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Creating accessible and affordable public EV charging networks for Australia

A report for Energy Consumers Australia

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Executive summary

Australia's transition to electric vehicles (EVs) is accelerating rapidly, yet the nation's public EV charging infrastructure remains fragmented and unevenly distributed, particularly comparing infrastructure development between metropolitan and regional/rural areas. As EV sales continue to surge, the adequacy and strategic placement of charging networks has emerged as a critical factor determining the pace of Australia's zero-emission vehicle transformation.

It is within this context that we have been asked by Energy Consumers Australia – the national voice for residential and small business electricity consumers in Australia – to prepare this report to identify the roles and responsibilities for public EV charging infrastructure in Australia that would best promote consumer interests.

Energy Consumers Australia's three-year plan has objectives including that:

- all households and small businesses can invest in and access consumer energy resources, regardless of their physical circumstances; and
- all consumers can use, charge, and pay for their EV conveniently and fairly.

Our focus has been on how best to ensure that public EV charging infrastructure develops to meet the needs of the EV charging community, at an efficient cost. This has involved examining the current EV charging infrastructure business models, technical, market and regulatory impediments. In so doing, we identify several trade-offs and questions for further investigation, to ensure that EV charging infrastructure develops in a way that provides value to the community.

In preparing this report, we have engaged with a large number of regulatory, state and local government authorities, distribution network service providers, e-mobility service providers, electricity retailers, consumer representatives and technical experts. We appreciate the valuable input we have received from all participants.

Accelerating EV adoption is intensifying the debate over optimal public charging infrastructure delivery

With the ongoing transition to net zero emissions, Australians have been increasingly considering the purchase of EVs over internal combustion engine (ICE) vehicles. The number of EVs registered on Australian roads has increased from 38,750 in January 2022 to over 300,000 in March 2025.

The Australian Energy Market Operator (AEMO) forecasts the number of EVs to continue exponentially increasing, with the number of battery EVs (BEVs) for residential use in Australia under AEMO's step change scenario increasing to 2 million in 2030, 8 million in 2040 and 14.9 million in 2050. This corresponds to an increased share of BEVs from approximately one per cent of vehicles in 2024 to 13.6 per cent in 2030 and 79.3 per cent in 2050.

The geographic distribution of that EV uptake is currently uneven, with uptake concentrated in the Australian Capital Territory and metropolitan areas of Sydney, Melbourne and Brisbane. This likely reflects socioeconomic factors and availability of home charging. In future, availability of public EV charging infrastructure will be essential to facilitate EV ownership for households without off-street carparking or who struggle to deliver electricity to their carpark, thereby ensuring equitable access to EV charging.

To date the pace of EV uptake has eclipsed the pace of public EV charging infrastructure, which increased by 121 per cent from January 2022 to March 2025, whilst EV registrations grew by 675 per cent over the same period. Australia is also at the lower end of public EV charging points per EV relative to mature international markets, having one per 37 EVs in 2025. In general, data on public EV charging availability is

inconsistent and the industry would benefit from a more coordinated, centralised approach to data collection and dissemination.

Domestic and international evidence demonstrates that the availability of reliable public EV charging infrastructure is an essential enabler for those without alternatives (ie, home charging) and a confidence-building measure for those who do have home charging access.

The increase in EV uptake is expected to have a significant impact on electricity consumption, making up 23 per cent of total electricity consumption by 2050. The effect of EVs on peak network load is not clear and depends on consumer charging behaviour to avoid network peak periods.

Done right, public alternating current (AC) pole-top EV charging presents a substantial opportunity to improve network utilisation, which is an important factor in the electricity prices that all consumers face. In contrast, public direct current (DC) fast EV charging infrastructure presents a substantial risk to increasing peak network use, which is one of the main drivers behind network augmentation expenditure.

A fragmented EV charging infrastructure market is not in the best interest of consumers

The public EV charging infrastructure supply chain involves distinct functional roles including charging infrastructure owners, charging infrastructure providers, charging infrastructure maintainers, electricity retailers and e-mobility service providers (EMSPs). In practice, current business models in Australia often consolidate multiple functional roles within a single organisation.

Distribution network service providers (DNSPs), as monopoly providers of regulated electricity distribution services, are prevented under the National Electricity Rules (NER) from providing contestable services, including public EV charging infrastructure. CitiPower, Powercor and United Energy is proposing a ring-fencing waiver to operate 100 public EV chargers to obtain data to support demand management innovations.

The current AC and DC markets have a range of disparate business models, funding structures and involvement from state and local governments. Inconsistent network capacity planning and site suitability assessment is hindering market development. Nevertheless, valuable lessons are arising from local trials that should inform broader market development.

We have an opportunity to learn from international experience which demonstrates that a fragmented EV charging infrastructure market, being a market with several discrete networks that are not interoperable and that has developed with a lack of centralised planning, is not in the best interest of consumers. We should leverage international lessons to develop an optimal public EV charging infrastructure network in Australia.

Delivering public EV charging infrastructure in the best interest of consumers – a future vision

Our vision for efficient delivery of public EV charging infrastructure is to unlock three distinct benefits for consumers, ie:

- ensuring **affordability** of EV charging through minimising network upgrade costs of meeting increased load from EV uptake, costs across the supply chain, and prices for public EV charging;
- providing **availability** of public EV charging infrastructure; and
- promoting a **positive user experience** from accessing public EV charging infrastructure.

These benefits can be unlocked through efficient near and long-term investment in public EV charging infrastructure to meet current and future EV charging needs. To deliver efficient investment in public EV charging infrastructure, the ideal future EV charging infrastructure market in Australia will have:

- **competition** that drives efficient delivery of public EV charging infrastructure for consumers, including an efficient mix of AC and DC charging infrastructure recognising the interrelationships and differences between these types of charging infrastructure; and
- **incentives** for efficient, near and long-term market development.

However, given the nascent public EV charging industry and the inherent market failures in delivering public EV charging infrastructure, it is unlikely that the vision statement we describe above could be achieved without government intervention. In particular, it is likely that intervention will be required to:

- address market failures including the ability to exclude parties, the presence of information asymmetries and externalities;
- facilitate market development and overcome the 'chicken and egg' problem between EV uptake and public EV charging infrastructure development; and
- facilitate public EV charging infrastructure in areas where it would otherwise not be commercially viable.

In determining the optimal quantity of public EV charging infrastructure, there are key trade-offs that need to be considered by state and local governments, including:

- the trade-off between charging infrastructure availability and bill impacts of charging infrastructure investment; and
- the trade-off between parking exclusivity and quantity of infrastructure.

Roles and responsibilities to deliver a customer focused EV charging infrastructure network

We have a range of recommendations for delivering an AC public EV charging network in the best interest of consumers in Australia, including:

- publicly available network capacity information is essential to facilitate delivery of public EV charging infrastructure. DNSPs should be required to:
  - in line with the integrated distribution system planning rule change, publish and maintain publicly available data on network capacity at the low-voltage transformer level; and
  - in addition, identify and publish a map of suitable poles on their networks for hosting public EV charging infrastructure;
- expedited approvals on fair terms are critical – DNSPs should be required to approve applications within certain timeframes, expedite approvals for poles they have identified as 'suitable', and publish pole assessment criteria with reasons for rejection;
- local governments are best placed to assess and approve locations for public EV charging infrastructure in their areas from a land-use planning perspective. A standard set of guidelines should be developed and published to assist local governments in this assessment, published by jurisdictional planning entities;
- for commercial delivery of public EV charging infrastructure, charging infrastructure owners should determine the quantity, specification and location of public EV charging infrastructure, as they are taking the commercial risk of that investment;
- any provision for non-commercial delivery of infrastructure should not deter commercial market development. In line with the NER, DNSPs should not be able to participate in the (contestable) commercial delivery of public EV charging infrastructure;
- intervention is likely to be required to facilitate non-commercial delivery of public EV charging infrastructure, given the nascent EV charging market;
- state and territory governments are best placed for non-commercial delivery decisions, including the appropriate quantity, specification and locations for public EV charging infrastructure, as they can

balance policy trade-offs between infrastructure availability and consumer bill impacts. Importantly, DNSPs cannot be allowed to determine the appropriate quantity, specification or location as their incentives are not sufficient to promote infrastructure development in the best interest of consumers;

- state and territory governments (or DNSPs on behalf of the jurisdictional government) should then be responsible for conducting tenders to supply, maintain and deliver AC public EV charging infrastructure to allow competition to ensure that this infrastructure is delivered at least cost; and
- there is a role for DNSPs to provide public EV charging infrastructure in non-commercial locations subject to participating in a competitive tender. In these circumstances, consideration should be given to mandating the sale of DNSP-owned infrastructure every five years if there is private market interest.

Importantly, to ensure the timely development of a comprehensive public AC EV charging network in the best interest of consumers, collaboration must occur between transport and energy sector organisations across Australia, in addition to local governments, state and federal governments and regulators.

We also have recommendations for developing a DC public EV charging network in the best interest of consumers, ie:

- network capacity planning and pricing must account for substantially higher strain of DC charging on electricity networks;
- DNSPs should be required to assess applications within a reasonable timeframe, so not to hinder charging infrastructure development; and
- land-use planning and oversight from the Australian Competition and Consumer Commission (ACCC) is essential to preventing localised monopolies.

Regulatory settings to deliver value for consumers

Changes to the NER are required to facilitate the ideal roles and responsibilities identified in section 5 and to achieve the vision statement, ie:

- changes to the ring-fencing provisions to ensure competitive tension whilst allowing DNSP provision of non-competitive infrastructure;
- changes to the shared asset rules to deliver value for consumers – we recommend that the Australian Energy Regulator (AER) undertakes a review of the suitability of the shared asset rules in the context of public EV charging infrastructure; and
- changes to the metering rules to allow multiple retailers to operate at a single national metering identifier via a ‘floating national metering identifier (NMI)’, to facilitate competition between EMSPs and interoperability.

The federal government should consider implementing a number of standards to facilitate a positive user experience from public EV charging infrastructure, including:

- mandating interoperability between public AC EV charging infrastructure;
- urgently implementing a uniform set of accessibility standards, either bespoke for public EV charging infrastructure or in line with general accessibility standards;
- implementing a set of payment accessibility standards for each of AC and DC charging infrastructure, considering the trade-off between the cost of installing additional payment options and improving payment accessibility when determining the threshold for being subject to those standards; and
- introducing reliability standards for EV charging infrastructure, including for both uptime and electricity throughput.

Some local governments and DNSPs are charging or considering rental fees for land and pole access, particularly for dedicated parking spaces. Given the potential public benefits of EV adoption which are facilitated by deployment of EV charging infrastructure, there is a strong argument for local governments and

DNSPs to take a facilitative rather than rent-seeking approach, particularly during the early infrastructure build-out phase.

Practically, this means that any rental fees charged by DNSPs or local governments should be minimised, and so only be used to recover the administrative and maintenance costs of facilitating access to the relevant infrastructure.

1. Introduction

Australia's transition to electric vehicles (EVs) is accelerating rapidly, yet the nation's public EV charging infrastructure remains fragmented and unevenly distributed, particularly comparing infrastructure development between metropolitan and regional/rural areas. As EV sales continue to surge, the adequacy and strategic placement of charging networks has emerged as a critical factor determining the pace of Australia's zero-emission vehicle transformation.

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In preparing this report, we have engaged with a large number of regulatory, state and local government authorities, distribution network service providers, e-mobility service providers, electricity retailers, consumer representatives and technical experts. We appreciate the valuable input we have received from all participants.

The remainder of this report is structured as follows:

- in section 2 we summarise the EV and charging infrastructure landscape in Australia;
- in section 3 we explain that a fragmented EV charging infrastructure market is not in the best interest of consumers;
- in section 4 we present a vision statement for delivering EV charging infrastructure in the best interest of consumers;
- in section 5 we set out the ideal roles and responsibilities to deliver that future vision; and
- in section 6 we describe the other regulatory settings required to unlock the vision statement.

2. Accelerating EV adoption is intensifying the debate over optimal public charging infrastructure delivery

With the ongoing transition to net zero emissions, Australians have been increasingly considering the purchase of EVs over internal combustion engine (ICE) vehicles. The number of EVs registered on Australian roads has increased from 38,750 in January 2022 to over 300,000 in March 2025.

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The geographic distribution of that EV uptake is currently uneven, with uptake concentrated in the Australian Capital Territory and metropolitan areas of Sydney, Melbourne and Brisbane. This likely reflects socioeconomic factors and availability of home charging. In future, availability of public EV charging infrastructure will be essential to facilitate EV ownership for households without off-street carparking or who struggle to deliver electricity to their carpark, thereby ensuring equitable access to EV charging.

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The relationship between EV adoption and public EV charging infrastructure availability is complex and evolving rapidly across Australia. While both EV registrations and charging point installations have grown, infrastructure deployment is not currently keeping pace with the accelerating demand from new EV owners.

In this section, we set out:

- the trends in EV adoption in Australia;
- the types and role of EV charging infrastructure;
- the trends in public EV charging infrastructure deployment in Australia;

- the relationship between EVs and charging infrastructure; and
- the opportunities that EVs present to improve network utilisation.

2.1 EV uptake has been increasing in Australia

With the ongoing transition to net zero emissions, Australians have been increasingly considering the purchase of EVs over ICE vehicles. This trend is expected to continue in the coming years as the price difference between EVs and ICE vehicles continues to reduce, battery technology development continues to reduce range concerns, charging infrastructure availability increases and consumer preferences change.

In this section, we describe Australia's EV uptake to date, and set out expected future EV uptake, along with the grid impact of that uptake.

2.1.1 EV uptake in Australia has steadily increased in recent years

EV adoption in Australia has gained significant momentum over recent years. Total EVs registered in Australia have demonstrated consistent year-on-year growth, with notable acceleration from 38,754 in January 2022 to 167,845 in January 2024 – see figure 2.1. The Electric Vehicle Council (EVC) found that approximately 114,000 new EVs were registered in Australia in 2024.[1] As of March 2025, the EVC states that there are now 300,000 EVs on Australian roads.[2]

This momentum coincides with the increased diversity in EVs available to Australian consumers.[3] The EVC states that this 'highlights the recent surge in adoption due to cheaper EVs, more charging infrastructure and greater awareness of the environmental benefits of EVs'.[4]

The geographic distribution of EV adoption is not even across the states – see figure 2.1. New South Wales leads the nation in the total number of EV registrations, accounting for the largest share of the national EV fleet. Victoria and Queensland follow as the second and third-largest markets, while other states show varying levels of adoption.

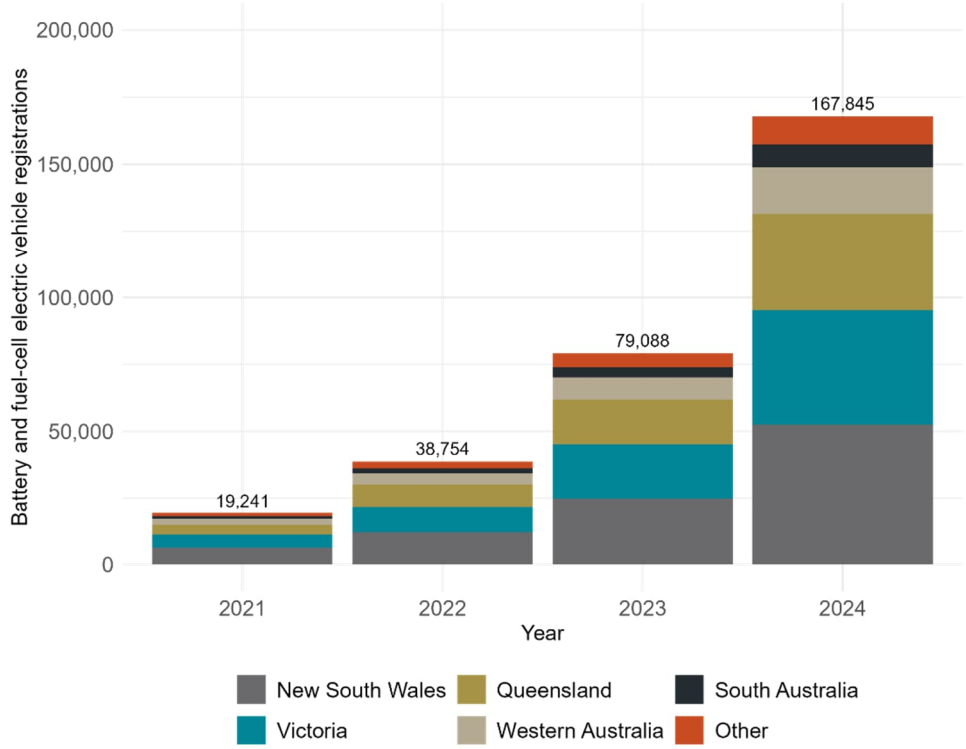
[1] EVC, *2024 sets new record for EV sales*, Media release, 6 January 2025, available at: https://electricvehiclecouncil.com.au/uncategorized/2024-sets-new-record-for-ev-sales-in-australia/, accessed 11 July 2025.

[2] EVC, *Real-time EV app set to improve charging experience, coverage and reliability*, Media release, 7 March 2025, available at: https://electricvehiclecouncil.com.au/media-releases/real-time-ev-app-set-to-improve-charging-experience-coverage-and-reliability/, accessed 21 June 2025.

[3] EVC, *State of Electric Vehicles 2024,* December 2024, p 17.

[4] EVC, *300,000 EVs on Aussie roads, with prices starting under $30,000*, Media release, 6 February 2025, available at: https://electricvehiclecouncil.com.au/media-releases/300000-evs-on-aussie-roads-with-prices-starting-under-30000/, accessed 11 July 2025.

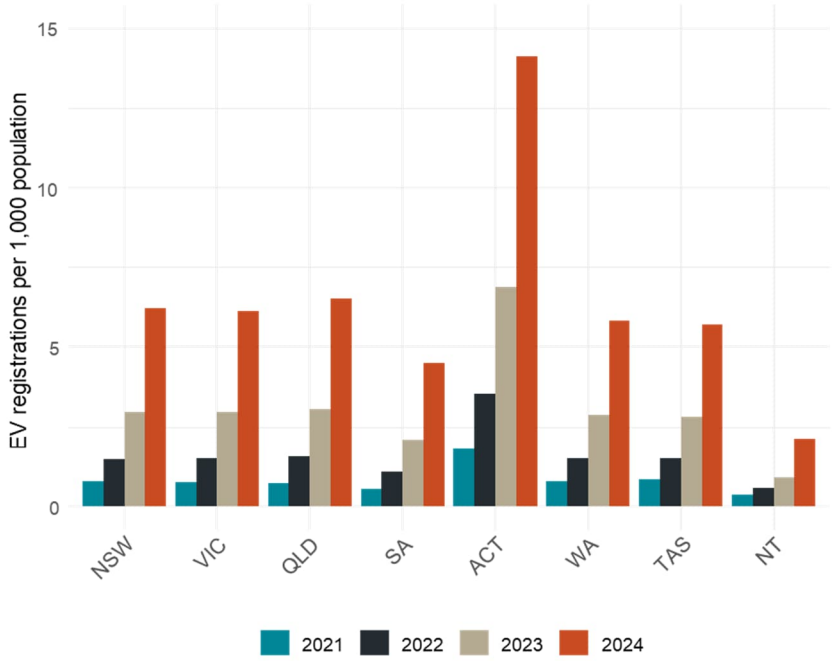
Figure 2.1: Battery and fuel-cell EV registrations in Australia by state, January 2021-2024 and March 2025



Source: Bureau of Infrastructure and Transport Research Economics, bitre-road-vehicles-australia—january2024.xlsx, 31 January 2024, 'Table 5' sheet; Bureau of Infrastructure and Transport Research Economics, BITRE-road-vehicles-australia-january2023.xlsx, 31 January 2023, 'Table 5' sheet.

This dominance reflects the larger population base in New South Wales. On a population-normalised basis, EV uptake has been relatively similar across most states, except for the Australian Capital Territory which leads in EV uptake, and South Australia and the Northern Territory which lag behind – see figure 2.2.

Figure 2.2: Battery and fuel cell EV registrations in Australia by state, population normalised



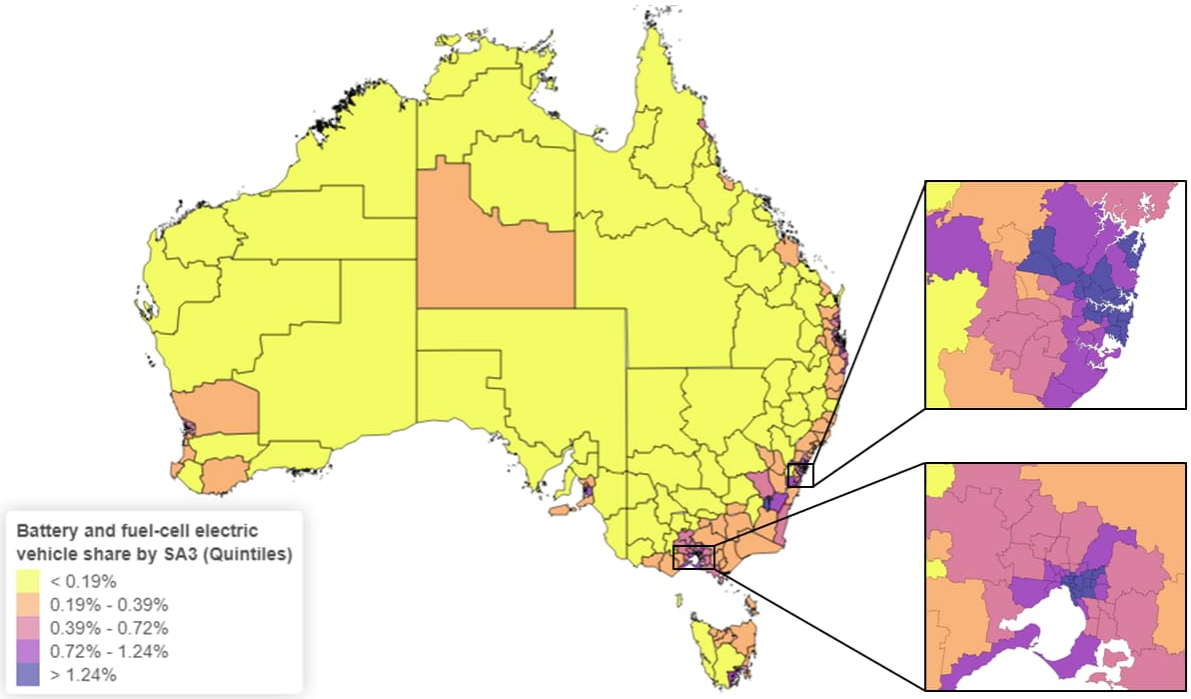
Source: Bureau of Infrastructure and Transport Research Economics, bitre-road-vehicles-australia—january2024.xlsx, 31 January 2024, 'Table 5' sheet; Bureau of Infrastructure and Transport Research Economics, BITRE-road-vehicles-australia-january2023.xlsx, 31 January 2023, 'Table 5' sheet.

Within states, EV uptake is biased towards metropolitan areas – see figure 2.3. Metropolitan areas benefit from generally higher household incomes, shorter average trip distances, and greater charging infrastructure density – all factors that facilitate EV adoption.[5] This aligns with user experience that anxiety about the ability to charge is a key barrier to EV uptake.[6] Conversely, regional areas face barriers including limited model availability, concerns about range adequacy for longer distances and a lack of back-up charging options if a site is not functioning due to the sparser charging network.

[5] Electric Loans Australia, *The Rise of Electric Cars in Australia – EV Adoption Guide,* 29 April 2025, available at: https://electricloans.com.au/the-rise-of-electric-cars-in-australia-ev-adoption-guide/, accessed 11 July 2025.

[6] See our discussion in section 2.4.

Figure 2.3: Proportion of battery and fuel-cell EV registrations in Australia by Statistical area 3 (SA3), 2024



Source: HoustonKemp analysis, Vehicle registration data: Data.gov.au, Road Vehicles Australia, January 2024 – Registered motor vehicles by vehicle type, state of registration, registered postcode and motive power(CSV), Updated 21 May 2025, available at: https://data.gov.au/dataset/ds-dga-767b84b8-6756-460a-96c9-9c073153485a/details?q=vehicle%20registration%20by%20postcode, accessed 16 June 2025 / Map data: ABS, Digital boundary files, 20 July 2021, available at: https://www.abs.gov.au/statistics/standards/australian-statistical-geography-standard-asgs-edition-3/jul2021-jun2026/access-and-downloads/digital-boundary-files, accessed 16 June 2025.[7]

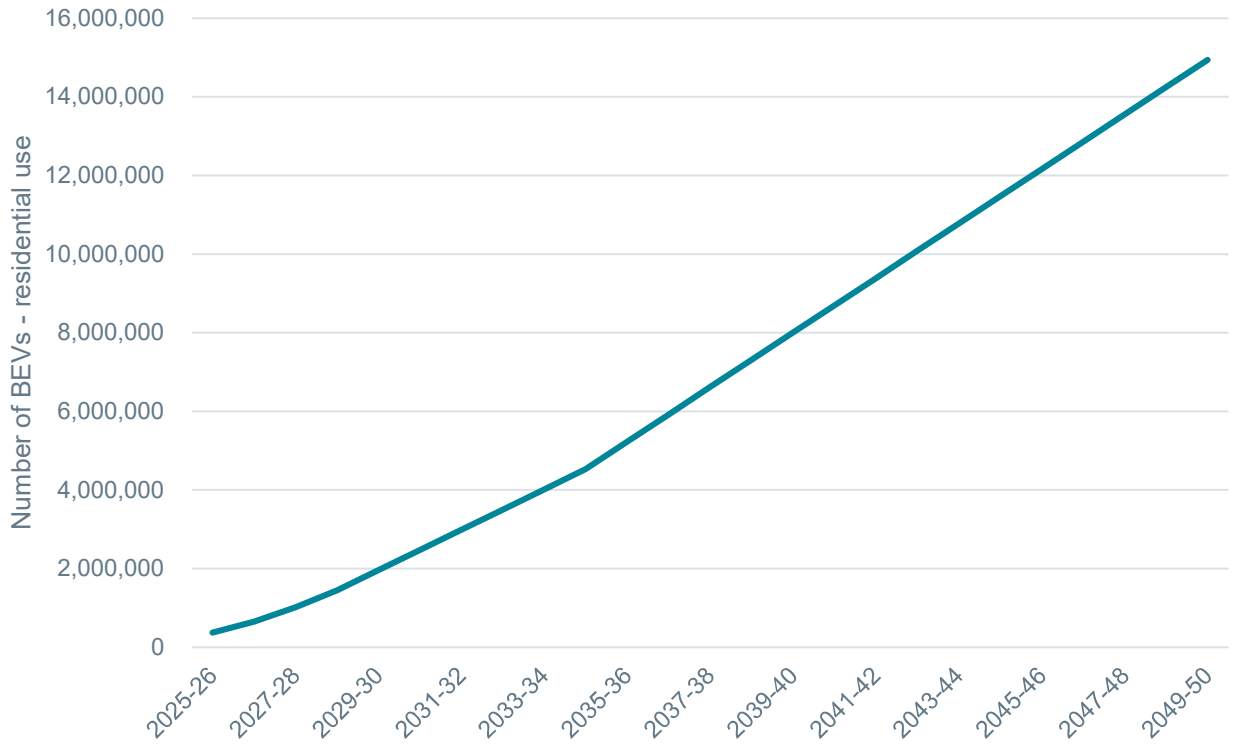
2.1.2 Residential EV uptake and load contribution is projected to continue increasing significantly

EV adoption is projected to increase significantly in the coming years, as the transition to net zero continues. In the draft 2025 inputs and assumptions report (IASR), AEMO forecasts that, under the step change scenario, the quantity of battery EVs for residential use in Australia will increase to 2.0 million in 2029-30, 8.0 million by 2039-40 and 14.9 million by 2049-50 – figure 2.4. For comparison, as of 31 January 2024, there were 15.7 million registered passenger vehicles.[8]

[7] Vehicle registration data is obtained at the postcode level. To convert data from postcode to SA3 level, we have employed the use of the Data.gov.au correspondence file, using 2021 postcodes and SA3s. For each conversion, the correspondence file provides the proportion, or 'ratio', of the postcode that can be 'donated' to that SA3 area. We have used this ratio to determine how to attribute vehicles between each SA3 where a postcode overlaps multiple SA3 areas and in so doing, we have implicitly assumed that vehicles are uniformly distributed across each postcode.

