WESTERN SYDNEY ENERGY PROGRAM

WSROC
Advocating for the people of Western Sydney

WESTERN SYDNEY **ELECTRIC VEHICLE ROADMAP**

2022 - 2030

November 2021

WESTERN SYDNEY ENERGY PROGRAM

This document has been prepared as part of the Western Sydney Energy Program (WSEP). WSEP is a partnership between Western Sydney councils and coordinated by WSROC. WSEP aims to reduce Western Sydney's emissions and energy costs.

If you are looking for more information about this program, please contact WSROC at:

Western Sydney Regional Organisation of Councils Ltd
Suite 201, Level 2, 85 Flushcombe Road
(PO Box 63) Blacktown NSW 2148
Phone: 02 9671 4333
Web: wsroc.com.au | Email: info@wsroc.com.au
Facebook: facebook.com/WSROC | Twitter: @WSROC_Australia
LinkedIn: https://www.linkedin.com/company/westernsydneycouncils/

EVENERGI
A better transport future

This document has been prepared in collaboration with Evenergi. Evenergi is Australia's leading zero-emission transport advisory business having provided advisory and software services to hundreds of local governments, state governments and private operators in Australia, the UK and Asia.

This Roadmap and the Western Sydney Energy Program are assisted by Ironbark Sustainability. Eight councils were involved in the development of this Roadmap.

Blacktown City Council
blue mountains City Council
CUMBERLAND CITY COUNCIL
FairfieldCity Celebrating diversity
Hawkesbury City Council
Lithgow CITY COUNCIL
LIVERPOOL CITY COUNCIL
CITY OF PARRAMATTA
WSROC Advocating for the people of Western Sydney
Ironbark Sustainability

WSROC acknowledges Aboriginal and Torres Strait Islander peoples as the traditional custodians of the lands and waters of this place we now call Greater Sydney. We pay our respect to Elders past, present and future.

Sunnyholt Road, Blacktown

CONTENTS

Contents 2

Executive summary 6

Western Sydney EV Roadmap 9

1 Introduction 10

1.1 National, state, and local commitments 15

1.2 The political, economic and environmental imperative to transition now 16

1.3 Regional collaboration is key 16

2 Western Sydney current situation analysis 18

2.1 Population profile 18

2.2 Emissions profile 18

2.3 Transport profile 20

2.4 Why zero-emission vehicles? 24

2.5 The role of councils 26

3 Western Sydney councils' EV progress 28

3.1 EV charging in Western Sydney 31

4 Western Sydney EV opportunities and barriers 32

4.1 Corporate opportunities 32

4.1.1 Corporate barriers 34

4.2 Helping our community transition 35

4.2.1 Barriers to community transition 35

5 Western Sydney EV Roadmap opportunities and benefits 36

Appendix A: Overview of current EV support from state and federal government 39

Appendix B: Grant opportunities for local councils 41

References 42

EXECUTIVE SUMMARY

There is a strong global shift towards zero-emission road transport. This shift has been powered by the significant commitments to transition from major countries such as the United Kingdom, United States of America, China, India, France and Germany.

This has led to most global vehicle manufacturers transitioning to zero-emission vehicles and phasing out fuel dependent technology.

This transition provides great opportunities for countries that position themselves to be at the forefront of this shift. They will be able to capitalise on creating new economic activity as well as benefit from reduced emissions and better air quality outcomes. However, countries that do not transition will end up with old, expensive, and polluting technologies.

The decarbonisation of transport involves the transition of passenger and heavy vehicle fleets and electric drive trains. Examples include hybrid electric, full electric or fuel cells driven by hydrogen. Many product options are available and continue to emerge; councils will continue to review opportunities to include other technologies.

This Roadmap focuses on the pathway for transition to EV transport and the resultant opportunity to significantly reduce transport emissions for Western Sydney by 2030.

Electric vehicle (EV) adoption is rapidly rising in Australia with sales increasing by 300% in 2019 and staying steady despite COVID-19 in 2020 and 2021. While this still represents a small portion of total car sales, the global movement of consumers, car companies and governments suggest that this rapid growth will continue.

The Australian and the NSW governments have strategies in place for electrification of road transport:

- The Commonwealth's National Electric Vehicle Strategy[1] will coordinate action across governments, industry, and communities. This commitment is backed up by funding available for EV transition by the Australian Renewable Energy Agency (ARENA) and the Clean Energy Finance Corporation (CEFC).
- The NSW Government's Net Zero Plan outlines the State's commitment to reach net zero carbon by 2050 and a 35% cut in emissions by 2030. The plan has a strong focus on supporting the transition to EV and is backed by the NSW Future Transport 2056 Strategy and the NSW Government's Electric Vehicle Strategy (2021).

Appendix A outlines the current (2021) support in place by the Australian and NSW governments to stimulate the EV transition. Councils participating in the Western Sydney Energy Program (WSEP) have identified the acceleration of low emission transport in the region as a key priority.

Analysis shows that transport emissions make up almost one third (around 5.8m tonnes) of Western Sydney's total emissions, with light passenger vehicles accounting for half of the transport emissions. This makes transport one of the most emission intensive sectors in the region.

Motorway in Western Sydney

This EV Roadmap provides strategic direction for Western Sydney to be at the forefront of the electrification transition. This roadmap aims to guide regional collaboration for Western Sydney councils to:

- Reduce carbon from councils' corporate fleet emissions
- create regional infrastructure plans
- Access grant funding for project and research delivery
- Collaboratively advocate to the NSW and Australian governments.

The EV Roadmap is informed by an analysis of the region's current transport emissions profile, government EV policies, the infrastructure landscape, and barriers and opportunities in the region.

The EV Roadmap identifies a series of priority actions to achieve the highest impact from an economic, social and sustainability perspective.

The EV Roadmap has been developed to assist Western Sydney councils to:

- Adopt the roadmap goals, targets and actions
- Set strong targets on council fleet transitions and charging infrastructure
- Collaborate on grant applications and procurement opportunities
- Develop and align council policies and land use planning approaches
- Continue and increase advocacy work towards net-zero transport for the region.

Each council is currently at a different point on the EV transition journey. The EV Roadmap will leverage the power of the regional group, while supporting each council to progress and accelerate internal goals toward zero-emission transport.

This EV Roadmap is structured as follows:

- Western Sydney EV Roadmap
- Sections 1 - 4: detailed information and assumptions that inform the EV Roadmap
- Section 5: table summary of EV Roadmap opportunities.

Penrith commuter car park

WESTERN SYDNEY EV ROADMAP

Timeline overview of regional EV transition milestones 2022-2030

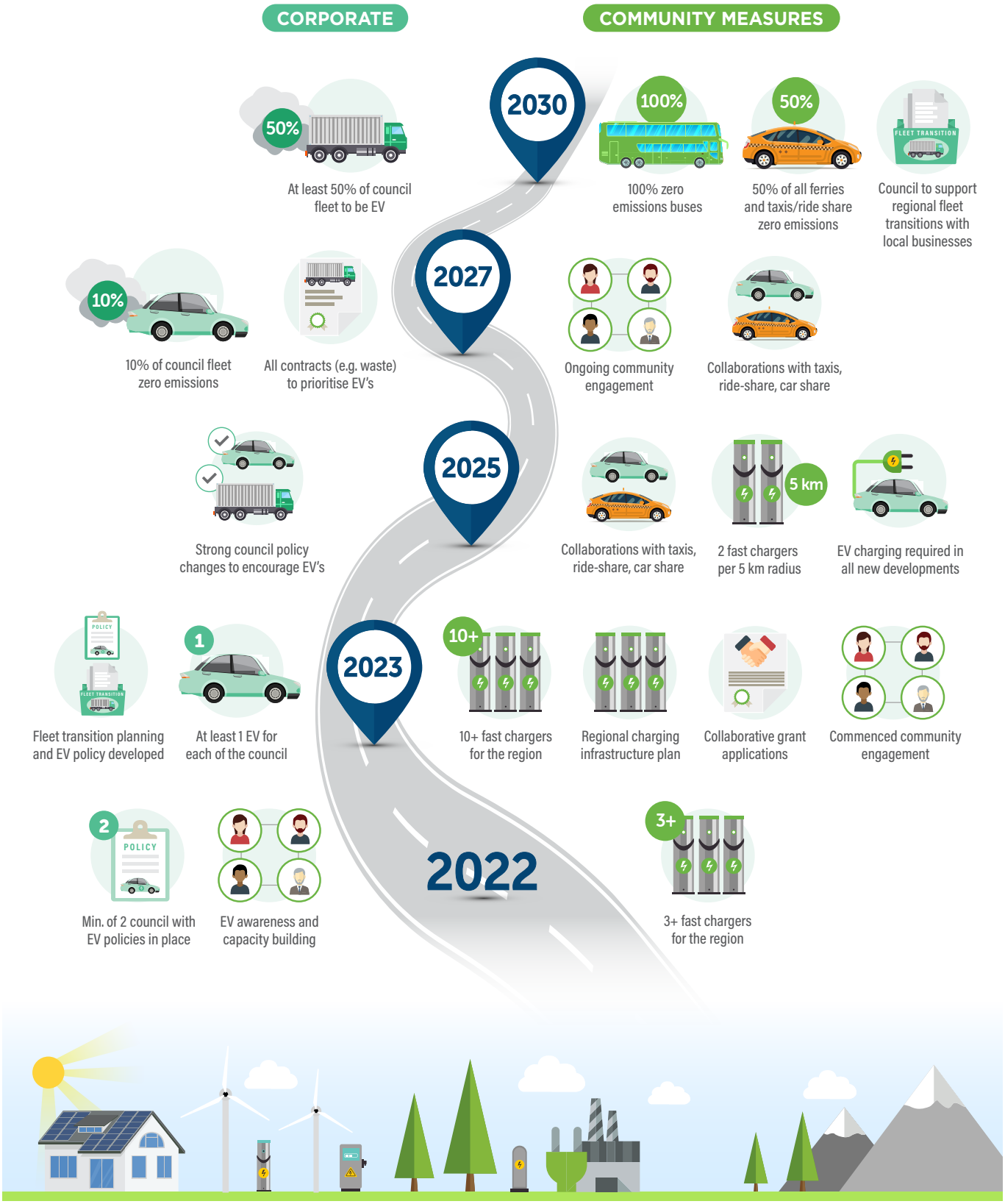


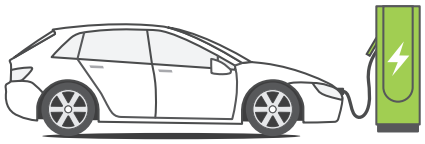
Figure 1 - Western Sydney EV Roadmap

1 INTRODUCTION

The decarbonisation of road transport represents a significant opportunity for councils in Western Sydney. There is policy commitment at all levels of government (national and international) for decarbonisation of road transport.

This roadmap provides strategic direction for Western Sydney to be at the forefront of the transition to EVs. Electric vehicles (EVs) refers to cars or other vehicles with motors that are powered by electricity rather than liquid fuels.

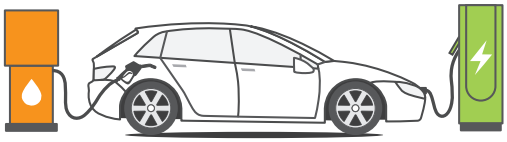
There are currently four main types of EVs:



1. Battery electric vehicles (BEVS)

Fully-electric, meaning they are solely powered by electricity and do not have a petrol, diesel or LPG engine, fuel tank or exhaust pipe. BEVs are also known as 'plug-in' EVs as they use an external electrical charging outlet to charge the battery.

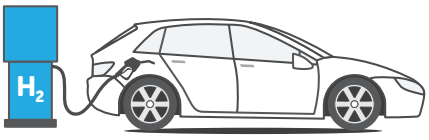
Electricity



2. Plug-in hybrid electric vehicles (PHEVS)

Powered by a combination of liquid fuel and electricity. They can be charged with electricity using a plug but also contain an internal combustion engine that uses liquid fuel.

