



SECCCA Electric Vehicle Charging Roadmap

Discussion Paper and Policy Template – Final Report

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1. Introduction



South East Councils Climate Change Alliance (SECCCA) requires the development of an electric vehicle (EV) charging roadmap, policy guidance and a snapshot of future trends, to help lower transport emissions. SECCCA is also undertaking work to help respond to community and stakeholder enquiries.

1.1 Brief background

SECCCA has a vision for the south east of Melbourne to be a thriving and productive region that has a safe and sustainable climate. There are a number of important reasons for the commissioning of this project:

- SECCCA has declared a climate emergency and have recognised that 25% of emissions are transport related.
- Community sentiment on EVs is evolving rapidly, and some member councils have begun to receive requests from residents, local businesses and other stakeholders for EV charging.
- EV charging equipment suppliers have approached councils seeking to install chargers on public land and clearer policy guidance is required to consistently manage these requests. The role of local government in facilitating this must be clarified.
- A stronger understanding is required on where future charging infrastructure should be placed, using a data-led approach.
- A clear, robust plan for publicly available charging infrastructure will provide a strong foundation for SECCCA members to apply for funding to have chargers installed in their LGAs.

1.2 What SECCCA need – in brief

In essence, SECCCA require three key deliverables in order to achieve the objectives of this project, namely:

1. EV Charging Roadmap, The Roadmap will need to:
 - a. Identify optimal locations for publicly available charging
 - b. Cover the key issues that must be considered for the development of an implementation plan, delivered in 2030, for each LGA, to create a regional network.
2. Discussion paper and policy template. This will need to consider:
 - a. Relevant planning and statutory requirements
 - b. Ownership models
 - c. Permits and approvals considerations for leasing public and private land (including on-street parking bays).
3. Future scan of emerging market trends and the implications of these trends for SECCCA members and the Roadmap.

This report is the 2nd major component of work required and will provide a guide to enable consistent decision making to grow the EV charging network.

Figure 1 provides a map of the SECCCA region and its member councils. As each member council is at a different stage of their EV journey, five of the nine SECCCA member councils are participating in this project (Cardinia, Casey, Frankston, Kingston, Mornington Peninsula).



Figure 1 SECCCA region

2. Government policy



This section provides a summary of current Commonwealth and Victorian government policies on electric vehicles (EVs) and charging infrastructure. This includes independent statutory authorities such as Infrastructure Victoria.

This section articulates the funding commitments and requirements for the development of EV charger networks.

2.1 Commonwealth

The Commonwealth government has a limited set of policies relating to EVs, and has been critical of Labor's policy to have 50% of new cars sold to be EV by 2030. Despite the history of criticism of EVs¹, the Commonwealth has begun to fund EV charging infrastructure. This has been done via their *Future Fuels Strategy*.²

Through the Australian Renewable Energy Agency (ARENA), the Commonwealth has dedicated \$24 million to boost EV charging opportunities in their first round of the Future Fuels Fund. This is primarily concentrated in cities rather than the regions and it is expected that future rounds of funds will focus at least partially on the regions.

The chargers must at a minimum, provide a 50kW DC charge to two vehicles simultaneously.

The delivery of the 19 fast charging projects will increase by seven-fold the number of fast chargers available. Melbourne sites are shown in Figure 2. A number of these proposed chargers are within the SECCCA region and these will be considered in the development of the SECCCA EV Charging Roadmap.

The Commonwealth government, at the time of writing, had yet to offer any vehicle fuel efficiency standards or financial incentives for EV purchase.

2.1.1 Future Fuels and Vehicle Strategy: Powering Choice, 2021

In November, 2021, the Commonwealth government released its *Future Fuels and Vehicle Strategy*.³ The objective of the Strategy is to accelerate the uptake of new technology, including hybrid, hydrogen, electric and bio-fuelled vehicles. The Strategy notes that it has already helped to add over 400 charging stations in Australia and will continue to expand this through the *Future Fuels Fund*.

The Strategy's \$250m investment intends to leverage private sector investment across four areas:

1. Public electric vehicle charging and hydrogen refuelling infrastructure
2. Heavy and long-distance vehicle fleets
3. Light vehicle commercial fleets
4. Household smart charging. A smart charger has the ability for the charger to be turned on/off/adjusted remotely, for instance by a utility company.

New policy reforms are also expected, via coordination with state and territory energy ministers, initially focused on:

- exploring network tariff reform to identify additional opportunities to encourage charging behaviour and infrastructure rollout that will support optimal grid operation
- incentivising the use of smart chargers in households
- tasking the energy market bodies to partner with governments on grid integration matters.

Key points of relevance for the SECCCA Roadmap:

- By 2030, Battery Electric Vehicles (BEVs) and plug in EVs are expected to make up 30% of new light vehicle sales. This is considerably less than Australia's two most populous states, which have a target of 50% by 2030.

¹ <https://www.theguardian.com/australia-news/2019/apr/10/liberal-party-facebook-ads-falsely-claim-labor-wants-to-tax-cars>

² <https://www.industry.gov.au/data-and-publications/future-fuels-and-vehicles-strategy>

³ <https://tinyurl.com/8vbnrzke>

- EV registrations increased from 31,191 vehicles in 2019 to 60,417 in 2020.

Given the objectives of the SECCCA project, the remainder of this summary will focus on the *public EV charging* component of the Future Fuels and Vehicle Strategy. The most pertinent points on the topic of EV charging include:

- Electricity tariff reform to encourage charging that places less stress on the grid.
- Incentivising smart chargers at households. Presumably this will enable easier control of when charging occurs.
- Charging infrastructure will be installed at over 400 businesses, 50,000 households and over 1,000 new public access fast charging stations. This is expected to cover 84% of the population, in terms of where they live, not necessarily where the owners of EVs may wish to drive.
- Result in 1.7m EVs in Australia by 2030, although many of these could be expected to be on the road in the absence of the actions listed in the Strategy.

Following the completion of the SECCCA EV Roadmap project, participating councils will be in a strong position to advocate to the Commonwealth for a portion of the 1,000 fast chargers.

Figure 2 identifies the fast-charging sites included in the *Future Fuels* funding. It should be noted that these locations are indicative and may change. The sites within the SECCCA area have been considered as part of the development of the SECCCA EV Charging Roadmap.

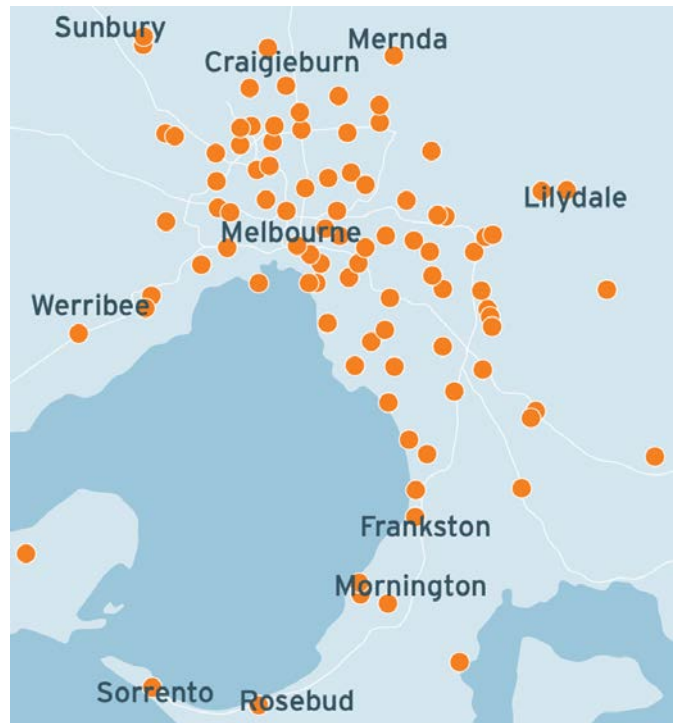


Figure 2 Future Fuels Fast Charging Sites Round 1, ARENA

Source: <https://arena.gov.au/assets/2021/07/future-fuel-fund-maps.pdf>

2.2 Victorian

2.2.1 State government

The Victorian government has articulated its support for the EV market, with the publication of its *Zero Emissions Vehicle Roadmap*. They have a target of 50% of vehicles sold in 2030 to be zero emission. While the Victorian government has been criticised by some for introducing an EV specific tax of 2.5 cents per kilometre, it has also provided some incentives for EVs, including:

- \$19m for charging infrastructure, with 100 new fast charging sites across Victoria, from 11kW to 100kW. In recent years, some \$3m was committed for the construction of ultra rapid fast chargers in Euroa, Moe, Torquay, Ballarat and Horsham.
- Trialling electric buses
- Including more EVs into the government fleet
- \$46m for a \$3,000 purchase subsidy for EVs under \$68,740.
- \$100 off registration fees for EVs.

A selection of the key actions included in the Zero Emissions Vehicle Roadmap are shown in Table 1.