[8] BITRE, *Road vehicles Australia – January 2024*, July 2024, p 6.

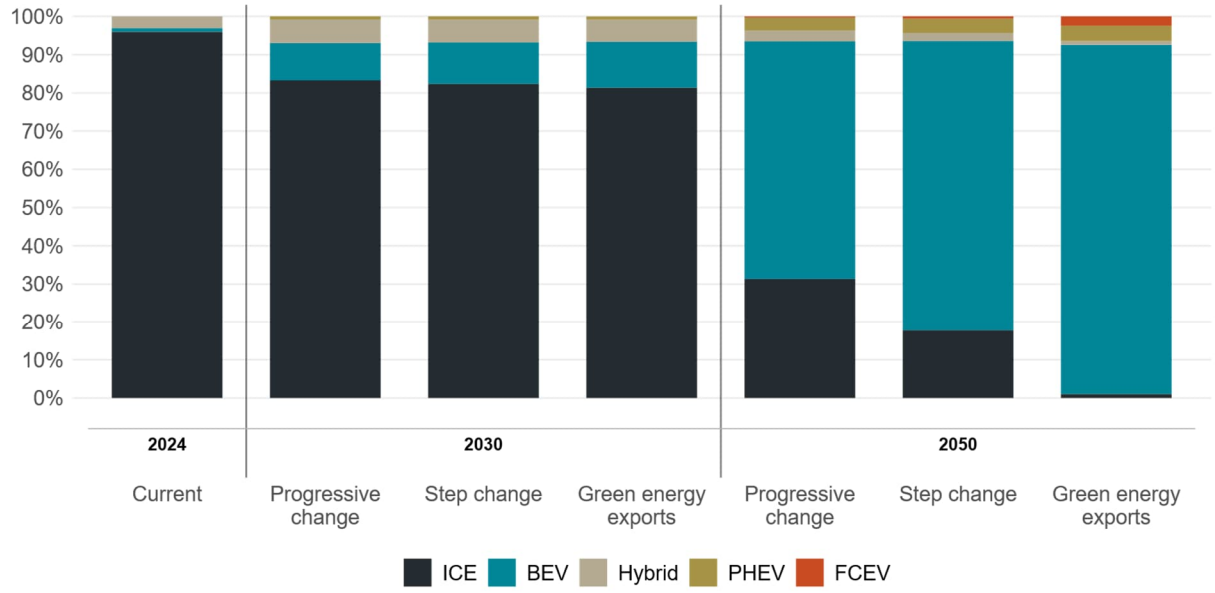
Figure 2.4: Forecast battery EVs in Australia – 2025 draft IASR, step change scenario



Source: Draft 2025 IASR EV workbook, February 2025, 'Step change' scenario

Under AEMO's draft IASR step change scenario, this is expected to result in an increased share of BEVs from approximately one per cent of vehicles in 2024 to 10.9 per cent by 2029-30 and 75.9 per cent by 2049-50 – see figure 2.5.

Figure 2.5: Projected mix of vehicle types - 2025 draft IASR



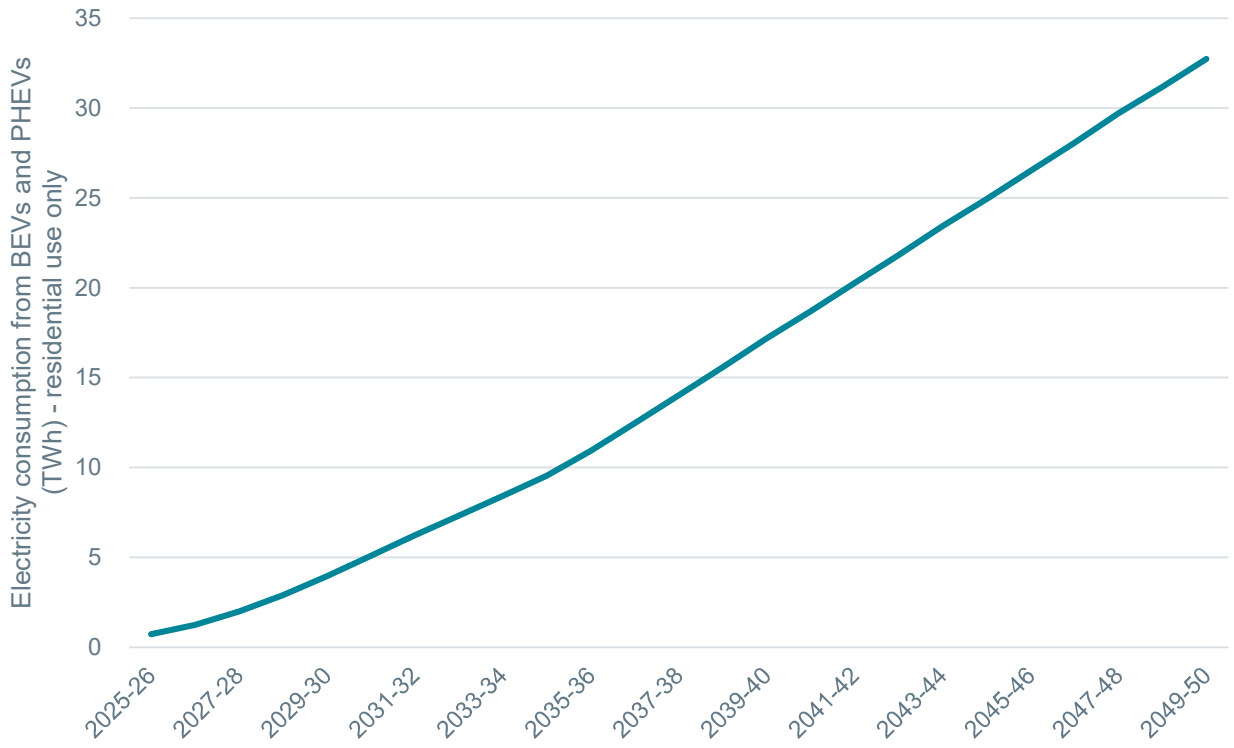
Source: HoustonKemp analysis, Bureau of Infrastructure and Transport Research Economics, bitre-road-vehicles-australia—january2024.xlsx, 31 January 2024, 'Table 5' sheet; Draft 2025 IASR EV workbook, February 2025.
Note: 2024 BEV figures include FCEVs, and Hybrid figures include PHEVs, due to data collection procedures by BITRE.

This increase in EV uptake is expected to have a corresponding significant impact on electricity demand. In the draft 2025 IASR, AEMO forecasts that, under the step change scenario, electricity consumption from BEVs and plug-in hybrid EVs (PHEVs)[9] for residential use is expected to be 4.0 terawatt hours (TWh) by 2029-30, growing to 17.2 TWh by 2039-40 and 32.9 TWh by 2049-50 – see figure 2.6. This represents a significant source of incremental electricity demand – for comparison, the total electricity consumption of South Australia in 2023-24 was 11.0 TWh.[10]

[9] PHEVs are a type of vehicle that combine an electric motor and a traditional internal combustion engine, with the ability to recharge the electric motor's battery by plugging it into an external power source.

[10] AEMO, *Forecasting data portal – 2024 ESOO*, 29 August 2024. Note: we use the operational (sent out) category as the total electricity consumption.

Figure 2.6: Forecast electricity consumption from EVs – 2025 draft IASR, step change scenario



Source: Draft 2025 IASR, February 2025, 'step change' scenario.

2.2 The types and roles of EV charging infrastructure

There are a range of types of EV charging infrastructure, each of which are designed to meet different charging needs and use cases.

EV chargers are typically classified into three levels, each offering distinct power outputs, charging speeds and different typical applications – see table 2.1. Level 2 charging infrastructure can be delineated further into single phase (7 kilowatt (kW)) and three phase (11-22 kW).

Kerbside charging refers to EV charging stations that are situated along public streets, typically near the curb and in residential areas to provide charging options for those without access to off-street parking. Destination charging refers to charging stations located at popular locations which allow EV users to top up their batteries while spending time at that location.

Table 2.1: Types and roles of EV charging infrastructure

Charging type	Power output	Range added per hour	Typical application
Level 1 AC single phase	1.4–3.7 kW	<20km	Home
Level 2 AC single phase	7 kW	20-40km	Home, slow kerbside and destination charging
Level 2 AC three phase	11-22 kW	40-120km	Fast kerbside and destination charging
Level 3 DC three phase	>22 kW	>120km	Highways and urban centres

Source: EVSE, How Long Does It Take to Charge an Electric Car?, available at: https://evse.com.au/blog/how-long-does-it-take-to-charge-an-electric-car/?srsltid=AfmBOooccVaaX4Kl5Q1wapl490scRR1Pqsvd3DwzNjUGUhYQdDOIIQsH, accessed 21 June 2025.

Across mature markets in Europe and the United States, as well as in Australia, most EV users charge at home (with the exception of China where there is a more diverse range of charging locations).[11] However, a substantial portion of the Australian population lacks access to dedicated parking to facilitate private EV charging, with:[12]

- 16 per cent living in apartments, some of which do not have the ability to access home charging solutions; and
- 13 per cent residing in townhouses, where only a portion have access to off-street parking suitable for charging installation.

In addition, some standalone houses will not have access to dedicated parking and some renters may be unable to install private EV charging infrastructure to facilitate private EV charging. For these households without off-street carparking or who struggle to deliver electricity to their carpark, availability of public EV charging infrastructure is necessary to facilitate EV ownership.

AC public EV charging infrastructure can be slow (typically 7 kW) or fast (typically 22 kW). In Australia, due to the properties of local electricity supply and pole specification, this infrastructure is best located on power poles, in contrast to some overseas jurisdictions where it is located on street lighting poles.[13] There are two main use cases for AC public EV charging infrastructure, ie:

- overnight charging, where consumers park near their residence overnight to charge; and
- destination charging, where consumers top up their vehicles near shops, beaches, tourist attractions, etc.

Each of these use cases is important but for different reasons, ie:

- overnight charging availability is likely to be a closer substitute to home charging; and
- destination charging is likely to be a closer substitute to fast charging.

[11] EVenergi, *EV owner demographics and behaviours – results of EVenergi's relevant surveys*, October 2023, p 7.

[12] Australian Bureau of Statistics, *Housing: Census*, 28 June 2022, *Housing data summary.xlsx*, worksheet 'Table 2', available at: https://www.abs.gov.au/statistics/people/housing/housing-census/2021, accessed 11 July 2025.

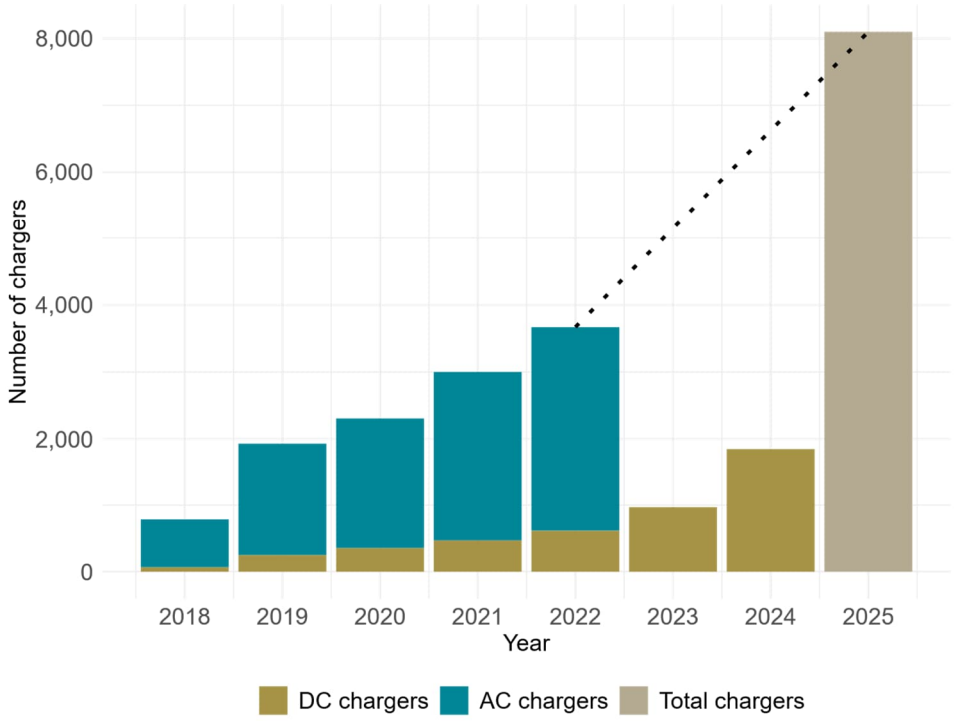
[13] Intellihub, *Street light pole EV charger with grid integration project – knowledge sharing report*, July 2022, p 13.

2.3 The quantity of public EV charging infrastructure needs to increase

The quantity of public EV charging infrastructure has been increasing, but at a slower pace than EV uptake. This reflects both the significant pace of EV uptake, with approximately 114,000 new EVs sold in Australia in 2024,[14] and the lagging increase in public EV charging infrastructure.

Australia's public EV charging infrastructure has increased by 121 per cent over the last three years, from approximately 3,650 in 2022 to 8,100 in 2025 – see figure 2.7. This reflects both government policy initiatives and private sector investment in charging networks. However, this lags significantly behind the growth in registered EVs of 674 per cent over the same time period.[15]

Figure 2.7: Growth in public EV charging infrastructure in Australia



Source: Electric Vehicle Council (EVC), The state of electric vehicles in Australia, June 2018, p 13; EVC, State of Electric Vehicles, August 2019, p 19; EVC, State of Electric Vehicles, August 2020, p 38; EVC, State of Electric Vehicles, August 2021, p 11; EVC, State of Electric Vehicles, October 2022, pp 14-15; EVC, State of Electric Vehicles, July 2023, pp 17-18; EVC, State of Electric Vehicles 2024, December 2024, p 20 and EVC, Real-time EV app set to improve charging experience, coverage and reliability, 7 March 2025, available at: https://electricvehiclecouncil.com.au/media-releases/real-time-ev-app-set-to-improve-charging-experience-coverage-and-reliability/, accessed 23 June 2025.

In line with this, the ratio of public EV charging points has decreased in recent years, from:

- one charging point per 11.6 EVs as of January 2022;[16] to

[14] EVC, *2024 sets new record for EV sales*, Media release, 6 January 2025, available at: https://electricvehiclecouncil.com.au/uncategorized/2024-sets-new-record-for-ev-sales-in-australia/, accessed 11 July 2025.

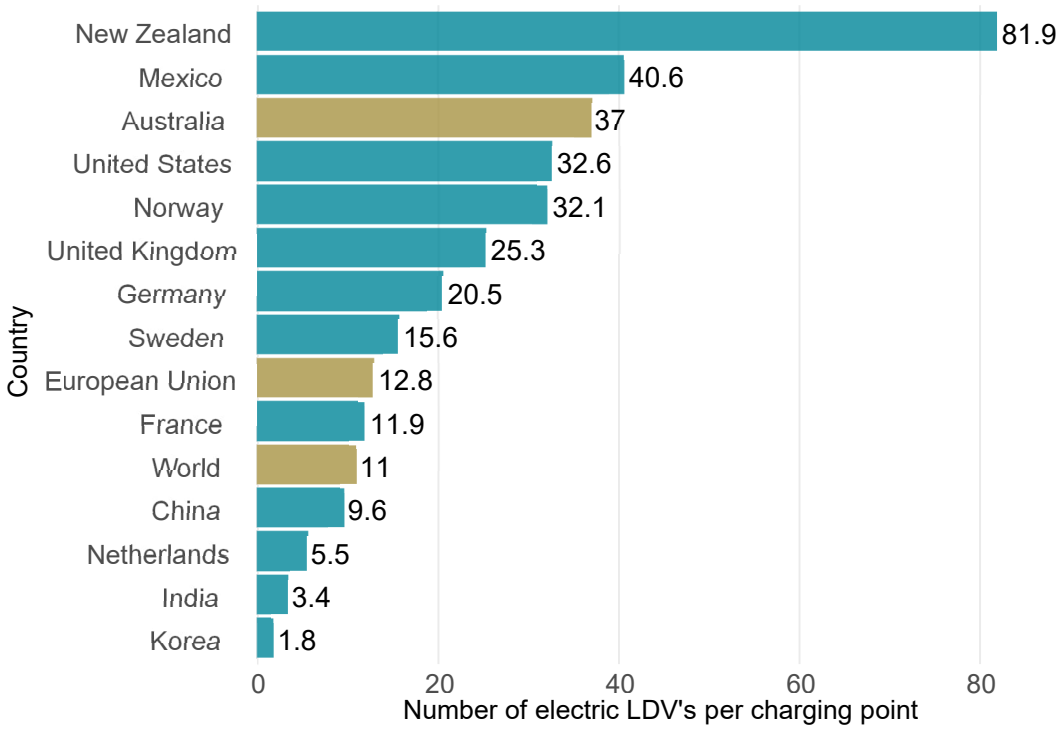
[15] Calculated as 300,000 EVs in 2025 divided by 38,754 EVs in 2022 minus one – see data in section 2.1.

[16] Calculated as 38,754 registered EVs divided by 3,669 public EV charging points. See: EVC, *State of Electric Vehicles*, October 2022, pp 14-15 and BITRE, *bitre-road-vehicles-australia—january2024.xlsx*, 31 January 2024, 'Table 5' sheet.

- one charging point per 37.0 EVs as of March 2025.[17]

We acknowledge there are data challenges when comparing EV charging infrastructure development between countries or over time. However, comparing this ratio of 37 EVs per public EV charging point with international experience using International Energy Agency data reveals that Australia is on the higher end of EVs per public charging point, reflecting a relative lack of public EV charger availability compared to other countries – see figure 2.8.[18]

Figure 2.8: Number of electric light-duty vehicles per public charge point, 2024/25



Source: International Energy Agency, Number of electric light-duty vehicles per public charging point and kilowatt per electric light-duty vehicle, 2024, 8 April 2025, available at: https://www.iea.org/data-and-statistics/charts/number-of-electric-light-duty-vehicles-per-public-charging-point-and-kilowatt-per-electric-light-duty-vehicle-2024, accessed 16 June 2025 and Electric Vehicle Council, Real-time EV app set to improve charging experience, coverage and reliability, 7 March 2025, available at: https://electricvehiclecouncil.com.au/media-releases/real-time-ev-app-set-to-improve-charging-experience-coverage-and-reliability/, accessed 23 June 2025.

Note: We have adopted Electric Vehicle Council data for Australia to reflect the most recent and accurate data available.

There is no definitive optimal ratio of EVs to public EV chargers. The ideal ratio depends on numerous factors, including local electricity grid capacity, the mix of AC and DC public charging infrastructure, EV adoption rates, home charging availability, and various other factors specific to each region. By way of example:

[17] Calculated as 300,000 registered EVs divided by 8,100 public EV charging points. See: EVC, *Real-time EV app set to improve charging experience, coverage and reliability*, Media release, 7 March 2025, available at: https://electricvehiclecouncil.com.au/media-releases/real-time-ev-app-set-to-improve-charging-experience-coverage-and-reliability/, accessed 11 July 2025.

[18] We acknowledge that there are significant concerns with the veracity of the International Energy Agency (IEA). In making this comparison, we have augmented IEA's reported EVs per public charge point to reflect more accurate data published by EVC.

- Norway has a relatively high ratio of EVs per public EV charging point (one charging point per 32.1 EVs)[19], which reflects its much higher proportion of DC charging infrastructure than other mature EV charging markets;[20] and
- the Netherlands has a relatively low ratio of EVs per public EV charging point (one charging point per 5.5 EVs)[21], which reflects its highly constrained electricity grid (and so preference for AC charging infrastructure), low availability of home EV charging and a universal 'right to charge'.[22]

Nevertheless, public EV charging availability in Australia is relatively low compared to more mature countries. This indicates a need for policymakers to consider the optimal public EV charging ratio over time, including how this is interrelated to EV uptake decisions. We explore how the availability of public EV charging infrastructure impacts EV uptake in section 2.4 below.

2.4 The availability of reliable public EV charging infrastructure is linked to EV uptake

Understanding the interdependence between public EV charging infrastructure availability and EV adoption is crucial for policymakers and infrastructure planners seeking to accelerate EV uptake through strategic charging network deployment.

Without adequate public charging networks, EV adoption is likely to be constrained to households with home charging access and with lower levels of range anxiety. This limits the potential for EVs to ICE vehicles.

Several surveys have been conducted investigating the correlation between public EV charging infrastructure availability and consumer willingness to adopt EVs.

Randwick, Waverley and Woollahra councils surveyed 1,186 respondents who mostly live and work in Sydney's Eastern Suburbs between July and September 2021, for which 53 per cent of respondents had access to off-street parking with a power point or electrical connection nearby. The study found that:[23]

- 40 per cent of respondents would be willing to walk up to 500 metres or eight minutes from home, and 73 per cent would be willing to walk up to 200 metres or three minutes from home, to use a public EV charger;[24]
- 79 per cent of respondents reported they would consider purchasing a hybrid or EV if more public charging stations were available; and
- 86 per cent of respondents said council should facilitate access to public charging stations.

The EVC's 2024 annual survey of 1,506 EV owners revealed that 92 per cent of existing EV owners can charge at home. Of these households:[25]

[19] International Energy Agency, *Number of electric light-duty vehicles per public charging point and kilowatt per electric light-duty vehicle, 2024*, 8 April 2025, available at: https://www.iea.org/data-and-statistics/charts/number-of-electric-light-duty-vehicles-per-public-charging-point-and-kilowatt-per-electric-light-duty-vehicle-2024, accessed 14 July 2025.

[20] Roland Berger, *EV Charging Index: Expert insight from Norway*, 15 August 2023, available at: https://www.rolandberger.com/en/Insights/Publications/EV-Charging-Index-Expert-insight-from-Norway.html, accessed 11 July 2025.

[21] International Energy Agency, *Number of electric light-duty vehicles per public charging point and kilowatt per electric light-duty vehicle, 2024*, 8 April 2025, available at: https://www.iea.org/data-and-statistics/charts/number-of-electric-light-duty-vehicles-per-public-charging-point-and-kilowatt-per-electric-light-duty-vehicle-2024, accessed 14 July 2025.

[22] Strategy&, *Unlocking EV smart charging to reduce grid congestion - lessons from the Netherlands*, March 2024, p 9 and Changing transport, Successful charging infrastructure roll-out – study tour findings, 18 November 2022, https://changing-transport.org/5-success-factors-for-charging-infrastructure-roll-out/#:~:text=For%20charging%20infrastructure%2C%20the%20Dutch,who%20own%20an%20electric%20vehicle., accessed 11 July 2025.

[23] Randwick City Council, *Leading the Charge – Supporting Documentation*, July 2023, pp 37-40.

[24] We note that the council incorrectly sums the response results in the text of this report – we present the corrected the figures here.

[25] EVC, *EV Ownership Survey 2024*, p 9.

- 80 per cent have solar panels;
- 66 per cent have an attached garage; and
- 50 per cent have a dedicated EV charger.

Regarding public charging, the EVC's annual survey revealed that over 85 per cent of EV owners make regular use of public charging, with:[26]

- 15 per cent solely relying on AC chargers;
- 32 per cent using a combination of AC and DC chargers; and
- 53 per cent preferring using dedicated DC fast chargers.

For EV owners that could not charge at home, availability of public charging was very or extremely important to their EV ownership decision. However, even for EV owners that can charge at home, availability of public charging remained moderately or very important to their decision to get an EV.[27]

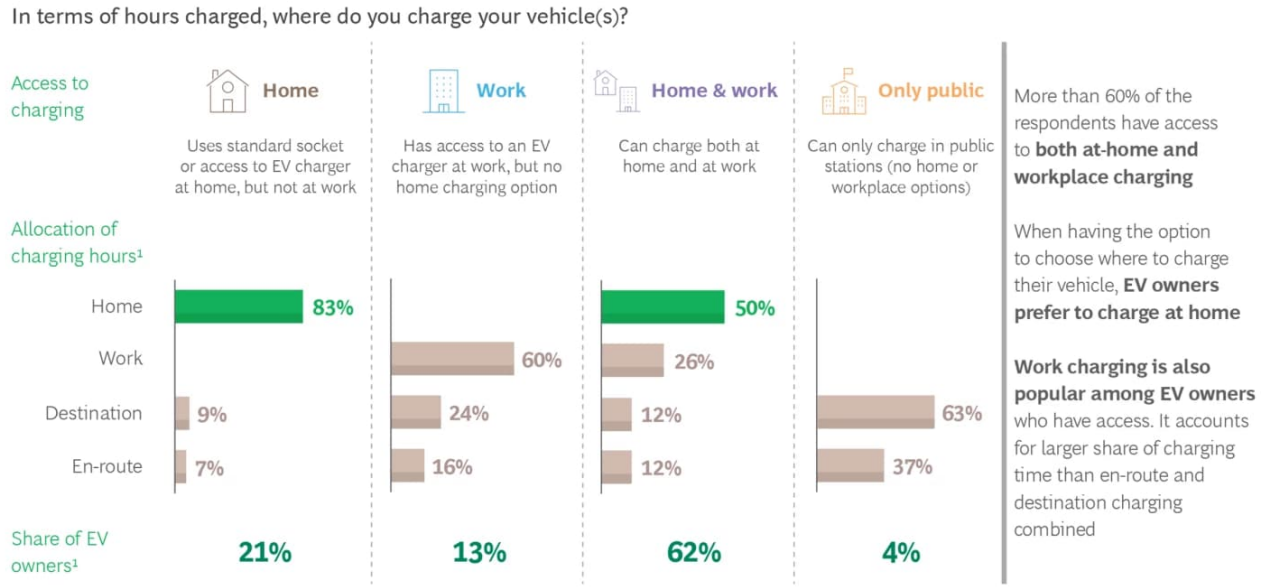
Range anxiety was not a concern of EVC's survey participants, with one in four respondents taking a long journey (>150 km) monthly, and the average longest journey reported by EV owners being 500km.[28] However, this is likely to be a feature of early adopters having more confidence in EVs than the general population.

These findings are consistent with overseas studies. For example, Boston Consulting Group (BCG) performed a study of European Union, United States and China EV owners in 2021, and found that 96 per cent of EV owners had access to home or work charging (or both), and that consumers prefer to charge at home where possible – see figure 2.9.