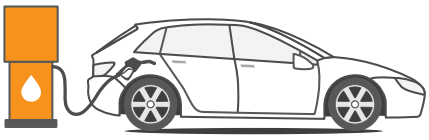
Petrol + Electricity



3. Fuel cell electric vehicles (FCEVS)

Use a fuel cell instead of a battery, or in combination with a battery or supercapacitor, to power their electric motors. FCEVs are typically fuelled by hydrogen and usually provide greater range than BEVs.

H_2 Hydrogen Fuel



4. Non-plug-in hybrid EVs (HEVS)

Instead of using an external plug to charge the vehicle, the electricity generated by the HEV's braking system is used to recharge the battery. This is called 'regenerative braking' and is also used in BEVs, PHEVs and FCEVs.

Petrol

Figure 2 - Main types of EVs

This Roadmap refers to all four types of EVs.

As the impacts of climate change on the region increase, councils are constantly looking for ways to reduce emissions.

Western Sydney is highly car dependent, due to demographic and spatial realities. EVs present a key pillar in the fight to reduce the region's emissions and associated adverse health impacts of pollution, while at the same time creating new economic activity and opportunity.

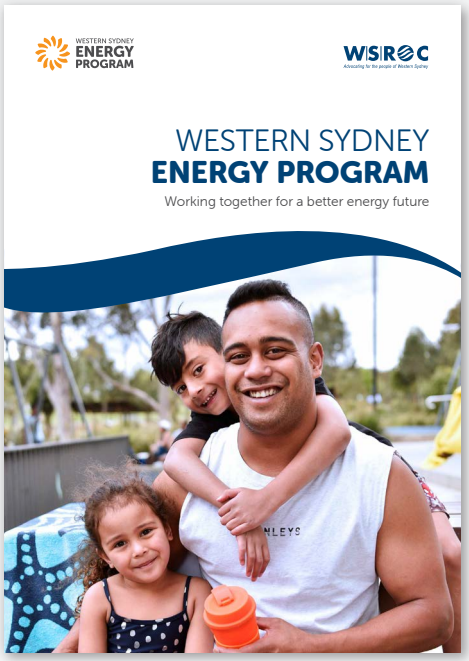
Western Sydney councils are placing a priority on sustainability for the region, now and into the future. Seven councils participate in the Western Sydney Energy Program (WSEP)[2], a collaboration led by WSROC, which aims to reduce the region's emissions and energy use.

The EV Roadmap is being delivered under the WSEP and is informed by a gap analysis of the regulatory and policy landscape and an EV scoping survey to capture the understanding of councils' priorities.

Light horse interchange, Western Sydney

The Western Sydney Energy Program (WSEP)

WSEP is a collaboration between seven councils[3], coordinated by the Western Sydney Regional Organisation of Councils (WSROC). The program aims to reduce Western Sydney's emissions by 200,000 tCO_2e each year, alongside increasing opportunities for energy and cost savings.



WSEP implements regional projects addressing transport, renewable energy, facilities & precincts design and community support. Supporting councils to transition their fleet to low carbon vehicles is a key priority of the WSEP. The program also aims to promote regional collaboration and advocacy to regional, state and federal partners for supporting transport infrastructure to deliver a low carbon, low-cost transport future in the region.

To date, collective efforts of Western Sydney councils have already saved more than $20 million and almost 338,134 tCO_2e through lighting and equipment upgrades, waste management, solar installations, community support and smart cities initiative (Figure 3). This is equivalent to taking nearly 78,636 conventional internal combustion engine cars off the road.

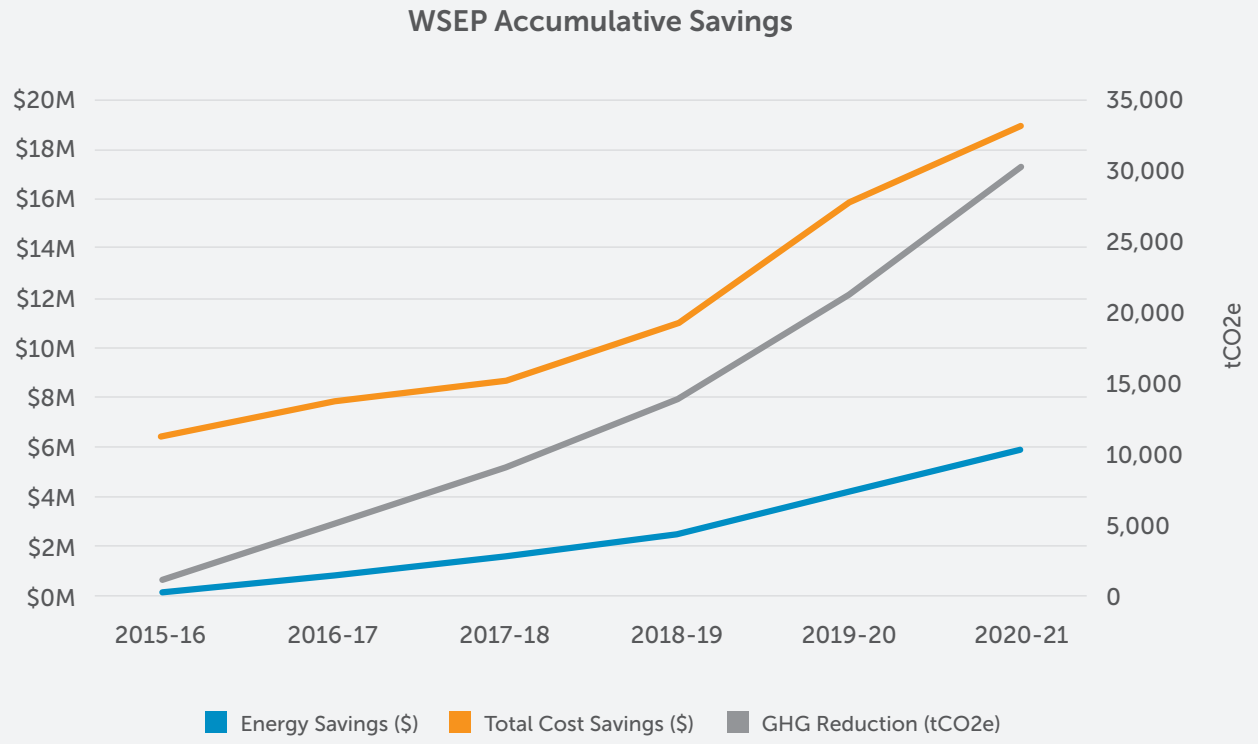


Figure 3 - Economic, social, and environmental benefits from WSEP program implementation since 2017

The aim for this roadmap is to guide regional collaboration and to assist Western Sydney councils to:

- Reduce carbon from councils' corporate fleet emissions (including contracted services like waste collection and road works)
- Create regional EV infrastructure plans
- Explore ways that councils could participate in reducing emissions from EV within their communities
- Access grant funding for project and research delivery
- Collaboratively advocate to the state and federal government for net zero transport.

Each council is currently at a different point on the EV transition journey. The EV Roadmap will leverage the power of the regional group, while supporting each council to progress and accelerate internal goals toward zero-emission transport.

Western Sydney is growing rapidly, with an additional one million people expected to settle in the region by 2036, thereby increasing the load on inter and intra-regional transport networks[4].

By taking a collaborative approach to improving economic and environmental outcomes, councils will be best placed to access and leverage resources, procurement, advocacy and grant opportunities. Working together will also ensure that scarce financial and human capital is effectively utilised from early planning to regional implementation of transport electrification.

The methodology for this EV Roadmap was created in collaboration with Ironbark Sustainability, WSEP working group members and leading EV consultancy Evenergi, and involved the following key steps:

- Identify key sources of emissions in road transport
- Identify the key opportunities and barriers to reduce emissions
- Identify the key interventions to reduce emissions and the current status of interventions in the region
- Create a regional action plan based on realistic and achievable measures with the highest impact from an economic, social and sustainability perspective.

Bus stop in Western Sydney

Western Sydney car park

1.1 National, state, and local commitments

Figure 4 outlines the current carbon reduction and renewable energy commitments across Australia.

To meet these emission targets will require strong action on reducing emissions from transport, which is one of the most emission intensive sectors. Western Sydney is no exception; road transport represents 29 per cent of the region's emissions[5]. Western Sydneysiders are heavily vehicle dependent, with over 45 per cent of all trips being in passenger vehicles[6].

The WSEP member councils currently have more than 3,157 corporate vehicles, with a potential value of over $200 million and an annual operating cost of over $40 million. If council fleets are fully decarbonised, this alone would represent a saving of 26,616 tonnes of CO_2e per annum.

As such, local governments in Western Sydney are in a strong position to drive the transition to zero-emission vehicles - within their communities and through corporate initiatives.

However, the current reality is that the region is falling behind in this area. This roadmap aims to lay out a map to ensure that the region capitalises on the opportunities.

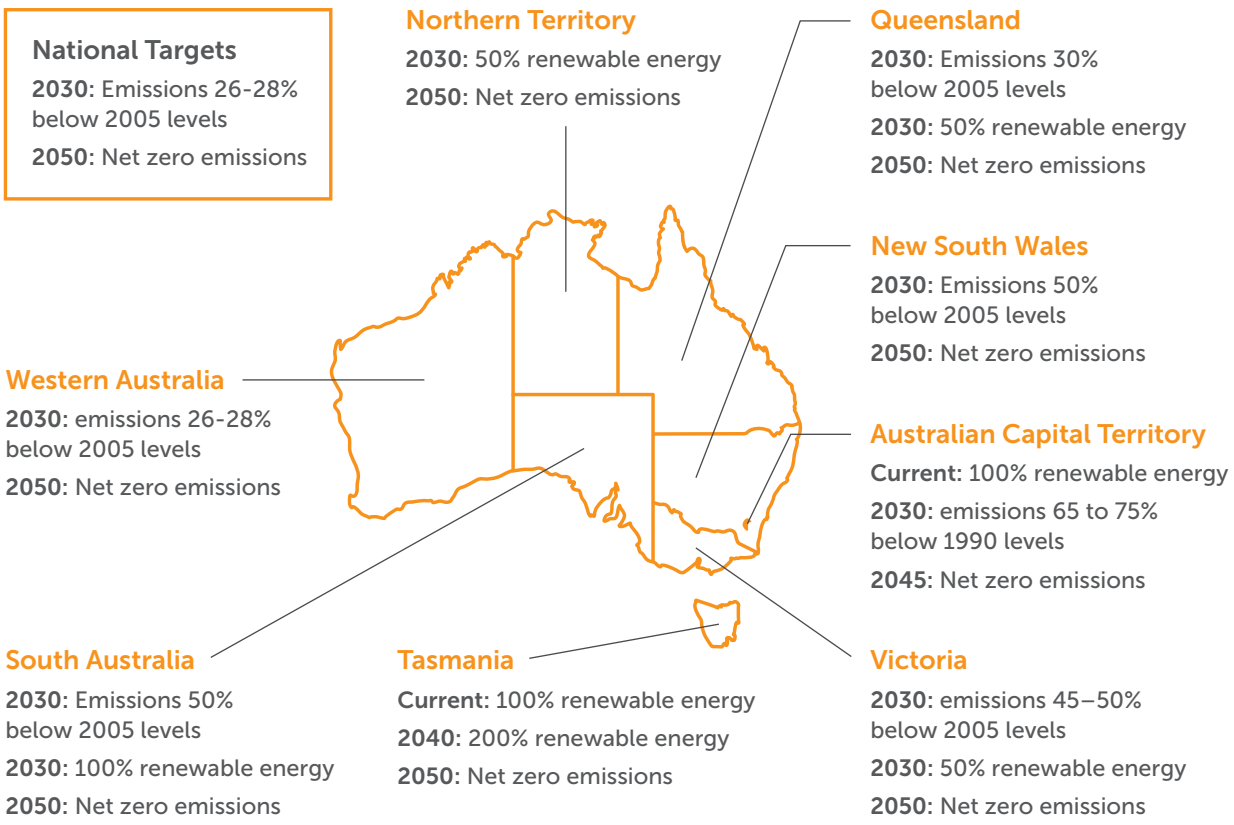


Figure 4 - Australian national, state and territory carbon reduction and renewable energy commitments

1.2 The political, economic and environmental imperative to transition now

There is no doubt that the national and international momentum is now strongly shifting to electric vehicles. The question is no longer "if", but rather "when" this shift will happen. The key drivers for this are outlined below.

