and VPPs

South Australia is delivering ambitious, world-leading household solar battery and VPP programs.

In October 2018, the South Australian government launched the Home Battery Scheme, the first of its kind in Australia, providing government subsidies and low-interest loans to help pay for a home battery system.

The \$100 million Scheme, which is in addition to Tesla's VPP Scheme, is supporting households to install solar and battery systems on South Australian homes. Many of these households have joined VPP that are supporting the electricity grid and contributing to more affordable, reliable and secure electricity for all South Australians.

Importantly, this leadership has paved the way for smart and two-way charging trials of EVs in homes. Visit homebatteryscheme.sa.gov.au for further information.



Further information

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Photograph Andre Gascoigne



Government of
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