BCG's survey found that in the majority of countries surveyed, public charging accounted for between 25 and 30 per cent of hours charged. Due to faster charging speeds, this will reflect a higher share of energy charged. BCG also found that consumers are willing to pay premiums for faster charging speeds, with premiums of 100 per cent or more for high power (>150 kW) charging over slow (<=22 kW) charging. BCG notes this may in part reflect the relatively wealthy nature, and so relative price insensitivity, of early adopters.[29]

[26] EVC, *EV Ownership Survey 2024*, p 14.
[27] EVC, *EV Ownership Survey 2024*, p 14.
[28] EVC, *EV Ownership Survey 2024*, p 6.
[29] BCG, *What electric vehicle owners really want from charging networks*, 17 January 2023, p 4.

Figure 2.9: BCG 2021 electric vehicle charging ownership survey results



Source: BCG, What electric vehicle owners really want from charging networks, 17 January 2023, p 2, available at: https://www.bcg.com/publications/2023/what-ev-drivers-expect-from-charging-stations-for-electric-cars, accessed 11 July 2025.
Note: allocation of charging hours and share of EV owners based on weighted European Union, United States and China BEV and PHEV ownership in 2021.

Overall, the survey data reveal two key insights, ie, that public EV charging infrastructure availability acts as both an enabler for those without alternatives and a confidence-building measure for those who do have home charging access.

In addition, to service consumers that are travelling, sufficient infrastructure needs to be developed across major roads in Australia. Best practice infrastructure deployment focuses on ensuring predictable charging access at regular intervals, providing drivers with confidence in their ability to complete journeys without charging interruptions.

The New South Wales government's approach to fast charging infrastructure demonstrates good practice to provide sufficient EV charging infrastructure availability for travellers. The New South Wales government aims to ensure that fast charging stations are positioned no more than five kilometres apart in metropolitan areas and no more than 100 kilometres apart on major roads and highways across the state.[30]

The metropolitan five-kilometre spacing standard recognises that urban drivers require accessible charging options within reasonable proximity to their regular destinations, whether for top-up charging during daily activities or as primary charging for those without home access. Meanwhile, the 100-kilometre highway spacing ensures that even long-distance travel remains feasible with current EV technology, addressing one of the most commonly cited concerns among potential EV buyers regarding vehicle capability for regional and interstate travel.

While these surveys provide valuable insights, they may capture different aspects of the market. Our analysis indicates that population-normalised EV adoption rates are currently similar across New South Wales, Victoria and Queensland, despite variations in public EV charging infrastructure availability. This finding suggests that, at least among early adopters, public EV charging infrastructure may be one of several

[30] NSW Government, *Fast charging grants,* 2 June 2025, available at: https://www.energy.nsw.gov.au/business-and-industry/programs-grants-and-schemes/electric-vehicles/electric-vehicle-fast-charging, accessed 11 July 2025.

factors influencing purchasing decisions, rather than a primary determinant. These results offer an additional perspective to complement the EVC's survey findings.

In addition, the availability of public EV charging infrastructure is not the only metric influencing EV adoption. Whilst the availability of public chargers is increasing, the reliability of those public chargers is a concern for current and potential EV owners. Charger anxiety, which is a user's concern regarding whether a charger will be operational when a user gets there, is a large concern for Australian drivers. A charger may not be operational because of maintenance issues or someone already using the charger.[31]

To alleviate this concern, consumers likely need more visibility over charger status, and charging infrastructure needs to be up more often. This may require implementing standards for reliability – we discuss this further in section 6.2.3.

2.5 EVs present a substantial opportunity to improve network utilisation

EVs presents a substantial opportunity to improve network utilisation, which is an important factor in the electricity prices that all consumers face. Energy Consumers Australia and Commonwealth Scientific and Industrial Research Organisation (CSIRO) found in 2023 that EV charging is typically aligned with solar production and not with periods of grid stress.[32] The EVC has found that as of August 2022, Australian consumers with EVs chose to self-manage their EV charging to a significant degree, with the majority of at-home EV charging occurring either in the middle of the night or the middle of the day, and with comparably little charging during peak times.[33]

However, current charging data and CSIRO's future projections for EV charging profiles indicate that whilst EV charging behaviour typically occurs outside of the evening peak period, a reasonable quantity of charging still occurs during the evening peak period.[34] Specifically, CSIRO's current charging data finds:[35]

- peak EV charging at 2:30pm of approximately 0.38 kW per vehicle; and
- minimum evening EV charging at 7:30pm of approximately 0.25 kW per vehicle.[36]

There are mixed findings in overseas jurisdictions on the effect of EVs on network utilisation and general electricity rates for consumers. For example, in California EV adoption has been reported to increase network utilisation and reduce costs for all consumers.[37] In addition, France has found there is sufficient network capacity to accommodate a huge number of EVs subject to minimum smart charging controls being implemented.[38]

However, in more constrained grids like the Netherlands, substantial network upgrades are being driven in-part by EVs.[39] In the United Kingdom, there are concerns that without policy measures to spread the load from EVs and heat pumps, peak demand may increase by more than double by 2050 (which we note the

[31] For example, see: The Conversation, *Range anxiety – or charger drama? Australians are buying hybrid cars because they don't trust public chargers*, 31 May 2025, available at: https://theconversation.com/range-anxiety-or-charger-drama-australians-are-buying-hybrid-cars-because-they-dont-trust-public-chargers-250281, accessed 11 July 2025; ABS, *Charger anxiety takes over from range anxiety as new worry for electric vehicle owners*, 5 February 2024, available at: https://www.abc.net.au/news/2024-02-05/electric-vehicle-ev-drivers-charger-anxiety/103408974, accessed 11 July 2025.

[32] Energy Consumers Australia, *Stepping Up: A smoother pathway to decarbonising homes*, August 2023, p 12.

[33] EVC, *Home EV charging and the grid: impact to 2030 in Australia*, August 2022, p 1.

[34] CSIRO, *Electric vehicle projections 2024*, February 2025, pp 35-36.

[35] CSIRO, *Electric vehicle projections 2024*, February 2025, p 36.

[36] This is the minimum point from 5pm-9pm.

[37] Synapse Energy Economics, *Electric vehicles are driving electric rates down*, December 2022, pp 1-4.

[38] RTE, Integration of electric vehicles into the power system in France, May 2019, p 8.

[39] S&P Global, *Dutch government acts as power networks near peak overload*, 20 October 2023, available at: https://www.spglobal.com/commodity-insights/en/news-research/latest-news/energy-transition/102023-dutch-government-acts-as-power-networks-near-peak-overload, accessed 11 July 2025.

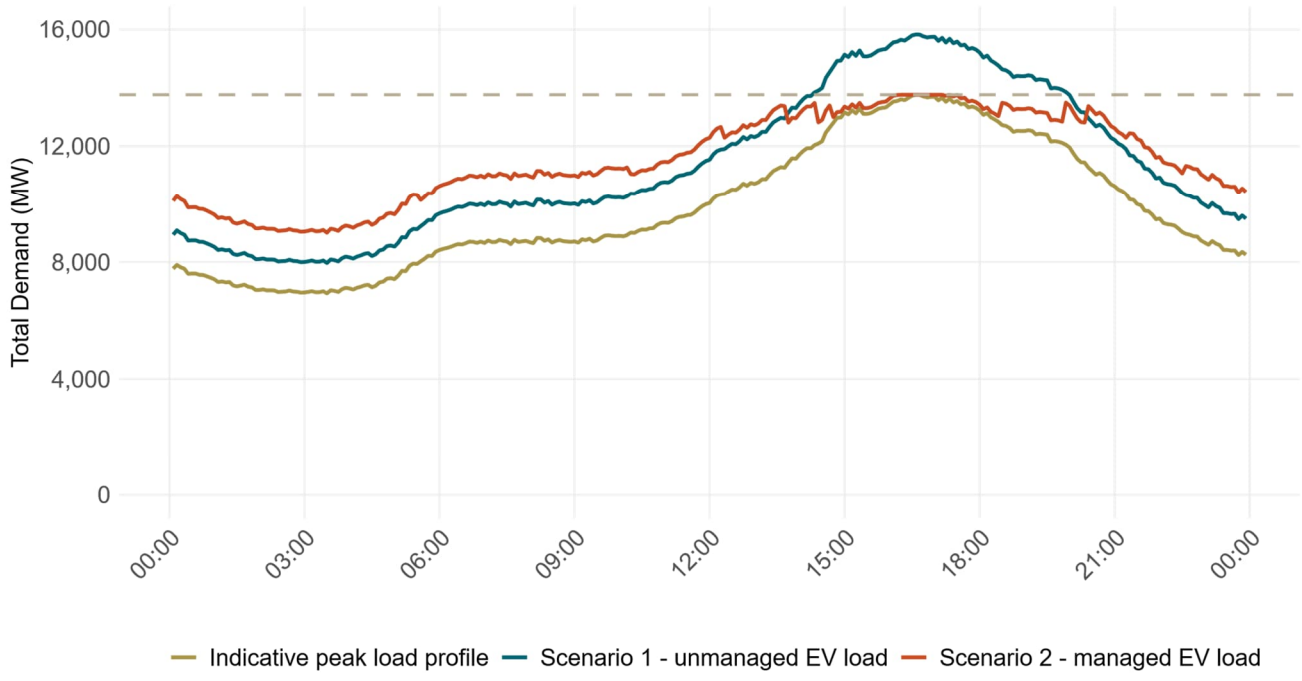
United Kingdom is addressing).[40] This highlights that positive consumer charging behaviour is required to increase network utilisation without increasing network peak load, and the potential role of policy and network pricing measures to drive this behaviour.

In Australia, distribution and transmission network businesses in Australia are already proposing investment to handle increases in peak demand caused by EVs. For example, AusNet is anticipating that EVs will increase network peak demand by three per cent by 2031 and five per cent by 2035, after assuming demand management for five per cent of the total EV fleet.[41]

Current EV owners in Australia are 'early adopters', and any behavioural trends in charging may change as EV technology reaches the mainstream.[42] In addition, there is very limited data on how EV owners use public EV charging infrastructure, including whether this occurs at the same time as home charging. Accordingly, it is difficult to conclude the potential impact of public EV charging infrastructure on network utilisation.

Nevertheless, done right, level 2 public EV charging infrastructure can prompt use of excess network capacity during off-peak periods, improving overall grid efficiency and reducing the need for network augmentation, thereby decreasing network tariffs for all consumers.[43] We set out an example of this in figure 2.10 below.

Figure 2.10: Indicative daily load profile – NSW summer, plus 15 per cent load



In contrast, public DC EV charging infrastructure presents a substantial risk to increasing peak network use, which is one of the main drivers behind network augmentation expenditure. This arises due to the possibility

[40] Electric Insights, *Electric vehicles and heat pumps are reshaping power demand*, 2025, available at: https://reports.electricinsights.co.uk/q1-2025/electric-vehicles-and-heat-pumps-are-reshaping-power-demand/, accessed 11 July 2025.

[41] AusNet, *Electric vehicle strategy – 2026 to 2031*, 31 January 2025, pp 7-8.

[42] EVenergi, *EV owner demographics and behaviours – results of EVenergi's relevant surveys*, October 2023, p 6.

[43] Energy Consumers Australia, *Stepping Up: A smoother pathway to decarbonising homes*, August 2023, p 12; Synapse Energy Economics, *Electric vehicles are driving electric rates down*, December 2022, pp 1-4.

of charging hotspots to occur in localised areas of the network, particularly as higher levels of charging infrastructure are adopted and EV penetration increases.[44]

[44] EVenergi, *Managing the impacts of renewably powered electric vehicles on electricity distribution networks*, 2019, p 9.

3. A fragmented EV charging infrastructure market is not in the best interest of consumers

The public EV charging infrastructure supply chain involves distinct functional roles including charging infrastructure owners, charging infrastructure providers, charging infrastructure maintainers, electricity retailers and e-mobility service providers (EMSPs). In practice, current business models in Australia often consolidate multiple functional roles within a single organisation.

Distribution network service providers (DNSPs), as monopoly providers of regulated electricity distribution services, are prevented under the National Electricity Rules (NER) from providing contestable services, including public EV charging infrastructure. CitiPower, Powercor and United Energy is proposing a ring-fencing waiver to operate 100 public EV chargers to obtain data to support demand management innovations.

The current AC and DC markets have a range of disparate business models, funding structures and involvement from state and local governments. Inconsistent network capacity planning and site suitability assessment is hindering market development. Nevertheless, valuable lessons are arising from local trials that should inform broader market development.

We have an opportunity to learn from international experience which demonstrates that a fragmented EV charging infrastructure market, being a market with several discrete networks that are not interoperable and that has developed with a lack of centralised planning, is not in the best interest of consumers. We should leverage international lessons to develop an optimal public EV charging infrastructure network in Australia.

In this section, we provide an overview of public EV charging infrastructure development in Australia and overseas. Specifically, we:

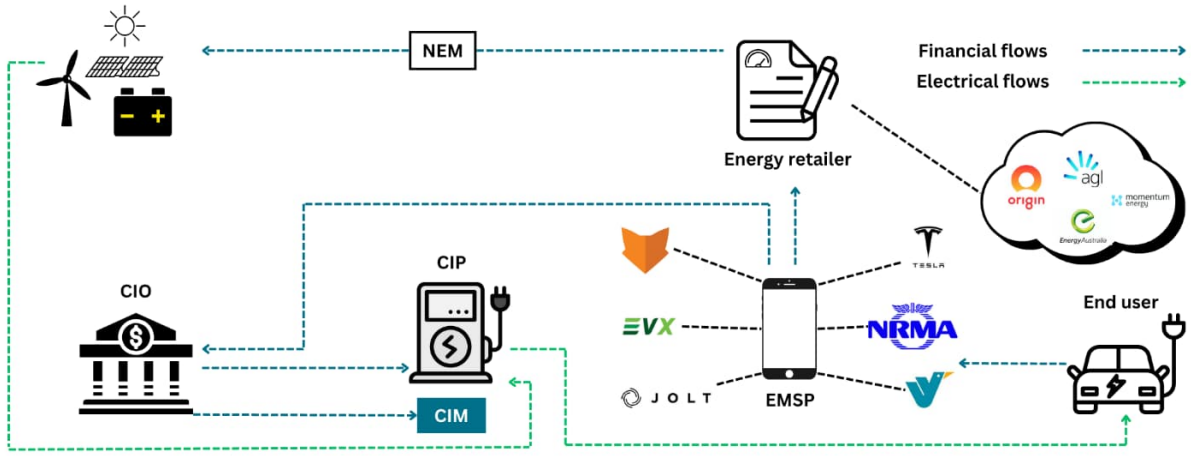
- provide an overview of the public EV charging infrastructure supply chain;
- set out the regulatory settings related to public EV charging infrastructure development in Australia;
- summarise the planning arrangements for public AC and DC charging infrastructure;
- summarise the current state of the public AC and DC EV charging infrastructure markets in Australia; and
- explain using international lessons that a fragmented EV charging infrastructure market is not in the best interest of consumers.

3.1 Overview of the public EV charging infrastructure supply chain

To establish a foundation for analysing EV charging infrastructure, this section identifies all functional roles for delivering electricity to EV consumers through public charging networks – see figure 3.1. In practice, current business models often consolidate multiple functional roles within a single organisation.

We note that we have intentionally avoided the use of the term ‘charge point operator’, given the lack of consistent definition of this term across the industry. We have also simplified the interaction of the electricity retailer with the national electricity market (NEM) to focus on the key elements of the supply chain for delivering electricity to consumers.

Figure 3.1: Functional roles for delivering electricity to EV consumers through public charging networks



3.1.1 Charging infrastructure owner (CIO)

The charging infrastructure owner (CIO) is the party responsible for purchasing the infrastructure, including where and how many units to install, what specification those units should be and who to procure the infrastructure from.

The charging infrastructure owner will also seek the full range of approvals required to install charging infrastructure, including:

- development/installation approvals from the land-owner or local government; and
- network capacity and pole suitability approvals to connect the infrastructure to the distribution network from the DNSP;

The charging infrastructure owner funds the installation and retains ownership of that charging infrastructure. There are several methods of cost recovery for that infrastructure, including:

- adding a 'margin' on the sale of electricity or access to infrastructure, through the charging infrastructure point;
- obtaining grant funding (such as government grants) to build that infrastructure; or
- for DNSPs, inclusion of expenditure in the regulatory asset base and recovery through network tariffs.[45]

The charging infrastructure owner is responsible for appointing the charging infrastructure provider, who installs the assets, and the charging infrastructure maintainer, to maintain the assets.

3.1.2 Charging infrastructure provider (CIP) and charging infrastructure maintainer (CIM)

Once the charging infrastructure owner purchases the hardware, the charging infrastructure provider installs that hardware. The charging infrastructure provider can also monitor the hardware to provide real time maintenance requirements back to the charging infrastructure owner via an open charge point protocol (OCPP).

[45] We acknowledge that the ringfencing guidelines prevent DNSPs from owning and operating charging infrastructure, which is discussed in further detail in section 3.2.1.

The charging infrastructure maintainer contracts with the charging infrastructure owner to maintain the hardware, typically consistent with the achievement of a desired level of infrastructure availability.

3.1.3 Electricity retailer

The electricity retailer interfaces with the National Electricity Market (NEM), purchasing electricity from the wholesale market for sale to end-users, typically under a retail contract. Electricity retailers act as the financially responsible market participant (FRMP) for transactions, being responsible for the settlement of any purchase of energy from the NEM or generation of energy to the NEM through that connection point.[46]

Currently, only one retailer can access each connection point, as one party needs to be financially responsible for settling all transactions at that connection point. Customers may transfer electricity retailers within two days.[47]

The retailer at a connection point can be appointed by either the charging infrastructure owner or the e-mobility service provider (EMSP).

3.1.4 E-mobility service provider (EMSP)

EMSPs are the interface between the charging infrastructure, the energy retailer and the end consumer. EMSPs are responsible for collecting payment from end customers – accordingly, they also determine the price faced by an end customer for charging at a particular location.

EMSPs typically operate as a mobile application, but may also facilitate payment through a physical location (eg, fast chargers at a petrol station), Radio-Frequency Identification (RFID) tags or touch-and-go credit card payments.

Multiple EMSPs can connect to a single charging infrastructure point through the open charge point interface. However, most established charging infrastructure points only have a single EMSP.

3.2 Regulatory settings related to public EV charging infrastructure development

The development and operation of public EV charging infrastructure is affected by several important regulations applying to the NEM, and in particular the ring fencing guidelines, shared asset rules and metering rules. We note that the regulatory landscape is different in other jurisdictions, such as the Wholesale Electricity Market (WEM) in Western Australia, and so the arrangements that affect development of public EV charging infrastructure may be different.

3.2.1 Ring fencing guideline

DNSPs, as monopoly providers of regulated electricity distribution services, are prevented under the National Electricity Rules (NER) from providing contestable services.[48]

The AER publishes the Electricity Distribution Ring-fencing Guideline (ring-fencing guideline) under cl 6.17.2 of the NER. The ring-fencing guideline's objective is to:[49]

- promote the national electricity objective by providing for the accounting and functional separation of the provision of direct control services by DNSPs from the provision of all other services by them, or their affiliated entities; and

[46] Each connection point has a unique (national metering identifier).

[47] AEMC, *National Electricity Amendment (Reducing Customers' Switching Times) Rule 2019*, Rule determination, 19 December 2019, pp i-ii.

[48] AER, *Ring-fencing Guideline Electricity Distribution – version 4*, February 2025, p 7.

[49] AER, *Ring-fencing Guideline Electricity Distribution – version 4*, February 2025, p 1.

- promote competition in the provision of electricity services.

The ring-fencing guideline imposes obligations on DNSPs targeted at, among other things:[50]

- cross-subsidisation, with provisions that aim to prevent a DNSP from providing other services that could be cross-subsidised by its distribution services; and
- discrimination, with provisions that aim to:
  - prevent a DNSP conferring a competitive advantage on its related electricity service providers that provide contestable electricity services; and
  - ensure a DNSP handles ring-fenced information appropriately.

The ring-fencing guidelines prevent DNSPs from directly owning and operating EV charging infrastructure by requiring strict separation between their regulated distribution services and contestable electricity services. Subject to ring-fencing separation, subsidiary businesses owned by DNSPs can provide contestable services. DNSPs must obtain a waiver from the AER to breach the ring-fencing provisions of the NER.

The ring-fencing rules prevent DNSPs from cross-subsidising EV charging infrastructure investments with revenues from their regulated network operations, ensuring that charging infrastructure competes on commercial terms rather than benefiting from regulated revenue streams.

Additionally, the guidelines prohibit DNSPs from leveraging their privileged access to network information or infrastructure to gain unfair competitive advantages in the contestable EV charging market, thereby promoting competition among independent charging service providers.

3.2.2 Shared asset rules

The shared asset rules cover when an asset is used to provide both standard control services and either:[51]

- unclassified distribution services; or
- services that are neither distribution services nor services provided in connection with dual function assets.

The shared asset rules allow the AER to reduce a DNSP's annual revenue requirement to reflect part of the cost of that asset being recovered from the provision of non-standard control services. In making this determination, the AER must consider the shared asset principles and shared asset guidelines.[52]

The shared asset principles include that:[53]

- the DNSP should be encouraged to use assets that provide standard control services for other services where that use is efficient and does not prejudice provision of those services;
- a shared asset cost reduction should be applied where the use of the asset for non-standard control services is material (ie, expected to exceed 1 per cent of the annual revenue requirement)[54];
- a shared asset cost reduction should be compatible with the cost allocation principles and cost allocation method; and
- any reduction in annual revenue requirement should be compatible with other incentives provided under the rules.

[50] AER, *Ring-fencing Guideline Electricity Distribution – version 4*, February 2025, p 1.

[51] NER, cl 6.4.4.

[52] NER, cl 6.4.4.

[53] NER, cl 6.4.4.

[54] Note, this materiality threshold applies except for stand alone power systems (SAPS) – see: AER, *Shared asset guidelines*, June 2025, cl 2.4(b).

The shared asset guidelines provide that, for determining shared asset cost reductions, a cost reduction will reduce a service providers standard control revenues by 10 per cent of the value of the service provider's expected total unregulated revenues from shared assets in that year,[55] which the AER may cap to the sum of the service provider's return on and of capital for their shared assets.[56]

The shared asset rules aim to provide financial incentives for DNSPs to efficiently utilise their network assets for public EV charging infrastructure by allowing dual-purpose use where it does not compromise standard distribution services.

3.2.3 Metering rules

Under the current metering rules, metering providers must have minimum specifications in line with a type meter. PLUS ES has a trial waiver to install and operate meters that are non-compliant with the metering rules for public EV charging infrastructure, which we discuss in section 3.4.1.

Upcoming changes to the metering rules will allow market participants to use accredited in-built measurement capability in technology such as EV chargers, which have lower minimum specifications than type four meters.[57] This is expected to deliver up to $100 million in benefits over 20 years.[58]

The metering rules under the NER currently only allow one financially responsible market participant (FRMP) for settlement purposes at each national metering identifier (NMI), or metering point.

Changes to the NER to facilitate flexible trading are coming into place in 2026 through the Australian Energy Market Commission's (AEMC's) rule change.[59] For large customers, these changes will allow multiple FRMPs to operate at a single connection point, but each FRMP must be separately metered.[60] There must also be a parent meter that conforms with the metering rules, behind which secondary meters may sit. We understand from stakeholder engagement that public EV charging infrastructure are unlikely to be classed as large customers.

The AEMC states that in the future, the ability to have one or more settlement points at a single connection point could allow deployment of floating NMIs,[61] which are not covered by current rule changes, but that could allow either:

- multiple retailers to access the same meter at a charging point; or
- the EV to act as a meter and NMI, having a retailer assigned to it and measuring its own electricity flows.

Specifically, the AEMC states:[62]

> The Commission considers that these rules also provide a foundation for emerging and innovative [consumer energy resources] CER products and services to be deployed in the NEM. In the future, the ability to have one or more settlement points at a single connection point could make it easier for peer-to-peer electricity trading to move from virtual platforms to being integrated into the NEM,

[55] AER, *Shared asset guidelines (version 2)*, June 2025, cl 3.1(d).

[56] AER, *Shared asset guidelines (version 2)*, June 2025, cl 3.3.

[57] AEMC, *National Electricity Amendment (Unlocking CER benefits through flexible trading) Rule 2024*, Rule determination, 15 August 2024, paras 36-40.

[58] Energeia, *Measuring energy flows from in-built technology (streetlights, EV chargers, other street furniture) analysis*, Final report, 15 August 2024, p 19.

[59] AEMC, *National Electricity Amendment (Unlocking CER benefits through flexible trading) Rule 2024*, Rule determination, 15 August 2024.

[60] AEMC, *National Electricity Amendment (Unlocking CER benefits through flexible trading) Rule 2024*, Rule determination, 15 August 2024, pp 14-15 and 17-18.

[61] AEMC, *National Electricity Amendment (Unlocking CER benefits through flexible trading) Rule 2024*, Rule determination, 15 August 2024, para 21.

[62] AEMC, *National Electricity Amendment (Unlocking CER benefits through flexible trading) Rule 2024*, Rule determination, 15 August 2024, para 21.

> and for floating or roaming National Meter Identifier (NMIs) to be deployed, which could be used to offer a consumer one bill capturing EV charging consumption across multiple locations. The Commission will continue to take into account arrangements that encourage innovative product development as we work with counterparts to deliver actions under the National CER Roadmap.

Across the NEM but excluding Victoria, FRMPs are required to appoint a metering coordinator for all of their connection points, with large customers able to appoint their own metering coordinator.[63] In Victoria, the local network service provider is appointed as the metering coordinator for relevant metering installations, including meters for public EV charging infrastructure.[64]

The current metering rules constrain EV charging infrastructure business models by allowing only one FRMP per metering point, limiting the ability of charging operators to offer flexible retail arrangements or competitive pricing from multiple energy suppliers.

3.3 Planning arrangements for public AC and DC EV charging infrastructure

Effective planning for public EV charging infrastructure requires careful consideration of network capacity, strategic site selection, and community acceptance. However, significant information gaps and inconsistent approaches currently hinder these planning processes.

This section examines the challenges facing charging infrastructure owners in accessing essential network capacity data, identifying suitable locations, and navigating the complex stakeholder landscape involving DNSPs and state and local governments.

3.3.1 Network capacity planning

Understanding network capacity is essential for charging infrastructure owners to avoid lodging applications with DNSPs that are inevitably going to be denied due to insufficient capacity on the network. Currently, unless they make it publicly available, DNSPs are the only parties with sufficient information to support rapid assessments of the hosting capacity for public EV charging infrastructure.

Across the NEM, there is no consistent approach to publicly disclosing network capacity information.

Essential Energy has published a network-specific capacity tool to assist in identifying the most suitable locations for EV charging on its network.[65] The EVC highlights that Essential Energy's tool to provide insight into the estimated capacity on its low voltage network is great for rapid assessment of site suitability, which likely increases the probability of successful applications and reduces the total number of individual applications.[66]

Other DNSPs have published similar tools, although these are at a less granular level and may not be sufficient for rapid assessment of network hosting capacity. In addition, there are no mandates for DNSPs to publish this information, nor any standardisation of that information between networks. For example, South Australia Power Networks has a network visualisation portal for grid capacity,[67] and the New South Wales

[63] AER, *Compliance with new metering rules requirement to appoint a metering coordinator*, 9 March 2018, available at: https://www.aer.gov.au/news/articles/communications/compliance-new-metering-rules-requirement-appoint-metering-coordinator, accessed 13 July 2025.

[64] *Victorian Government Order-In-Council, No. S 346*, 12 October 2017, cl 4.