- **Economic benefits** - EVs are lower cost to run, and while the upfront costs are still higher, they are dropping rapidly. From a social perspective, the electricity generated for EVs is locally produced and drives local economic value-add.
- **Global commitments** - Many countries are committing to banning petrol vehicles. The UK for example has recently moved its commitment forward to 2030. Currently, 14 major countries have committed to some phasing out of petrol vehicles by 2040.
- **Manufacturer commitments** - Propelled by these government commitments, and the success of Tesla, most global manufacturers have committed to either total or significant migration to EV models by 2030.
- **Environmental benefit** - Electric vehicles integrated into a renewable energy grid will significantly reduce emissions as well as reduce pollution within our cities and regions.
- **Energy security** - With the impacts of COVID-19, the requirements for energy security have come to the fore. EVs deliver real energy security by eliminating the need to fuel imports, which in 2018/19 were three times higher than local production[7].

Federal grants are currently available for fast-charging infrastructure, with more funding opportunities expected in the short term. At a state level, the NSW Government has released it's Electric Vehicle Strategy with rebates for new EV purchases, phasing out of stamp duty, fleet incentives for councils and business and building a world-class EV charging network. This is in addition to their commitment to the electrification of the state's bus network by 2030, investment in fast-charging infrastructure and incentives for public charging and fleet transitions.

Refer to Appendix A for an overview of current support and incentive packages available by the Australian and NSW governments.

There is a very pressing opportunity for regional collaboration across Western Sydney councils to deliver an accelerated and economically sensible transition by taking advantage of current and future grant opportunities and investment in fleets over the coming 10-year period.

At this stage, the transition to low emission vehicles could come at a higher cost compared to business as usual. But it is predicted that in the next few years, such a transition will save councils and the Western Sydney community millions of dollars through reduced operating and maintenance costs.

1.3 Regional collaboration is key

A real and current opportunity exists for the WSEP councils to collaborate to drive greater success across the region. This collaboration can come in the form of:

- Regional charging plans
- Collaborative learning and information exchange
- Joint grant submissions
- Collective purchasing.

The EV Roadmap assists councils within the region to:

- Adopt the roadmap goals, targets and actions
- Set strong targets on council fleet transitions and charging infrastructure
- Collaborate on grant applications, planning learning, purchasing
- Agree and harmonise council policies, including setting EV conditions in waste contracts
- Continue and increase advocacy work.

Many other community and corporate opportunities will emanate from the EV shift. Establishing the first key steps with clear outlines of governance will set the direction for years to come.

The future is electric

Imagine in 2030 where we have significant numbers of EVs within Western Sydney or visiting Western Sydney; rideshare, carshare, taxis, buses, autonomous electric delivery, and heavy vehicles. Council fleets are electrified and integrated into the grid locally and at local government facilities and depots, running on local renewable energy and storage.

Electrification will lead to reduced exhaust fumes both in councils' operations and within the wider community. Councils can provide support to other fleet managers, support regional industry development and accelerate reductions to pollution and energy costs.

Early and co-ordinated regional action will mean that this will happen at a lower cost due to the ability to leverage grants. As the economics and business case for EV transition gets stronger and payback periods shorter, those proactive councils will have the experience and policy framework in place to quickly move forward.

More charging infrastructure through strategically utilising grant funding and better planning will make Western Sydney a destination of choice for EV drivers. Late action means missing the boat, slower transitions, and higher long-term costs.

Blacktown City Council electric vehicle

2 WESTERN SYDNEY CURRENT SITUATION ANALYSIS

2.1 Population profile

The Greater Western Sydney region covers a large area, extending over 8,948 square kilometres, ranging from densely populated metropolitan areas of Parramatta, Liverpool, Cumberland, Fairfield and Blacktown to rural lands of the Hills and Hawkesbury and the World Heritage Area of the Blue Mountains and Lithgow. The region's population is 2.3 million and is expected to increase by almost one million in the next 20 years[8].

Western Sydney households are vulnerable to the impacts of climate change, including increased risk of bushfires, extreme weather events, drought, and flooding. Of particular note is the region's exposure to heat; temperatures across the region are higher on average than other areas in Sydney. Research shows that Western Sydney households use 100% more energy for cooling compared to Eastern Sydney[9].

Adding to this vulnerability is the region's pockets of disadvantage; nine out of the 10 lowest Socio-Economic Indexes for Areas (SEIFA) scores in the Sydney Metropolitan area are attributed to LGAs in Greater Western Sydney[10].

2.2 Emissions profile

Western Sydney produces approximately 20 million tonnes of carbon emissions each year, which accounts for 5% of all emissions in Australia[11]. Transportation in Western Sydney represents almost one third (around 5.8 million tonnes) of these emissions, making it one of the most emission intensive sectors in the region. Further breakdown of the transport emissions identifies light passenger vehicles as typically responsible for around 50 per cent of transport emissions[12]. See Figure 5.

Source	Sector	Emissions
Agriculture		74,602
Electricity	Commercial	2,165,434
Electricity	Industrial	7,331,475
Electricity	Residential	3,235,156
Gas	Commercial	476,269
Gas	Industrial	1,612,046
Gas	Residential	253,246
Transport	Aviation	0
Transport	On Road	4,642,632
Waste	Landfill	313,989
Waste	Water	197,722
Total		**20,302,570**

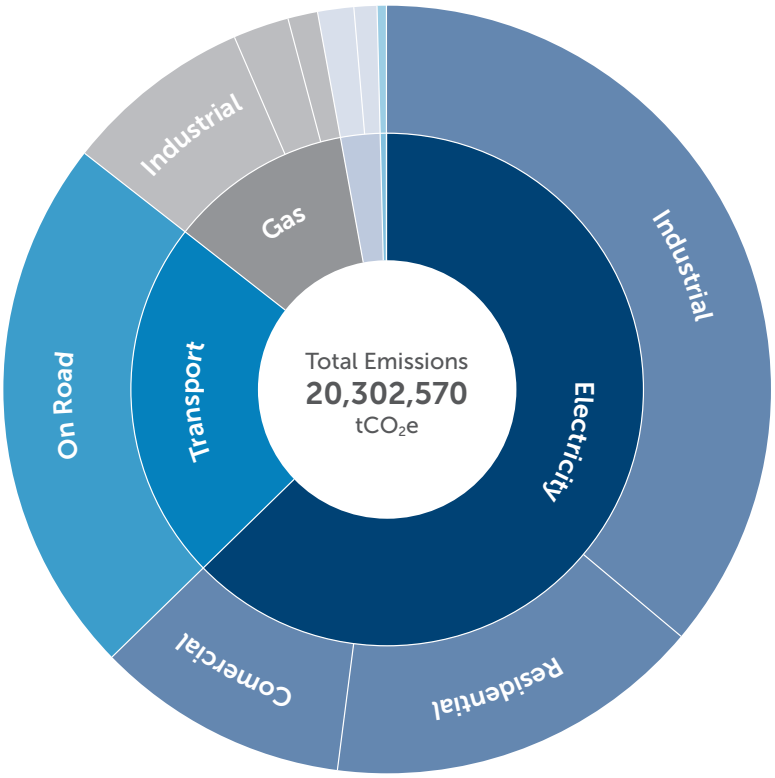


Figure 5 - Key Western Sydney emission sources 2018-19[13]

Parramatta River ferry

2.3 Transport profile

Transportation emissions have continuously increased since 1990, with the biggest contributing factors being high-emitting vehicles, lack of emissions standards and relatively low fuel prices (in comparison with other countries). The average emission intensity profile for new passenger vehicles sold in Australia is approximately 45 per cent higher than vehicles in Europe[14].

The National Transport Commission in Australia estimates that if consumers purchased best-in-class emission vehicles, the average emissions for new light vehicles would decrease by approximately 60 per cent[15].

Personal vehicles continue to be the main form of mobility for residents in Western Sydney, with 45 per cent of all trips being conducted as vehicle drivers and 21 per cent as vehicle passenger[16].

Buses and trains each account for around 5 per cent of the total share, with active transport (walking and cycling)[17] accounting for around 23 per cent in total. Commuting and work-related business trips in the area represents between 20-30 per cent of all conducted trips[18]. See Figure 6.

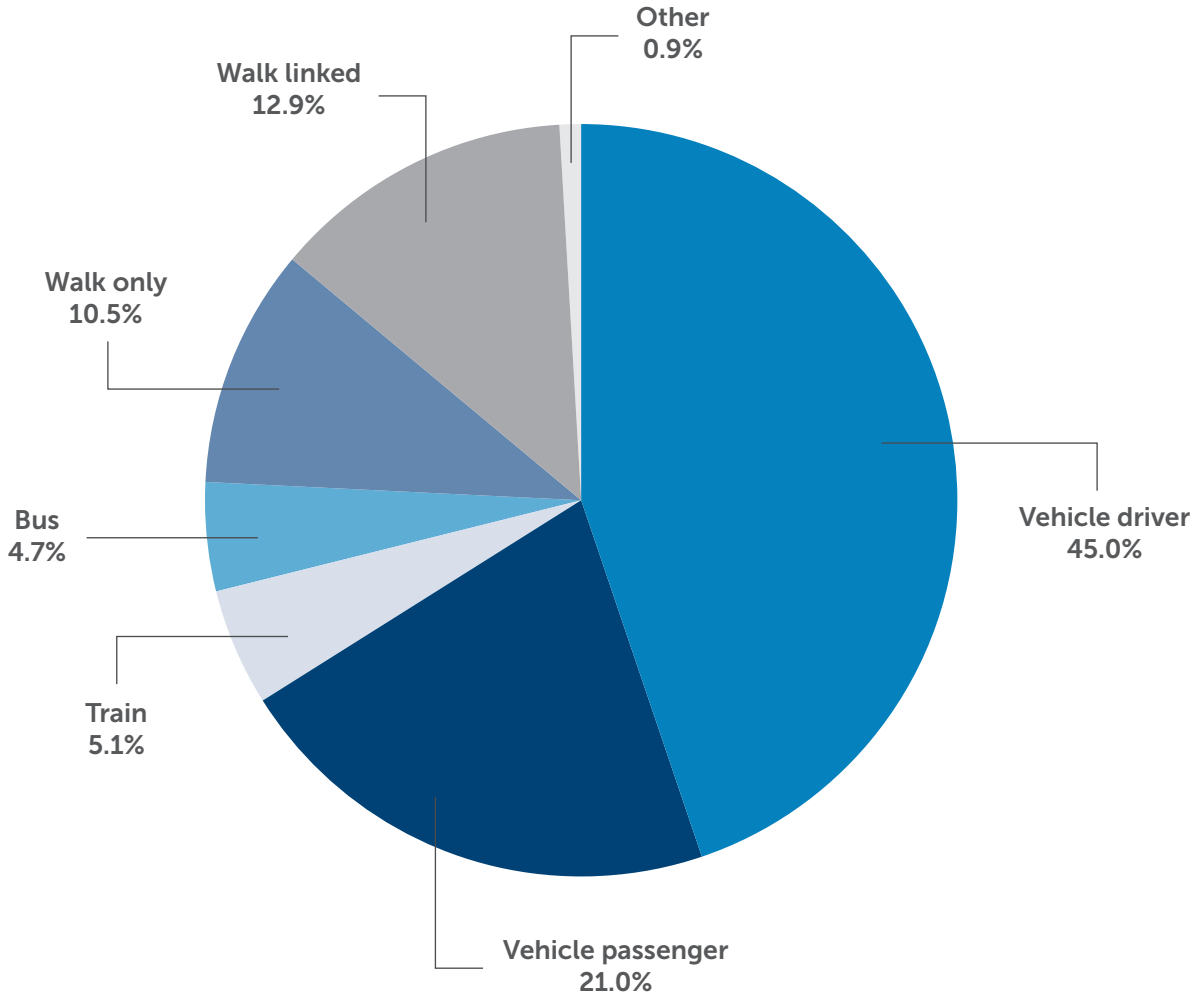


Figure 6 - Mobility breakdown by mode in Western Sydney 2018-19[19]

Car ownership is high in the Western Sydney area, with over 84 per cent of households owning at least one vehicle and 67 per cent with two or more vehicles. This resembles the broader NSW profiles (Figure 7). Multiple vehicle households have been an increasing trend in the region since the 2000s[20]. Western Sydney's high reliance on cars is in part due to the region's lack of active and public transport infrastructure and access[21].