Table 1 Key actions - Zero Emissions Vehicle Roadmap

Public education	Addressing concerns about ZEVs and their performance
	Supporting an improved understanding about ZEV options and transition
Advocacy	Working with other States and Territories to look at options for developing a harmonised approach to vehicle emissions standards, given the lack of action at the national level, and allowing parallel imports from other right-hand drive markets
Promoting 'ZEV-readiness'	Investing \$19 million to accelerate the rollout of battery electric vehicle charging infrastructure across regional Victoria, and support electric vehicle fleets
	Supporting changes to the National Construction Code from 2022 to reduce barriers to future installation of EV charging in new buildings
	Undertaking a \$298,000 study on ZEV-readiness in new developments
	Developing an online guide for apartment owners and body corporate committees to assist them in identifying and assessing options to enable EV charging in existing buildings
	Investigating the need for, and feasibility of, hydrogen re-fuelling stations and other supporting infrastructure
Transitioning our fleets	Investing \$46 million for Australia's first public ZEV subsidy program – supporting the purchase of more than 20,000 ZEVs
	Setting a target of 50% of new light vehicle sales to be ZEV by 2030
	Establishing an expert panel to recommend policies, enabling investments and timelines to support the achievement of this 2030 target
	\$10 million to green the Victorian Government Fleet, including replacement of 400 vehicles with ZEVs by 2023
	\$5 million to establish a Commercial Sector Zero Emissions Vehicle Innovation Fund
	\$20 million to undertake a ZEV bus trial
	Setting a target for all public transport bus purchases to be ZEVs from 2025
Transitioning our energy sector	Managing the integration of ZEVs into our energy system through participation in inter-jurisdictional forums and research activities
Transitioning Victorian industry and workforce	Commencing work on an industry development and transition plan to explore opportunities for Victorian industry associated with ZEV manufacturing, maintenance, repair and recycling
	Identifying industry development pathways for emerging technologies, including investigating the potential for hydrogen in transport
	Planning to support our workforce through the transition to zero emissions road transport as part of Victoria's clean economy workforce development strategy

Source: Department of Environment, Land, Water and Planning (2021) Victoria's zero emissions vehicle roadmap

Note: The initiatives for zero emission buses are also contained in Victoria's bus plan.

Destination Charging Across Victoria Program

The Victorian government funds the Destination Charging Across Victoria (DCAV) Program, which includes \$5m in grants to install EV fast charging.

A number of sites within the SECCCA region were included in the recent round of funding, including Moorabbin, Portsea, Red Hill, Rosebud and Mordialloc.

More information on the DCAV can be found at <https://tinyurl.com/yckmzpx8>

2.2.2 Infrastructure Victoria

Infrastructure Victoria have conducted a number of activities related to EVs over recent years.

2.2.2.1 Community Reference Panel

The Community Reference Panel was formed in early 2021 and asked the question 'How should the Victorian Government support more people to

*adopt low and zero-emissions vehicles sooner?*⁴ A summary of the Panel's findings include:

- Ending the sale of internal combustion engine vehicles by 2030.
- Deliver a broad community awareness and education campaign
- Introduce planning controls that require new developments to install charging infrastructure
- Provide financial incentives to individuals to support the initial transition to low and zero emissions vehicles
- Create a state-wide charging network strategy, involving the provision of EV Charging stations at activity and town centres
- Establish Vehicle Emissions Standards
- Support the installation of EV charging as part of the Solar Homes Program.
- Advocate to the private sector to lease low or zero emissions vehicles to employees
- Support the integration of energy capture through solar panels and battery storage
- Provide incentives for taxis, rideshare vehicles and courier vehicles to use low or zero emissions vehicles
- Offer subsidies to reduce the cost of installing home charging infrastructure
- Build professional and business knowledge to instil zero-emission workforce and commerce.
- Introduce a Vehicle Emissions Scheme, whereby those who drive low emission vehicles are rewarded, while those with carbon intensive modes pay an additional fee.
- Introduce a means tested loan scheme for purchasing low or zero emissions vehicles.
- Create an independent vehicle cost comparison website
- Create a trade-in scheme for internal combustion engine vehicles
- Mandate a standardised charging connector for use across Victoria

- Undertake community engagement to inform the strategic planning of electric and hydrogen vehicle infrastructure
- Advocate to local governments to change their fleets to EVs.

2.2.2.2 Driving down emissions: accelerating Victoria's zero emission vehicle uptake

In August, 2021, Infrastructure Victoria published *Driving down emissions: accelerating Victoria's zero emission vehicle uptake*.⁵

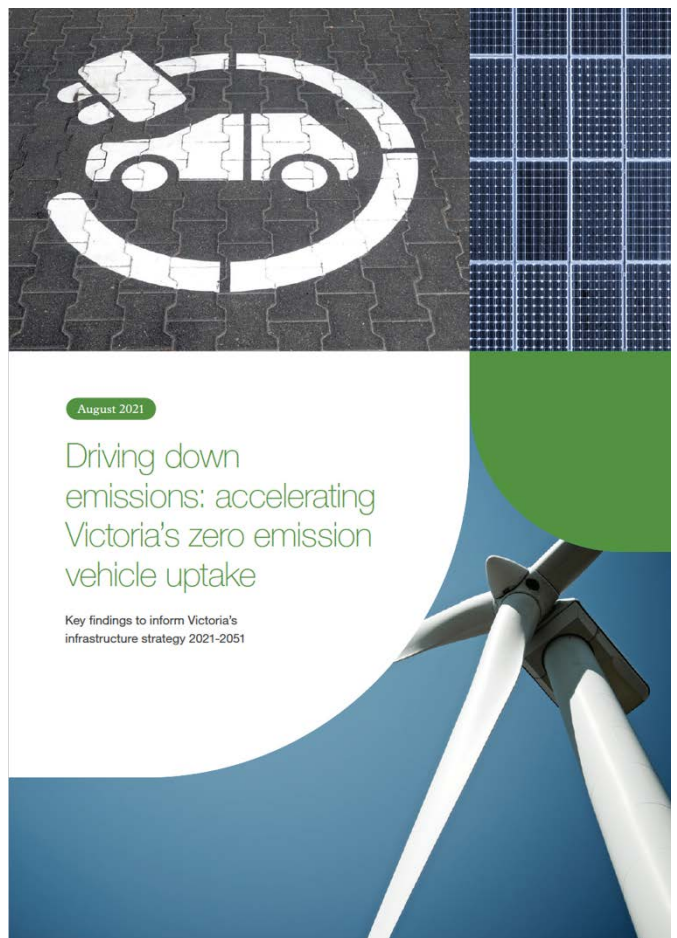


Figure 3 Infrastructure Victoria's 2021 report on increasing EV uptake

This report highlights that cars are responsible for over half of Victoria's transport emissions and that transport is the second largest contributor to GHG emissions in the state. Furthermore, unlike many other sectors, the report points out that transport emissions are rising rather than falling.

⁴ <https://tinyurl.com/ywcd5b77>

⁵ <https://tinyurl.com/32x3b9v4>

The key focus of this report is the identification of methods for Victoria to reduce transport emissions by increasing the uptake of zero and low emission transport, especially EVs.

The report's four key actions to increase the uptake of zero emission vehicles in Victoria are:

1. By 2023, publish a state-wide EV charging network strategy, including design standards and payment principles.
2. By 2026, monitor and review the effectiveness of financial incentives to encourage early uptake of zero and low emission vehicles.
3. By 2026, require all new government fleet vehicles to be zero and low emissions (where available). Incentivise uptake of zero emissions freight vehicles.
4. By 2035 at the latest, no longer register new petrol or diesel vehicles in Victoria, via increasingly stringent emission standards.

Zero emission Expert Advisory Panel

In 2021, the Victorian government announced the creation of a five member Expert Advisory Panel. The Panel has been formed to advise the Government on EV policy and is expected to deliver their final report in December, 2021.

Box 1 Victoria's new Zero Emission Expert Advisory Panel

3. Factors that influence EV adoption & market preferences



This section provides a review of the factors known to influence EV adoption. The content is drawn from a mixture of peer reviewed and grey literature. Every effort has been made to include Australian relevant research.

A number of recent studies, conducted separately by the RACV and the Electric Vehicle Council (EVC) have found that around 54 – 60% of respondents state they would consider an EV for their next vehicle purchase.

The EVC conducted a consumer survey in 2021, and presented the results in Figure 4. This indicates the degree to which the factors on the left hand side of the figure act to either *encourage* or *discourage* EV adoption. As will be discussed in this section, current *purchase price* and availability of *charging infrastructure* are acting as *discouraging* factors.

Lower running costs and *safety features* are the two top factors encouraging consideration of EV purchase. It is interesting to note that while lower emissions performance might be the key factor for government encouragement of EVs, the three most popular responses in Figure 4 all relate to the individual, rather than global factors.