[65] Essential Energy, *Install an EV charger*, available at: https://www.essentialenergy.com.au/our-network/electric-vehicles/electric-vehicle-charging-connection-guide, accessed 13 July 2025.

[66] EVC, *EVC response to: Energy Security Board – Benefits of increased visibility of networks – consultation paper*, August 2023, p 2.

[67] South Australia Power Networks, *New network visualisation portal launched*, 19 June 2023, available at: https://www.sapowernetworks.com.au/data/315234/new-network-visualisation-portal-launched/, accessed 13 July 2025.

DNSPs have in conjunction with the New South Wales government published a New South Wales network hosting capacity opportunities map.[68]

Accordingly, charging infrastructure owners can often only find sufficient information to conduct a rapid assessment of network hosting capacity through informal engagement with DNSPs or by lodging connection requests and observing whether their application gets approved or declined. This increases the effort to prepare and number of connection requests charging infrastructure owners must lodge.

Overseas, this issue is handled through regulatory requirements requiring publication of network hosting capacity. For example, in the European Union distribution network operators are required to publish and update at least quarterly information with 'high spatial granularity' on their network hosting capacity.[69]

There is currently no standardised definition or presentation of information pertaining to network hosting capacity We note Energy Consumers Australia's Integrated Distribution System Planning (electricity) (IDSP) rule change request and the AEMC's corresponding consultation paper may change this, though the timing of any standardised presentation of that information may not occur until July 2027 (or later, if DNSPs do not comply with the network data and insights roadmap).[70]

3.3.2 Site suitability

Strategic location for EV charging infrastructure

Governments have an important strategic role in considering the appropriate locations for EV charging networks.

The New South Wales government has also published maps of existing EV charging infrastructure, and strategic areas suitable for future EV charging infrastructure.[71] This is helpful for applicants to assess the likely suitability of areas for public EV charging infrastructure, and where funding applications are likely to be granted. However, these maps have not been combined with network capacity, such as Essential Energy's network capacity tool.

The Victorian and Queensland governments have published some resources for existing/planned government-funded EV charging infrastructure,[72] but have not published documents for EV charging infrastructure owners to determine strategic locations for EV charging infrastructure.

Site suitability and social license for charging infrastructure

Local government has an important role in locations for EV charging infrastructure, as they know their local areas and can best engage with communities to ensure there is social license for infrastructure. In particular, we understand from stakeholder engagement that some communities and pockets within communities have concerns with parking spaces being taken for dedicated EV carparking.

Most local governments have not undertaken an assessment or published maps of where they are agreeable to public EV charging infrastructure being located in their communities. This is an activity that would likely

[68] NSW DNSPs and NSW government, *NSW network hosting capacity opportunities map*, available at: https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f1d4c73ef5df4c6a937d93618b264309, accessed 13 July 2025.

[69] Directive 2019/944, *Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU*, Article 31.

[70] Energy Consumers Australia, *Integrated Distribution System Planning (electricity) rule change request*, 22 January 2025; AEMC, *National Electricity Amendment (Integrated Distribution System Planning) Rule 2026*, Consultation paper, p 18.

[71] NSW government, *EV maps*, available at: https://nswmaps.evenergi.com/, accessed 13 July 2025.

[72] Victoria Government, *Destination Charging Across Victoria Program*, available at: https://www.energy.vic.gov.au/grants/destination-charging-across-victoria-program, accessed 14 July 2025 and Queensland Government, *Queensland's Electric Super Highway*, 16 June 2025, available at: https://www.qld.gov.au/transport/projects/electricvehicles/super-highway, accessed 13 July 2025.

significantly expedite interest in installing public EV charging infrastructure, as it would reduce the effort and timeframes required to deliver that infrastructure.

We have heard from local governments that they are in various stages of their EV charging infrastructure journey. Many of them do not know how to assess locations for suitability, and there are no publicly available guidelines to assist with their assessment.

Overseas, in Germany, parties (including governments) with land suitable for hosting public EV charging infrastructure can upload site information on a centralised map, for matching with EV charging infrastructure providers.[73] This can include information on tendering for building public EV charging infrastructure.

Pole suitability for AC charging infrastructure

Pole requirements for AC charging infrastructure are strict, and involves finding wooden poles in good condition, preferably with streetlights, and with no impeding footpath, high voltage air-break switches, underground to overhead cable attachments, earth down leads, pole top transformers or overhead mains/cables.[74]

Intellihub's pole assessment tool assists charging infrastructure owners or local governments to assess pole suitability.[75] However, this tool and guidelines were prepared for a limited segment of metropolitan Sydney and may not be appropriate for other areas.

Essential Energy's overlaid map of poles is also helpful for matching network capacity to poles.[76] However, this map does not at this stage cover which poles are suitable to host EV charging infrastructure.

In general, there is a lack of information or uniform standards for assessing pole suitability across Australia.

3.4 State of the public EV charging infrastructure market in Australia

Australia's public EV charging infrastructure market is currently characterised by diverse business models and ownership structures, with various trials and pilot programs testing different approaches to deployment and operation. In this section, we examine the current state of both the AC and DC charging markets in Australia, including local government-led initiatives, DNSP trials and government grant programs.

3.4.1 Public AC charging infrastructure market

The nascent public AC charging infrastructure market in Australia has multiple trials testing different ownership and operating models for infrastructure deployment. The majority of Australia's AC charging infrastructure development to date has been concentrated in New South Wales, followed by Victoria.[77] Figure 3.2 summarises some of the current entities involved in the AC charging infrastructure market in Australia, excluding DNSPs, councils and governments.

[73] Flächentool, Map, available at: https://flaechentool.de/map, accessed 13 July 2025.

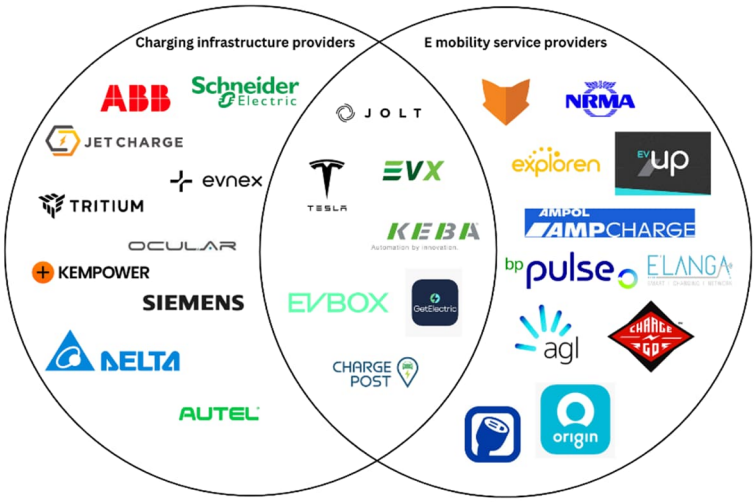
[74] Intellihub, *Street Light Pole EV Charger Project 2021/ARP002 – M2 Knowledge Sharing Report*, December 2022, pp 20-28.

[75] Intellihub, *Street Light Pole EV Charger Project 2021/ARP002 – M2 Knowledge Sharing Report*, December 2022, p 28.

[76] Essential Energy, *Install an EV charger*, available at: https://www.essentialenergy.com.au/our-network/electric-vehicles/electric-vehicle-charging-connection-guide, accessed 13 July 2025.

[77] Drive, *These are the most EV-friendly states in Australia*, 13 April 2024, available at: https://www.drive.com.au/caradvice/how-many-ev-chargers-in-australia-2024/ accessed 13 July 2025.

Figure 3.2: Current entities in the AC charging infrastructure market in Australia, excluding DNSPs and governments



To date there have been a range of initiatives from council-led networks and DNSP trials to private sector partnerships, each exploring distinct approaches to infrastructure ownership, operation, and regulatory frameworks. We summarise some of these initiatives in the remainder of this section.

Charging the East trial

The Charging the East initiative commenced in 2019 as a joint effort by three Sydney eastern suburbs councils (Waverley, Woollahra and Randwick) to establish a network of council owned kerbside public EV charging stations.[78] Randwick city council had 40 charging spaces in 2024, which is expected to increase to 140 by the end of 2025. The three councils network is expected to deliver 250 council owned charging spaces by the end of 2025.[79] The councils have also committed to facilitate private companies who have been awarded state government EV grants to install additional charging points.[80]

The infrastructure is principally comprised of kerbside level 2 AC chargers with power ratings of 7-22 kilowatts, but it also includes some level 3 fast DC chargers.[81]

Under the trial, the three councils own the charging infrastructure, making investment decisions regarding quantity, technology and location of installation whilst seeking development approvals and managing land access. However, the councils are awarding the installation, operation, maintenance and EMSPs for these EV chargers to third party licensees. The council has appointed JETCharge to install and manage the charging stations, and Chargefox as the EMSP.[82]

[78] Randwick City Council, *Leading the Charge – Eastern Suburbs Electric Vehicle Infrastructure Strategy 2023*, October 2023, p 5.

[79] Randwick City Council, *Sneak peek at new EV charging locations*, 21 August 2024, available at: https://www.randwick.nsw.gov.au/about-us/news/news-items/2024/august/sneak-peek-at-new-ev-charging-locations, accessed 13 July 2025.

[80] Randwick City Council, *Leading the Charge – Eastern Suburbs Electric Vehicle Infrastructure Strategy 2023*, October 2023, p 19.

[81] Randwick City Council, *Leading the Charge – Eastern Suburbs Electric Vehicle Infrastructure Strategy 2023*, October 2023, pp 14-15.

[82] Waverley Council, *Eastern suburbs councils powering ahead with public electric vehicle charging stations*, 5 June 2019, available at: https://web.archive.org/web/20250417114524/https://www.waverley.nsw.gov.au/top/news_and_media/media_releases/all/2019/eastern_suburbs_councils_powering_ahead_with_public_electric_vehicle_charging_stations, accessed 13 July 2025.

Intellihub trial

The Australian Renewable Energy Agency (ARENA)/Intellihub pole-top EV charger pilot operated from 2021 to 2024 with the objective of providing a blueprint for how DNSPs, local councils and investors could implement street-side EV charging using existing power pole infrastructure, including ascertaining technical, regulatory, engineering, community and commercial lessons to inform development of the market.[83]

The project deployed 50 public EV charging stations across eight council areas within the Ausgrid network.[84] Originally, the infrastructure was intended to comprise level 2 AC 7.5 kW EV chargers mounted to street-side power poles but was revised to 22kW chargers to be more 'forward looking'.[85] In undertaking these investments, Intellihub found through DNSPs and its installation partner that:[86]

- whilst deployment on street lighting poles is common overseas, Australia's infrastructure favours delivery on power poles, principally due to its street lighting poles being too old; and
- it is cheaper to install on wooden rather than metal poles, with the potential savings being approximately $250/pole.

The total cost of the project was $2.04 million, of which $871,000 was funded by ARENA.[87] Intellihub owns and operates the charging infrastructure during the pilot phase, with the potential to transfer ownership to councils post-trial.[88] In engaging third party providers for the installation of the chargers, Intellihub engaged Schneider Electric to provide the charging hardware and EVSE as the EMSP through its Exploren software platform to manage the customer interface, data collection and billing processes.[89]

Citipower, Powercor, and United Energy ring-fencing waiver application

The three DNSPs in Victoria - CitiPower, Powercor and United Energy (CPU) – have lodged a ring-fencing waiver with the AER to conduct a trial to own, install and maintain 100 kerbside EV chargers in its distribution areas, to collect data to support demand management services.[90] The chargers will be 22kW chargers.[91] The AER has not yet approved the ring-fencing waiver, and there are significant stakeholder concerns with CPU's proposal.[92]

In its ring fencing waiver application, CPU claims that DNSPs are best placed to deliver kerbside EV charging infrastructure, ie:[93]

> Third-party operators aiming to establish EV charging networks face significant barriers, particularly due to regulatory delays and the complexity of obtaining necessary approvals…

[83] Intellihub, *Intellihub Street Power Pole EV Charger with Grid Integration*, 22 March 2023, available at: https://arena.gov.au/projects/intellihub-street-power-pole-ev-charger-with-grid-integration/, accessed 13 July 2025.

[84] Hon Chris Bowen MP, *Power pole EV chargers switched on across NSW*, 7 November 2023, available at: https://minister.dcceew.gov.au/bowen/media-releases/power-pole-ev-chargers-switched-across-nsw, accessed 13 July 2025.

[85] Intellihub, *Street Light Pole EV Charger Project 2021/ARP002 – M2 Knowledge Sharing Report*, December 2022, p 4.

[86] Intellihub, *Street Light Pole EV Charger with Grid Integration Project*, July 2022, p 13.

[87] Hon Chris Bowen MP, *Power pole EV chargers switched on across NSW*, 7 November 2023, available at: https://minister.dcceew.gov.au/bowen/media-releases/power-pole-ev-chargers-switched-across-nsw, accessed 13 July 2025.

[88] Intellihub, *Intellihub Street Power Pole EV Charger with Grid Integration*, 22 March 2023, available at: https://arena.gov.au/projects/intellihub-street-power-pole-ev-charger-with-grid-integration/, accessed 13 July 2025.

[89] Intellihub, *Street Light Pole EV Charger with Grid Integration Project,* July 2022, p 11.

[90] CitiPower, Powercor and United Energy, *Application for a Ringfencing Waiver – Electric Vehicle Charging Infrastructure Project*, 17 December 2024, pp 3 and 6.

[91] Powercor, *Australian-first plan to install safer, more reliable EV charging on power poles*, 19 December 2024, available at: https://www.powercor.com.au/media-and-resources/media-centre/australian-first-plan-to-install-safer-more-reliable-ev-charging-on-power-poles/, accessed 13 July 2025.

[92] For example, see: EVX, *Submission Opposing the DNSPs' Ring-Fencing Waiver Application for Electric Vehicle Charging Infrastructure (EVCI)*, n.d.; Evie Networks, *Evie Networks Response to AER Consultation*, 13 June 2025.

[93] CPU, *Application for a ringfencing waiver – electric vehicle charging infrastructure project*, December 2024, pp 10-11.

> Networks, however, are uniquely positioned to address these barriers by leveraging our existing infrastructure and expertise.

CPU expects the trial to cost approximately $1.2 million to install the necessary charging infrastructure. CPU plans to explore the possibility of funding the rollout through the demand management innovation allowance mechanism, and to share costs for EV infrastructure maintenance in accordance with its existing cost allocation mechanism, noting that it will log time for maintenance of EV charging infrastructure to a separate job code. CPU notes it does not plan to become the provider of last resort for EV charging infrastructure.[94]

CPU proposes to install 80 chargers in high demand areas, where EV adoption is already large, though notes it has also considered the availability of off-street parking and balanced coverage of metropolitan and regional areas. The locations of the remaining 20 chargers will be determined based on consultation with the Victorian Government and local councils considering various factors such as:[95]

- local EV ownership growth trends;
- proximity to major roadways and public facilities; and
- regional and suburban coverage areas.

PLUS ES trial waiver for non-compliant meters

PLUS ES, a ringfenced entity part-owned by Ausgrid, has received approval from the AER under a trial waiver to install up to 1,000 7-22kW kerbside, pole-mounted EV chargers with within-charger smart meters (that are non-compliant with the metering rules) across New South Wales and South Australia over a five year period.[96] The trial waiver is only for the non-compliance with metering rules, as PLUS ES is already permitted to undertake charger and metering installations.

Under the trial, PLUS ES will own, operate and maintain the charging infrastructure. However, PLUS ES proposes to provide access to multiple EMSPs for each pole. EMSPs will then be able to designate their retailer, or allow users to select their retailer through their app.

PLUS ES will lease space from Ausgrid and South Australia Power Networks under arms-length commercial arrangements. Ausgrid will not prioritise applications from PLUS ES over other CIOs.

Ausgrid's response to New South Wales parliamentary inquiry

More generally, Ausgrid is proposing to deliver 11,000 DNSP owned and maintained 7kW public EV chargers across its network over the coming years.[97] Specifically, Ausgrid states:[98]

> Ausgrid is committed to supporting government and industry efforts to increase the uptake of EVs. There are over 52,000 EVs in our network area and we forecast this will grow to around 600,000 EVs by 2030. We currently manage and maintain 440,000 power poles across the Sydney Basin, Central Coast, Newcastle, and Upper Hunter. We believe that we can help deliver a significant portion of the 38,000 public EV charging ports the CSIRO estimates will be needed in [New South Wales] NSW by 2030 by installing EV chargers on our power poles. Our existing network infrastructure, already readily accessible in kerbside locations, and expert workforce can be leveraged immediately to roll-out accessible and affordable public charging options across our network. If enabled to do so, we can dramatically and rapidly increase the availability of charging

[94] CPU, *Application for a ringfencing waiver – electric vehicle charging infrastructure project*, Supplementary report, May 2025, pp 3-6.

[95] CPU, *Application for a ringfencing waiver – electric vehicle charging infrastructure project*, December 2024, p 7.

[96] AER, *Decision – PLUS ES trial waiver*, Final decision, March 2025, pp 4-5.

[97] Ausgrid, *Ausgrid submission to the NSW Parliamentary Inquiry on infrastructure for electric and alternative energy source vehicles*, 2 May 2025, p 3.

[98] Ausgrid, *Ausgrid submission to the NSW Parliamentary Inquiry on infrastructure for electric and alternative energy source vehicles*, 2 May 2025, p 1.

> infrastructure, giving [New South Wales] NSW consumers the confidence to invest in and benefit from EVs sooner and support NSW's broader decarbonisation efforts.

To deliver these public EV chargers, Ausgrid proposes that the NSW government amends the *Electricity Supply Act 1995 (NSW)* to enable installation of kerbside EV chargers as a Standard Control Service of New South Wales DNSPs, which would provide a derogation to the National Electricity Law and Rules.[99]

Ausgrid proposes to operate the chargers as 'neutral hosts' allowing any EMSP to use the chargers at no cost.[100] It is not clear from the existing rules and incoming rule changes how competition between multiple EMSPs would be facilitated, given the current and incoming metering rules allow only one FRMP per physical metering point.

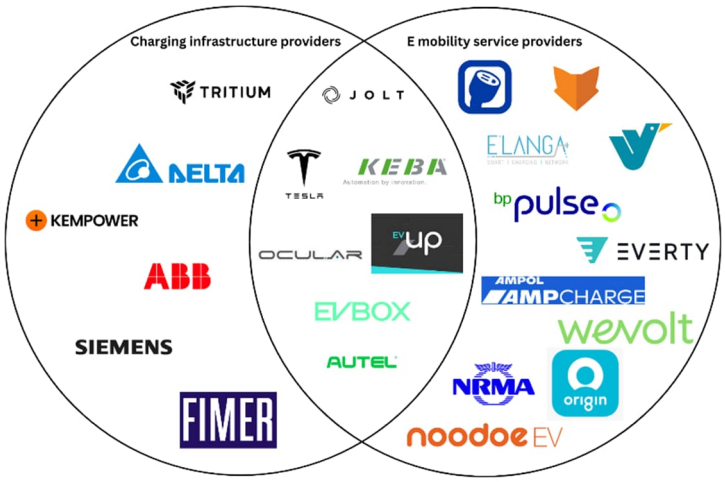
In addition, as a standard control service, Ausgrid's proposal would result in public EV charging infrastructure being rolled into the regulatory asset base, which would de-risk the roll-out for Ausgrid.

3.4.2 State of the DC EV charging infrastructure market in Australia

The Australian DC charging market is developing in a more consistent manner, with individual providers competing to provide either single sites or a network of public EV charging infrastructure to serve their customers.

The Australian DC EV charging network is comprised of chargers with power ratings ranging from 75 kilowatts to 350 kilowatts. These charging networks are typically located along major travel routes and in commercial locations like shopping centres and petrol stations to provide EV users the ability to add large amounts of range in a short period. The DC charging network is spread across Australia, although appears to be concentrated in New South Wales, Victoria and South Australia.[101]

Figure 3.3: Current entities in the DC charging infrastructure market in Australia



[99] Ausgrid, *Ausgrid submission to the NSW Parliamentary Inquiry on infrastructure for electric and alternative energy source vehicles*, 2 May 2025, p 4.

[100] Ausgrid, *Ausgrid submission to the NSW Parliamentary Inquiry on infrastructure for electric and alternative energy source vehicles*, 2 May 2025, pp 3-4.

[101] EV Charge Card, *Everything You Need to Know About Australia's Public EV Charging Networks (2024)*, 18 April 2024, available at: https://www.evchargecard.com.au/p/everything-you-need-to-know-about-australias-public-ev-charging-networks/, accessed 13 July 2025.

Some state governments in Australia have DC EV charging strategies, which aim to provide sufficient public DC charging infrastructure along major motorways, including:

- New South Wales which aims to have four fast chargers every 5km in metropolitan areas and at 100km intervals across all major New South Wales highways;[102] and
- Queensland, which aims to create an electric super highway from Brisbane to Mount Isa, Goondiwindi to Emerald, Cunnamulla to Barcaldine and Longreach to Cairns.[103]

New South Wales Department of Climate Change, Energy, the Environment and Water EV fast charging grants

The EV fast charging grants program represents a collaboration between government and the private sector to deliver 275 publicly accessible fast and ultra-fast EV chargers across New South Wales. The $149 million program aims to support Greenfield fast charging projects through co-funding with private investment.[104]

The program has operated across multiple funding rounds with different eligibility criteria and contribution levels for each geographic stream:[105]

- stages 1 and 2 focused on destination charging infrastructure to assist regional New South Wales businesses; and
- stage 3 is focusing on developing a network of public EV fast charging stations across New South Wales.

Under the program, developers submit applications to install publicly accessible EV charging infrastructure in locations across New South Wales deemed by the New South Wales government as requiring investment. Stage 3 provides differentiated funding support by location and fast-track status, ie:[106]

- standard metropolitan sites can bid for a 50 per cent contribution capped at of $300,000 per site;
- fast-track metropolitan sites can bid for a 70 per cent contribution capped at $450,000 per site;
- standard regional sites can bid for a 50 per cent contribution up to $550,000 per site; and
- remote regional sites can bid for an 80 per cent contribution up to $650,000 per site.

We understand from discussions with stakeholders that stage 3 was undersubscribed for a variety of reasons, including land access constraints, the approvals process (which required demonstrating lodgement of an initial connection inquiry with the relevant DNSP) and caps on funding for individual sites. This highlights the need to closely consider the appropriate roles and responsibilities for parties to facilitate development of EV charging infrastructure.

[102] New South Wales government, *Electric vehicle fast charging stations*, available at: https://www.energy.nsw.gov.au/households/guides-and-helpful-advice/electric-vehicle-fast-charging-stations, accessed 13 July 2025.

[103] Queensland government, *Queensland's electric super highway*, available at: https://www.qld.gov.au/transport/projects/electricvehicles/super-highway, accessed 13 July 2025.

[104] New South Wales government, *Fast charging grants*, available at: https://www.energy.nsw.gov.au/business-and-industry/programs-grants-and-schemes/electric-vehicles/electric-vehicle-fast-charging, accessed 13 July 2025.

[105] New South Wales government, *Electric vehicle destination charging grants – Round 1*, available at: https://www.nsw.gov.au/grants-and-funding/electric-vehicle-destination-charging-grants-round-1, accessed 13 July 2025; New South Wales government, *New grant rounds continue to drive EV charge in NSW*, 23 July 2024, available at: https://www.energy.nsw.gov.au/news/new-grant-rounds-continue-drive-ev-charge-nsw, accessed 13 July 2025.

[106] Each of these is an average across the total bid – individual sites can exceed the caps or percentages. See: NSW DCCEEW, *Drive electric NSW Electric Vehicle fast charging grants – funding guidelines – round 3*, June 2024, pp 71-78.

3.5 International experience demonstrates that fragmented EV charging infrastructure markets hamper user experience

International experience has demonstrated that a fragmented EV charging infrastructure market, being a market with several discrete networks that are not interoperable and that has developed with a lack of centralised planning, is not in the best interest of consumers.

In addition to interoperability concerns, fragmented EV charging infrastructure markets often result in a poor user experience through concerns with a lack of reliability of charging infrastructure and insufficient consideration of accessibility.

3.5.1 Interoperability – avoiding multiple apps

In several overseas jurisdictions including Germany and Norway, charging infrastructure is owned by different parties and only one EMSP operates at each charge point. This means that users must either:

- charge using different EMSPs, which may require maintaining multiple apps or RFID cards; or
- face limited access to charging infrastructure, as they can only use a subset of the total public EV charging infrastructure network served by their preferred EMSP.

By way of example, Norway has approximately 10 major providers of EMSP services, which favours downloading ten apps or having charging locations restricted.[107] EMSPs include fuel retailers, automotive equipment manufacturers, electricity retailers and a range of independent and energy company backed players. Because the scope of unmet need has been high, all players have gained some traction in Norway's EV charging infrastructure market. Accordingly, competition for EMSP market share is high.[108]

The United Kingdom has addressed the issue of interoperability through their Public Charge Point Regulations 2023, where all public charge points by the end of 2025 must enable consumers to pay through at least one roaming provider at their charge points.[109]

3.5.2 Reliability and up-time of charging infrastructure

In Norway, many fast charging locations have a small number of chargers at each site, which has led to queueing. These concerns are compounded by system glitches and shortfalls, including limited options for direct payment, poorly designed parking spots, short charging cables, and malfunctioning hardware. To address this issue, larger sites with higher concentrations of chargers are required.[110] This highlights the problems with poor charging stations design.

In France, there have been several problems with charger up-time. France's experience illustrates the impact of poor reliability, where publicly available information criticises the reliability of France's public EV charging

[107] Visit Norway, *Norway – the EV capital of the world*, available at: https://www.visitnorway.com/plan-your-trip/getting-around/by-car/electric-cars/, accessed 13 July 2025.

[108] Other sources of demand and profit are work charging and fleet depots. See: McKinsey & Company, *What Norway's experience reveals about the EV charging market*, 8 May 2023, available at: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/what-norways-experience-reveals-about-the-ev-charging-market, accessed 13 July 2025.

[109] United Kingdom Government, *Public Charge Point Regulations 2023 guidance*, 21 October 2024, available at: https://www.gov.uk/government/publications/the-public-charge-point-regulations-2023-guidance/public-charge-point-regulations-2023-guidance, accessed 13 July 2025.

[110] McKinsey & Company, *What Norway's experience reveals about the EV charging market*, 8 May 2023, available at: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/what-norways-experience-reveals-about-the-ev-charging-market, accessed 13 July 2025.

network, with an availability rate of only 81 per cent for AC chargers in February 2024,[111] though this improved to 93 per cent by April 2025.[112]

Reliability standards are becoming a cornerstone of user experience requirements. The United Kingdom regulations mandate that rapid public charge points must be available 99 per cent of the time, measured as an average across a charge point operator's network.[113]

3.5.3 Accessibility of EV charging infrastructure

Accessibility of public EV charging infrastructure encompasses a range of needs, including but not limited to physical access, digital literacy and payment transparency.

For physical accessibility, many jurisdictions have accessibility guidelines for public EV charging infrastructure. For example, the European Union adopts general accessibility requirements applicable to products and services for recharging and refuelling infrastructure, ie:[114]

> Transport infrastructure should allow seamless mobility and accessibility for all users, including older persons, persons with reduced mobility and persons with disabilities. In principle, the location of all recharging and refuelling stations, as well as the recharging and refuelling stations themselves, should be designed in such a way that they are accessible to and user-friendly for as much of the public as possible, in particular older persons, persons with reduced mobility and persons with disabilities. This should include, for example, providing sufficient space around the parking place, ensuring that the recharging station is not installed on a kerbed surface, ensuring that the buttons or screen of the recharging station are at an appropriate height and the weight of the recharging and refuelling cables is such that persons with limited strength can handle them with ease. In addition, the user interface of the related recharging stations should be accessible. In that sense, the accessibility requirements set out in Directive (EU) 2019/882 of the European Parliament and of the Council should be applicable to recharging and refuelling infrastructure.