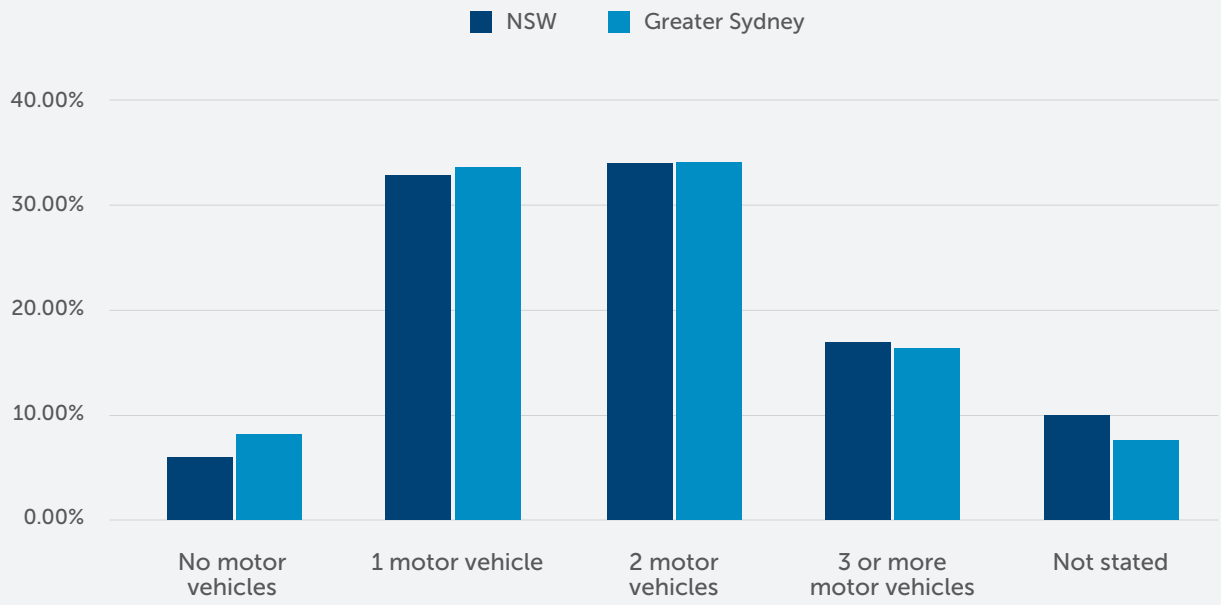


Figure 7 - Car ownership breakdown Greater Sydney 2016-18[22]

Local road in Liverpool, Western Sydney.

Taxi driver in Blacktown

There were over 1 million light and heavy vehicles registered in Western Sydney by the second quarter of 2020 (Figure 8). Around half of these are light passenger vehicles, followed by light off-road vehicles. The next largest registered categories were light trucks (10.0 per cent) and light trailers (9.7 per cent). Buses account for 0.15 per cent of all registrations, with just under 1,600 buses in the area, whereas there were over 28,000 light and 8,000 heavy trucks and heavy trailers registered.

Of the registered vehicles, petrol and diesel account for almost the entire vehicle fleet in Western Sydney, with the expected trend of petrol dominating the light vehicle segments and diesel the heavier duty vehicle segments.

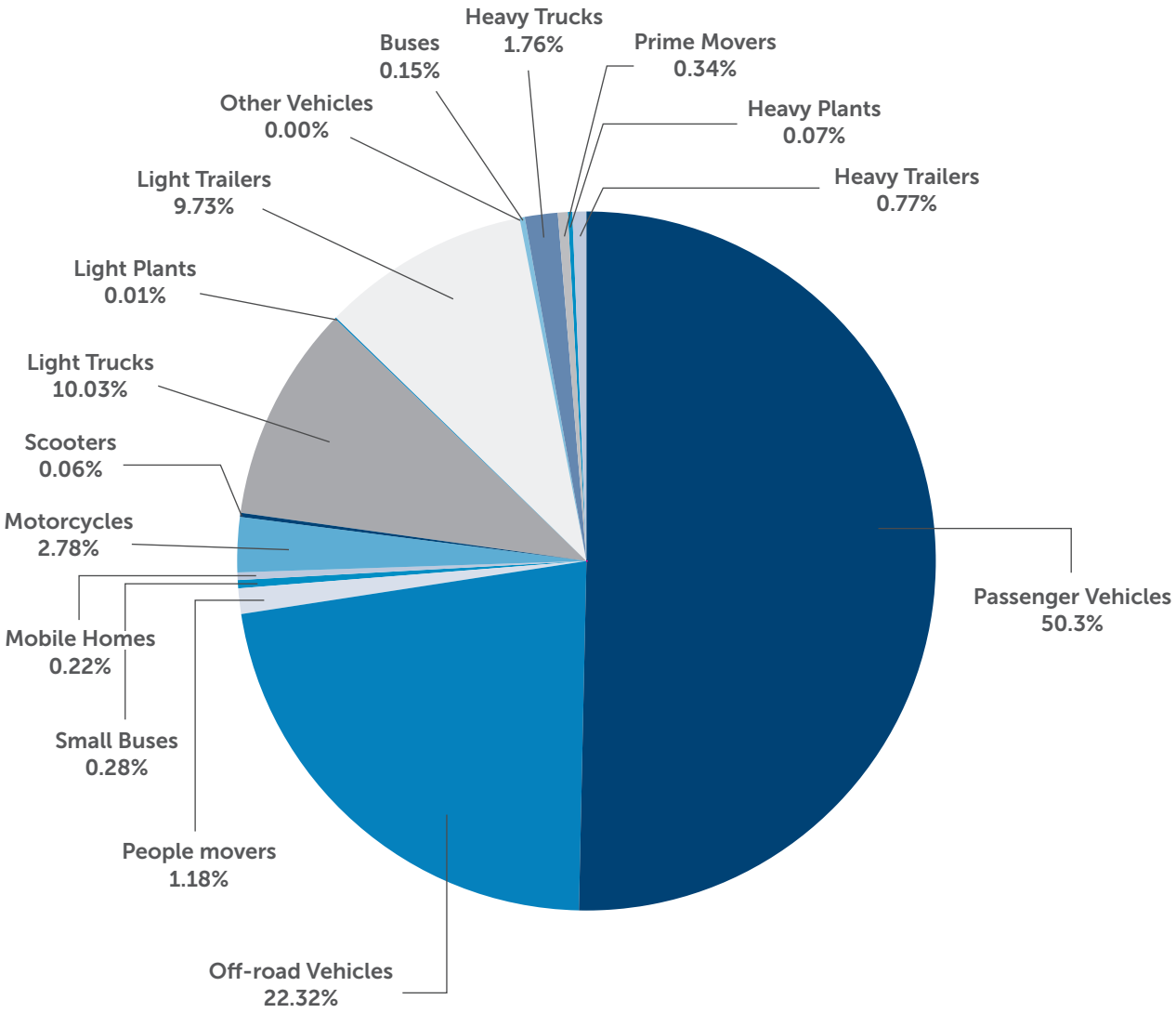


Figure 8 - Western Sydney new vehicle registrations by type by Q2 2020[23]

2.4 Why zero-emission vehicles?

As outlined in the transport profile, Western Sydney is, and will continue to be, heavily car-dependent. There is a global shift away from internal combustion vehicles, shown by the significant commitments to transition to low emission vehicles by major countries such as the United Kingdom, United States of America, China, India, France, and Germany. This has led to most global vehicle manufacturers delivering zero-emission vehicles and ultimately this shift will mean that countries that do not transition will end up with old, expensive, and polluting technologies.

The decarbonisation of transport involves the transition of passenger and heavy vehicle fleets and electric drive trains. Examples include hybrid electric, full electric or fuel cells driven by hydrogen.

Figure 8 from PwC and the Electric Vehicle Council identifies the economic, environmental and social value-add from electrification and this can be mirrored to a large degree in Western Sydney.

Annually EVs are estimated to save the average driver $1,700 every year by 2030. This is just less than the current cost of purchasing petrol per year in the average household ($1,950[24]). PWC indicate there are many other benefits to EVs including increase in real GDP, reduction in reliance on fuel importation and of course, significant reduction in greenhouse gas emissions.

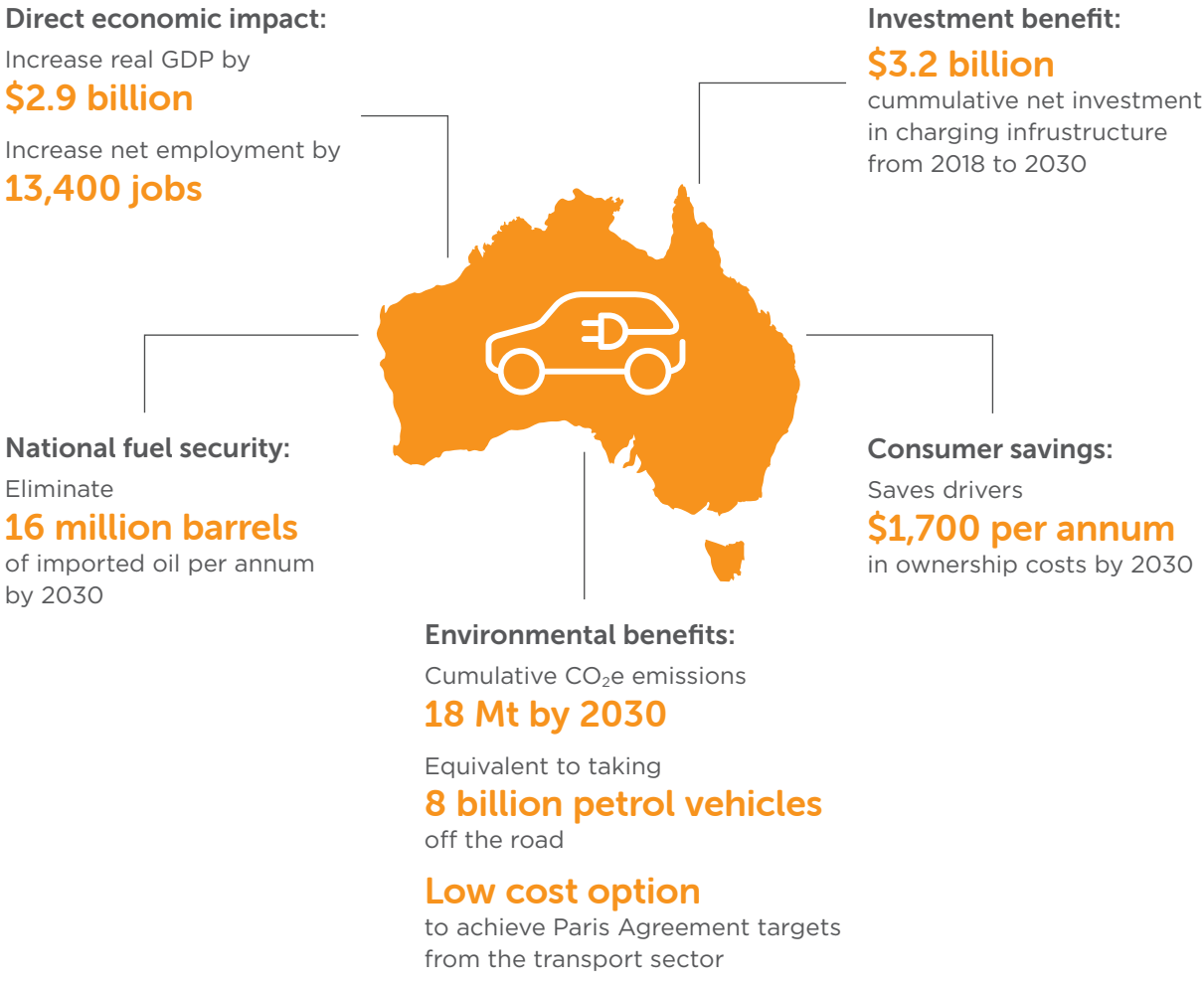


Figure 9 - The economic impact of accelerating electric vehicle adoption (source: Electric Vehicle Council, 2019)

Electric bus

There are other challenges with this transition. For example, installing requisite charging infrastructure is a significant change for local governments. Charging infrastructure is required for electric vehicles belonging to councils as well as residents and those travelling to the region from other parts of Sydney or inter-regionally.