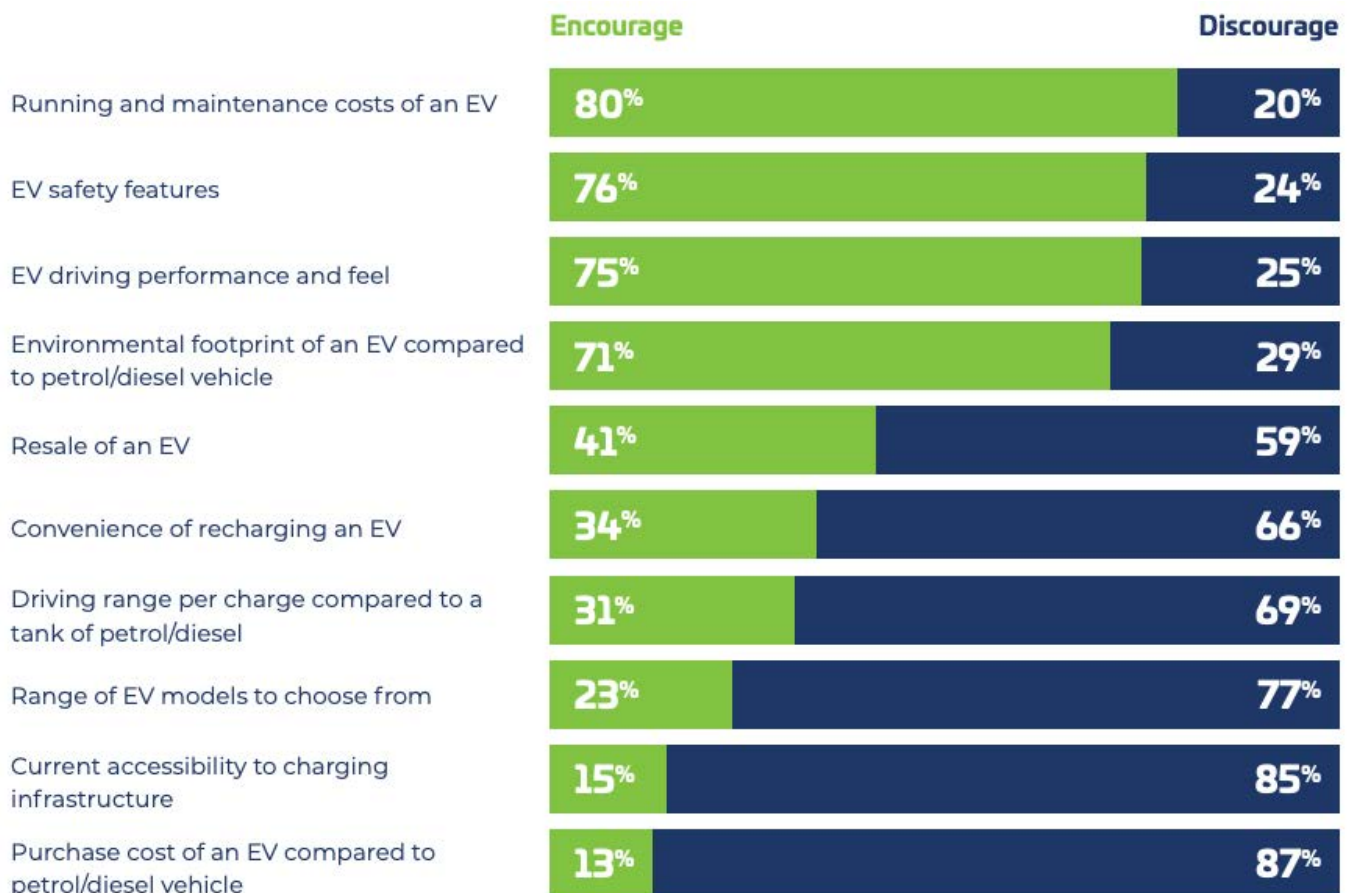


Figure 4 Encouraging and discouraging factors for EV adoption

Source: <https://tinyurl.com/9wa6k6tm>

3.1 Barriers to EV adoption

There are a number of known barriers to the adoption of EVs, and these vary by country. There are some well established barriers to EVs, the main ones being purchase price and driving range, as identified in Figure 4 above. A global consumer survey by Deloitte in 2021 found that *driving range* and *lack of charging infrastructure* were the two most commonly reported concerns. These two issues can be viewed as two sides of the same coin and concerns around driving range can be mitigated against via additional charging infrastructure.

Table 2 provides an overview of Deloitte’s study of common concerns regarding EVs. Upfront cost was the third highest ranking barrier. These results support the findings from the previously mentioned EVC study.

Many previous studies have cited cost as the main barrier. For instance, the RACV, in conjunction with EV Council conducted a study with over 1,000 participants. Seventy seven percent of respondents said they were discouraged by the high purchase price.

Table 2 Concerns regarding EVs

Concern	United States	Germany	Japan	Rep. of Korea	China	India
Driving range	28%	28%	22%	11%	25%	13%
Lack of charging infrastructure	25%	22%	29%	32%	20%	26%
Cost/price premium	20%	16%	23%	17%	9%	16%
Time required to charge	13%	13%	15%	18%	13%	14%
Safety concerns	8%	12%	10%	19%	29%	25%
Lack of choice	4%	5%	1%	3%	4%	6%
Other	2%	4%	0%	0%	0%	0%

Source: Deloitte (2021) Global automotive consumer study

Other barriers to EV adoption found in the RACV study include:

- Limited range of EV models. Australia, due in part to the lower levels of government support have a small range of EVs to choose from than other Organisation of Economic Cooperation and Development (OECD) markets. This is expected to change over coming years, and since the study was published (2020), more EV models have entered the market.
- Range anxiety. As with many other studies, people responded that limited range, coupled with patchy fast charging possibilities acted as a barrier to EV adoption. Interestingly, the *minimum* range people said on average that they would find acceptable was 461km. This is on the high end of the spectrum of range for the existing models currently available. Some EV drivers often note that concerns around range anxiety diminishes with experience. It is also likely that acceptable range will lower over time as the fast charging network develops into the regions.

3.2 Facilitators to EV adoption

The following factors have been identified by recent Australian research (RACV) as factors likely to encourage the EV purchase:

- Lowering cost: Around 3 in 4 respondents to the RACV study said incentives to reduce purchase price was important. Only 40% of respondents to the EVC study indicated that government subsidies were important.
- More public charging: 75% of respondents to the RACV study said greater public charging possibilities would be important before committing to purchasing an EV, compared to 90% for the EVC study.
- Incentives to lower the cost of home charger installation: Some 70% said they would like incentives to lower the cost of installing home chargers.

The earlier cited EVC report from 2021 found that the strongest motivating factors for considering an EV purchase included:

- Lower maintenance costs
- Safety features
- Driving performance
- Environmental footprint.

The EVC report asked what government support prospective EV owners would encourage them to purchase an EV. Figure 5 indicates that subsidies to lower the purchase price to be most important. Interestingly, over a fifth of the sample said there was nothing government could do, as they simply were not interested in purchasing an EV. Lane priority and parking privileges were not considered to be important, although there are jurisdictions such as Norway, in which vehicle lane and parking privileges have been implemented, to encourage the uptake of EVs.

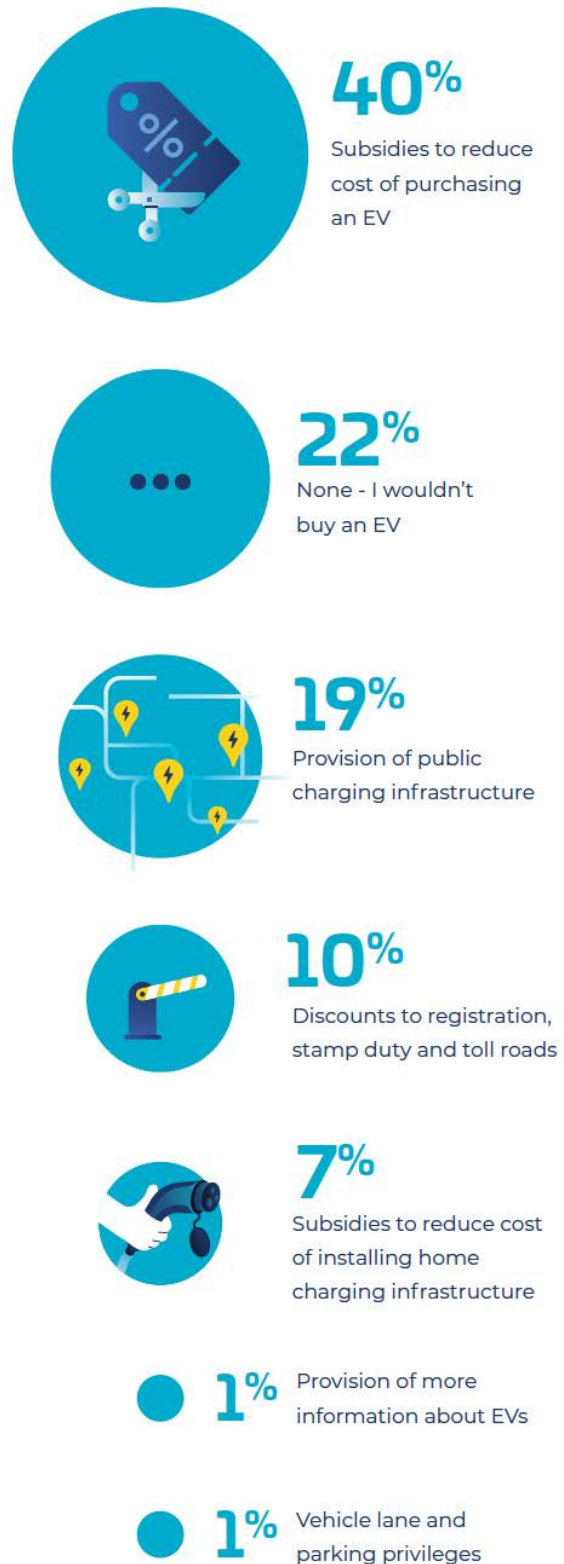


Figure 5 What prospective EV owners want from government (EVC)

Source: <https://tinyurl.com/9wa6k6tm>

3.3 Consumer preferences

3.3.1 Charging costs

The RACV survey asked respondents how much would be an acceptable cost for charging their future EV. The average response was \$24.50 for a full charge. Given that 90% of charging happens at home or workplace, in most instances, the cost for a full charge will be considerably less than \$24.50. Table 3 provides a summary of the different costs of EV charging, depending on some of the likely tariffs, using a 70kwh battery.