For digital literacy, the United Kingdom's regulations require that the 'content and composition of remote digital platforms used for public charge point operation and usage shall be designed such that the content is accessible to a broad range of user, including font, size, colours, contrast and layout'.[115]

For payment accessibility, the United Kingdom's regulations require new public charge points of 8kW and above and existing charge points of 50kW and above to offer contactless payment options in close proximity to the public charge point.[116] This requirement will also help to assist those with limited digital literacy by allowing users to opt for a payment option which does not require a mobile application.

[111] Gireve, *123,347 charging points in France - March 2024*, 14 March 2024, available at: https://www.gireve.com/charging-points-in-france-march-2024/, accessed 13 July 2025.

[112] Gireve, *160,000 charging points in France – April 2025*, 14 April 2025, available at: https://www.gireve.com/160000-charging-points-in-france-april-2025/, accessed 13 July 2025.

[113] United Kingdom Government, *Public Charge Point Regulations 2023 guidance*, 21 October 2024, available at: https://www.gov.uk/government/publications/the-public-charge-point-regulations-2023-guidance/public-charge-point-regulations-2023-guidance, accessed 13 July 2025.

[114] Regulation 2023/1804, *Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU (Text with EEA relevance)*, para 38.

[115] Energy Saving Trust, *Summary: Electric vehicle accessible charging standard PAS 1899*, March 2023, available at: https://energysavingtrust.org.uk/wp-content/uploads/2023/03/PAS-1899-Summary_Doc_Energy_Saving_Trust.pdf, accessed 13 July 2023, p 5.

[116] United Kingdom Government, *Public Charge Point Regulations 2023 guidance*, 21 October 2024, available at: https://www.gov.uk/government/publications/the-public-charge-point-regulations-2023-guidance/public-charge-point-regulations-2023-guidance, accessed 13 July 2025.

4. Delivering public EV charging infrastructure in the best interest of consumers – a future vision

Our vision for efficient delivery of public EV charging infrastructure is to unlock three distinct benefits for consumers, ie:

- ensuring **affordability** of EV charging through minimising network upgrade costs of meeting increased load from EV uptake, costs across the supply chain, and prices for public EV charging;
- providing **availability** of public EV charging infrastructure; and
- promoting a **positive user experience** from accessing public EV charging infrastructure.

These benefits can be unlocked through efficient near and long-term investment in public EV charging infrastructure to meet current and future EV charging needs. To deliver efficient investment in public EV charging infrastructure, the ideal future EV charging infrastructure market in Australia will have:

- **competition** that drives efficient delivery of public EV charging infrastructure for consumers, including an efficient mix of AC and DC charging infrastructure recognising the interrelationships and differences between these types of charging infrastructure; and
- **incentives** for efficient, near and long-term market development.

However, given the nascent public EV charging industry and the inherent market failures in delivering public EV charging infrastructure, it is unlikely that the vision statement we describe above could be achieved without government intervention. In particular, it is likely that intervention will be required to:

- address market failures including the ability to exclude parties, the presence of information asymmetries and externalities;
- facilitate market development and overcome the 'chicken and egg' problem between EV uptake and public EV charging infrastructure development; and
- facilitate public EV charging infrastructure in areas where it would otherwise not be commercially viable.

In determining the optimal quantity of public EV charging infrastructure, there are key trade-offs that need to be considered by state and local governments, including:

- the trade-off between charging infrastructure availability and bill impacts of charging infrastructure investment; and
- the trade-off between parking exclusivity and quantity of infrastructure.

In this section, we set out a vision for delivery of public EV charging infrastructure in the best interests of consumers, including the interventions that may be required to achieve that vision and the trade-offs that must be made between public EV charging infrastructure development and consumer bill impacts.

4.1 Benefits to consumers from efficient delivery of public EV charging infrastructure – a vision statement

Our vision for efficient delivery of public EV charging infrastructure will result in three distinct benefits for consumers, ie:

- ensuring affordability of EV charging;

- providing availability of public EV charging infrastructure; and
- promoting a positive user experience from accessing public EV charging infrastructure.

4.1.1 Affordability of EV charging

The first tangible benefit from the efficient delivery of public EV charging infrastructure is affordability of EV charging, which is driven by minimising:

- network upgrade costs of meeting increased load driven by EV uptake;
- costs across the public EV charging infrastructure supply chain;
- the price of public EV charging, without cross-subsidising EV drivers;

We discuss each of these in turn below.

Minimising network upgrade costs of meeting increased load driven by EV uptake

Whilst consumers without access to home charging, whether due to the characteristics of their residence or because they are travelling, can charge at public DC fast charging stations, this:

- can be more expensive than slow charging; and
- puts more strain on the electricity network, which may require network upgrades, in some cases requiring significant capital investment.

Some consumers may be able to use public AC charging instead of DC fast charging, if that infrastructure was available. As such, strategically deployed level 2 public EV charging infrastructure would provide consumers an opportunity to avoid unnecessary use of public DC fast charging.

Where AC charging can adequately meet user needs, it avoids substantial capital investment and potential network upgrade costs required to support DC charging infrastructure. This will reduce the cost of DC infrastructure development, which can reduce the cost of EV charging for consumers, promoting EV uptake.

In addition, consistent with our discussion in section 2.5, done right, level 2 public EV charging infrastructure can prompt use of excess network capacity during off-peak periods, improving overall grid efficiency and reducing the need for network augmentation, thereby decreasing network tariffs for all consumers.[117]

However, realising these benefits is contingent on appropriate pricing structures, strategic location selection, and usage patterns that align with network capacity availability.

Minimising costs across the public EV charging infrastructure supply chain

Efficient public EV charging infrastructure development will result in lower costs of infrastructure deployment and operation across the supply chain. In particular, competition and appropriate long-term incentives will drive:

- charging infrastructure owners to deliver charging infrastructure that consumers want at the lowest cost;
- charging infrastructure owners adapting to the latest technology;
- innovative packages of EMSP services that deliver the best deals for consumers; and
- procuring the lowest price retail electricity.

[117] Energy Consumers Australia, *Stepping Up: A smoother pathway to decarbonising homes*, August 2023, p 12; Synapse Energy Economics, *Electric vehicles are driving electric rates down*, December 2022, pp 1-4.

Competition acts to ensure that charging infrastructure owners are incentivised to consider the types of public EV charging infrastructure that consumers want and to deliver that infrastructure at the lowest cost. This will decrease the cost of infrastructure deployment and so costs for consumers.

In addition, in a market that may be initially reliant on government grants, reduced cost of infrastructure deployment will facilitate more charging infrastructure for the same availability of grant funds, further stimulating EV uptake.

In a market with ever-changing battery and charging technology, it is likely that the most efficient types of EV charging infrastructure in the future will be constantly evolving. Strong competition in the charging hardware market is likely to result in lower cost and/or higher quality infrastructure being offered in the future. Appropriate incentives should be in place to ensure charging infrastructure owners procure the latest infrastructure at competitive prices, promoting affordability for consumers.

Unlocking competition between EMSPs is essential to ensure the lowest price electricity for public EV charging. Innovative packages of EMSP services will drive value for consumers, including through packages of public EV charging with other services such as home electricity, insurance or car purchase. To unlock this value, as EMSPs compete for customers they will procure retail electricity at lowest cost.

Minimising the price of public EV charging, without cross-subsidising EV drivers

Relative to a state of the world with more DC charging infrastructure, lower levels of competition and inappropriate incentives for infrastructure deployment, EV drivers will benefit from lower prices of public EV charging. Specifically, these lower prices arise from:

- the ability to access AC charging infrastructure where the use of DC charging infrastructure can be avoided, as AC charging is typically cheaper than DC charging;
- lower cost delivery and operation of public EV charging infrastructure, as AC charging infrastructure can be delivered at a significantly lower cost than DC charging infrastructure; and
- not over-investing in public EV charging infrastructure.

There are several changes to regulatory settings that would further drive down prices of public EV charging for EV drivers such as reducing/removing parking and pole rental charges. Implementing these changes would likely facilitate additional EV uptake and supercharge public EV charging infrastructure development – we discuss this further in section 6.3.

Importantly, these lower prices for public EV charging do not come from cross-subsidisation of public EV charging from general electricity consumers – they are solely derived from more efficient delivery of public EV charging infrastructure.

4.1.2 Availability of public EV charging infrastructure

Delivering public EV charging infrastructure is crucial for users without home charging access, or because they are travelling, because it influences whether EVs are a viable option to replace ICE vehicles for these consumers. An ideal future market would deliver availability of public EV charging infrastructure for all consumers, including those without access to home charging or who are travelling.

Many people live in apartments, townhouses, or rental properties and may have limited ability to access charging at home. Accordingly, without robust public EV charging infrastructure, affordable EV charging is less accessible for these consumer groups.

Based on the observed quantity of infrastructure developed to date, we believe that prevailing market failures are preventing efficient delivery of public EV charging infrastructure.

Delivering an efficient quantity of public EV charging infrastructure will involve developing a public EV charging network that:

- is sufficient to encourage EV uptake over time;
- provides users who cannot charge at home the ability to charge at a nearby public charger;
- has the appropriate mix of AC and DC infrastructure to serve consumer demand; and
- is equitable, including serving areas that have a lower propensity to purchase an EV and lower density regional areas.

However, importantly, efficient delivery also requires not over-investing in public EV charging infrastructure. As the market develops, competition is likely to assist in determining the appropriate quantity and mix of public EV charging infrastructure. Nevertheless, in the short-term and to deliver equitable charging infrastructure, balancing the appropriate quantity of public EV charging is a trade-off decision that needs to be made by government, to maximise value for consumers.

In addition, delivering an efficient quantity of public EV charging infrastructure requires that any solution does not impede private market delivery of infrastructure.

4.1.3 Promoting a positive user experience

We discuss in section 3.5 that a positive user experience is essential to driving consumer value from public EV charging infrastructure. However, the status-quo development of public EV charging infrastructure is unlikely to deliver on several essential components of the user experience.

Efficient delivery of public EV charging infrastructure includes:

- promoting interoperability of EV charging infrastructure, avoiding the need for consumers to maintain multiple apps or hunt for charging infrastructure compatible with their preferred retailer;
- ensuring reliability of public EV charging infrastructure that allows consumers peace of mind that they can charge their EV if required; and
- upholding a range of accessibility standards, including physical accessibility, digital literacy and payment accessibility.

In absence of a positive user experience from charging infrastructure, many consumers will be discouraged from making the switch from ICE vehicles to EVs.

In addition, the risks of a negative user experience are potentially larger for AC public charging, as private market players are more likely to compete to attract users to their infrastructure through a positive user experience for DC public charging infrastructure. In contrast, AC public charging is more likely to be a convenience charging opportunity and so there will likely be less emphasis on competing on the basis of the user experience. This may result in consumers preferring DC public EV charging infrastructure and underutilising AC public EV charging infrastructure, which has consequences for grid costs.[118]

We discuss the standards to unlock this positive user experience further in section 6.1.3.

4.2 How to achieve these benefits for consumers

Our objective is to promote efficient near and long-term investment in public EV charging infrastructure to meet current and future EV charging needs. To meet this objective, the ideal future EV charging infrastructure market in Australia will have:

- **competition** that drives efficient delivery of public EV charging infrastructure for consumers, including an efficient mix of AC and DC charging infrastructure recognising the interrelationships and differences between these types of charging infrastructure; and

[118] We discuss this in section 2.5.

- **incentives** for efficient, near and long-term market development.

However, given the nascent public EV charging industry and the inherent market failures in delivering public EV charging infrastructure, it is unlikely that the vision statement we describe above could be achieved without government intervention. In particular, it is likely that intervention will be required to:

- address market failures;
- facilitate market development; and
- facilitate EV charging infrastructure in areas where it would otherwise not be commercially viable.

We discuss each of these features of the public EV charging infrastructure market in further detail below.

4.2.1 Competition that drives efficient delivery of public EV charging infrastructure

Competition between firms will drive efficient delivery of public EV charging infrastructure in the best interest of consumers.

Competition is a dynamic process of rivalry whereby firms seek to maximise their profits by offering price, product and service packages to consumers that are more attractive than their rivals' offerings, whilst minimising their costs.[119] It serves the interest of consumers because firms have a strong incentive to provide what consumers want.

Competition also allows important information to be revealed that is otherwise hard to discover, including what EV charging services consumers want, how much consumers are willing to pay for those services, the best form of distribution of those services, the least cost means of providing public EV charging services and the cheapest suppliers of inputs required to provide those services.[120]

In contrast, in the absence of competition between firms in a market, consumers may:[121]

- pay more than an efficient price or their willingness to pay for public EV charging services; and/or
- end up with less or more than the efficient quantity of public EV charging infrastructure.

Competition naturally arises from a market-led delivery of infrastructure and operation, with or without government subsidies. In absence of market-led delivery, competition can be induced or proxied through:[122]

- competitive tendering for delivery of services, with appropriate funding and risk sharing mechanisms; or
- regulation, where a firm's revenue or prices are constrained to the level of a firm in a competitive market.

It is essential that competition is maximised or induced for the delivery and operation of public EV charging infrastructure, as well as for EMSP and electricity retail services, for the delivery of public EV charging infrastructure in the best interest of consumers.

We discuss the market failures that may require interventions to stimulate or induce competition in section 4.2.3.

4.2.2 Incentives for efficient long-term market development

Incentives need to be appropriate to facilitate short-term market development and also encourage development of an efficient public EV charging network in the long-term. This requires setting incentives that:

[119] Carlton, D and Perloff, J, *Modern Industrial Organisation*, Pearson Addison-Wesley, Boston, 2005, p 85.

[120] Motta, M, *Competition Policy – Theory and Practice*, Cambridge University Press, New York, 2009, pp 57; 40 and 45.

[121] Motta, M, *Competition Policy – Theory and Practice*, Cambridge University Press, New York, 2009, pp 42-43.

[122] Carlton, D and Perloff, J, *Modern Industrial Organisation*, Pearson Addison-Wesley, Boston, 2005, pp 694 and 682.

- incorporate relevant information into charging infrastructure investment decisions as it becomes available; and
- encourage innovation from all market participants in the provision of EV charging infrastructure services.

In the current developing market, information on EV charging infrastructure demand and consumer willingness to pay for EV charging infrastructure is highly uncertain. Further, the appropriate mix of AC and DC charging infrastructure is not clear, nor are the quantity or locations of EV take-up over time.

Incentives for public EV charging infrastructure investment should encourage firms to react to information as it becomes available. For market-led delivery of infrastructure, absent any market failures, competition is a sufficient incentive to ensure information is taken into account in investment decisions. In absence of market-led delivery, this can be facilitated through appropriate risk sharing mechanisms, or through a government or regulator planning the appropriate locations and quantities of public EV charging infrastructure.

Incentives to encourage innovation from all market participants will ensure:

- charging infrastructure owners invest in infrastructure consumers want at the lowest prices;
- charging infrastructure providers compete on the specifications and price of their products;
- electricity retailers deliver the lowest prices for public EV charging; and
- EMSPs compete on their offerings and service quality to customers, including novel bundling opportunities.

These incentives are delivered through competition. However, in absence of market-led delivery, governments or regulators should consider the appropriate timeframes for any approvals to deliver charging infrastructure, and mechanisms to reopen decisions if a change in the external environment occurs. By way of example, locking the market into a roll-out of specific infrastructure is unlikely to promote long-term innovation or deliver value to consumers, as new or lower cost technology becomes available.

In addition, regulatory changes may be required to unlock some of these incentives, particularly for EMSPs. We discuss this further in section 6.1.

4.2.3 Intervention to address market failures

When it works well, competition provides a range of benefits to consumers, including lower prices, better quality and more desirable infrastructure and services, and more innovation. However, competition does not work well in all situations. There are well recognised market failures that can cause a lack of competition or competition to lead to poor outcomes that are likely to be present in the market for public EV charging infrastructure, including the ability to exclude parties, the presence of information asymmetries and externalities.

Ability to exclude and information asymmetries

The ability or perceived ability to exclude other parties arises from a party having substantial market power and ownership of an essential element of the supply chain.[123] Information asymmetries arise when one party is privy to information that other participants in the market do not have access to.[124]

DNSPs have the ability or perceived ability to exclude parties from the provision of pole-top EV charging infrastructure as they own the poles that the infrastructure would sit on.[125] This gives DNSPs an inherent advantage in the provision of charging infrastructure.

[123] ACCC, *Guidelines on misuse of market power*, August 2018, p 3.

[124] Varian, H, *Intermediate Microeconomics - A Modern Approach,* W.W. Norton and Company, New York, 2010, p 718.

[125] AER, *Submission to Parliament of NSW's terms of references on infrastructure for electric and alternative energy source vehicles in NSW*, 30 May 2025, p 2.

In addition, DNSPs are likely to have significant information advantages regarding network hosting capacity compared to private charging infrastructure owners and operators, which give them an advantage in developing public EV charging network infrastructure.[126]

In the European Union, there is a blanket ban on DNSPs owning, developing, maintaining or operating recharging points for EVs, except where:[127]

- other parties, following an open, transparent and non-discriminatory tendering procedure that is subject to review and approval by the regulatory authority, have not been awarded a right to own, develop, manage or operate recharging points for EVs, or could not deliver those services at a reasonable cost and in a timely manner;
- the regulatory authority has carried out an ex ante review of the conditions of the tendering procedure under point (a) and has granted its approval; and
- the distribution system operator operates the recharging points on the basis of third-party access in accordance with Article 6 and does not discriminate between system users or classes of system users, and in particular in favour of its related undertakings.

In France they narrow this exemption further, where DNSPs may not own or operate EV charging infrastructure except in the case of a specific exemption granted by the CRE (French Energy Regulatory Commission), based on the absence of a private initiative and for a duration of five years.[128]

At the end of the five year period, a public consultation is required to reassess the potential interest of other stakeholders in owning, developing, managing or operating charging points. If the exemption is not renewed, the charging point will be transferred to third parties, and the network operator will be compensated for the residual value of the investments made.[129]

Similarly, in the United Kingdom, DNSPs are prohibited from owning, developing, managing or operating an EV recharging point unless the regulatory authority has issued a 'Provider of Last Resort' direction.[130] This applies where the regulatory authority is satisfied that no person other than the DNSP:[131]

- is able to own, develop, manage or operate an EV recharging point; or
- could do so at a reasonable cost and in a timely manner.

Where the regulatory authority is satisfied of the above, they may grant a DNSP with the ability to own, develop, maintain and/or operate provided that the DNSP (or another party the regulatory authority deems appropriate):[132]

- carries out a tender process, in an open, transparent and non-discriminatory manner to determine whether the any other party is able to own, develop, manage and operate an EV recharging point at reasonable cost and in a timely manner;
- prior to carrying out the tender process, prepares a statement of its proposed methodology for undertaking the tender process;

[126] AER, *Submission to Parliament of NSW's terms of references on infrastructure for electric and alternative energy source vehicles in NSW*, 30 May 2025, p 2.

[127] Directive 2019/944, *Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU*, Article 33.

[128] Except where that charging infrastructure is for the exclusive use of the DNSP. Article L. 353-7 of the French Energy Code, available at: https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000043212090, accessed 14 July 2025.

[129] Article L. 353-7(2) of the French Energy Code, available at: https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000043212090, accessed 14 July 2025.

[130] *The Electricity and Gas (Internal Markets) (No. 2) Regulations 2020*, cls 31F.1(b).

[131] *The Electricity and Gas (Internal Markets) (No. 2) Regulations 2020*, cls 31F.4.

[132] *The Electricity and Gas (Internal Markets) (No. 2) Regulations 2020*, cls 31F.5 – 31F.12.

- consults publicly on its proposed methodology for 28 days, which may or may not then be approved with or without amendments by the regulatory authority; and
- provides a report to the regulatory authority on whether anyone else has been awarded the right to own, develop, manage or operate an EV recharging point.

The DNSP must within five years of the coming into force of the direction and every subsequent period of five years, or such other date as the regulatory authority may direct, provide a report to the regulatory authority informed by public consultation on whether the conditions above hold. If they do not, the DNSP must within 18 months phase out its activities, and is eligible for compensation for the residual value of their investments.[133]

These policies on DNSP participation in the market clearly reflect the need to maintain a level playing field for charging infrastructure ownership and operation. Similar policies are currently in place in Australia through the ring-fencing rules.

In addition, some market development pathways pose potential ability for substantial market power to arise, leading to an incumbent operator bias. Overseas, in Norway, there is significant competition over prime charging locations.[134] Whilst this could be positive for EV charging provision in the short term, it may result in incumbent providers having an advantage over new entrants in the medium-long term, which may have the effect of reducing competition between CIOs and EMSPs.

We understand anecdotally that a similar 'land-grab' for prime charging locations is occurring in Australia, particularly for DC charging infrastructure. This may not have significant short-term implications, but left unchecked may allow development of localised monopolies. Localised monopolies are concentrations of a single provider in a geographical location and can result in a lack of competition in a particular area. In the petrol retailing industry, localised monopolies are closely monitored by the Australian Competition and Consumer Commission (ACCC).[135]

Remove barriers to entry

Barriers to entry are obstacles that make it difficult or costly for new firms to enter a market and compete with existing participants.[136]

We explain above that DNSPs own poles, which pole-top EV charging infrastructure would require access to. We understand from anecdotal discussion that third party operators currently find accessing poles on some DNSPs' networks to be a difficult process due to unfair terms in facilities access agreements (FAAs) and delays in application processing. This was also observed by Intellihub in its trial.[137]

To the extent that access to DNSPs' poles is currently posing barriers to entry for market participants, interventions to remove barriers to entry by facilitating access to DNSPs' poles may be required to facilitate market development.

[133] *The Electricity and Gas (Internal Markets) (No. 2) Regulations 2020*, cls 31F.14 – 31F.17.

[134] McKinsey & Company, *What Norway's experience reveals about the EV charging market*, 8 May 2023, available at: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/what-norways-experience-reveals-about-the-ev-charging-market, accessed 14 July 2025.

[135] Australian Competition and Consumer Commission, *Report on the Darwin petrol market,* November 2015, p 18.

[136] Carlton, D and Perloff, J, *Modern Industrial Organisation*, Pearson Addison-Wesley, Boston, 2005, p 76.

[137] Intellihub, *Street Light Pole EV Charger Project 2021/ARP002*, Lessons learnt report 3, 28 June 2024, p 14.

Externalities

Externalities arise when one party does not bear the full set of costs, or reap the full set of benefits, from its actions, which are instead borne by a third party.[138] Put another way, externalities arise when one party does not face accurate price signals for the true costs or benefits arising from its actions.

Developing DC charging infrastructure requires paying a connection fee for access to the electricity network and network prices for electricity consumed. However, in the event that DC charging infrastructure increases the peak load of the network, particularly if upstream network augmentation is required to facilitate that load, or it increases overall shared network investment needs, prevailing connection charges may not provide the most appropriate locational signals. This is because the peak load of that DC charging infrastructure may not be known ahead of time, or may only arise in conjunction with other EV and charging infrastructure loads.[139]

In the same vein, to the extent that development of AC charging infrastructure avoids any network augmentation that would otherwise be required to facilitate DC connection, this positive externality will not be captured.

4.2.4 Intervention to facilitate market development

We have heard from many parties that there is a 'chicken and egg' problem with EV uptake and public EV charging infrastructure development. Put another way:

- prospective EV owners do not want to purchase an EV because they do not have sufficient access to public EV charging infrastructure; and
- prospective public EV charging infrastructure owners do not want to invest in that infrastructure because they have a high risk of insufficient utilisation to recover the costs of their investment.

To the extent that a lack of public EV charging infrastructure availability is hindering EV uptake, there is likely to be a need for intervention to stimulate supply of public EV charging infrastructure in the short-term.

Overseas, governments have facilitated market development in several different ways, for example:

- in California, the state government provided funding for developing public EV charging infrastructure to individuals;[140]
- in the United Kingdom, the government facilitated public EV charging infrastructure development through grants to local governments, who undertook tendering processes (allowing DNSPs to bid);[141] and
- in France, regional public energy associations developed, owned and operated public EV charging infrastructure before the private market was willing to invest.[142]

We discuss how these may be implemented in Australia in section 5.

[138] Carlton, D and Perloff, J, *Modern Industrial Organisation*, Pearson Addison-Wesley, Boston, 2005, p 82.

[139] For example, we understand from anecdotal evidence that two nearby fast charging locations were built simultaneously, and the grid had sufficient capacity to host charging at one of them at a time. Accordingly, both could be built with no network upgrade costs, but concurrent use of them put strain on the network.

[140] Center for Sustainable Energy, *California Electric Vehicle Infrastructure Project, available at: https://energycenter.org/program/california-electric-vehicle-infrastructure-project*, 14 July 2025.

[141] Energy Saving Trust, *Local Electric Vehicle Infrastructure (LEVI) Capital Fund Information Pack 2023-2025*, August 2024, p4, available at: *https://energysavingtrust.org.uk/wp-content/uploads/2024/09/LEVI-capital-fund-info-pack-v13-T2.pdf*, accessed 14 July 2025.

[142] EVBoosters, *How France's public energy associations – SDEs -kickstarted the EV charging revolution*, 22 April 2025, available at: https://evboosters.com/ev-charging-news/how-frances-public-energy-associations-sdes-kickstarted-the-ev-charging-revolution/, accessed 14 July 2025.

4.2.5 Intervention to facilitate EV charging infrastructure in areas where it may not be commercially viable

There are likely to be a range of areas throughout Australia where delivering availability of public EV charging infrastructure may not be commercially viable. This may be:

- temporary (in the short term), which is alleviated as EV take-up increases; or
- long-term, due to the location of/demographics around that charging infrastructure.

In particular, we expect that charging infrastructure in regional and rural areas is likely to have lower utilisation than in metropolitan areas. In addition, in the short-term, we expect that charging infrastructure is likely to be more commercially viable in areas with high EV uptake, which may not be in areas with high density apartments or areas with a lack of off-street parking.

To facilitate availability of charging infrastructure in these areas, governments may need to intervene to deliver that charging infrastructure, as it would not otherwise be delivered by the private market.

4.3 Trade-off decisions in developing public EV charging infrastructure

There are key trade-offs that need to be considered in developing public EV charging infrastructure, including:

- the trade-off between charging infrastructure availability and bill impacts of charging infrastructure investment; and
- the trade-off between parking exclusivity and quantity of infrastructure.

4.3.1 Trade-off between charging infrastructure availability and bill impacts of investment

It is well accepted that there is likely to be a need to facilitate public EV charging infrastructure development due to the chicken and egg problem, ie, to facilitate EV uptake and stimulate demand for public EV charging infrastructure before it becomes commercially viable.

However, it is also well accepted that over-delivery of infrastructure in the short-term is not in the best interest of consumers, because consumers would pay for that infrastructure when it is not needed. This is a particularly pressing issue given the current cost of living crisis. In addition, the longer we wait to deliver unnecessary charging infrastructure, the better the technology and lower the unit cost it will be to roll out that infrastructure, thereby benefitting consumers.