Most residents charge their vehicles at home or at work (over 89 per cent), so while public charging infrastructure is not as vital for this cohort, it is critical for visitors and for providing peace of mind for all EV drivers that they can "top-up" in case of emergency.

Installing charging infrastructure will require a change in strategic direction, capital budgeting process and infrastructure. Taking a regional approach will make these challenges far more manageable, through collective planning, accessing regional grants, working with industry, and implementing behaviour change programs.

In summary, with electric vehicle options becoming more cost effective combined with a global and state government shift away from combustion engine vehicles, now is the time to set the future direction for the region. By taking proactive action, councils and communities will position themselves to maximise social, environmental, and economic benefits for their communities.

2.5 The role of councils

Electric vehicle adoption is rapidly rising in Australia with sales increasing by 300 per cent in 2019 and staying steady despite COVID-19 in 2020[25] (Figure 10). While this still represents a small portion of total car sales, the global movement of consumers, car companies and governments suggest that this rapid growth will continue.

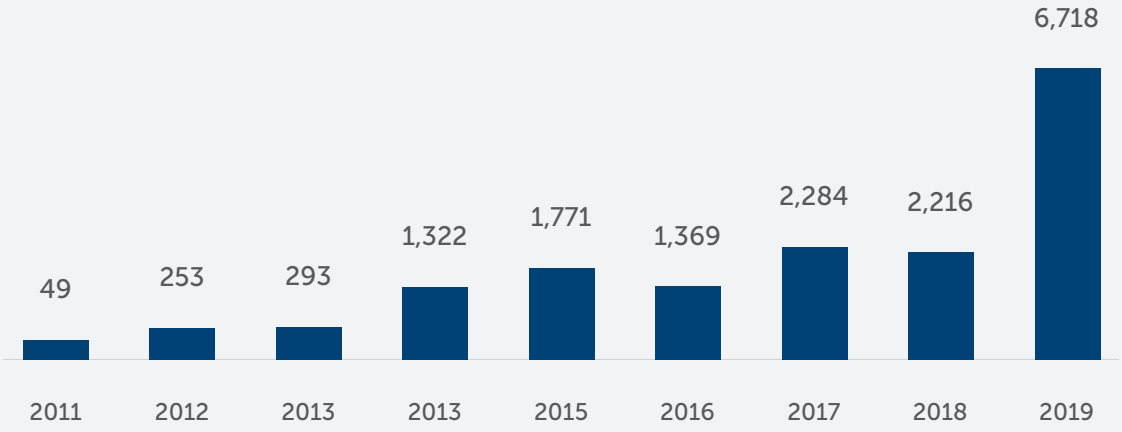


Figure 10 - Electric vehicle sales in Australia - Electric Vehicle Council (2020)

Many councils around Australia have strategies in place to decarbonise their corporate fleets and service delivery, as well reducing community emissions. They are doing this to:

- Meet their climate change and emission reduction targets
- Prepare for key technology changes that will drive long-term economic benefit
- Provide charging infrastructure:
  - to ensure that tourists who drive electric vehicles are comfortable visiting the region
  - to ensure that residents and businesses have adequate charging should they decide to purchase an electric vehicle.

Councils are creating and implementing zero-emission fleet transition plans, are implementing charging infrastructure, encouraging or enforcing charging station provisioning in new buildings and advocating to the state and federal government for electrification of public transport and community charging infrastructure.

NSW councils with electric vehicle strategies

Although not exhaustive, here is a list of councils with electric vehicle strategies in 2021:

City of Sydney, City of Ryde, Northern Beaches Council, Canterbury Bankstown City Council, Wagga Wagga City Council, Lake Macquarie City Council, Lismore City Council, Willoughby City Council, Penrith City Council, City of Newcastle, Sutherland Shire Council, Port Macquarie Council, and North Sydney Council.

Western Sydney councils already show leadership with transport electrification. Examples are Blacktown City Council's smart poles with EV charging capacity, the City of Parramatta's EV charging planning provisions[26], and the Western Sydney Energy Program's advocacy for increased charging infrastructure and an electric public bus fleet for the region.

See the breakout boxes throughout this document for case study examples of other councils leading the EV way.

Case study: Moreland City Council EV fleet transitions

Moreland City Council is leading by example to encourage uptake of zero-emission vehicles and promote zero-emission transport, a process which started in 2013 and has gathered momentum since then.

In June 2018, Council adopted a zero-emission corporate vehicle procurement policy to transition Council's fleet to zero-emission, underpinned by a number of Council plans and strategic objectives including the Corporate Carbon Reduction Plan, Zero Carbon Moreland Climate Emergency Action Plan, and the Moreland Integrated Transport Strategy.

Specifically, Moreland City Council decided to review light vehicle fleet operations and fleet policy and update their Light Vehicle Policy to promote the uptake of electric vehicles in their fleet. The updated policy included an EV first procurement policy, based on the idea that a zero-emission procurement priority is needed to ensure emissions reductions of the Council fleet. This means that if there is an entry-level zero-emission vehicle that fulfils the first stages of purchase (fit for purpose and safety), then the EV must be purchased regardless of price.

Council's secondary vehicle procurement standard states that where a zero-emission vehicle cannot be procured then the fallback vehicle must meet the secondary standard of maximum emissions (adopted of 100gCO2/km) per the Green Vehicle Guide.

Other policy considerations address cost calculations, including downstream environmental impact of vehicles chosen, approved vehicle list, staff training, purchasing and resale values, mayoral vehicle governed by the same policy, and environmental performance, with no diesel-powered passenger vehicles to be considered.

Council now has 23 electric vehicles in its fleet and 10 private charging stations to refuel them, including five publicly-available DC fast charge stations. This is the largest local government EV fleet in Victoria.

Western Sydney residents

3 WESTERN SYDNEY COUNCILS' EV PROGRESS

Within Western Sydney, the progress towards EVs has been slow relative to other regions nationally. There is not a consistent approach across the region, with some councils' actively pursuing and trialling low emission alternative and others not.

As part of the development of the EV Roadmap a survey was conducted among participating councils. This section outlines the current status and preferred way forward as identified by councils.

To date, the standard hybrid vehicles have been the preferred technology within Western Sydney council fleets, accounting for approximately 3.4 per cent of all council vehicles. On the other hand, fully electric vehicles or battery electric (BEV) account for only approximately 0.1 per cent, and plug-in hybrids (PHEV) for approximately 0.3 per cent of all council vehicles.

From the nine Western Sydney Energy Program councils, only two reported to have BEVs within their fleet, and one stated to have PHEVs (see Table 1). These EVs are light vehicles, and no medium or heavy-duty electric vehicles have been reported.

Blue Mountains City Council electric garbage truck trial

Table 1 - Electric vehicles across Western Sydney councils

Vehicle type	Total electric vehicle per type across councils	Type of electric vehicles per council (avg.)	Councils with EV (per type) on their fleet
BEV (Battery electric Vehicle)	3	0.34	2
PHEV (Plug-in Hybrid Electric Vehicle)	10	1.12	1
HEV (Hybrid Electric Vehicle)	108	13.50	4
Other (i.e., ebike, eScruber, eGluttons)	6	-	1

A similar context is evidenced within charging infrastructure. While there are 20 charging stations reported for the use of councils' fleets and thirteen stations commissioned for public use, these are split across only three councils (Blacktown City Council, Fairfield City Council and City of Parramatta Council).

Under the current set-up, there are 1.5 charging stations for every plug-in capable electric vehicle within councils' fleets in Western Sydney (see Table 2).

Table 2 - Charging station availability across Western Sydney councils

	Total stations	Councils with stations
Charging stations for councils' fleet	20	2
Charging stations for Public use	13	3

When looking at interventions towards decarbonising transportation, three councils (Lithgow City Council, City of Parramatta Council and Blacktown City Council) have implemented at least one intervention for transitioning light or heavy vehicle fleets with the incorporation of renewables (see Figure 11).

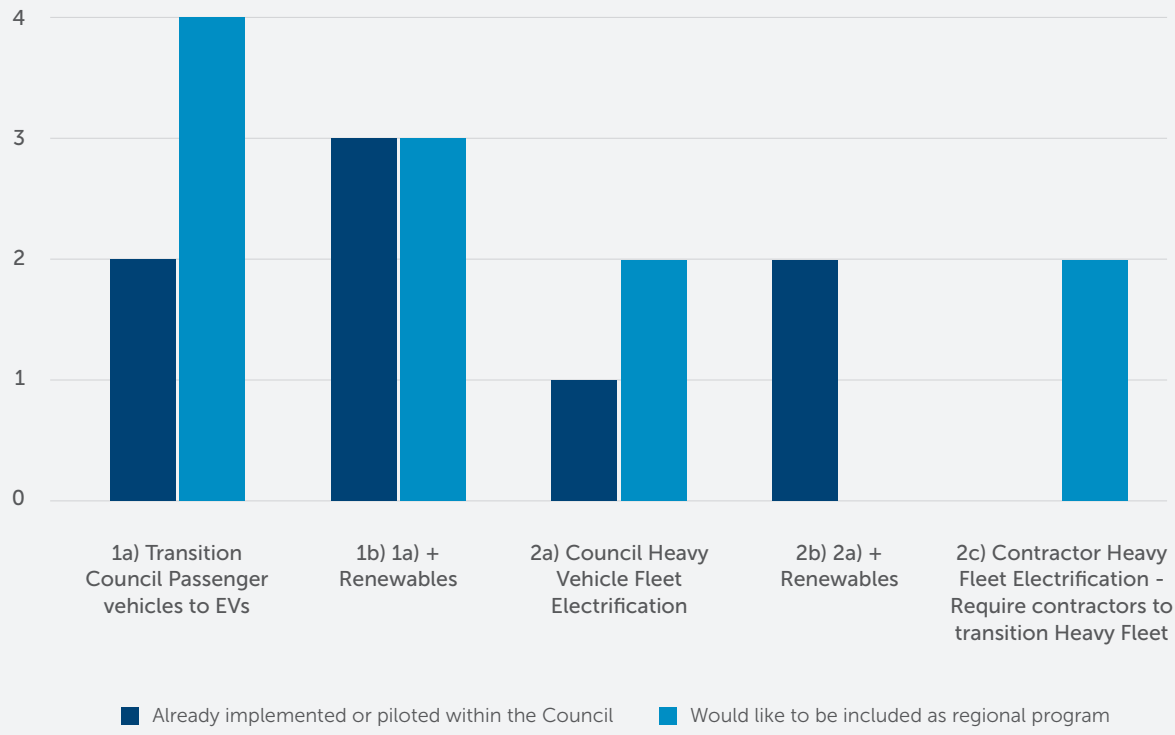


Figure 11 - Councils corporate actions

In the survey, a majority of the councils stated willingness to be included in a regional decarbonisation program across Western Sydney for transitioning the council fleets to electric. There was also strong support to implement strategies within their communities such as developing public charging infrastructure networks (Figure 12).