Table 3 Charging EV costs at different tariffs

	70 kwh EV Battery
Solar feed in tariff rate (5.2 cents per kwh)	\$3.64
Standard electricity rate (20 cents per kwh)	\$14
Fast charger standard rate (40 cents per kwh)	\$28

3.3.2 Electricity supply

The RACV survey asked respondents where they would like their electricity to come from when charging their EV. Figure 6 illustrates the responses to this question, highlighting that less than half consider it important that the electricity is generated sustainably.

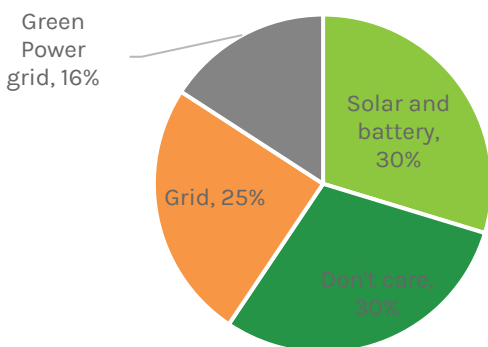


Figure 6 Where do prospective EV owners want their power to come from? (RACV)

Source: <https://tinyurl.com/y6du96x7>

The RACV results differ from more recent work conducted by the EVC which found that 55% of

people would charge their EV with solar panels. This is plausible given that around 25% of households already have solar panels, and one might imagine that EV owners may be more likely than the general population to have installed solar panels. The graphic produced by the EVC to highlight the source of electricity likely to be used to charge their future EV is shown in Figure 7.

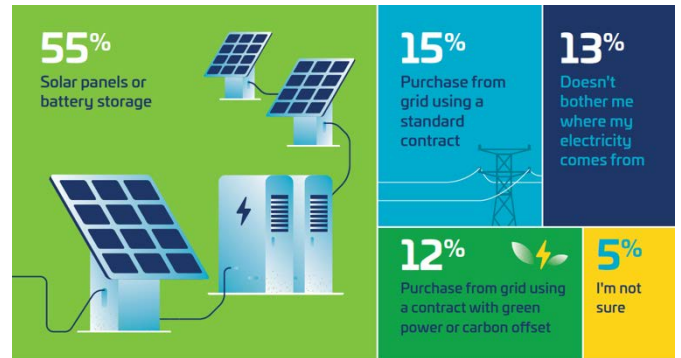


Figure 7 Where do prospective EV owners want their electricity to come from (EVC)

Source: <https://tinyurl.com/9wa6k6tm>

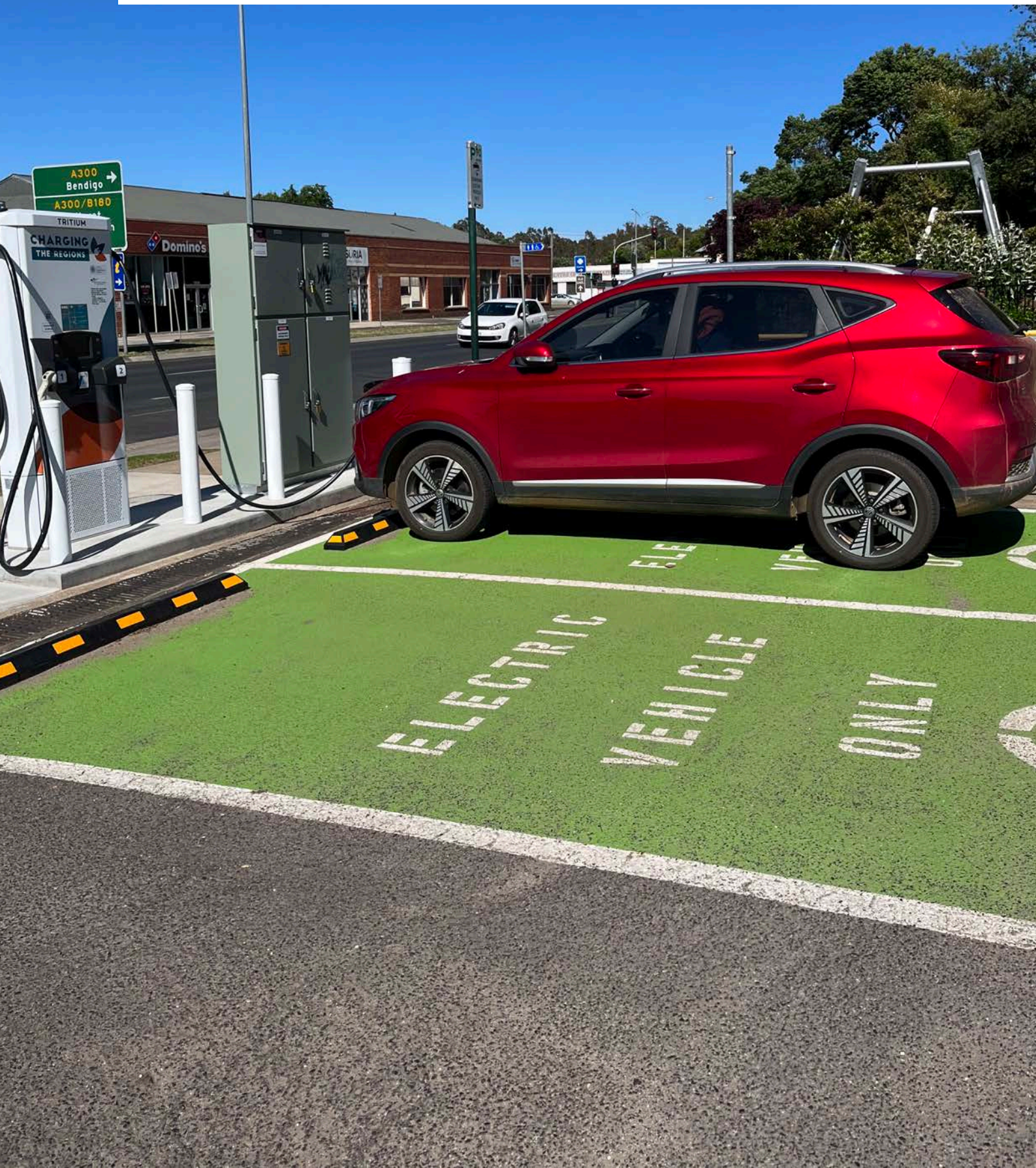
3.3.3 Charging speed

Respondents to the RACV survey were asked what would be an acceptable wait time while charging (presumably when not at their destination). Thirty minutes was the average acceptable wait period, which roughly accords with revealed preference data from existing fast chargers.

3.4 Implications for the SECCCA Roadmap

The synthesis of the barriers and facilitators has some important implications for the SECCCA Roadmap. It highlights that while opportunities for charging are important, a lowering of the purchase price is likely to be the number one issue for most people considering the purchase of an EV. This suggests that in addition to the identification of suitable charging sites, SECCCA may wish to consider working with other councils to advocate to the state and federal governments for rebates and other incentives that work to lower the upfront cost of EVs.

4. Planning and regulatory requirements



This section describes the planning and regulatory requirements to facilitate the charging of EVs. Current planning and regulatory requirements for EV chargers are still in their infancy. Existing planning requirements are outlined, as well as recommended amendments to maximise the availability of charging opportunities.

The typical life of a new building can be expected to be 60 – 150 years. Most government and infrastructure advisory agencies estimate that EVs will be the dominant motor vehicle within the next 20 – 30 years (if not before) and it is therefore prudent for SECCCA councils to consider the EV charging requirements of new buildings.

4.1 Planning Schemes – current treatment of EV charging

The Victorian Planning Scheme guides the development of land and changes in land use in Victoria. The Planning Scheme includes a number of sections that are relevant to overcoming the barrier presented by the need to charge EVs conveniently and affordably. As the primary statutory mechanism that directs the construction of car parking for new developments and changes in land use, changes to the Planning Scheme to encourage EV uptake will be an important tool for SECCCA member councils to consider.