As such, there is the need to balance the trade-off between public EV charging infrastructure availability and the bill impacts of investing in that infrastructure. Importantly, state or local governments are best placed to make those trade-off decisions, and not parties that would otherwise invest in and potentially profit from development of that infrastructure. We discuss this issue further in section 5 below.

4.3.2 Trade-off between parking exclusivity and infrastructure quantity

Many potential areas for public EV charging infrastructure have limited parking availability. There is a need to balance that parking availability with EV charging infrastructure development.

EV infrastructure can be deployed:

- in dedicated EV charging car parks, which increases utilisation of charging infrastructure but removes the availability of a carpark for non-charging or internal combustion engine vehicles; or
- in undesignated carparks, which increases the risk that infrastructure is not available for charging, but increases carparking availability.

In areas with dedicated EV charging car parks, it is likely that a lower quantity of infrastructure will be required to service EV charging requirements, but greater social license may be required. In contrast, for areas with undedicated carparks, more infrastructure may be required to service EV charging needs. This trade-off decision is best managed by local governments.

5. Roles and responsibilities to deliver a customer focused EV charging infrastructure network

We have a range of recommendations for delivering an AC public EV charging network in the best interest of consumers in Australia, including:

- publicly available network capacity information is essential to facilitate delivery of public EV charging infrastructure. DNSPs should be required to:
  - in line with the integrated distribution system planning rule change, publish and maintain publicly available data on network capacity at the low-voltage transformer level; and
  - in addition, identify and publish a map of suitable poles on their networks for hosting public EV charging infrastructure;
- expedited approvals on fair terms are critical – DNSPs should be required to approve applications within certain timeframes, expedite approvals for poles they have identified as 'suitable', and publish pole assessment criteria with reasons for rejection;
- local governments are best placed to assess and approve locations for public EV charging infrastructure in their areas from a land-use planning perspective. A standard set of guidelines should be developed and published to assist local governments in this assessment, published by jurisdictional planning entities;
- for commercial delivery of public EV charging infrastructure, charging infrastructure owners should determine the quantity, specification and location of public EV charging infrastructure, as they are taking the commercial risk of that investment;
- any provision for non-commercial delivery of infrastructure should not deter commercial market development. In line with the NER, DNSPs should not be able to participate in the (contestable) commercial delivery of public EV charging infrastructure;
- intervention is likely to be required to facilitate non-commercial delivery of public EV charging infrastructure, given the nascent EV charging market;
- state and territory governments are best placed for non-commercial delivery decisions, including the appropriate quantity, specification and locations for public EV charging infrastructure, as they can balance policy trade-offs between infrastructure availability and consumer bill impacts. Importantly, DNSPs cannot be allowed to determine the appropriate quantity, specification or location as their incentives are not sufficient to promote infrastructure development in the best interest of consumers;
- state and territory governments (or DNSPs on behalf of the jurisdictional government) should then be responsible for conducting tenders to supply, maintain and deliver AC public EV charging infrastructure to allow competition to ensure that this infrastructure is delivered at least cost; and
- there is a role for DNSPs to provide public EV charging infrastructure in non-commercial locations subject to participating in a competitive tender. In these circumstances, consideration should be given to mandating the sale of DNSP-owned infrastructure every five years if there is private market interest.

Importantly, to ensure the timely development of a comprehensive public AC EV charging network in the best interest of consumers, collaboration must occur between transport and energy sector organisations across Australia, in addition to local governments, state and federal governments and regulators.

We also have recommendations for developing a DC public EV charging network in the best interest of consumers, ie:

- network capacity planning and pricing must account for substantially higher strain of DC charging on electricity networks;

- DNSPs should be required to assess applications within a reasonable timeframe, so not to hinder charging infrastructure development; and
- land-use planning and oversight from the Australian Competition and Consumer Commission (ACCC) is essential to preventing localised monopolies.

In this section, we set out the ideal roles and responsibilities for delivering a public AC and DC EV charging infrastructure network in line with the future vision.

5.1 Developing an AC public EV charging infrastructure network

There are five key roles for developing an AC EV charging infrastructure network that we discuss in this section, ie:

- network capacity planning;
- site suitability assessment;
- EMSPs and retailers;
- determining the number and location of AC charging infrastructure; and
- funding, owning and operating that charging infrastructure.

5.1.1 Publicly available network hosting capacity information is essential to facilitating EV charging infrastructure development

The AER has identified that it is possible that DNSPs are best placed to determine where EV charging infrastructure would be best located on their network in terms of constraints and capacity, ie:[143]

> We consider it possible that DNSPs have information and cost advantages over third-parties to identify 'black spots' where EV charging services may be facilitated, in terms of identifying where there are network constraints or capacity to support [EV charging infrastructure] EVCI.

The EVC highlights that Essential Energy's tool to provide insight into the estimated capacity on its low voltage network is helpful for rapid assessment of site suitability, which likely increases the probability of successful applications and reduces the total number of individual applications.[144]

The AER believes that a key element of the integrated distribution system planning (electricity) (IDSP) rule change that can improve network visibility is requiring DNSPs to publish some data more frequently, such as consumer energy resources (CER) hosting capacity maps no less frequently than every three months.[145]

Energy Consumers Australia lodged the IDSP rule change request, which aims to resolve these information asymmetries and improve visibility of network constraints to support public EV charging infrastructure.[146] The AEMC released its consultation paper on this topic on 26 June 2025. However, key elements of the proposal such as the network data and insights roadmap are only required to be implemented by July 2027, meaning that if DNSPs did not comply with the roadmap, these key elements could be implemented even later than 2027.[147]

Consistent with Energy Consumers Australia's IDSP rule change, we believe that publicly available data on network hosting capacity, such as Essential Energy's online tool, is essential to facilitate EV charging infrastructure rollout in Australia. Accordingly, in line with the IDSP rule change, we recommend that DNSPs

[143] AER, *Ring-fencing waiver application for an EV charging infrastructure trial from CitiPower, Powercor, and United Energy*, Consultation paper, April 2025, p 14.

[144] EVC, *EVC response to: Energy Security Board – Benefits of increased visibility of networks – consultation paper*, August 2023, p 2.

[145] AER, *Low-voltage network visibility*, Phase 3 final report, 31 March 2025, pp 11 and 15.

[146] Energy Consumers Australia, *Integrated Distribution System Planning (electricity) rule change request*, 22 January 2025.

[147] AEMC, *National Electricity Amendment (Integrated Distribution System Planning) Rule 2026*, Consultation paper, p 18.

be required to publish and maintain publicly available data on network capacity at the low-voltage transformer level.

However, in our opinion, DNSPs are also likely to be best placed to consider precisely where on their networks public EV charging infrastructure could be facilitated at the pole level, as they have visibility over the network hosting capacity, forecast load in that area and pole condition. DNSPs being required to identify specific sites (ie, poles) suitable for hosting public EV charging infrastructure would:

- accelerate the potential delivery of public EV charging infrastructure; and
- allow decision makers such as state and local governments to consider the current and potential future network of public EV charging infrastructure that best serves consumers, including improving the visibility of information for making the trade-off decisions we highlight in section 4.3.

As such, we recommend that DNSPs are further required to identify suitable poles on their networks for hosting public EV charging infrastructure.

In addition, we note that DNSPs or their ring-fenced entities that use network hosting capacity information before its public release would gain an unfair competitive advantage for identifying optimal sites that undermines consumer interests. We recommend strict enforcement of ring-fencing requirements in this area.

5.1.2 Expedited site suitability approvals on fair terms are required to facilitate EV charging infrastructure development

Before installing public EV charging infrastructure, the charging infrastructure owner must get approval from:

- the relevant DNSP, for both the network hosting capacity and pole suitability; and
- the relevant local government, if that EV charging infrastructure requires a dedicated carpark or proposes to replace an already metered carpark.

To access a DNSP's pole, both a facilities access agreement (FAA) and site nomination agreement (SNA) is required. FAAs transfer risk and liability to the vendor, and SNAs have application and annual pole rental fees for the life of the agreement.[148]

The perception of unfavourable terms in FAAs that are typically offered by DNSPs prevented a number of leading international and local providers from participating in Intellihub's trial.[149] This is consistent with opinions expressed to us as part of our stakeholder engagement, where we heard that some DNSPs' approvals processes take a long time and may have onerous terms for charging infrastructure owners, which prevent commercial investment into pole-top EV charging infrastructure. We note that we have also heard positive opinions about some DNSPs' approvals processes.

In addition, Intellihub observed that SNA fees are typically set at relatively high levels, meaning only sites with high utilisation levels would be commercially viable.[150] Again, we note that we have heard both positive and negative opinions about some DNSPs' fee levels in our stakeholder engagement. We discuss the role and level of pole rental fees further in section 6.3.

Expedited applications on fair terms are required to facilitate the development of public EV charging infrastructure. To this end, we recommend that requirements be implemented on DNSPs to:

- approve applications within a certain timeframe;
- expedite approvals for poles that DNSPs have identified are 'suitable' in its network capacity planning; and

[148] Intellihub, *Street Light Pole EV Charger Project 2021/ARP002*, Lessons learnt report 3, 28 June 2024, pp 14-15.

[149] Intellihub, *Street Light Pole EV Charger Project 2021/ARP002*, Lessons learnt report 3, 28 June 2024, p 14.

[150] Intellihub, *Street Light Pole EV Charger Project 2021/ARP002*, Lessons learnt report 3, 28 June 2024, pp 14-15.

- publish pole assessment criteria,[151] assess applications against that pole assessment criteria, and publish reasons for rejection.

In addition, the charging infrastructure owner may also require local government approval. Local governments are best placed to consider the social license and other local planning considerations for public EV charging infrastructure in particular areas.

Local governments in Australia are at various stages in their EV charging infrastructure journey. Some local governments have published EV strategies and own public EV charging infrastructure, whereas some are still attempting to gain social license for EVs in their area.

Local governments are best placed to assess and approve locations for public EV charging infrastructure in their areas from a land-use planning perspective. To facilitate approvals, we recommend that a standard set of guidelines for local governments to assess public EV charging infrastructure applications should be developed. As part of these guidelines, recommended timeframes for assessment should be included to promote quick assessment of location suitability.

5.1.3 Competition between EMSPs and retailers delivers value for consumers

Competition between EMSPs and retailers is essential to deliver best the outcomes to consumers. This competition can be facilitated in two ways, ie:

- through networks of charging infrastructure points with different EMSPs, like how competition occurs currently between petrol stations, such that consumers can choose the charging infrastructure point they would like to use based on their EMSP; or
- through interoperability at each charging infrastructure point, where consumers can select between multiple EMSPs at each charging infrastructure point.

Overseas experience demonstrates that consumers prefer interoperability of charging infrastructure, so they do not need to maintain multiple apps on their phone or drive to alternative charging points.

However, EMSPs are unlikely to be able to compete at a single EV charging infrastructure point without the ability to access their preferred retailer. In a competitive market, EMSPs would each provide a different electricity charging service to consumers. Some EMSPs may bundle public EV charging infrastructure electricity with home electricity packages, and some may adopt further innovative bundling or subscription models. These are only viable if EMSPs can work with their preferred retailer across the network of charging infrastructure. Accordingly, to unlock competition between EMSPs, the ability for EMSPs to be able to select their preferred retailer at each charging infrastructure point is essential.

To facilitate this, changes to metering rules to allow multiple FRMPs and a floating NMI would be required.[152] Rule changes amending the landscape for a secondary FRMP will come into effect in May 2026, but these rule changes require a second, physical meter to be installed for the secondary FRMP.[153] The AEMC states that in the future, the ability to have one or more settlement points at a single connection point could allow deployment of floating NMIs,[154] but this is not covered by current rule changes.

Accordingly, we recommend that the metering rules are changed to allow multiple FRMPs and a floating NMI for EVs.

[151] For example, see: Intellihub, *Street Light Pole EV Charger Project 2021/ARP002*, M2 knowledge sharing report, December 2022, pp 20-28.

[152] We discuss this further in section 3.2.3.

[153] AEMC, *National Electricity Amendment (Unlocking CER benefits through flexible trading) Rule 2024*, Rule determination, 15 August 2024, pp 14-15 and 17-18.

[154] AEMC, *National Electricity Amendment (Unlocking CER benefits through flexible trading) Rule 2024*, Rule determination, 15 August 2024, para 21.

We have heard anecdotally that the cost of implementing a floating NMI is potentially prohibitive to implementation. In this case, in our opinion, lower cost alternatives should be explored which preserve competition between EMSPs and retailers.

By way of example, in France, a third-party entity connects charging infrastructure owners with EMSPs through maintaining thousands of contracts, while managing billing and clearing functions.[155] This removed the need for multiple FRMPs, as the third-party clearing house acts as the FRMP.

5.1.4 The ideal party for determining the quantity, type and location of public EV charging infrastructure

There are two methods of delivering public EV charging infrastructure, ie:

- on a commercial basis, where charging infrastructure owners can determine the quantity, type and location of that infrastructure; and
- on a non-commercial basis, where centralised planning about the quantity, type and location for infrastructure with competitive tendering for delivery of that infrastructure should occur.

We discuss each of these in further detail below.

Commercial delivery of public EV charging infrastructure

We define commercial delivery of public EV charging infrastructure as where the charging infrastructure owner decides the quantity, specification and location to build, funds the installation of and takes the financial risk of that charging infrastructure, including where that market participant receives external funding (such as a government grant) for that infrastructure.

Commercial delivery of public EV charging infrastructure should be facilitated where possible. Any non-commercial delivery of public EV charging infrastructure should not impede delivery of that infrastructure on a commercial basis.

For commercial delivery of public EV charging infrastructure, charging infrastructure owners are able to determine the quantity, specification and location of public EV charging infrastructure, as they are taking the commercial risk of that investment. However, the AER or ACCC should consider the potential for localised monopolies to arise in the commercial delivery of public EV charging infrastructure. Some grants may require delivering infrastructure in certain locations.

DNSPs have inherent information and pole ownership advantage over market participants. This position results in the ability or perceived ability to exclude private market participants who would otherwise deliver higher quality and lower cost infrastructure. This advantage is explicitly recognised in the NER, which explicitly prohibits DNSPs from providing contestable services.[156]

Whilst the information sharing provisions contemplated by the IDSP rule change would improve the availability of information to other market participants, DNSPs will always have an ability or perceived ability to exclude private market participants from accessing poles. Accordingly, the ring fencing guidelines should strictly apply for the commercial delivery of public EV charging infrastructure.[157] This is consistent with European Union directives prohibiting DNSPs from owning, operating or maintaining public EV charging infrastructure except where a competitive tender has occurred.[158]

[155] Gireve, *EV charging services*, available at: https://www.gireve.com/ev-roaming-services/, accessed 14 July 2025.

[156] AER, *Ring-fencing Guideline Electricity Distribution – version 4*, February 2025, p 7.

[157] AER, *Ring-fencing Guideline Electricity Distribution – version 4*, February 2025, p 1.

[158] Directive 2019/944, *Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU*, Article 33.

DNSPs should be required to approve connection approvals from private market participants within a reasonable timeframe, subject to sufficient network hosting capacity and pole suitability. This process should be expedited for locations that DNSPs have identified as 'suitable' in their network capacity planning. In the event that a DNSP does not approve an application, the DNSP should be required to provide reasons for that rejection.

Non-commercial delivery of public EV charging infrastructure

We explain in section 4.2 that there a range of reasons that the private market may not deliver an 'optimal' quantity of public EV charging infrastructure in particular locations, particularly given the nascent EV charging market.

In our opinion, in this case, state governments are best placed to consider the appropriate quantity and locations for charging infrastructure over time. This is because state governments are best placed to make the policy decision that is the trade-off between public EV charging infrastructure availability and the bill impacts of that investment for customers in their state. State governments can also balance the mix of AC and DC infrastructure that best serves their state, integrating EV charging infrastructure into their transport planning.

In our opinion, regulators are not well placed to assess the appropriate quantity of investment, as this involves a policy decision for how quickly to accelerate the delivery of public EV charging infrastructure when it is not commercial to do so.

In addition, and importantly, DNSPs cannot be responsible for determining the location and quantity of public EV charging infrastructure. This is because:

- for RAB funded infrastructure, DNSPs' incentives are not aligned with those in a competitive market, as DNSPs are:
  - incentivised to maximise the number of EV charging infrastructure delivered because they are guaranteed recovery of that infrastructure through the RAB, and do not have any incentives to consider the utilisation of or demand for that charging infrastructure;
  - not incentivised to deliver that infrastructure at a competitive price, except to the extent that the infrastructure cost is assessed as 'efficient' by the AER – this is less reliable than market testing the cost of that infrastructure;
  - not incentivised to maximise the value of the infrastructure to consumers – by way of example, there are no consumer signals about a preferred size of AC chargers eg, the 7kW or 22kW; and
  - not taking any risks of investment generating revenues sufficient to recover investment, and so under-recoveries of revenue would be rolled into their annual allowable revenue to be recovered from their broader customer base. This can result in cross-subsidisation of EV charging infrastructure by electricity consumers; and
- for non-RAB funded provision of infrastructure, DNSPs have an inherent advantage over other private market participants due to their ability to exclude them from or charge higher fees for pole access.[159]

In our opinion, state governments also have a role for determining the appropriate specification of that charging infrastructure, eg, whether it is 7 kW or 22 kW. This decision requires holistic consideration of the types of infrastructure, including the mix of AC and DC infrastructure in particular locations. Consistent with our discussion above, in our opinion, the AER is not well placed to make this decision, and DNSPs do not have appropriate incentives to consider what types of infrastructure consumers want.

[159] This is consistent with the NER provisions preventing DNSPs from providing contestable services.

State governments are likely going to be required to have an active involvement in setting the quantity of infrastructure expected in the short term, to stimulate delivery of public EV charging infrastructure in locations with low EV uptake, and so low expected utilisation of that charging infrastructure.

Once the state government has determined the appropriate quantity and location of public EV charging infrastructure, a tendering process should occur to ensure efficient delivery of that infrastructure. In our opinion, and consistent with European Union directives, DNSPs cannot be allowed to participate in charging infrastructure delivery without going through a competitive tendering process.[160] Specifically, DNSPs should only be able to provide public EV charging infrastructure if private market participants are not interested in providing that infrastructure, or cannot do so at a reasonable cost.

As part of this process, similar to the arrangements in the United Kingdom, DNSPs could be required to run a robust tendering process where other parties have the opportunity to bid for the right to build that infrastructure. Alternatively, this tendering process could be run by state or local governments.

If a DNSP is tasked with running a tendering process, the AER is best placed to ensure the DNSP:

- undertakes a robust tendering process to determine whether private market participants are willing and able to deliver the infrastructure at a reasonable cost; and, if not
- delivers the public EV charging infrastructure at a reasonable cost.

This tendering process should involve the DNSP setting a reasonable and uniform rental charge for pole access for all market participants, including for its subsidiary businesses. This ensures that the selection of who delivers that infrastructure is not influenced by DNSPs' pole access rates.

Like France and the United Kingdom, consideration should be given to mandate the sale of DNSP-owned public EV charging infrastructure every five years or at the AER's request, with appropriate provisions for compensation of residual value of those assets. This is consistent with the principle of no DNSP ownership except where private market participants are not interested in investing in that infrastructure.

5.1.5 The ideal roles for funding, owning and operating charging infrastructure

The development of EV charging infrastructure requires significant capital investment. Different funding approaches will shape who bears the financial risk, how costs are recovered, and how quickly infrastructure can be deployed. Three primary funding models are available, each with distinct characteristics and implications:

- **market and grant funding** involves private investors or governments funding infrastructure upfront, with costs recovered through user fees over time;
- **tax concession funding** provides government tax benefits to parties operating charging infrastructure, effectively subsiding private investment through the tax system; and
- **regulatory asset base (RAB) funding** allows DNSP's to include charging infrastructure in its RAB, with costs recovered from all electricity users over the asset's lifetime.

Market and grant funding has the following benefits:

- EV drivers pay for the infrastructure they use with financial risks borne by investors and/or government, preventing cross-subsidisation by general electricity consumers; and
- stimulating competitive delivery of public EV charging infrastructure by multiple private providers, which creates incentives for cost efficiency likely resulting in better outcomes for consumers.

[160] Directive 2019/944, *Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU*, Article 33.

Market or grant funding has the following shortfalls:

- it may result in a slower delivery of public EV charging infrastructure compared to RAB-funded delivery, as there would be more unique businesses lodging connection applications; and
- market or subsidy funding requires capital investment by investors or governments now. This may constrain the total quantity of charging infrastructure able to be delivered.[161]

Tax concession funding has the following benefits:

- it leverages private capital so that government does not need to provide upfront funding, using foregone tax revenue instead of direct expenditure;
- maintains market competition as multiple private providers can compete while receiving similar tax benefits; and
- preserves a user-pays principle as EV drivers still pay usage fees, while operators receive tax relief to improve investment returns.

Tax concession funding has the following disadvantages:

- it represents a real cost to government through reduced tax receipts with opportunity cost implications for other public spending;
- required detailed design of eligibility criteria, compliance monitoring and ongoing assessment; and
- it may incentivise EV charging infrastructure projects that would proceed anyway, as this approach makes targeting of specific infrastructure challenging.

RAB funding has the following benefits:

- derisking the investment by guaranteeing the recovery of costs from all electricity consumers, thereby eliminating market demand risk;
- lowering the risks likely translates to lower financing costs for the investment (ie, the cost of capital reflects the regulated rate of return); and
- potentially leading to investment in EV charging infrastructure sooner than otherwise, as the DNSPs have access to systems and processes to speed up delivery of the charging infrastructure.

RAB funding has the following shortfalls:

- it will include cross-subsidisation from non-EV users if there is under-recovery of revenue, even if a separate tariff class exists (as under-recovered revenue is rolled into an unders/overs account and recovered through the following year's maximum allowable revenue); and
- it provides limited incentives for DNSPs to deliver infrastructure in an efficient manner or at the lowest cost, noting that this effect may be addressed by competitive tendering processes.

There may be some additional requirements for DNSP RAB funding, including to track the residual value of assets for a future sale of those assets.

The choice between funding models involves trade-offs between deployment speed, cost efficiency and distributional fairness. Hybrid approaches may be possible, such as grant funding supported by electricity user levies, which could combine the benefits of both market and RAB funding.

[161] That said, it would be possible to fund grants through a levy paid by electricity users, which would result in grant funding aligning with RAB funding.

The optimal approach may vary for EV charging infrastructure in different locations and over the development timeline. This suggests that a flexible framework that accommodates multiple funding models may be most appropriate.

5.2 Developing a DC public EV charging infrastructure network

We are observing more development of DC charging infrastructure by a range of competitive charging infrastructure owners, and DNSPs are not proposing to enter this market. Accordingly, there are fewer considerations for efficient long-term market development in this area.

Nevertheless, in our opinion, there are two key issues for consideration in the DC public EV charging infrastructure market that are distinct from the AC market, ie:

- network capacity planning and the role of price signals; and
- site selection to prevent localised monopolies and deliver charging infrastructure that consumers want.

5.2.1 Network capacity planning and the role of price signals

Like with AC charging infrastructure, DNSPs are best placed to assess the capacity of their network. However, the strain of DC charging infrastructure on the network is likely to be substantially higher than for AC charging infrastructure. Accordingly, DC charging infrastructure may require network augmentations.

For example, Ampol has found that network capacity limitations have slowed the development of DC chargers at its sites.[162]

We understand that current connection charging arrangements mean that DC charging infrastructure appropriately contribute to the direct costs of network connection, including upgrades like transformers or distribution lines needed to meet their power requirements. However, these connections over time are expected to trigger broader network upgrades with these costs being borne by all electricity users.

DNSPs should consider how best to minimise these shared network cost increases by developing flexible negotiated connection agreements that enable better trade-offs between power demand requirements and shared network costs, ensuring more efficient outcomes for all electricity consumers. One key strategy for managing these shared network costs may be facilitating investment in AC charging infrastructure, which can reduce peak demand from DC fast-charging stations. By lowering DC network demand through complementary AC charging investments and other approaches, the overall network can be optimised while maintaining the principle that DC charging operators pay their fair share of direct connection costs.

In addition, Ampol has found ballooning DNSP approval timeframes have contributed to slowing DC charging development.[163] Similarly, BP pulse states it has redirected capital to other countries due to its inability to secure grid connections and roll out infrastructure at its planned rate in Australia.[164]

We recommend requiring DNSPs to assess applications within a reasonable timeframe, to facilitate the delivery of DC public EV charging infrastructure. We acknowledge that these timeframes are likely to be longer than those for AC public EV charging infrastructure, given the complexity of network capacity assessment.

[162] AFR, *Power grid foils Ampol's big EV charger plans*, 19 August 2024, available at: https://www.afr.com/companies/energy/ampol-dials-back-ev-charging-target-slashes-dividend-20240812-p5k1q4, accessed 14 July 2025.

[163] AFR, *Power grid foils Ampol's big EV charger plans*, 19 August 2024, available at: https://www.afr.com/companies/energy/ampol-dials-back-ev-charging-target-slashes-dividend-20240812-p5k1q4, accessed 14 July 2025.

[164] bp, *bp Australia submission to the Infrastructure for electric and alternative energy source vehicles in NSW inquiry*, 8 May 2025, p 5.

5.2.2 Site selection to prevent localised monopolies and deliver optimal charging infrastructure

There is strong competition across the supply chain for DC charging infrastructure, including EMSPs, retailers and charging infrastructure owners. There is also sufficient demand for fast charging to support commercial development of charging networks, supported by government funding to achieve policy outcomes such as to ensure one station every 100 kilometres on key highways in New South Wales.

Unlike kerbside charging, consumers are more likely to accept non-interoperable DC charging networks. This is because DC charging payments are often done by tap and go credit card payments, rather than through an app. This means that competition will likely occur between providers at different sites.

Whilst there are no concerns about the competition between DC charging infrastructure owners across the broader Australian landscape, there is the potential for a single network provider to have a concentration of DC charging infrastructure in particular areas. This leaves the potential for localised monopolies to arise.

International experience in Germany has shown that many local governments awarded most or even all contracts for charging infrastructure installation in suitable public areas to their own municipal utility companies or to specific individual providers, and that as a direct result there were very few providers of charging stations and EV charging electricity in many local markets. The German competition regulator found that this situation could have been avoided by setting better framework conditions for the award of public areas for charging infrastructure installation.[165]

In our opinion, there is a role for land-use planners to consider the optimal location and mix of DC charging infrastructure providers in a given area, to prevent localised monopolies from developing.

[165] Bundeskartellamt, *Anti-competitive structures in the provision of EV charging electricity – Final report on sector inquiry into EV charging infrastructure*, Press release, 1 October 2024, available at: https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2024/01_10_2024_SU_Ladesaeulen.html, accessed 14 July 2025.

6. Regulatory settings to deliver value for consumers

Changes to the NER are required to facilitate the ideal roles and responsibilities identified in section 5 and to achieve the vision statement, ie:

- changes to the ring-fencing provisions to ensure competitive tension whilst allowing DNSP provision of non-competitive infrastructure;
- changes to the shared asset rules to deliver value for consumers – we recommend that the Australian Energy Regulator (AER) undertakes a review of the suitability of the shared asset rules in the context of public EV charging infrastructure; and
- changes to the metering rules to allow multiple retailers to operate at a single national metering identifier via a 'floating national metering identifier (NMI)', to facilitate competition between EMSPs and interoperability.