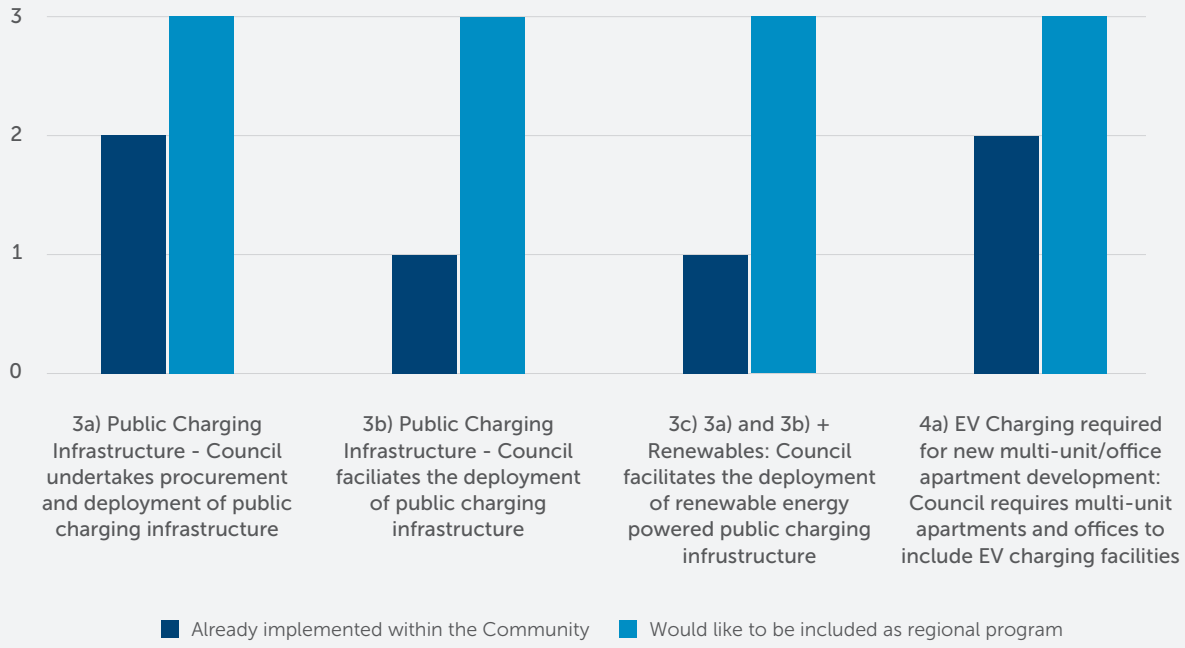


Figure 12 - Councils community interventions

Several Western Sydney councils (e.g., City of Parramatta Council, Blacktown City Council, Liverpool City Council, Blue Mountains City Council, Lithgow City Council) have conducted fleet assessments and transition plans, developing strategies in the EV area.

For example, the City of Parramatta Council recently conducted a fleet transition plan and adopted a series of recommendations on EV related measures such as trialling BEVs, mandating charging facilities in new buildings, and encouraging car share and rideshare to move to zero-emission options.

In addition, Blacktown, Blue Mountains and Fairfield City Councils have trialled low emission technologies for waste trucks (EV and hydrogen) and are actively implementing public charging facilities for EVs.

Currently, a lack of harmonisation prevails in Western Sydney with regard to regional targets and planned actions, integration of transition into business-as usual operations and long-term asset renewal planning.

A unified, streamlined approach is required to maximise the opportunities for better buying power and best practice technology.

EV charging is best planned regionally to support fleets across councils and ensure harmony of planning for public facilities.

Case study: City of Canterbury Bankstown public charging infrastructure project

The City of Canterbury Bankstown's Charging Ahead project[27] involves the provision of public place EV charging points in the Local Government Area.

In 2017, Council pledged to "Develop an Electric Vehicle (EV) charging strategic plan, including public spaces and new strata developments". This was due to a lack of recharging infrastructure being identified as a major barrier to the uptake of EVs in Australia. Along with the increasing number of multi-unit developments in Canterbury Bankstown, and as Council introduces EVs into the corporate fleet, strategic placement of EV chargers will support this.

In 2019 Council started introducing Electric Vehicles into the operational fleet replacing petrol vehicles. All electricity used to charge the EVs will be renewable or offset so the cars will be effectively carbon neutral. As of January 2020, Council has 13 Electric Vehicles with plans to double this number in 12 months as vehicles are due for replacement and have placed their first community EV chargers at Campsie.

3.1 EV charging in Western Sydney

There are approximately 60 charging stations across Western Sydney for recharging battery and plug-in hybrid electric vehicles, around half of which are Tesla charging stations (either 22kW or below, see Figure 13)[28]. This represents around one charging station per 10,000 passenger vehicles in the Western Sydney area. Although this figure is quite high by global standards, in reality, this simply reflects that there are very few electric vehicles currently in place. As the EV market rapidly expands, increased availability of charging facilities will need to follow; or preferably precede, the increase in EV numbers to assist in accelerating the transition.

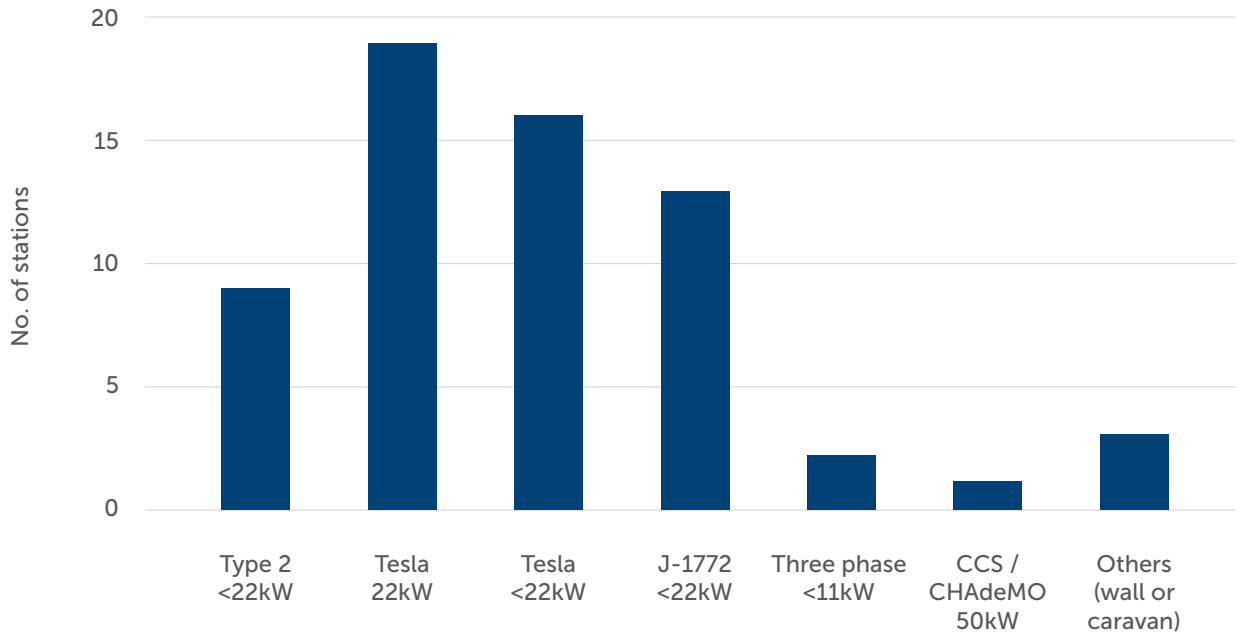


Figure 13 - Charging stations by type in Western Sydney[29]

4 WESTERN SYDNEY EV OPPORTUNITIES AND BARRIERS

4.1 Corporate opportunities

One of the most important measures for councils is the electrification of their own fleets. Council fleets typically include a range of passenger, light commercial and heavy vehicles and a typical emissions profile for a mid-sized fleet is outlined below in Figure 14.

Figure 15 outlines the breakdown of vehicles across the councils in the Western Sydney Energy Program. This is a very significant fleet comprising 3,157 vehicles – collectively representing one of the largest fleets in Australia.

Asset information was not provided; however, it could be estimated at an average vehicle value of $63,000, at $200 million of assets across the region.

As shown in Figure 16, this represents a very significant source of emissions for councils[30], estimated at 26,161 tonnes of CO_2e per annum. A full transition to EV could reduce this to zero if vehicles were charged with renewable energy.