Planning controls can trigger the need for a permit, for the ‘use’ of land or structure or for the ‘development’ of land or structures. Planning controls have the potential to facilitate EV ownership by compelling developers to install the wiring and conduits to enable the easy installation of chargers, or require the full installation of chargers themselves. This section identifies existing areas of the Planning Scheme that may require amendment in order to encourage EV ownership as an alternative to ICE vehicles.

Limited work has been undertaken to date to incorporate EV charging into Victorian Planning Schemes. Indeed, there are very few mentions of EVs or EV charging. Many permit triggers associated with EVs would be due to the broader use of the land for car parking (or other uses/developments). Specific mention is included in *Victorian Planning Provisions 62.02 Building and Works*, which sets out buildings and works not requiring a permit. Within this Clause, ‘any requirement in this scheme relating to the construction of a building or the construction or carrying out of works, other than a requirement in the Public Conservation and Resource Zone, does not apply to:... An electric vehicle charging station’. However, Clause 62.02 states that ‘this does not apply if a permit is specifically required for any of these matters.’ This means that a permit is not required for the installation of electric vehicle charging equipment alone, with a permit only being required where there is a specific requirement to apply for a permit elsewhere in the scheme.

A recent amendment to Victorian Planning Provision 43.01 Heritage Overlay (HO) has removed the need for a permit to install an EV charging installation in properties that are subject to an HO, as long as it is not visible from the street (other than a lane or public park). Amendment VC142 was gazetted in January 2018, making a series of reforms to the Smart Planning section of the Planning Scheme. Smart Planning’s intention is to reduce permit requirements for certain developments and uses, reducing time and financial barriers for local governments and developers. VC142 removed the requirement for a permit to build an EV charging station for properties that fall within an HO. The requirements stipulate that the charging infrastructure not be visible from the street or park and be capable of being removed without impacting the heritage value of the property. It may be necessary to re-consider the wording, as there may be some instances in which a charging station cannot be provided elsewhere. Moreover, there may be more strategic alignment in having a charging station in full public view (to increase community awareness), even under HO conditions.

A 2018 *Senate Inquiry Into Electric Vehicles* sought to take stock of the barriers and opportunities to increasing EV uptake. Unfortunately, the Inquiry did

not address potential changes to the Planning Scheme, although it did note planning mechanisms currently act as a barrier to the installation of EV chargers.

There are some additional circumstances where EV charging may trigger a permit. Development of car parking on many zones (commercial, residential etc) can trigger a permit. Overlays, such as Design and Development Overlays, Environmental Significance Overlays, Flooding Overlays, etc, may also contain triggers associated with development. A private land manager seeking any development on Public Land Zones can trigger a permit if an agreement with the landowner has not been entered into. Signage associated with EV charging may also trigger a permit pursuant to Clause 52.05. While these triggers may affect use and development associated with EV charging, this is generally due to the underlying use or development of land for car parking.

4.1.1 Municipal Strategies

All Local Government Areas in Victoria are required to have municipal strategies included in their planning schemes. Below is a brief review of the components of SECCCA Council municipal strategies which are relevant to the EV Charging Roadmap.

4.1.1.1 Cardinia

The Cardinia Municipal Strategic Statement has the objective:

- To develop and promote more environmentally sustainable ways of living and working, including greenhouse gas emission reductions.

This is supported by strategies to:

- Encourage developments that are based around public transport and alternative forms of transport including walking and cycling.
- Promote sustainable communities through appropriate urban design that encourages alternate forms of transport to reduce energy consumption.

4.1.1.2 Casey

The Casey Municipal Strategic Statement has the objective:

- To progressively improve the health of Casey's built and natural environments through ecologically sustainable land use and development practices.

This is supported by strategies to:

- Contribute to better air quality in Casey through integrated transport and land use planning
- Reduce the reliance on non-renewable resources and reduce the production of greenhouse gases for all new development
- Manage Casey's suburban structure to create a more efficient suburban form, with improved accessibility, greater reliance on public transport and pedestrian/cycling networks, and energy-efficient subdivision design.
- Embrace new green technologies which lead to improved energy efficiency and environmentally sustainable outcomes.

4.1.1.3 Frankston

The Frankston Municipal Strategic Statement states the need to:

- Integrate transport planning by providing safe and functional pedestrian, bicycle and vehicle networks.
- Minimise the impact of climate change, reduce pollution and encourage the sustainable use of natural resources.

The Frankston Municipal Strategic Statement identifies key priorities as:

- Encouraging the development of the Frankston MAC as a community, employment and commercial focal point, with excellent public transport to minimise use of fossil fuels and greenhouse gas emissions.
- Encouraging increased residential densities around centres with good public transport access and a range of community and commercial services and employment opportunities.
- Encouraging new development to incorporate both environmentally sustainable design and integrated water management principles and feature.

4.1.1.4 Kingston

The Kingston Municipal Strategic Statement identifies as critical issues:

- Adapting to the impacts of climate change.
- Recognising the economic, social and environmental benefits of incorporating environmentally sustainable design into new built form and integrating land use and transport planning to create a more sustainable community.

The Kingston Municipal Strategic Statement includes an objective:

- To mitigate the impacts of climate change.

The Kingston MSS recommends further strategic work to:

- monitor and develop leading practice approaches to manage future climate change risk to coastal assets and communities in the context of broader climate change policy and new knowledge.

4.1.1.5 Mornington

The Mornington Peninsula Municipal planning strategy has the strategic objectives:

- To demonstrate leadership in climate change mitigation and adaptation.
- To facilitate improved mobility and connectivity accessible to all within the Mornington Peninsula.

4.1.1.6 Potential for change

While all municipal strategies note the need to act to avert climate change, and for the need for more sustainable transport outcomes, none directly address the need to support EVs or their charging infrastructure. The City of Melbourne's Municipal Strategic Statement provides an example of incorporation of Electric Vehicle Charging into the Planning Scheme. Section 21.09-5 Private Motor Transport has the objective:

- To encourage more efficient use of private motor vehicles.

Which has a strategy directly addressing EVs:

- Support provision of re-charging facilities powered by renewable sources of energy for electric powered vehicles.

The City of Melbourne's Municipal Strategic Statement provides an example of how to incorporate EVs and charging into a Council Municipal Strategic Statement. SECCA councils can implement a similar objective and strategy to support EVs and charging into their Municipal Strategic Statements. This could be done as part of regular reviews of Municipal Strategic Statements following adoption of Council Plans. This would create a policy context for council to refer to when assessing permit applications.

4.1.2 Clause 52.06 – Car Parking

Clause 52.06 of the Victorian Planning Provisions (VPPs) is the primary mechanism that facilitates the provision of car parking for new developments and changes in use for a site.

The existing objective of the Clause *'To ensure the provision of an appropriate number of car parking spaces having regard to the demand likely to be generated, the activities on the land and the nature of the locality'*. There are a number of Strategies that sit under the Objective, and while many of them are discredited (e.g., see Taylor and Clements, 2018) and service to entrench car use rather than align with Council's broader strategic objectives, there is an opportunity to add specific requirements for EV charging, to encourage uptake in EV usage and future-proof developments.

The Clause also includes a table that specifies the number of car parking spaces for different uses. The table specifies two separate measures, Columns A and Column B rates. Column A rates are the default. Column B rates are applicable when the site is subject to other modifying overlay, such as the Principle Public Transport Network Overlay and some Parking Overlays.

4.1.3 Parking Overlays

Planning Overlays (PO) enable Planning Authorities to stipulate variations to the standard planning scheme requirements for the sites within the area covered by the overlay (including 'Columns B rates'). POs are often used to set out reductions in the standard car parking rates. They could also be used to set out requirements for the inclusion of EV

charging infrastructure for a proportion of the required car parking.

POs vary the parking requirements of Victorian Planning Provision Clause 52.06 – Car Parking. POs allow Council to set maximum and minimum parking rates, tailored to individual parts of the municipality. Schedules to POs could be used to facilitate the charging of EVs. Victorian Planning Provision Clause 45.09 – 8 allows a schedule to a PO to specify ‘additional design standards’ and ‘other requirements for the design and management of car parking’.

Three SECCCA councils participating in the EV Charging Road Map have implemented Parking Overlays. These include:

- Cardinia in the Pakenham Activity Centre and Officer Town Centre
- Casey in the Berwick Village Commercial
- Frankston in the Frankston Metropolitan Activity Centre.

None of the Parking Overlays make mention of EVs, or the need to provide charging infrastructure. Kingston and Mornington Peninsula have not implemented any Parking Overlays.

The Planning Scheme offers substantial opportunity to ensure that future developments offer EV charging for residents and visitors. Providing EV charging infrastructure from the start will lower the cost and complexity barrier to retrofit larger developments at a later date and offer a compelling value-add for apartment owners.

4.2 Council’s role in facilitating the development of a charging network

Councils can play an important role in the planning and provision of EV charging infrastructure, as they:

- Assess planning mechanisms, applications and issue permits. This includes parking provision for new developments, both residential and commercial.
- Own and manage many of the off street car parks that serve as potential publicly available EV charging sites.