The federal government should consider implementing a number of standards to facilitate a positive user experience from public EV charging infrastructure, including:

- mandating interoperability between public AC EV charging infrastructure;
- urgently implementing a uniform set of accessibility standards, either bespoke for public EV charging infrastructure or in line with general accessibility standards;
- implementing a set of payment accessibility standards for each of AC and DC charging infrastructure, considering the trade-off between the cost of installing additional payment options and improving payment accessibility when determining the threshold for being subject to those standards; and
- introducing reliability standards for EV charging infrastructure, including for both uptime and electricity throughput.

Some local governments and DNSPs are charging or considering rental fees for land and pole access, particularly for dedicated parking spaces. Given the potential public benefits of EV adoption which are facilitated by deployment of EV charging infrastructure, there is a strong argument for local governments and DNSPs to take a facilitative rather than rent-seeking approach, particularly during the early infrastructure build-out phase.

Practically, this means that any rental fees charged by DNSPs or local governments should be minimised, and so only be used to recover the administrative and maintenance costs of facilitating access to the relevant infrastructure.

In this section, we set out the regulatory settings, including changes to the NER and standards that may need to be implemented, to achieve the vision statement and deliver value for consumers.

6.1 Changes to the National Electricity Rules

To facilitate the ideal roles and responsibilities identified in section 5 and achieve the vision statement, three key rule changes will need to be made, ie:

- changes to the ring-fencing guideline to ensure competitive tension whilst facilitating DNSP participation in deploying non-commercial infrastructure;
- changes to the shared asset rules to deliver value for consumers; and

- changes to the metering rules to facilitate competition between EMSPs and interoperability.

6.1.1 Ring fencing guideline

Currently, DNSPs are prevented from providing contestable services under the ring-fencing provisions of the NER. We explain in section 3.2.1 that the ring-fencing guideline's objective is to:[166]

- promote the national electricity objective by providing for the accounting and functional separation of the provision of direct control services by DNSPs from the provision of all other services by them, or their affiliated entities; and
- promote competition in the provision of electricity services.

In our opinion, the intent of the ring-fencing guideline, which aims to promote competition in the provision of electricity services, is essential to meet the vision of affordable EV charging. Specifically, in the absence of competition in the provision of electricity services, DNSPs are unlikely to face the same incentives to provide affordable EV charging.

To this end, the existing ring-fencing rules should apply for the commercial ownership, operation and maintenance of public EV charging infrastructure, which prevent DNSPs from providing contestable services.

However, we explain in section 5.1 that there are alternative methods of imposing competitive pressure in the non-commercial delivery of public EV charging infrastructure, which may include DNSP participation subject to a tendering process. In our opinion, subject to a robust tendering process having occurred, DNSPs should be allowed to participate in the provision and maintenance of non-commercial public EV charging infrastructure.

We understand there are some stakeholder concerns about needing to provide DNSPs information on their business models for the commercial delivery of public EV charging infrastructure. To this end, the ring-fencing provisions should be strictly enforced and subsidiaries should not have any additional information on network capacity that are not publicly available. In addition, DNSPs should treat their subsidiaries at arm's length in negotiating fees for pole access. This will act to ensure that subsidiaries do not have any competitive advantage over other businesses in the commercial delivery of public EV charging infrastructure.

CPU's ring-fencing waiver for operation of public EV charging infrastructure will be important for understanding how demand management at AC charge points affects consumers' charging behaviour, thereby providing useful insights on how best to design network access arrangements for charging infrastructure to minimise network costs. However, it is essential that CPU's trial is confined to 100 sites, to ensure no further development of DNSP-owned EV charging infrastructure without competitive tendering.

6.1.2 Shared asset rules

The shared asset rules were designed to:

- incentivise DNSPs to host other infrastructure on their poles that deliver value without detracting from the infrastructure's intended use; and
- ensure DNSPs do not recover the cost of assets twice through revenue from unregulated services (eg, hosting telecommunications infrastructure on a pole), and share that revenue with electricity consumers.

The shared asset rules have been important for encouraging DNSPs to host non-electricity infrastructure. However, we do not believe the shared asset rules in their current state should apply to public EV charging infrastructure, as it is a direct opportunity for DNSPs to increase their revenue from unregulated services without sharing those benefits with consumers.

[166] AER, *Ring-fencing Guideline Electricity Distribution – version 4*, February 2025, p 1.

In our opinion, there are two potential methods of maximising the value of public EV charging infrastructure for consumers, ie:

- implementing changes to the NER to mandate DNSPs hosting public EV charging infrastructure, and excluding that infrastructure from the shared asset rules; or
- removing the materiality threshold of the shared asset rules and implementing a greater sharing ratio, ensuring that the benefits from hosting public EV charging infrastructure are shared with consumers.

We recommend that a review of the suitability of the shared asset rules in the context of public EV charging infrastructure be conducted.

6.1.3 Metering rules

We explain in section 3.2.3 that:

- the current metering rules under the NER currently only allow one financially responsible market participant (FRMP) for settlement purposes at each metering point; and
- changes to the metering rules to facilitate flexible trading coming into place in 2026 will allow multiple FRMPs at a single connection point, but each FRMP must be separately metered, and this only applies to small customers.

Accordingly, the current metering rules nor changes on the horizon do not facilitate competition between EMSPs at a single connection point.

We recommend that the AEMC considers metering rule changes to facilitate multiple FRMPs at a single connection point for public EV charging infrastructure through use of a floating NMI. This will require a single 'parent' NMI at a public EV charging point, and then a 'secondary' NMI for each of the retailers that may be selected at each charging point.

We envisage that this will require having a single 'default' FRMP at each connection point, which could be static and unique to the connection point. This ensures that a consumer without a bundled package can charge using a default retailer at any connection point.

We understand that this is likely to also require changes to accreditation for metering providers, to ensure they have sufficient billing capabilities to measure usage from specific charging sessions throughout the day that may be done through different FRMPs and secondary NMIs.

6.2 Standards to promote a positive user experience

The public EV charging infrastructure market could benefit from several standards to deliver a positive user experience, including for interoperability, accessibility and reliability.

6.2.1 Interoperability standards

In the context of public AC charging infrastructure, interoperability allows users to access and pay for public EV charging infrastructure using their preferred EMSP and retailer.

Since 1 January 2024, developers of government supported EV charging programs have been encouraged to consider the implementation of an open charge point protocol (OCPP).[167] However, there are currently no Australian standards that mandate the interoperability of publicly accessible EV chargers, particularly for those without government funding.

[167] DCCEEW, *Minimum operating standards for government-supported public electric vehicle charging infrastructure, available at:*https://www.dcceew.gov.au/sites/default/files/documents/minimum-operating-standards-electric-vehicles-charging-infrastructure.pdf, accessed July 2025.

We explain in section 3.5 that interoperability is a key issue for several overseas jurisdictions. The United Kingdom has addressed the issue of interoperability through their *Public Charge Point Regulations 2023*, where all public charge points by the end of 2025 must enable consumers to pay through at least one roaming provider at their charge points.[168] This increases convenience for the customer as they do not have to switch between multiple apps or carry multiple RFID cards to charge their EV. This also facilitates competition among EMSPs who are incentivised to provide attractive offerings to potential customers.

We recommend that the government implements standards to mandate interoperability between public AC EV charging infrastructure, to ensure a positive user experience.

6.2.2 Accessibility standards

The Australian government has a lead role in developing a set of national standards for charging infrastructure under the National Electric Vehicle Strategy.[169]

There are currently no accessibility standards in place for public EV charging infrastructure. We note that for all government-supported programs from 1 January 2024, charging infrastructure owners must:

- demonstrate that access for people with disability has been considered, including the height and access to use screens and the usability of digital and physical infrastructure for people with various types of disabilities, in compliance with relevant guidance and standards; and
- ensure parking bays are clearly marked and easy to find through use of way-finding technology or signage.

The United Kingdom has implemented comprehensive standards that specify critical design requirements, including charging cable weight limits, optimal screen positioning height, standardised parking bay dimensions, and streetscape integration guidelines for charging infrastructure.[170] These are also important considerations across the European Union.[171] California has also recently proposed a set of laws to address similar concerns as the state continues to expand its network of publicly accessible EVCI.[172]

The European Union has mandated accessibility and mobility for all users through its standard accessibility requirements, ie:[173]

> Transport infrastructure should allow seamless mobility and accessibility for all users, including older persons, persons with reduced mobility and persons with disabilities. In principle, the location of all recharging and refuelling stations, as well as the recharging and refuelling stations themselves, should be designed in such a way that they are accessible to and user-friendly for as much of the public as possible, in particular older persons, persons with reduced mobility and persons with disabilities. This should include, for example, providing sufficient space around the parking place, ensuring that the recharging station is not installed on a kerbed surface, ensuring that the buttons or screen of the recharging station are at an appropriate height and the weight of the recharging and refuelling cables is such that persons with limited strength can handle them

[168] United Kingdom Government, *Public charge point regulations 2023 guidance*, 21 October 2024, available at: https://www.gov.uk/government/publications/the-public-charge-point-regulations-2023-guidance/public-charge-point-regulations-2023-guidance, accessed 14 July 2024.

[169] DCCEEW, *Minimum operating standards for government-supported public electric vehicle charging infrastructure, available at:* https://www.dcceew.gov.au/sites/default/files/documents/minimum-operating-standards-electric-vehicles-charging-infrastructure.pdf, accessed 14 July 2025.

[170] Motability Foundation, *Accessible electric vehicle charging standard is published*, available at: https://www.motabilityfoundation.org.uk/news/accessible-electric-vehicle-charging-standard-is-published/, accessed 14 July 2025.

[171] Regulation 2023/1804, *Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU (Text with EEA relevance)*, para 38.

[172] CDF Labor Law, *U.S. Access Board's Proposed Rules for Accessible EV Charging Station Design,* 19 September 2024, available at: https://www.cdflaborlaw.com/blog/u.s-access-boards-proposed-rules-for-accessible-ev-charging-station-design, accessed 14 July 2025.

[173] Regulation 2023/1804, *Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU (Text with EEA relevance)*, para 38.

> with ease. In addition, the user interface of the related recharging stations should be accessible. In that sense, the accessibility requirements set out in Directive (EU) 2019/882 of the European Parliament and of the Council should be applicable to recharging and refuelling infrastructure.

We recommend that the federal government urgently implements a uniform set of accessibility standards, either bespoke for public EV charging infrastructure or in line with general accessibility standards, to ensure these are in place as increasing quantities of public EV charging infrastructure are delivered.

In addition, we note there are no Australian standards for digital literacy or payment accessibility. This risks EV drivers being unable to find available public EV charging infrastructure, or pay for public EV charging.

Contactless payment allows drivers to pay directly using methods such as Apple Pay, Google Pay, or bank cards without requiring a subscription to an EMSP's service offering. This allows users to pay for charging in areas with reduced mobile service coverage, where app payments cannot be facilitated. This is essential for charging infrastructure in regional and rural areas.

Payment via an EMSP's app is likely to be cheaper to implement than contactless payment, but may be less accessible than contactless payment. This issue is compounded if there is limited interoperability of public EV charging infrastructure, as users will need to maintain multiple apps.

Having the ability to pay via contactless payment is an important consideration for all public EV charging infrastructure. However, we acknowledge the trade-off between the cost of installing additional payment options for AC charging and improving payment accessibility. We note that, under the United Kingdom's regulations, new public charge points of 8 kW and above must offer contactless payment options to end users.[174]

The Australian Government has introduced minimum operating standards which state that all DC charging sites must be able to support credit card and debit card payments and where practical an alternative method of payment such as smart phone. However, these standards only apply to government-supported DC charging programs beginning from 1 January 2024.[175]

We recommend that the federal government implements a set of payment accessibility standards for each of AC and DC charging infrastructure. We recommend the government considers the trade-off between the cost of installing additional payment options for AC charging and improving payment accessibility when determining the threshold for facilitating payment accessibility.

6.2.3 Reliability standards

EV charging infrastructure faces significant reliability challenges. From a technology perspective, charging stations are vulnerable to power grid instabilities, software malfunctions, communication network failures, and component degradation that can result in outages. Charging stations, particularly in their earlier years of operation, can also experience high rates of vandalism driven largely by community resentment over the conversion of contested parking spaces to dedicated EV charging bays.

Government supported programs beginning from a suggested date of 1 January 2024 in Australia will be subject to a suggested minimum 98 per cent annual uptime standard for each plug under the National Electric Vehicle Strategy.[176] All existing programs, including those announced prior to this date will not be

[174] United Kingdom Government, *Public charge point regulations 2023 guidance*, 21 October 2024, available at: https://www.gov.uk/government/publications/the-public-charge-point-regulations-2023-guidance/public-charge-point-regulations-2023-guidance, accessed 14 July 2024.

[175] DCCEEW, *Minimum operating standards for government-supported public electric vehicle charging infrastructure, available at:* https://www.dcceew.gov.au/sites/default/files/documents/minimum-operating-standards-electric-vehicles-charging-infrastructure.pdf, accessed 14 July 2025.

[176] DCCEEW, *Minimum operating standards for government-supported public electric vehicle charging infrastructure, available at:* https://www.dcceew.gov.au/sites/default/files/documents/minimum-operating-standards-electric-vehicles-charging-infrastructure.pdf, accessed 14 July 2025.

subject to the suggested standard. Each state and territory retains the right to implement EV charging programs in a manner that meets their objectives and can therefore vary minimum requirements accordingly.[177] It is not clear whether there are any penalties for programs that do not meet the minimum requirements, and there are no minimum reliability standards that apply to non-government supported public EV charging infrastructure.

The lack of minimum reliability standards can negatively impact the EV user experience. Poor reliability performance can undermine public confidence in EVs generally and impede EV adoption.

The United Kingdom requires a CIO's rapid public charge point network to be available 99% of the time. This is measured as an average across a charge point operator's rapid network of public charge points of 50kW and above over the calendar year.[178] However, we understand from anecdotal evidence that operators in the United Kingdom are not subject to electricity throughput requirements, and so often significantly throttle charging speeds rather than taking infrastructure offline. Unlike Australia's suggested approach, these requirements are less demanding because they base measurements on network-wide averages rather than individual plug performance.

The government should consider implementing reliability standards for EV charging infrastructure, including for both uptime and electricity throughput.

6.3 Local government and DNSP charges for land and electric pole access

Our discussions with stakeholders reveal that some local governments and DNSPs are currently charging or considering rental fees for land and pole access from charging infrastructure owners. This practice requires careful consideration of the complex trade-offs between infrastructure development, public resource management and consumer interests.

There are several economic and policy principles that justify the implementation of land and pole rental fees, namely:

- **cost recovery for infrastructure owners** – local governments and DNSPs incur costs associated with maintaining land and poles and the administrative costs of providing access to EV charging infrastructure, and so rental fees help to recover these expenses and fund ongoing maintenance;
- **market based pricing mechanisms** – rental charges can reflect location value, with premium sites commanding higher rents, encouraging optimal placement of charging infrastructure;
- **revenue generation for public or electricity user benefit** – fees from public land use can support broader community services and infrastructure improvements by local governments, while fees for poles provide benefits to electricity users that funded those assets; and
- **resource scarcity and opportunity cost** – to the extent that public land and power poles have competing uses, then rental charges ensure efficient allocation by requiring EV charging infrastructure to value the access against alternative uses (for example, use for ICE vehicle parking), thereby preventing speculative land-banking of prime spots and encouraging efficient site selection.

However, rental fees also create barriers to EV charging infrastructure development, particularly during the early stages of EV charging infrastructure development. These include:

- **increased deployment costs** – additional rental fees raise the already substantial capital requirements for installing EV charging point infrastructure, potentially slowing network expansion;

[177] DCCEEW, *Minimum Operating Standards for Government-supported Public Electric Vehicle Charging Infrastructure – Guidance Document*, n.d., p 5.

[178] United Kingdom Government, *Public charge point regulations 2023 guidance*, 21 October 2024, available at: https://www.gov.uk/government/publications/the-public-charge-point-regulations-2023-guidance/public-charge-point-regulations-2023-guidance, accessed 14 July 2024.

- **reduced commercial viability** – in areas with lower EV charging infrastructure utilisation rates, rental charges may render charging installations unprofitable, creating coverage gaps;
- **double-charging concerns** – EV infrastructure already contribute to electricity network through network charges and connection fees, and so a rent may constitute double dipping of fees (which differs from other pole users); and
- **public good considerations** – EV charging infrastructure contributes to environmental and energy security benefits that justify public support rather than rent extraction.

These considerations suggest that land and pole rental fees should be:

- minimal, to ensure that these fees do not create a barrier to development of EV charging infrastructure where these
- reflect the costs incurred by a local government or DNSP in making access available;
- be concessional during early deployment phases to encourage infrastructure development; and
- to the extent that rents are charged, should vary by location given that the value at locations are likely to be different.

The current early phase of EV market development demands careful evaluation of how land and pole rental policies impact infrastructure deployment. Policymakers must balance the legitimate need for cost recovery with the imperative to rapidly expand charging networks to meet climate goals and consumer needs. This may require temporary fee waivers, graduated fee structures that increase as the market matures, or performance-based models that link charges to EV charging infrastructure utilisation rates.

Further, consideration should be given to how rental charge structures can actively promote desired outcomes, such as incentivising installations in underserved communities, supporting interoperability standards, or encouraging renewable energy integration. The framework for these charges should evolve alongside the EV charging infrastructure market, remaining flexible enough to support innovation while ensuring fair contribution to public resources as the sector matures.

The role of land and pole rental charges in the EV charging ecosystem represents a critical policy lever that requires ongoing refinement to achieve the optimal balance between public benefit and private investment in EV charging infrastructure. We believe that consumer interests are likely best served by minimal, transparent, cost-based fees rather than market-rate rents that could slow deployment and increase charging costs to EV users.

A1. Appendix – international case studies

In this section, we summarise seven international case studies from around the world, including California, the European Union, France, Germany, the Netherlands, Norway and the United Kingdom. We note that there was insufficient and inconsistent data on China and South Korea, and so we have not summarised the charging arrangements in these jurisdictions.

Below we summarise key strategic insights from the international case studies:

- **public sector role in market establishment** – the most successful deployments show a clear pattern – strong initial government support in the provision of charging infrastructure that gradually transitions to market-led development. France and Norway demonstrate this well, with public authorities de-risking the initial establishment of markets before private operators take over;
- **regulatory framework preventing DNSP participation** – the European Union's approach to preventing DNSP ownership maintains a clear stance for ensuring competition. We note that this approach does not exist in the United States, but does not appear to have been a large 'talking point' in Californian literature;
- **facilitating demand for charging infrastructure** – Netherlands' 'right to charge' creates guaranteed demand that reduces commercial risk, while other jurisdictions' deployment targets (California, Norway) provide clear market signals – both approaches work but require different policy tools;
- **grid integration** – Netherlands' grid constraints have driven the development of a slow charging network with consideration of smart charging, which contrasts with Norway's focus on fast charging as a result of relatively unconstrained distribution infrastructure – planning must match local grid realities;
- **equity** – California's disadvantaged community targets and France's recommendation to adopt 'profitability clusters' provide two different approaches to encouraging service in areas with accessibility concerns; and
- **user experience** – whilst the rollout of public EV charging infrastructure has been mostly positive in these areas, consumers are not appreciative of needing to maintain multiple apps, queueing for charging infrastructure or unreliable infrastructure.

A1.1 California

California is leading the United States by a significant margin in public EV charging infrastructure deployment. There are more than 178,000 publicly accessible chargers in the state, with over 162,000 level 2 chargers and nearly 17,000 fast chargers.[179] This represents approximately 4.5 chargers per 1,000 inhabitants.[180] The California Energy Commission (CEC) Chair states that 94 per cent of Californians live within 10 minutes of a public EV charger.[181]

California has the largest EV registration count in the US at approximately 1.25 million EVs, which is five times greater than the next state, representing roughly 35 per cent of all light-duty EVs registered nationwide

[179] California Governor's Office, *California now has 48% more EV chargers than gasoline nozzles in the state*, 20 March 2025, available at: https://www.gov.ca.gov/2025/03/20/california-now-has-48-more-ev-chargers-than-gasoline-nozzles-in-the-state/, accessed 14 July 2025.

[180] Calculated as 178,000/39.43 million inhabitants*1000. Population estimates obtained from: United States Census Bureau, *California*, 1 July 2024.

[181] California Energy Commission, *California ZEV sales hold steady at start of 2025*, 16 May 2025, available at: https://www.energy.ca.gov/news/2025-05/california-zev-sales-hold-steady-start-2025, accessed 14 July 2025.

in the US.[182] This translates to approximately 7 EVs per public charging point[183]. Approximately 25 per cent of new car purchases in California in the first quarter of 2025 were zero emission vehicles.[184]

The state government has played an influential role in developing California's public charging network. California has a goal of transitioning the state to 100 per cent zero-emission vehicle sales by 2035 and recognises the widespread deployment of EV charging stations as being a key to achieving this goal.[185] The CEC estimates that the state will need 2.11 million public and shared private charging stations, including 83,000 DC fast chargers, to support the 15.2 million passenger plug-in EVs expected to be on the road by 2035.[186]

Local governments in California have requirements under State law to streamline and expedite the permitting of EV chargers, which require localities to:[187]

- approve an EV charging station permit application unless the locality finds, based on substantial evidence, that the charging station would have a 'specific, adverse impact upon public health or safety';
- ministerially approve EV charging permit applications regardless of siting location and local zoning regulations, and regardless of the type or size of the proposed installation; and
- within 20 or 40 business days depending on the number of chargers, approve the complete permit application.

However, common areas of noncompliance with the permit timeframe requirements are hindering the expedited rollout of EV charging stations.[188]

The CEC, in collaboration with the California Public Utilities Commission, has begun developing reliability record keeping and reporting requirements for certain EV charging stations. These standards will be used to direct CEC funding toward charging projects that are reliable and make charging convenient and accessible for the public.[189]

In December 2024, the CEC approved a US$1.4 billion investment plan to accelerate progress on the State's EV charging and hydrogen refuelling goals, building on the US$2.3 billion invested since 2007 under the Clean Transportation Program.[190]

We set out below a summary of the California Electric Vehicle Infrastructure Project (CALeVIP) program, which provides funding for installing publicly available EV charging stations through a statewide rebate program for private applicants.

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[182] US Department of Energy, *Electric Vehicle Registrations by State*, September 2024, available at: https://afdc.energy.gov/data/10962, accessed 14 July 2025.

[183] Calculated as 1,256,646/178,000.

[184] California Energy Commission, *California ZEV sales hold steady at start of 2025*, 16 May 2025, available at: https://www.energy.ca.gov/news/2025-05/california-zev-sales-hold-steady-start-2025, accessed 14 July 2025.

[185] California Department of Justice, *Attorney General Bonta Issues Legal Alert Reminding Local Jurisdictions to Streamline Permitting for Electric Vehicle Charging Stations*, 18 March 2025, available at: https://oag.ca.gov/news/press-releases/attorney-general-bonta-issues-legal-alert-reminding-local-jurisdictions, accessed 14 July 2025.

[186] California Energy Commission, Davis A et al, *Assembly Bill 2127 electric vehicle charging infrastructure assessment – assessing charging needs to support zero-emission vehicles in 2030 and 2035*, 24 August 2023, p ii.

[187] California Department of Justice, *Attorney General Bonta Issues Legal Alert Reminding Local Jurisdictions to Streamline Permitting for Electric Vehicle Charging Stations*, 18 March 2025, available at: https://oag.ca.gov/news/press-releases/attorney-general-bonta-issues-legal-alert-reminding-local-jurisdictions, accessed 14 July 2025.

[188] California Department of Justice, *Attorney General Bonta Issues Legal Alert Reminding Local Jurisdictions to Streamline Permitting for Electric Vehicle Charging Stations*, 18 March 2025, available at: https://oag.ca.gov/news/press-releases/attorney-general-bonta-issues-legal-alert-reminding-local-jurisdictions, accessed 14 July 2025.

[189] California Energy Commission, *Electric Vehicles & Charging Infrastructure*, available at: https://www.energy.ca.gov/programs-and-topics/programs/clean-transportation-program/clean-transportation-funding-areas-0, accessed 14 July 2025.

[190] California Energy Commission, *CEC approves $1.4 billion plan to expand zero-emission transportation infrastructure*, 11 December 2024, available at: https://www.energy.ca.gov/news/2024-12/cec-approves-14-billion-plan-expand-zero-emission-transportation-infrastructure, accessed 14 July 2025.

A1.1.1 Overview of CALeVIP program

CALeVIP has funded the installation of more than 5,000 EV charging ports and has over 6,000 more in progress across the state since its launch in 2017.[191] CALeVIP 1.0 launched 13 projects between 2017 and 2022, covering 36 counties across California, and included installing level 2 and DC fast chargers at publicly accessible sites. CALeVIP 2.0 launched in 2023, and exclusively covers DC fast chargers with a minimum 150kW capability.[192]

CALeVIP 1.0 was funded for $186 million in EV charging rebates and the Centre for Sustainable Energy was awarded an agreement for up to $250 million for CALeVIP 2.0.[193]

A1.1.2 CALeVIP 1.0 case study – Southern California Level 2 Incentive Project

The Southern California Level 2 Incentive Project (SCIPL2) launched on April 5, 2022 under CALeVIP 1.0, addressing regional needs for electric vehicle charging infrastructure throughout Southern California (Los Angeles, Orange, Riverside, and San Bernardino counties) and supporting California's green energy goals. The program aimed at level 2 AC charging infrastructure for residential and commercial applications.[194]

The program was eligible for owners or representatives of businesses and commercial properties, multifamily properties, nonprofits, government-owned properties and higher education and K-12 school districts. A minimum of 60 per cent of the project's funding aimed to be invested in disadvantaged and low-income communities. This represents a higher equity threshold than the broader CALeVIP program's 50 per cent requirement.[195]

The funding offered rebates of the maximum of $3,500 or 75 per cent of project costs per connector. There were additional rebates for chargers installed in disadvantaged communities, low-income communities, and multi-dwelling sites. $12.2 million was also reserved to incentivize the installation of publicly available EV charging stations in Los Angeles County through SCIPL2.[196]

A1.1.3 CALeVIP 2.0

CALeVIP funding comes from the Californian Energy Commission's clean transportation program and the state's Greenhouse Gas Reduction Fund.[197] Rebates of up to 100 per cent of a project's total approved costs are provided under CALeVIP 2.0, but are capped at:[198]

- $100,000 for charging ports with a guaranteed output greater than 275 kW; and
- $55,000 per charging port for guaranteed outputs between 150 kW and 275 kW.

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[191] Center for Sustainable Energy, *California Electric Vehicle Infrastructure Project*, available at: https://energycenter.org/program/california-electric-vehicle-infrastructure-project, accessed 14 July 2025.

[192] ChargeLab, *California Electric Vehicle Infrastructure Project (CALeVIP)*, available at: https://chargelab.co/rebates/calevip, accessed 14 July 2025.

[193] ChargeLab, *California Electric Vehicle Infrastructure Project (CALeVIP)*, available at: https://chargelab.co/rebates/calevip, accessed 14 July 2025; and California Energy Commission, *California Electric Vehicle Infrastructure Project (CALeVIP) 2.0*, available at: https://www.energy.ca.gov/programs-and-topics/programs/california-electric-vehicle-infrastructure-project-calevip-20#:~:text=The%20Center%20for%20Sustainable%20Energy,agreement%20is%20named%20CALeVIP%202.0, accessed 14 July 2025.

[194] Clean Power Alliance, *Are you ready for California's Electric Vehicle (EV) Future?*, available at: https://cleanpoweralliance.org/get-involved-old/calevip/, accessed 14 July 2025.