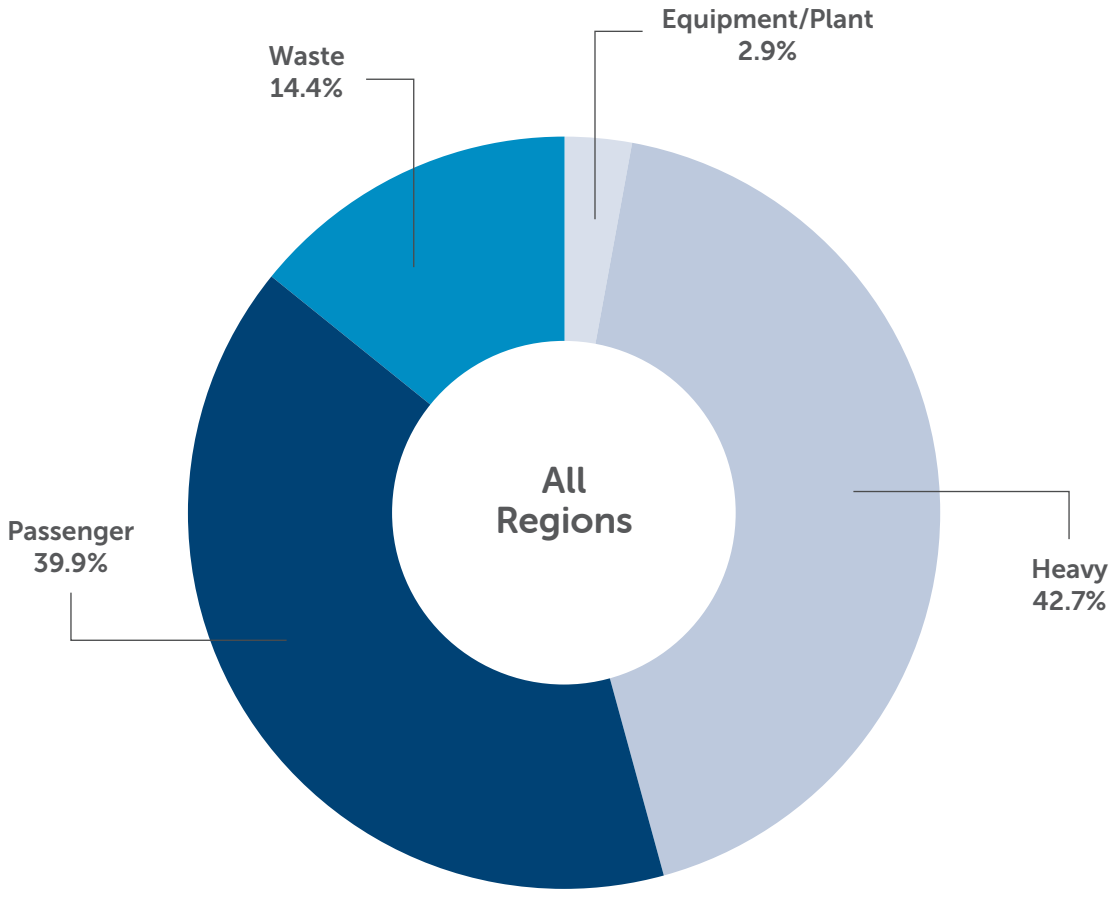


Figure 14 - Emissions profile of fleets in Western Sydney by type of vehicle

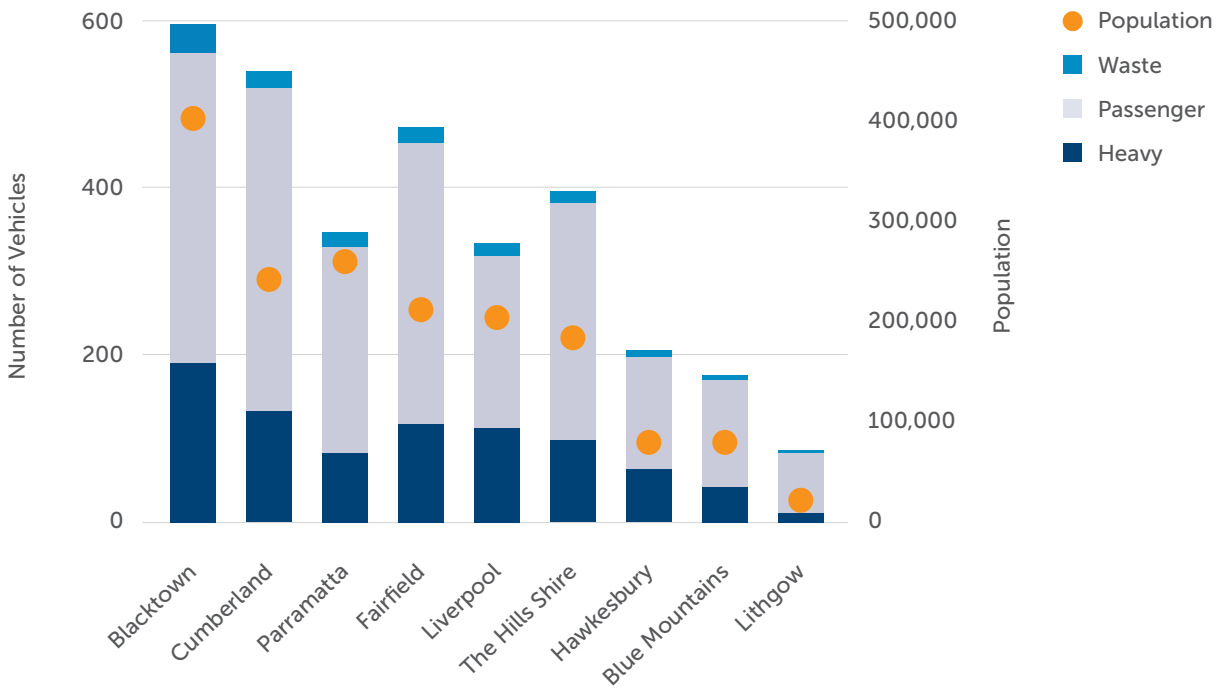


Figure 15 - Number of vehicles within WSEP councils' fleets

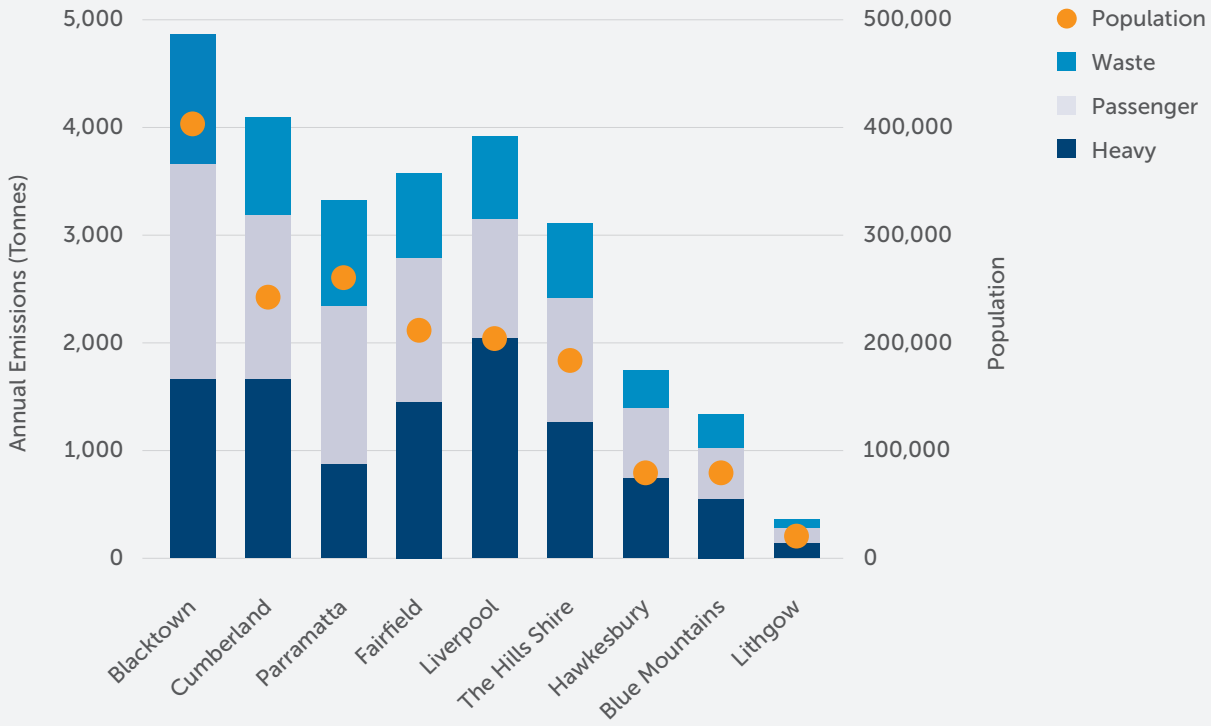


Figure 16 - Emissions profile for WSEP councils' fleets

4.1.1 Corporate barriers

There are many barriers to transitioning council fleets. While there is likely to be a strongly positive return on investment over the next 10 years, there is a significant increase in capital costs for more expensive vehicles and for charging infrastructure.

In addition, there are new skills sets required for procuring, installing and using charging, and the supporting energy infrastructure. One of the key goals of this strategy is to help find pathways to manage these barriers through regional collaboration.

Table 3 - Barriers to council fleet electrification

Barriers	Solutions
Increased up-front capital cost	Joint purchasing and financing, joint grant applications
Fit for purpose vehicle availability	Collaborative procurement - working with suppliers
Education/knowledge	Collaborative learning

Figure 17 - EV chargers at Parramatta Station carpark. Credit: EVSE Australia

4.2 Helping our community transition

Councils have a key role in assisting their communities to transition to a lower cost and lower emission transport system. Specific actions that require the support of councils include the following:

- Support the installation of public charging infrastructure
- Ensure new developments require the installation of EV charging
- Engage with the community to lower barriers to EV uptake (Leading by example, promoting EV practice and use, partnering with other EV transitioned organisations, public demonstration and information sessions)
- Partnering with key regional stakeholders to ensure a systematic investment in low cost and emission transport sector that supports a reliable and low-cost electricity system (including state, federal government and Electricity Distribution Network Service Providers (DNSPs, inc. Ausgrid And Endeavour Energy)).

It is noted that the actions listed above are by no means exhaustive. It is expected that as the work on EV transition progresses, more detailed programs and plans will need to be developed to drive specific interventions. These are discussed further in Section 5 (i.e., the Roadmap table).

4.2.1 Barriers to community transition

Barriers to supporting community transition to electric vehicles include the need for appropriate planning processes (for EV public charging and in new developments) as well as ensuring the role of councils in supporting sustainable business models for charging is more clearly understood.

In addition, many barriers identified at the corporate project level (section 4.1.1) equally present challenges for community transition.

As councils manage and overcome these barriers, the experience can be used to support community members in their transition process.

Table 4 - Barriers to charging infrastructure provision

Barriers	Solutions
Up-front cost and lack of sustainable business	Collaborative grant applications. Working with potential site hosts to unlock co-benefits
No clear standards for EV charging installation in new buildings	Establish uniform policies across the region
Lack of cohesive plan about where and when to place chargers	Create a regional charging infrastructure plan

Case study: Yarra City Council's best practice standards

Yarra City Council's best practice standards are intended to guide sustainable building design and include best practice guidelines on making new developments 'EV ready' by incorporating electric vehicle charging infrastructure into the development.

The best practice standards are communicated through an *EV ready fact sheet - best practice requirements*[31] document that outlines benefits and the electrical infrastructure required to make new developments EV ready.

5 WESTERN SYDNEY EV ROADMAP

This section outlines the opportunities and benefits identified for the Western Sydney Energy Program councils to assist with and maximise the transition to EV. Table 5 outlines potential for council interventions and programs, and Table 6 lists advocacy priorities for the region and individual councils.

These tables have informed the Roadmap infographic listed on page 9.

Table 5 - Recommended direct interventions for Western Sydney councils

Measure	Intervention Target (Corporate or Community)	Purpose
Set mid-term WSEP council fleet electrification targets for light and heavy vehicles (public and private)	Corporate	Area under council control where leadership can be taken directly leading to significant reduction in emissions and second-hand vehicles into the community.
Establish joint process for grant applications for council fleets from NSW Government and Australian Government funding pools	Corporate	Major funding pools will make it possible to accelerate transitions at no net cost to councils. Becoming grant ready means having fleet transition plans in place for each council with a potential for collaborative process for developing plans (for those that do not have them) and for lodging for grants minimising the costs of submitting the grants.
Establish joint process for grant applications for charging infrastructure from NSW Government and Australian Government funding pools	Community	Development of regional infrastructure plans to make councils grant ready.
Update procurement policies to emphasise preference for suppliers who use zero-emission vehicles - particularly for waste	Mainly corporate but there are flow-on benefits to the wider community	Pushing for council suppliers to use zero-emission vehicles is a low cost but highly effective tool.
Harmonise council policies to make developments EV ready	Community	A low-cost measure with significant long-term impact. Some councils have this in train, so it is just a matter of leveraging existing policy in the region.
Institute engagement strategies for ride share and car share	Community	Engage with rideshare and car share services in the region to encourage them to move to zero-emission options. Could include collaborations around charging infrastructure.
Agree on community engagement strategies	Community	Consider collaborative platforms for engaging with the community to encourage EV uptake in the region.

	Timeframe	Potential economic and greenhouse impact
	Now	Positive cost benefit and 10,000 - 20,000 tCO_2e- savings/year
	Now	Positive cost benefit and 10,000 - 20,000 tCO_2e- savings/year
	Now	Positive cost benefit
	Mid term	Positive cost benefit and 4,000 - 6,000 tCO_2e- savings/year
	Mid term	Neutral cost benefit
	Mid term	Neutral cost benefit
	Mid term	Neutral cost benefit

While councils have ownership over their own fleet and can drive processes and policy at a local government level, a major opportunity exists to influence decisions outside of local government by joining forces on advocacy to the NSW and Australian governments and industry stakeholders.

Table 6 outlines priority opportunities for advocacy.

To ensure the transition to a low emission transport sector is smooth and low cost for Western Sydney collaboration between all levels of government, private business and energy companies is required. Western Sydney councils are ideally placed to lead this local transition and working as a region will reduce the overall workload and increase the ability to collaborate with key partners effectively.