- Are leaders in their community and can influence the strategic direction of the build environment and the transport system.
- Have the potential to address disparities in the provision of chargers, which may occur under a purely commercial model.
- Have the ability to see amendments to the local planning policies and advocate for changes to the state policies.
- Have a role in ensuring that charging locations are accessible to all in the community. This applies to all future publicly accessible charging locations, whether on public or private land.

4.2.1 Public land

A significant proportion of publicly available car parking is owned and/or managed by public agencies, either at the local or state government level. While some 90% of charging happens at the home or workplace, there are a number of circumstances in which EV owners will require charging outside of their home/workplace, such as:

- Those making a long distance trip, requiring charging at a public destination (e.g. foreshore or botanic garden car park).
- When visiting Activity Centres. This helps to increase the attractiveness of town centres by offering an incentive to spend time and money in these locations.
- Those without the capacity to install chargers at their dwelling.

Public car parking can broadly be classified into two categories; on-street and off-street. It is preferable to install publicly accessible EV charging equipment in off-street parking locations, as they:

- Provide more versatility in terms of the ease with which a car can be positioned based on the location of its plug (e.g. some EVs have the connector at the rear, other at the front etc...).
- Are easier to provide larger spaces, and allow those with mobility issues to access chargers. The larger space also reduces the chance of accidental damage, compared to an on-street vehicle that may be swiped by a passing vehicle.

- Generally offer a larger quantity of parking bays, allowing for a larger bank of chargers and greater potential for expandability.

There are however instances in which on-street locations are appropriate for the installation of EV chargers, such as:

- Where there are no off-street locations
- In residential areas with large numbers of dwellings lacking private off street parking capable of EV charging.

In instances where EV charging equipment is installed on-street, it is vastly more preferable to design the bays for 90-degree parking. This allows EVs with different connector positions to manoeuvre the vehicle to be as close as possible to the charger, reducing the chance of accidental damage. The more generous space around the vehicle enhances user comfort and accessibility. Figure 8 offers an example of this approach.



Figure 8 On-street charging, Whittlesea

For residents who own or seek to own an EV, but without the capacity to install an EV charger on their property, it is recommended a *demand responsive* approach be adopted, which is discussed in Section 4.4.1.3.

There are a number of other options for EV charging for on-street locations. These include:

- Pop up charging, in which the charger sits underground, and pops up when activated by the user.
- Light pole adaptations to allow for EV charging.

- Standalone totem, such as the one illustrated in Figure 8.

Council’s role in the provision of EV charging on public land should be to identify potential sites meeting certain criteria (to be discussed in the *EV Charging Roadmap Report*) and then call for expressions of interest from the commercial EV charging sector to provide chargers in these locations.

Council has a role in broadly determining what type of charger speeds are desirable. In residential locations, these are likely to be slow chargers, and in Activity Centres they are likely to be within the 25 – 75kW range. Based on the discussions that took place with the EV charging industry, it was clear the commercial sector prefer to be offered a range of potential sites rather than pin pointing single, specific sites.

Council should be aware that the commercial sector will focus on those sites that have the greatest revenue potential. As highlighted earlier, there may be gaps that can only be filled through the involvement of Council. For example, a Council may determine that it is only willing to provide high value public sites to a commercial provider if they are also willing to include a small number of chargers in locations Council consider important, but less commercially attractive. An example may be a residential street with high numbers of dwellings in which EV charging is not possible. In essence, the high value locations subsidise the less profitable locations.

There is potential for complexity when installing charging equipment on council, state or crown land which is managed by another party. This could apply to Council land managed by a local community group, or on State land managed by Council, for example. As mentioned earlier, in Section 4.1, installation of EV charging equipment on Public Use Land would trigger a permit where an agreement between the land owner and manager is not in place.

Councils should actively support these forms of developments, as they expand the EV charging network. However, there should be a number of guiding principles. All installations must meet all building and planning requirements and regulations; further, as they are located on public

land, they should be fully accessible by all members of the community, meeting DDA requirements.

As highlighted earlier, there may be gaps that can only be filled through the involvement of Council. For example, a Council may determine that it is only willing to provide high value public sites to a commercial provider if they are also willing to include a small number of chargers in locations Council consider important, but less commercially attractive. An example may be a residential street with high numbers of dwellings in which EV charging is not possible. In essence, the high value locations subsidise the less profitable locations.

4.2.2 Private land

Council has multiple roles, as the planning authority, responsible authority, and as community leaders. It is therefore important that Council provide an encouraging, permissive approach to the development of the EV charging networks in their LGA, and wider region.

Chargers on private land take the following forms:

- In a dwelling's garage/driveway. This is where most chargers are likely to be located.
- In a workplace car parks, such as an office development.
- Publicly accessible, privately held car parks, where car parking bays are designated for customer use (e.g. shopping centres, super markets, fast food outlets). Some of these locations will lend themselves to ultra-fast

chargers catering to passing through motorists. These are in most cases likely to be located close to major freeways.

Council's role in facilitating the development of EV charging on private land is more limited. As the Council is not the land owner, its role may include:

- Information provision.
- Identification of suitable sites
- Assistance coordinating with the Distribution Network Service Provider (DNSP).

In addition to the above, Council can help facilitate the process of installing EV chargers. They can develop fact sheets and guidance documents relating to:

- Installation considerations for private residential land holders (e.g. heritage considerations, installation costs, charger selection). This is similar to the role some Councils play in the installation of photovoltaic systems.
- Information for renters seeking to install EV chargers
- Information on EV charging options for those without the capacity to charge an EV on their property.
- General information about EV benefits, capabilities, costs and model availability.

4.3 Planning Scheme Amendment Recommendations

Box 2 describes the importance of the Planning Scheme in facilitating the development of more charging possibilities.

The role of the Planning Scheme in EV charging

The Victorian Planning Scheme guides the development of land and changes in land use in Victorian. The Planning Scheme includes a number of sections that are relevant to overcoming the barriers presented by the need to charge EVs conveniently and affordably. As the primary statutory mechanism that directs the construction of car parking for new developments and changes in land use, amending the Planning Scheme to encourage EV adoption via the provision of EV chargers will help more people adopt zero emission vehicles.

Box 2 The role of the Planning Scheme in EV charging development

Ensuring the Planning Scheme encourages the provision of EV charging infrastructure will help to lower cost (compared to retrofit) and assist Council in meeting its goal of a zero-emission community by 2050. It is recommended that SECCCA:

- Advocate to state government to make changes to the Planning Scheme (as SECCCA directly, or via MAV). This should include amending Clause 52.06 of the Victorian Planning Provisions (VPPs) to include an additional 'purpose' to support the design and location of parking to: 'respond to demand for Electric Vehicle charging'.

Further, it is recommended Planning Schemes of Councils be amended so that:

- All areas envisaged to have multi-dwelling and commercial development have Parking Overlays to ensure the inclusion of EV charging infrastructure.
- All Parking Overlay Schedules have an objective *'to facilitate the uptake of EVs'* in sub-clause 'Parking objectives'.

- Parking Overlay Schedules have subclause 'Design standards for car parking' which requires that all developments of two or more dwellings on a lot and residential buildings (Victorian Planning Provision 55) provide EV charging equipment for every parking space. This has the objective of ensuring that all multi-dwelling developments are future proofed with EV charging equipment, because:
 - It can be very difficult and expensive to retro-fit EV charging in multi-dwelling developments.
 - New builds can be expected to have a lifespan of 60 – 150 years
 - EVs are expected to account for the majority of vehicles within the next few decades.
 - Most charging will occur at home
 - The home is where EVs can be plugged in for long periods, helping to support grid interactivity once this becomes a mainstream options (2025 and beyond)
- Parking Overlay Schedules have subclause 'Design standards for car parking' which requires that all office developments with staff car parking, have those bays provided with EV charging at the ratio of one in every 10 bays, rounded up. The intended users are office staff without easy access to charging at home.
- Parking Overlay Schedules have subclause 'Decision guidelines' which requires 'That EV charging facilities are available and conveniently located'.

4.4 Council Policies

4.4.1 Existing residential developments

4.4.1.1 Owner-occupiers

In most cases, owner occupiers in the SECCCA region will have an off street car park on their property. This means that in most cases, Council involvement will not be required, and the owner will be able to contract an electrician to install an EV charger. Currently, most EV owners simply plug their car into a standard power socket. As highlighted in the *Future Scan* report, as costs for smart chargers comes down, more vehicle owners will install smart chargers on their property.

While the role of council may be minimal for owner occupiers with off street parking, council can play an important role in providing information to the resident. It is recommended councils provide a web page and links to further information for residents considering an EV, similar to the role many councils play in providing information to residents wishing to install photovoltaic panels.

4.4.1.2 Renters

For renters with off street parking, a paucity of regulation exists to assist in the negotiation between a renter and their landlord regarding the installation of EV charging. The installation costs may vary considerably and can only be assessed on a site-by-site basis. Moreover, there will be a wide range of preferences between renter and landlord in relation to costs, who bears these costs, and the payback period (e.g. up front, or through instalments/increased rent).

In the future, when EVs have become a mainstream option, EV charging may be seen as an important property attribute, and thereby may result in increased rental returns. However, at the time of writing, EV charging is unlikely to attract higher rental yields to the landlord except to a sitting tenant that has requested it to enable the purchase of an EV. The high rental fee may or may not be mutually agreeable and worthwhile for the landlord to install the necessary wiring and recover costs in rent.

In terms of the implication for future Council policy, it may be useful for Council to produce some advice for renters and landlords to act as a catalyst for providing charging facilities in rental properties.

4.4.1.3 Those without off-street parking

For dwellings without access to off street parking (rare within SECCCA), councils may need to set up a process to enable the resident to submit a formal request for an on-street EV charging location nearby to their home. This can be done by creating a web-based form, using the *demand responsive* process

The following process is recommended:

- The resident/household completes an online form requesting an EV charging facility proximal to their home (within ~200m).
- Proof of residential address is uploaded, using the online form (e.g. utility bill).
- Assessment is undertaken by Council to determine suitability of area within 200m of residential address for EV charging.
- The resident pays a notional fee (e.g. \$1,000) which is then credited against their use of the charger until exhausted. This avoids frivolous requests.

When Council decide to install a public charger via the demand responsive process, it is important to inform the applicant that they do not have exclusive use. This should be reinforced via street signage. Where the number of chargers in an area increases beyond about four, the number of users per charger can be allowed to increase to between three and four EVs per charger until reports about poor availability become significant.

Figure 9 provides an example of the decision-making framework for residential charging decisions. This provides a transparent, consistent decision-making chart for the provision of EV charging in the residential setting.

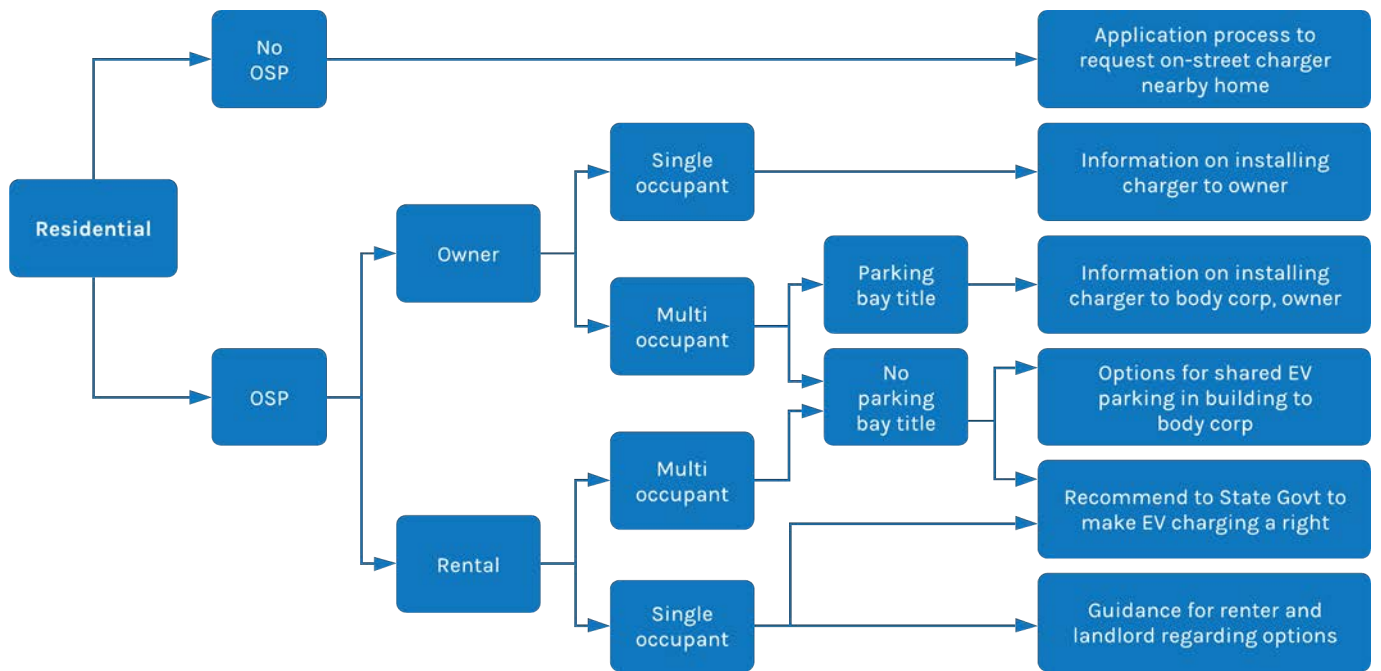


Figure 9 Residential EV charging

NB: OSP is Off-Street Parking



4.4.2 Risks, liabilities, vandalism and enforcement

The introduction of publicly available EV charging infrastructure comes with a set of risks, and while a well-planned EV charging plan will not eliminate these risks, their identification is necessary to a) mitigate against them and b) create an operational model that ensures a timely response to any interruption of quality service. ‘ICE-ing’ refers to an internal combustion engine vehicle blocking access to an EV charger. Table 4 provides an outline of common risks, and mitigation measures.

Table 4 Risks and mitigation issues

Risks	Description	Mitigation
Vandalism	Intentional damage to equipment; highest occurrence where poor public oversight, near pubs and late-night venues.	Good public oversight (passive surveillance). Avoid areas near pubs, late night venues. CCTV cameras (with signs), unremarkable hardware to reduce appeal/attention.
Accidental damage	Most often vehicle impacts, running over cords or connectors not returned to holders.	Bollards carefully placed to avoid reducing accessibility to those with mobility issues. Equipment designed to bill customer until charger replaced to holder. Design of charger and holder to minimise misuse.
Denial of access by blocking charger (ICE-ing)	Cars not charging denying access to EVs needing a charge; may include non-charging EVs as well as ICE vehicles.	Use vehicle detector in pavement and link to charge status indicator; if a vehicle is present but not connected, alert an enforcement officer after 5 minutes; charge vehicles for connected time whether charging or not; Intense enforcement for short periods will lead to compliance with low level of effort on average.
Obsolescence	Chargers no longer used as not compatible or more desirable equipment is available.	Replace chargers with newer models; ensure power supply can provide useful charging rates even if initial charger not using the full capacity; buy over-capable equipment in expectation of users seeking higher rates in future (e.g. three phase 32A chargers even if few cars can use now) as additional cost is low.
Low utilisation rate	Chargers installed but unused leading to frustration at being unable to use car parking space and complaints.	Transitional signs: “Please park elsewhere if space available if not charging”; “5/10/15 minute parking if not charging” (in an otherwise one or two-hour zone); put chargers in low demand parts of a parking area to reduce annoyance; don’t over-invest early in parking spaces.
Very high utilisation rate	Chargers always busy causing frustration for users	Raise the price; charge per minute, not per half hour or longer period; install chargers in groups making it easier to find a free charger, more likely that someone in the group will leave soon; have a time based charge that increases the price per minute for longer charge sessions; if profitable, install more chargers and encourage private providers to do so.
Ongoing costs	Maintenance, insurance, and billing costs are higher than expected	Plan and budget for all costs up front and price accordingly (if for a fee) or ensure sufficient budget available (if free). Monitor costs closely and adjust as required; if not competitive with other suppliers of charging services, allow traffic to go to others and gradually close sites down.

Case Study in Brief: City of Port Phillip's Electric Vehicle Charging Policy

Since at least 2019, the City of Port Phillip has been working on expanding opportunities for charging EVs within their municipality. The following identifies the actions Port Phillip has taken to support EVs:

- Worked with a wide variety of stakeholders for installing charging opportunities on public land
- Encouraged developers and building owners to install charging opportunities on privately-owned property
- Advocated to the State and Commonwealth for more supportive policies on EVs
- Begun transitioning the Council fleet towards EVs.

Update on new charging stations and kerbside vehicle charging trial

In mid-2021, the City of Port Phillip went to market requesting Expressions of Interest for the cost neutral (to Council) delivery of EV charging in Port Phillip. In return for providing spaces on Council plan, the EV charging industry was asked to provide publicly available charging stations.

In 2021, the City of Port Phillip announced a trial designed to enable residents without off street parking to run power from their house to the kerb. The householder is required to pay the installation fee, which is estimated to be around \$5,500. Our understanding is that the parking bay and charger can only be used by the householder that installed the charger and this does not appear to be a good use of private or public goods, as the charger will be underutilised in almost all instances.

More information at <https://www.portphillip.vic.gov.au/council-services/traffic-roads-and-transport/electric-vehicles>

Source: City of Port Phillip

5. Policy Template



The purpose of this section is to provide a *Policy Template* SECCCA members can use or adapt for their own Electric Vehicle Charging Policy. Councils are encouraged to adapt any of the material provided in Section 4, or any other part of the reports prepared as part of this project.

5.1 Introduction and context

Electric vehicles (EVs) are a small but rapidly growing segment of the vehicle fleet.

Electric vehicles have the potential to reduce transport emissions.

Charging opportunities are one of main barriers for Australians interested in EVs. Local government are well placed to help facilitate the development of the EV charging network, as they manage much of the parking within a municipality and have an important role to play in fostering a more sustainable transport system.