Table 6 - Recommended advocacy by Western Sydney councils

Opportunity	Detail	Timeframe	Key stakeholders
Advocacy within local government networks	• Push for collaborative purchasing • Push for collaborative learning • Look for opportunities for innovative business models and finance	Now	Councils - Australia wide
Advocacy to NSW Government	• Advocate for harmonisation of building regulations • Push for public transport electrification • Continued push for incentives	Mid term	NSW Government, WSROC
Advocacy to Australian Government	• Funding availability for council fleet • Funding availability for infrastructure within the region • Regulation of ride share and car share around zero-emission options	Mid term	WSROC, Australian Government
Advocacy to taxi and rideshare industry	• Collaboration to help accelerate the transition	Long term	WSROC and industry
Collaboration with planners and development industry	• Engagement on planning changes to make buildings EV ready	Long term	WSROC, NSW Government
Continued advocacy and collaboration with DNSPs (Ausgrid and Endeavour Energy)	• Ensure that DNSPs are a strong collaborator in determining where infrastructure is placed • Ensure that DNSPs are aware of any regional plans for infrastructure • Ensure DNSPs are aware of policy changes for the region and is consulted	Mid term	WSROC
Advocacy and education for waste providers	• Work with waste providers transition to EVs	Mid term	WSROC, NSW Government and waste industry

APPENDIX A:

Overview of current EV support from state and federal government

This appendix outlines the current (2021) strategies and programs in place by the Australian and NSW governments to stimulate the EV transition. The Commonwealth has established assistance for electric vehicles and related technologies through the following mechanisms shown in Table 7:

Table 7 - Commonwealth Government mechanisms of support for electric vehicles

Response	Details
Climate Solutions Package	• Developing a National Electric Vehicle Strategy to ensure a planned and managed transition to new vehicle technology and infrastructure so all Australians can reap the benefits. • A National Electric Vehicle Strategy will ensure that the transition to electric vehicle technology and infrastructure is planned and managed, so that all Australians can access the benefits of the latest vehicle technology. Electric vehicles produce no tailpipe emissions and use very efficient motors.
Future Fuels Fund	• The federal Coalition government allocated $74 million for a "Future Fuels Fund" that will enable more infrastructure and remove "blackspots" for regional charging and refuelling, including both hydrogen and EVs. • The funding was announced as part of a $1.9 billion "low emissions" funding package, including a 10-year funding agreement for the Australian Renewable Energy Agency, which will manage the Future Fuels Fund[32]. • ARENA will manage the Future Fuels Fund, with the initial round of the fund of around $10 million in funding allocated for regional charging blackspot funding, scheduled to open in January 2021[33].
Clean Energy Finance Corporation	• The CEFC committed an equity investment of $3.5 million, through the Clean Energy Innovation Fund, as part of JetCharge's capital raising round of $4.5 million, which also drew co-investment from industry executives and private investors. • A $50 million CEFC-financed program is encouraging business, government and not-for-profit fleet buyers to choose low emissions vehicles. The CEFC finance allows Eclipx Group, one of Australia's largest independent fleet leasing companies, to offer favourable loan interest rates to customers when they invest in passenger and light commercial vehicles satisfying low emissions benchmarks. • Through the Clean Energy Innovation Fund, the CEFC has invested $3.25 million in Relectrify, which was founded in 2015 and was part of the University of Melbourne accelerator program. Relectrify is engaging with globally leading battery storage manufacturers, distributors and integrators, seeking strategic partners to help bring leading products to the market. • EV Market Study, reporting the key findings of the Australian Electric Vehicle Market Study prepared by Energeia for the CEFC and ARENA. • The CEFC committed $5 million in finance to help SEA-Electric take its next growth step, enabling it to purchase components.
ARENA	• 25 projects funded to date, such as the National Ultrafast EV Charging Infrastructure Network, with $15m funded by ARENA through the Advancing Renewables Program of total project cost of $50.2m.
Luxury Car Tax	• The luxury car tax threshold is more beneficial for electric vehicles than the threshold for other vehicles, meaning more electric vehicle buyers do not pay this tax.

Overview of current EV support from state and federal government (continued)

State and territory governments have employed various EV supporting mechanisms, for e.g., ACT Government leads with the most generous incentives for electric vehicles, followed by NSW and Queensland. Remaining states have very little in the way of electric vehicle friendly policies.

Details of policy mechanisms employed by NSW Government are described in the following Table 8:

Table 8 - NSW mechanisms of support for electric vehicles

Response	Details
NSW Government Net Zero Plan - Stage 1	A plan to reach net zero carbon by 2050 and a 35% cut in emissions by 2030. • The NSW Department of Planning Industry and Environment has been working on mapping and investing in potential charging infrastructure through the *Electric vehicle infrastructure and model availability fund* announced in March 2020. • The Electric Vehicle Infrastructure and Model Availability Program will run competitive funding processes that will co-fund the deployment of fast electric vehicle charging infrastructure. It will also incentivise vehicle fleet owners, such as car rental companies, car share companies, and local councils to procure electric vehicles.
The Future	• Future travel in regional NSW is covered in the Future Transport 2056.
Transport 2056 Strategy	Strategy, with a particular focus on connections through a 'hub and spoke' network model radiating out from regional cities, rather than a network focused on Sydney. • NSW Transport launched the Electric and Hybrid Vehicle Plan reflects our growing focus on future mobility and technology innovations which will modernise transport for the community and businesses across New South Wales. This has been superseded to some extent by the Net Zero Plan actions on EVs. • NSW Department of Transport has committed to transition its entire bus fleet to electric buses.
NSW Electric Vehicle Strategy	• The NSW Electric Vehicle Strategy is the NSW Government's plan to accelerate the State's vehicle fleet of the future. It outlines the government's commitments to increasing the uptake of electric vehicles to ensure New South Wales shares in the benefits. • Through the Strategy, the NSW Government is targeting key areas of action to make New South Wales the easiest place to buy and use an EV in Australia. The Strategy includes rebates, phased removal of stamp duty for EVs, targets for NSW Government fleet, incentives for council and private fleets and major investment to ensure widespread, world-class EV charging coverage. • The Strategy is intended to increase EV sales to 52% by 2030–31 and help NSW achieve net-zero emissions by 2050.

APPENDIX B:

Grant opportunities for local councils

There are several concrete funding opportunities available to councils, some of which would benefit from regional collaboration. See Table 9:

Table 9 - Grant opportunities for local councils

Pathway	Details
Electric Vehicle Infrastructure and Model Availability Program	Designed to fast-track the growth of the electric vehicle market in NSW, with this program understood to be opening early 2021 with match funding. The investment will be targeted by running competitive funding processes that co-fund: • the deployment of fast electric vehicle charging infrastructure • the procurement of electric vehicles by vehicle fleet owners such as car rental companies, car share companies and local councils. The competitive funding process may be a reverse-auction process which will be finalised and launched by the end of 2020.
ARENA - Future Fuels fund[34]	A new $74.5 million Future Fuels package announced in September 2020 will help businesses and regional communities take advantage of opportunities offered by hydrogen, electric, and bio-fuelled vehicles. Allocated into defined funding pools to support solutions for various technologies and challenges, the Future Fuels fund is set to see the imminent launching of a regional charging infrastructure fund to support projects enabling regional charging, especially targeted at those improving charging 'blackspots'. The fund is set to be managed by ARENA and is understood to be launching in January 2021.
Unsolicited approaches	Unsolicited approach with a strategically aligned, clearly defined plan directly to Destination NSW, or other areas of the NSW Government or elected leaders.
ARENA[35]	If a novel project that involves grid integration can be developed, then the Australian Renewable Energy Agency can be a source of funding. This would likely need the involvement of Essential Energy. An example would be trialling off-grid or remote charging applications using solar and storage.
NSW Government Sustainability Advantage[36]	NSW Government Sustainability Advantage provides assistance and funding for businesses to deliver sustainability related projects - with electric vehicles being a stream of the program.
Environmental Upgrade Agreements[37]	Environmental Upgrade Agreements (EUAs) provide owners or managers with access to loans to upgrade a commercial building to maximise the building's energy efficiency. The EUA mechanism, while not a grant, may be a means of funding charging infrastructure upgrades.

REFERENCES

1 A National Strategy for Electric Vehicles (apo.org.au)

2 https://wsroc.com.au/projects/project-western-sydney-energy-program

3 Blacktown, Blue Mountains, , Hawkesbury, The Hills, Lithgow, Liverpool and Parramatta.

4 NSW Department of Planning, NSW population projections, 2016

5 https://wsroc.com.au/media-a-resources/reports/send/3-reports/293-western-sydney-energy-program-strategy

6 Data consolidated from Transport for NSW – Household Travel Survey

7 Australian Petroleum Statistics - Issue 281 December 2019, https://www.energy.gov.au/publications/australian-petroleum-statistics-2019

8 NSW Department of Planning, NSW population projections, 2016

9 www.sydneywater.com.au

10 Australian CENSUS, SEIFA Index of relative advantage and disadvantage 2016

11 Western Sydney emissions footprint https://wsroc.com.au

12 Transport Emissions in Australia https://www.climatecouncil.org.au

13 Consolidated from Transport for NSW

14 Transport https://www.energy.gov.au/households/transport

15 National Transport Commission https://www.energy.gov.au/households/transport

16 Image of Blacktown City Council Public Charging Stations, source ene-hub.com

17 Walking and Cycling - Local Government Relations - Partners & suppliers - Business & Industry - Roads and Maritime Services (nsw.gov.au)

18 Consolidated from Transport for NSW

19 Consolidated from Transport for NSW

20 NRMA https://www.mynrma.com.au/-/media/documents/reports-and-subs/the-future-of-car-ownership.pdf?la=en

21 Addressing Western Sydney's job's slide. Centre for Western Sydney, Western Sydney University.

22 Consolidated from Transport for NSW and idcommunity

23 Data obtained from Transport for NSW

24 https://www.smh.com.au/money/planning-and-budgeting/the-real-cost-of-running-your-car-it-s-time-to-change-gears-20200409-p54ij6.html

25 Image from Electric Vehicles - State of EVs 2020

26 Parramatta CBD Planning Proposal

27 https://citiespowerpartnership.org.au/wp-content/uploads/2019/02/Electric-Vehicle-Business-Case-Charging-Ahead-City-of-Canterbury-Bankstown-web.pdf

28 Data from PlugShare

29 Data from PlugShare

30 Note that Cumberland, Blue Mountains, Fairfield and the Hills Shire councils are estimated values.

31 https://electricvehiclecouncil.com.au/wp-content/uploads/2020/12/EVC-Local-Government-Resource-Pack.pdf

32 https://www.pm.gov.au/media/investment-new-energy-technologies#:~:text=Prime%20Minister%20Scott%20Morrison%20said,reliability%20of%20our%20energy%20supply.&text=%E2%80%9CThese%20investments%20create%20jobs%20and%20they%20bring%20new%20technologies%20into%20play.

33 https://arena.gov.au/funding/future-fuels-fund/

34 https://arena.gov.au/funding/future-fuels-fund/

35 https://arena.gov.au/funding/

36 https://www.environment.nsw.gov.au/topics/sustainable-business-and-government/sustainability-advantage

37 https://www.business.gov.au/Grants-and-Programs/Environmental-Upgrade-Agreements-NSW

WSROC

The Western Sydney Regional Organisation of Councils' (WSROC) mission is to build collaboration between local governments across Greater Western Sydney, promoting Western Sydney, its people and places, through advocacy, business improvement, strategic leadership, research and partnerships. WSROC has facilitated the development of this roadmap under its Western Sydney Energy Program (WSEP).

Western Sydney Regional Organisation of Councils Ltd
Suite 201, Level 2, 85 Flushcombe Road
(PO Box 63) Blacktown NSW 2148

Phone: 02 9671 4333
Web: wsroc.com.au
Email: info@wsroc.com.au

facebook.com/WSROC
@WSROC_Australia
Linkedin.com/company/westernsydneycouncils