5.1.1 Benefits of Electric Vehicles

There are a number of important benefits from transitioning petrol and diesel vehicles to EVs. These include:

1. Cleaner air
2. Less greenhouse gas emissions when charged with renewable energy
3. Lower motor vehicle operational costs.

While some 90% of all charging will occur at the home or workplace, Council has an important role to play in the development of EV charging opportunities. In particular, Council can:

- Use planning controls to encourage EV charging in new residential and commercial developments.
- Coordinate and facilitate public charging opportunities
- Coordinate and facilitate for the provision of charging in instances in which a resident is not able to install electric vehicle charging on their property.
- Provide awareness raising and information regarding EV charging, to make it easier for residents and businesses to install charging infrastructure.

5.2 Policy objective

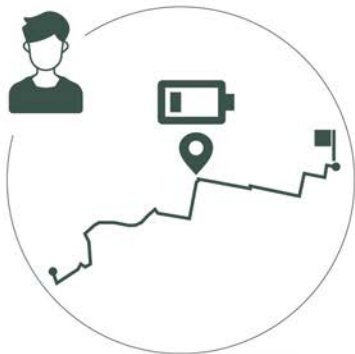
The objective of this policy is:

- To support the development of EV charging infrastructure to support the transition away from fossil fuel motor vehicles.
- To provide guidance to the local community on EV charging equipment.
- To support developers in including EV charging equipment in their projects.

5.3 Electric Vehicle Charging

In 90% of cases, charging EVs occurs at home or the workplace, as this is what owners generally find most convenient, as it is where their vehicle is mostly parked. People's charging needs can be different and the graphic below highlights the three main types of charging.

1 Passing Through Motorist
Daniel, needs a recharge to get to his destination



150kW - 350kW
DC charger



2 Opportunistic
Sam, goes to the shops and tops up while parked



25kW - 50kW
DC charger



3 Local Resident
Cassie, does not have a garage for charging



7kW
charger



5.4 Electric Vehicle Charging for existing households

Council supports the installation of EV charging equipment in existing residences. No approval is required from Council when a charger is installed at a private dwelling, exclusively for private use.

Melbourne has a number of specialist EV charging installers able to assist households and businesses in the provision of a charger to meet their needs. It is important that any works are carried out in a manner that meets relevant Australian standards for electrical works.

Locations under heritage controls may require planning permission for the installation of visible EV charging equipment. Council will support applicants in understanding these requirements. Council will support the installation of charging infrastructure in heritage locations where visible impact is minimised as much as possible.

All EV charging must be consistent with the Planning Scheme. Council will support applicants in understanding their obligations under the Planning Scheme.

5.4.1 Leased properties

Council views installation of EV equipment at rental properties as a necessary step in the transition away from fossil fuel motor vehicles. Renters can have challenges when faced with installing EV charging equipment. These could be financial, or due to conditions in their lease. Council will provide renters and landlords the information necessary for them to navigate the installation of EV charging equipment.

5.5 Electric Vehicle Charging for households without the capacity to install a charger

Some dwellings do not have the capacity to install an EV charger; either because they lack off street parking, or the parking that is available is not used to the install of a charger on the property. Council have a *demand responsive* system to assess the need for a publicly available slow (overnight) charger in these instances, as detailed below:

1. The resident/household completes an online form requesting an EV charging facility proximal to their home (within ~200m).
2. Proof of residential address is uploaded, using the online form (e.g. utility bill).
3. Assessment is undertaken by Council to determine suitability of area within 200m of residential address for EV charging.
4. The resident pays a notional fee (e.g. \$1,000) which is then credited against their use of the charger until exhausted.

It is important to note that chargers will generally be located on the street and available to other residents that have an approved EV Charging Permit. Parking is only allowed while charging, to maximise the availability of the charger for other users. When the demand for the charger exceeds its capacity, Council will investigate installing another charger.

5.6 Electric Vehicle Charging at existing commercial and industrial locations

Council supports the installation of EV charging by businesses for their staff and customers. Council will provide information to business owners and managers to support the installation of EVC charging equipment.

All EV charging must be consistent with the Planning Scheme. Council will support applicants in understanding their obligations under the Planning Scheme.

5.7 Electric Vehicle Charging in New Developments

Council encourage the installation of EV charging in new residential and commercial developments. Council will provide developers with information about best practice EV installation in new developments.

All EV charging must be consistent with the Planning Scheme. Council will support applicants in understanding their obligations under the Planning Scheme.

5.8 Electric Vehicle Charging for All

Council will facilitate the development of a network of fast chargers. These chargers will generally:

- Provide between a 25kW DC and 50kW DC charge at shopping centres/Activity Centres, providing up to ~60km of charge every 15 minutes.
- Be provided by the private sector. The charger may be either on private or public land, via an agreement with the landholder.
- Require the user to pay a fee to cover the cost of the equipment and electricity.

A small number of *Ultra Fast* chargers will be considered in areas with a major freeway, to help motorists passing through our area.

Publicly available chargers can be found here: <https://www.plugshare.com/>

5.9 Fees for charging

Council's policy is that EV charging could attract a fee, to cover the cost of charging equipment, installation, maintenance, as well as electricity and network connection costs. Having users pay a fee will help ensure:

- Private operators set up charging stations within the municipality. When charging is provided by councils for free, it inhibits the interest of the private sector in installing chargers.
- Chargers are well maintained, and repaired rapidly when damaged.
- Non-EV owners are not subsidising EV owners.

5.10 Policy duration

Given the rapid developments within the EV and charging sector, this Policy will be reviewed annually.

6. Data capture and management



The purpose of this section is to provide recommendations on data capture and management to enhance the effectiveness of monitoring and evaluation of publicly available EV chargers.

Smart, connected chargers can provide a rich source of information regarding their usage. All commercial charge network operators capture and monitor operating data to inform their network management and development. This is a necessary part of all chargers requiring payment. Free chargers may not have data monitoring and reporting capability. As highlighted in the Roadmap report, it is not advised Councils provide charging for free.

Some information such as *chargers in use* at any time is made available on user apps by each network. More detailed information may be treated as commercial in confidence by operators. Where local government is the host site, it may be made a condition to operate on the site that certain data be shared with the local authority, even if agreed that certain detail is not provided publicly.

Some parameters potentially of interest include:

- Chargers currently in use (generally visible on each network app).
- Charger use frequency (e.g. average. no. of times per day). This may be regarded as confidential.
- Charge duration (dwell time can relate charging activity to context and inform charger power offered).
- Vehicle type (generally not recorded but potentially obtainable from customer confidential information).
- Energy consumed (totals generally provided but amount by site may be deemed confidential).
- \$ spent, per charge, per charger etc (generally regarded as confidential).

Information that should be available publicly:

- **Hours of charging per bay per day by charger postcode:** gives a good indication of distribution of demand across LGAs without divulging commercially sensitive site information and can identify areas needing additional capacity. Four hours per day is typically a 'busy' charger.
- **Hours per bay per day by charging type across the LGA:** helps determine mix of demand by type and need for more capacity by certain types: AC chargers, low power DC (25kW or less), fast chargers (26-100kW), super-fast chargers (>100kW)
- **Time-of-day and day-of-week demand curve (aggregate):** can assist users to avoid peaks, help LGA plan parking use; also shows share of overnight charging at AC sites in residential areas.
- **Total hours and total energy use:** allows an estimate of the share of charging at public chargers of all EV charging. This is not meaningful at a small scale and may best be collated to at least the SECCCA region and probably for all of Metropolitan Melbourne or Victoria.
- **Average cost per kWh to user by charger type:** generally faster chargers cost more to provide than slow charging.
- **Up-time:** the percentage of time chargers are functioning and useable (should exceed 99.9% to be considered reliable).
- **Frequency of queuing:** how often users have to wait for a charger to become free. This is a parameter of interest to most users but is relatively hard to capture accurately. A proxy measure is the proportion of charge events at a bay that are separated by less than five minutes from the previous charge event.

Monthly data can be volatile and too much to report and process in detail for the extra value provided. Quarterly data can provide insights into seasonal variation. Annual data would be the minimum to provide insights into growth in use and other trends.

It is possible to export a .csv file, to enable further analysis, such as heatmaps of charger activity etc. Depending on account information the user is required to provide, it is also possible to analyse the percentage of vehicles that are registered at an address within the SECCCA region, compared to 'visiting' cars.

When working with the charging industry and other levels of government, SECCCA should identify its preferred data requirements captured by publicly available chargers.

Much of the information captured in the above dot points can be helpful metrics to inform future modelling activities; to estimate energy consumption, emissions and a comparison with a scenario in which the chargers were not provided. It is important to note however that public chargers are generally only responsible for around 2% - 10% of the electricity consumed by a typical EV. The overwhelming majority of charging occurs at non-public charging, mostly at home, but also at workplaces. The provision of public charging can help induce EV purchase, and therefore contribute to emissions reduction, even if only a minority of charging events occur at public chargers. More detailed discussion on emission reductions can be found in the *EV Charging Roadmap Report*.

Finally, while much of the dashboard data identified above will generally need a log in, it is also possible to prepare a publicly available metrics dashboard, to enable the community to see the usage and impact of the charger network deployed in the SECCCA region.

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