[195] Clean Power Alliance, *Are you ready for California's Electric Vehicle (EV) Future?*, available at: https://cleanpoweralliance.org/get-involved-old/calevip/, accessed 14 July 2025.

[196] Clean Power Alliance, *Are you ready for California's Electric Vehicle (EV) Future?*, available at: https://cleanpoweralliance.org/get-involved-old/calevip/, accessed 14 July 2025.

[197] California Energy Commission, *California Energy Commission launches $55 million project for high-powered electric vehicle charging stations throughout the state*, 13 February 2025, available at: https://www.energy.ca.gov/news/2025-02/california-energy-commission-launches-55-million-project-high-powered-electric, accessed 14 July 2025.

[198] California Energy Commission, *Fast Charge California Project*, available at: https://calevip.org/fast-charge-california-project, accessed 14 July 2025.

From CALeVIP 1.0, the commission learnt that:[199]

- applications on a 'first-come, first-served' basis was problematic as:
  - there were a large influx of applications on launch day, and the program was highly oversubscribed;
  - applications were submitted as placeholders/with missing information; and
  - as a result, there were long processing times and a large waitlist;
- varying program requirements led created challenges for applicants and inefficiencies for processing, as applicants often had to be reached out to multiple times;
- 40 per cent of applications were cancelled after funds were approved, and 30 per cent of applications required additional information.

Accordingly, for CALeVIP 2.0, the commission:[200]

- implemented a tiered randomisation system with block application windows;
- required site verification and evidence of application with local utility for application; and
- amended the project from 13 regional projects (with counties) to two statewide projects.

In addition, CALeVIP 2.0:[201]

- focused on DC fast charging only 'to ensure the best driver experience';
- directed 50 per cent of project funding for installations in low-income and disadvantaged communities, to focus on equity; and
- gave 'top priority to applicants who have done pre-planning to get chargers in the ground quickly and efficiently'.

A1.2 European Union

Article 33 of Directive 2019/944/EU relates to the integration of electromobility into the electricity network, and specifically the role of the distribution system operator, ie, the DNSP. It states that distribution system operators shall not own, develop, manage or operate recharging points for EVs, except for their own private and sole use, and except in the limited circumstances covered in paragraph 3 below:[202]

> 1. Without prejudice to Directive 2014/94/EU of the European Parliament and of the Council (*2), Member States shall provide the necessary regulatory framework to facilitate the connection of publicly accessible and private recharging points with smart charging functionalities and bidirectional charging functionalities in accordance with Article 20a of Directive (EU) 2018/2001 to the distribution networks. Member States shall ensure that distribution system operators cooperate on a non-discriminatory basis with any undertaking that owns, develops, operates or manages recharging points for electric vehicles, including with regard to connection to the grid.
>
> 2. Distribution system operators shall not own, develop, manage or operate recharging points for electric vehicles, except where distribution system operators own private recharging points solely for their own use.

[199] Center for Sustainable Energy, *Presentation for the CALeVIP 2 Public Workshop*, 12 May 2022, p 20.

[200] Center for Sustainable Energy, *Presentation for the CALeVIP 2 Public Workshop*, 12 May 2022, p 22.

[201] California Energy Commission, *About CALeVIP*, available at: https://calevip.org/about-calevip, accessed 14 July 2025.

[202] Directive 2019/944, *Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU*, Article 33.

3. By way of derogation from paragraph 2, Member States may allow distribution system operators to own, develop, manage or operate recharging points for electric vehicles, provided that all of the following conditions are fulfilled:

    a. other parties, following an open, transparent and non-discriminatory tendering procedure that is subject to review and approval by the regulatory authority, have not been awarded a right to own, develop, manage or operate recharging points for electric vehicles, or could not deliver those services at a reasonable cost and in a timely manner;

    b. the regulatory authority has carried out an *ex ante* review of the conditions of the tendering procedure under point (a) and has granted its approval;

    c. the distribution system operator operates the recharging points on the basis of third-party access in accordance with Article 6 and does not discriminate between system users or classes of system users, and in particular in favour of its related undertakings.

    The regulatory authority may draw up guidelines or procurement clauses to help distribution system operators ensure a fair tendering procedure.

4. Where Member States have implemented the conditions set out in paragraph 3, Member States or their designated competent authorities shall perform, at regular intervals or at least every five years, a public consultation in order to re-assess the potential interest of other parties in owning, developing, operating or managing recharging points for electric vehicles. Where the public consultation indicates that other parties are able to own, develop, operate or manage such points, Member States shall ensure that distribution system operators' activities in this regard are phased-out, subject to the successful completion of the tendering procedure referred to in point (a) of paragraph 3. As part of the conditions of that procedure, regulatory authorities may allow the distribution system operator to recover the residual value of its investment in recharging infrastructure.

A1.3 France

France has approximately 156,000 publicly available charging points. France has the European Union's largest share of slow charging infrastructure, with 32 per cent of its publicly available EV chargers below 7.5kW and a further 47 per cent between 7.5 and 22kW. However, its share of ultra-fast chargers (>=150kW) is equivalent to the European Union average, as a result of its low share of fast chargers (22kW-150kW).[203]

France's publicly available charging network is evenly dispersed geographically, with its densest region having 2.9 chargers per 1,000 inhabitants, compared to 1.9 chargers per 1,000 inhabitants in its least dense region.[204] However, the majority of these are concentrated within metropolitan areas, and there are a range of 'areas to be filled' that will not otherwise be covered by charging infrastructure without government intervention due to factors like low economic attractiveness, low traffic, or a need for affordable on-street charging.[205]

France's public EV charging infrastructure rollout in 2017-2020 was driven by regional public energy authorities which lay the foundation for a nationwide charging network, deploying tens of thousands of EV charging points in locations overlooked by private investors. These public energy authorities prioritised accessibility and regional equity, not short-term profit, which helped to de-risk the market and pave the way for commercial expansion. These public energy authorities principally operate AC chargers, with only a small

[203] GridX, *Charging report 2025*, 2025, p 22.

[204] GridX, *Charging report 2025*, 2025, p 22.

[205] AFRY and Avere-France, *Hit the Road: Volume 1 – State of charging infrastructure in France*, October 2023, p 4.

percentage dedicated to DC charging. From 2021, private initiatives took over, and by 2025, private operators are expected to cover over 70 per cent of the country's total charge points.[206]

In line with the European Union Directives, France has adopted a total ban on grid operators, including those of closed distribution networks, owning, developing, managing or operating an e-charging infrastructure (with the same two exemptions in the European Union Directives). In addition, France's legal framework does not require the operator of charging infrastructure to act as an electricity supplier subject to the corresponding applicable regime.[207]

The public procurement regulation in France offers two main solutions for the deployment of charging stations, ie:[208]

- a public procurement contract-based model, where the local authority does not transfer risk to the contract holder, and the contract holder is compensated through the price paid by the local authority for constructing and/or operating the EV charging station (not from day-to-day operation of that station) – this is typically used where there is a need for the infrastructure and it is unlikely to be economic for a private operator; and
- a concession-based model, where the contract holder is compensated through day-to-day operation of the station, and so bears the risk of that investment. The local authority may have an interest in subsidising the EV charging station or risk-sharing.

Some publicly available information criticises the reliability of France's public EV charging network, with an availability rate of only 81 per cent for AC chargers in February 2024 (indicating that these chargers were down almost 20 per cent of the time).[209] We note that this figure has increased to 93 per cent as of April 2025.[210]

One challenge that may eventually arise in France is the transition from non-tendered access to public land for EV charging stations, which was initially granted to accelerate development of charging infrastructure, to a commercialisation of that land by competition for access.[211]

One interesting insight from a study to address 'areas to be served' is to tender based on profitability clusters, which would pair more profitable locations with less desirable locations to ensure equitable access.[212]

A1.4 Germany

Germany has approximately 160,000 publicly available charge points, with 76 per cent of these being 7.5 – 22 kW chargers. On a per capita basis, this puts it at 1.9 charge points per 1,000 inhabitants, which is slightly below the EU average of 2.2 charge points per 1,000 inhabitants. Germany's charge point operators

[206] EVBoosters, *How France's public energy associations – SDEs -kickstarted the EV charging revolution*, 22 April 2025, available at: https://evboosters.com/ev-charging-news/how-frances-public-energy-associations-sdes-kickstarted-the-ev-charging-revolution/, accessed 14 July 2025.

[207] Watson Farley & Williams, *The Future of EV Charging: Spotlight on France*, 18 April 2024, available at: https://www.wfw.com/articles/the-future-of-ev-charging-spotlight-on-france/, accessed 14 July 2025.

[208] Watson Farley & Williams, *The Future of EV Charging: Spotlight on France*, 18 April 2024, available at: https://www.wfw.com/articles/the-future-of-ev-charging-spotlight-on-france/, accessed 14 July 2025.

[209] Beev, *The problem of public charging stations in France*, 27 September 2024, available at: https://www.beev.co/en/blog/borne-de-recharge/le-probleme-des-bornes-de-recharge-publiques-en-france/, accessed 14 July 2025.

[210] Avere-France, *[Baromètre] 168 055 points de recharge ouverts au public fin avril 2025*, 13 May 2025, https://www.avere-france.org/publication/barometre-168-055-points-de-recharge-ouverts-au-public-fin-avril-2025/, accessed 14 July 2025.

[211] Watson Farley & Williams, *The Future of EV Charging: Spotlight on France*, 18 April 2024, available at: https://www.wfw.com/articles/the-future-of-ev-charging-spotlight-on-france/, accessed 14 July 2025.

[212] AFRY and Avere-France, *Hit the Road: Volume 3 – EV charging in areas to be filled*, October 2023, pp 10-11.

have low concentration, with its top 5 operators having only a 23 per cent market share in 2024. However, this rose from only 15 per cent in 2023, suggesting consolidation is occurring.[213]

In Germany, the construction and operation of charging infrastructure competitively tendered. While in many other European countries the distribution network operators initially built the infrastructure, in Germany there is competition among the providers that aim to connect charging points to their networks.[214]

To promote the integrated planning of charging infrastructure, the German National Centre for Charging Infrastructure provides stakeholders with three different publicly available tools, ie:[215]

- the Standorttool which indicates currently installed charging points, planned charging points and forecasted future demand;
- the Flächentool, which allows charging infrastructure owners to identify potential sites for projects; and
- the Ladelerntool, which aims at providing practical knowledge for development of EV charging infrastructure within federal states and municipalities.

In particular, the Flächentool allows private land owners to flag sites that may be eligible for EV charging infrastructure and provide detail on those sites, which may result in interested charging infrastructure providers contacting them.[216]

Germany has recently implemented strict requirements for electricity charges at public EV charging stations, which require that consumers are billed only on a kWh basis for electricity they consume.[217] Consumers almost always pay for electricity through charging cards, which are unique to each network. Some networks provide interoperable charging cards, though it is recommended to have two or three cards if you're travelling around Germany.[218]

A1.5 Netherlands

The Netherlands has one of the most mature public EV charging networks in the world, which has been driven by long-term favourable government policy. The Netherlands has 183,000 publicly available chargers, with 94 per cent of those being between 7.5 and 22kW chargers. The top five operators of AC chargers operate approximately 84 per cent of charging sites, suggesting a relatively concentrated market, though the top five operators of DC chargers only operate approximately 44 per cent of charging sites. They also have 594,000 EVs, representing 3.2 EVs per charging point, and 10.0 charging points per 1,000 inhabitants.[219]

A key driver of this network development is the 'right to charge', which is a government mandate that provides any EV owner the right to access public charging within 250 metres of their house. This generates 'guaranteed demand' for charge point operators, which reduces the commercial risk of investment. Charge point locations are determined in conjunction between municipalities, DNSPs and charge point operators.[220]

[213] GridX, *Charging report 2025*, 2025, p 23.

[214] EU regional development fund and Emobicity, *Report on EV charging pricing, regulatory framework and DSO role in the e-mobility development*, n.d., p 28.

[215] Changing transport, *Successful charging infrastructure roll-out – study tour findings*, 18 November 2022, https://changing-transport.org/5-success-factors-for-charging-infrastructure-roll-out/#:~:text=For%20charging%20infrastructure%2C%20the%20Dutch,who%20own%20an%20electric%20vehicle, accessed 14 July 2025.

[216] Flächentool, *Map*, available at: https://flaechentool.de/map, accessed 14 July 2025.

[217] Inepro, *What is Eichrecht? German calibration law for EV charging explained*, 14 April 2025, available at: https://www.ineprometering.com/blog/what-is-eichrecht, accessed 14 July 2025.

[218] EU regional development fund and Emobicity, *Report on EV charging pricing, regulatory framework and DSO role in the e-mobility development*, n.d., p 31.

[219] GridX, *Charging report 2025*, 2025, p 26.

[220] Changing transport, *Successful charging infrastructure roll-out – study tour findings*, 18 November 2022, https://changing-transport.org/5-success-factors-for-charging-infrastructure-roll-

In accordance with the European Union's recommendations, distribution system operators are not permitted to own public EV charging infrastructure.[221]

The Netherlands implemented standards for EV charging infrastructure very early on. ElaadNL, a knowledge and innovation centre in the field of smart charging infrastructure funded by the DSOs, was founded in 2009. This vendor-independent equipment certification centre ensures that standards are met, and that all equipment is interoperable. ElaadNL also supports the development of charging standards and open protocols, which are crucial to the development of open markets.[222]

The Netherlands Knowledge Platform has also standardised a set of guidelines for municipalities and market parties to facilitate the roll-out of charging infrastructure. These guidelines cover:[223]

- applications and construction;
- agreement on maintenance and management;
- the functionality, design, engineering and safety of charging stations;
- the back offices and interfaces (such as communications protocols and payment options), and cybersecurity requirements;
- smart charging and vehicle to grid charging;
- security;
- engineering and safety; and
- an updates list of general standards and requirements that must be adhered to.

The Netherlands has a relatively constrained grid, which cannot accommodate significant increases in peak load. The high and medium voltage grid in the Netherlands is already facing significant congestion issues, which are in many places already at the point where congestion management cannot further alleviate capacity constraints.[224]

Accordingly, the Netherlands is trialling pilot programs to encourage 'grid-aware' charging. One successful trial decreased charging speed between 3pm and 9pm, increasing it gradually to full power by 11pm. Consumers were given the ability to opt out of the trial. The trial found that many charging sessions could be completed on time, without users having to stop charging prematurely, whilst shifting the load to the night where there are lower network constraints.[225]

In addition, a large number of organisations in the Netherlands' EV charging industry including charge point operators, EMSPs and CIPs have signed an agreement on better data exchange for smart charging of EVs. This aims to bring data around smart charging, ie, programming the speed and time of EV charging to adapt to a lower kWh price, to gain consumer understanding of charging to reduce grid impacts of charging sessions. According to the implementation manager, the reason this is not occurring on a large scale is because companies have been waiting for each other to implement it, leaving technical interfaces missing. In

out/#:~:text=For%20charging%20infrastructure%2C%20the%20Dutch,who%20own%20an%20electric%20vehicle., accessed 14 July 2025.

[221] EU regional development fund and Emobicity, *Report on EV charging pricing, regulatory framework and DSO role in the e-mobility development*, n.d., p 48.

[222] Changing transport, *Successful charging infrastructure roll-out – study tour findings*, 18 November 2022, https://changing-transport.org/5-success-factors-for-charging-infrastructure-roll-out/#:~:text=For%20charging%20infrastructure%2C%20the%20Dutch,who%20own%20an%20electric%20vehicle., accessed 14 July 2025.

[223] Netherlands Knowledge Platform, *Uniform standards for charging participants*, 2018, available at: https://nklnederland.nl/wp-content/uploads/2021/12/NKL-Engels-2018-def-charging-stations.pdf, accessed 14 July 2025.

[224] Strategy&, *Unlocking EV smart charging to reduce grid congestion - lessons from the Netherlands*, March 2024, p 9.

[225] Electric Vehicle charging and infrastructure, *Dutch 'grid-aware' charging pilot reduces grid congestion*, 20 March 2025, available at: https://www.evcandi.com/news/dutch-grid-aware-charging-pilot-reduces-grid-congestion, accessed 14 July 2025.

the future, the program could allow consumers to select their 'end time' for a charging session and how full the battery is currently, and let the smart charging determine how best to fill it up.[226]

However, a key feature of the Netherlands is its relatively compact geography, which is likely to lend itself to shorter driving distances than Australia (better facilitated by overnight slow charging, and less likely to generate range anxiety).

A1.6 Norway

Norway has the highest share of public EV charging capacity per capita, with 30,224 chargers in 2024 and 430.7kW of capacity per 1,000 inhabitants. This in part reflects Norway's large share of ultra fast chargers (>=150kW), which represents 27 per cent of all publicly available chargers.[227]

Norway has the greatest share of EVs as a proportion of new cars sold, with almost 82 per cent of all new registered passenger vehicles being EVs.[228] In 2024, the total number of EVs on the road surpassed the number of petrol vehicles.[229] Norway's EV sales rose sharply once the cost of EV ownership reached parity with internal combustion engine (ICE) ownership, which was principally due to higher taxes and tolls for ICE vehicles compared to EVs.[230]

In contrast to the Netherlands, Norway has a relatively uncongested grid and extensive hydropower, making up more than 90 per cent of electricity generation, which helps to facilitate reliable power supply of electricity for EVs. In addition, the country has ample interconnection capacity, which is required due to its population density and geography.[231]

The costs of public EV fast charging are typically three to four times greater than home charging – McKinsey estimates that by 2030, public EV charging (fast and destination charging) will make up 40 per cent of total EV power demand and provide three quarters of total EBITDA from EV charging, whereas home charging will make up 25 per cent of total EV power demand and only provide 10 per cent of total EBITDA from EV charging.[232]

A fast charging station has been installed on every main road in the country, and users will never need to travel more than 30 miles (50 kilometres) to a fast charger. Norway has also introduced legislation establishing a charging right for people living in apartments.[233] The government played an active role in establishing the charging network. In some cases, to ensure that chargers were placed at regular intervals on main roads, it subsidised up to 100 per cent of the installation costs through competitive tenders from CIOs. However, since June 2022, new passenger EV charging stations have been built entirely on a commercial basis.[234]

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[226] Greenflux, *EV charging players agree on better smart charging information exchange in the Netherlands*, 18 April 2025, available at: https://www.greenflux.com/about/news/ev-charging-players-agree-on-better-smart-charging-information-exchange-in-the-netherlands/, accessed 14 July 2025.

[227] GridX, *Charging report 2025*, 2025, p 28.

[228] GridX, *Charging report 2025*, 2025, p 28.

[229] Clenergy EV, *EV News: Norway's World First and Multi-Million EV Investment*, 30 September 2024, available at: https://www.clenergy-ev.com/resources/news/ev-news-norways-world-first-and-multi-million-ev-investment/, accessed 14 July 2025.

[230] McKinsey & Company, *What Norway's experience reveals about the EV charging market*, 8 May 2023, available at: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/what-norways-experience-reveals-about-the-ev-charging-market, accessed 14 July 2025.

[231] IEA, *Norway Electricity Security Policy*, 5 October 2022, available at: https://www.iea.org/articles/norway-electricity-security-policy, accessed 14 July 2025.

[232] Other sources of demand and profit are work charging and fleet depots. See: McKinsey & Company, *What Norway's experience reveals about the EV charging market*, 8 May 2023, available at: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/what-norways-experience-reveals-about-the-ev-charging-market, accessed 14 July 2025.

[233] Mer, *EV Charging Infrastructure Best Practice: What We Can Learn from Norway*, 15 August 2024, available at: https://uk.mer.eco/news/ev-charging-infrastructure-best-practice-learnings-from-norway/, accessed 14 July 2025.

[234] Washington Post, *Most new cars in Norway are EVs. How a freezing country beat range anxiety*, 30 May 2025, available at: https://www.washingtonpost.com/climate-solutions/2025/05/30/norway-ev-adoption-electric-cars/, accessed 14 July 2025.

However, there are some concerns that the design of Norway's public EV charging network is hampering user experience in some aspects, including:

- a fragmented market of EMSP services requiring multiple apps or restricting user access to charging infrastructure; and
- a highly dispersed and sometimes unreliable charging system resulting in long wait times.

First, the market is highly fragmented, which means there are approximately 10 major providers of EMSP services, which favours downloading 10 apps or having charging locations restricted.[235] EMSPs include fuel retailers, automotive equipment manufacturers, electricity retailers and a range of independent and energy company backed players. Because the scope of unmet need has been high, all players have gained some traction in Norway's EV charging infrastructure market. Accordingly, competition for EMSP market share is high.[236]

Second, many fast charging locations have a small number of chargers at each site, which has led to queueing. These concerns are compounded by system glitches and shortfalls, including limited options for direct payment, poorly designed parking spots, short charging cables, and malfunctioning hardware. Larger sites with higher concentrations of chargers are required to address this issue – CIOs are recognising this gap in the market and working to address it.[237]

In addition, there is significant competition over prime charging locations.[238] This may be positive for EV charging provision in the short term, but may result in incumbent providers having an advantage over new entrants in the medium-long term, which may have the effect of reducing competition between CIOs and EMSPs.

Despite these concerns, Norway's charging infrastructure rollout shows a high degree of maturity and facilitates a nearly 100 per cent adoption rate of EVs (Norway's goal for 2025).

A1.7 United Kingdom

The United Kingdom has over 82,300 EV charging points across nearly 40,500 charging locations. This includes over 16,600 chargers classed as rapid or ultra-rapid with a power output above 50 kW. While these rapid and ultra-rapid chargers make up around 20 per cent of total chargers in the United Kingdom, they account for around 60 per cent of total capacity. Of these sites, 673 are rapid charging hubs defined as a location with at least six chargers capable of charging at above 50 kW.[239]

The deployment of EV chargers across the United Kingdom reveals stark regional disparities. In London there were an average of 210 public chargers per 100,000 people, over two and a half times the United Kingdom's average of 80 in 2024.[240]

[235] Visit Norway, *Norway – the EV capital of the world*, available at: https://www.visitnorway.com/plan-your-trip/getting-around/by-car/electric-cars/, accessed 14 July 2025.

[236] Other sources of demand and profit are work charging and fleet depots. See: McKinsey & Company, *What Norway's experience reveals about the EV charging market*, 8 May 2023, available at: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/what-norways-experience-reveals-about-the-ev-charging-market, accessed 14 July 2025.

[237] McKinsey & Company, *What Norway's experience reveals about the EV charging market*, 8 May 2023, available at: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/what-norways-experience-reveals-about-the-ev-charging-market, accessed 14 July 2025.

[238] McKinsey & Company, *What Norway's experience reveals about the EV charging market*, 8 May 2023, available at: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/what-norways-experience-reveals-about-the-ev-charging-market, accessed 14 July 2025.

[239] Zapmap, *EV charging statistics 2025 – Tracking the growth in charging points across the UK*, 3 July 2025, available at: https://www.zap-map.com/ev-stats/how-many-charging-points, accessed 14 July 2025.

[240] The Eco Experts, *Regional Disparity In Public EV Chargers In The UK,* 13 February 2024. Available at: https://www.theecoexperts.co.uk/electric-vehicles/regional-disparity-in-public-ev-chargers-uk, accessed 14 July 2025.

As of the end of April 2025, there were over 1.55 million EVs in the United Kingdom. This equates to approximately 4.6 per cent of the 34 million vehicles registered on United Kingdom roads.[241]

The United Kingdom Government has recently released a series of regulations surrounding the operation of public EV charging stations. The Public Charge Point Regulations 2023 (the regulations) came into effect on 24 November 2023 to ensure that the experience of consumers using public charge points across the United Kingdom is consistent and positive. The regulations build on four key areas of the consumer experience to ensure:[242]

- consumers can easily locate the right public charge point to fit their needs: this includes displaying prices transparently in pence per kWh either on the charge point or through a separate device which does not require a person to have entered into a contract with the charge point operator;
- ease of payment across public charge points: this is ensured by requiring new public charge points of 8kW and above and existing charge points of 50kW and above to offer contactless payment options in close proximity to the public charge point;
- consumers can be confident that public charge points will be in good working order: rapid public charge points must be available 99 per cent of the time, measured as an average across a charge point operator's network of public charge points of 50kW and above over the calendar year; and
- consumers are able to compare prices across multiple public charge point networks: charge point operators must enable consumers to pay through at least one third party roaming provider at their charge points. Roaming is the ability to pay to charge an EV across multiple charge point networks using a single app or RFID card.

The United Kingdom government has launched several EV charging infrastructure programs over the past decade. These programs have been heavily concentrated towards London through the Source London EV charging scheme and the Go Ultra Low City Scheme.[243]

The most recent of these programs is the nationwide Local Electric Vehicle Infrastructure (LEVI) program involving local authorities across the United Kingdom, which we set out below.

A1.7.1 Overview of United Kingdom LEVI program

The LEVI program was implemented in 2023 and aims to:[244]

- support local authorities in England to plan and deliver charge point infrastructure for residents without off-street parking; and
- accelerate the commercialisation of, and investment in, the local charging infrastructure sector.

The program is led by the Department for Transport who announced funding to deploy primarily low power (less than 22kW) level 2 AC charging stations targeting on-street charging for residential use of:[245]

- £343m in capital funding for local authorities in England, for the installation of EV charge points, including hardware, electrical connection costs, civil engineering costs and other installation costs; and

[241] Zapmap, *EV market stats 2025 - Tracking the growth in EV sales in the UK over time,* 8 June 2025, Available at: https://www.zap-map.com/ev-stats/ev-market, accessed 14 July 2025.

[242] United Kingdom Government, *Public charge point regulations 2023 guidance*, 21 October 2024, available at: https://www.gov.uk/government/publications/the-public-charge-point-regulations-2023-guidance/public-charge-point-regulations-2023-guidance, accessed 14 July 2025.

[243] Transport for London, *London electric vehicle infrastructure delivery plan*, June 2019, p 7.

[244] Energy Saving Trust, *Local Electric Vehicle Infrastructure (LEVI) Capital Fund Information Pack 2023-2025*, August 2024, pp 4-5.

[245] Energy Saving Trust, *Local Electric Vehicle Infrastructure (LEVI) Capital Fund Information Pack 2023-2025*, August 2024, p 8 and United Kingdom Government, *Local Electric Vehicle Infrastructure (LEVI) funding allocation methodology*, available at: https://www.gov.uk/government/publications/local-ev-infrastructure-levi-funding-amounts/local-electric-vehicle-infrastructure-levi-funding-allocation-methodology, accessed 14 July 2025.

- £37.8m in capability funding to develop in-house expertise within local authorities, and ability to coordinate charge point plans and work with private operators.

The LEVI Fund is available to Tier 1 local authorities (unitary, county council or combined authorities) in England on behalf of all their constituent authorities. In London, capital funding will be delivered through borough partnerships.[246]

The capital allocation model was developed with two guiding principles. The first is based on addressing the need for EV charging in areas with lower levels of off-street parking. The second is based on progress which aims to provide greater funding to areas with less existing EVCI.[247]

Four allocation variables were chosen to reflect these principles and determine the level of funding available for each local authority, ie, the number of public charge points per 100,000 of population in each area, the index of multiple deprivation, the level of rurality, and the estimate of vehicles without off-street parking.[248]

Local authorities must retain appropriate influence over tariffs throughout the contract, including considerations for time of use tariffs.[249] The program enables flexible approaches to cost recovery and pricing structures, with local authorities maintaining oversight of tariff setting to ensure public interest considerations are reflected in charging costs.[250] The focus is to provide affordable charging to all residents. Therefore, tariff levels should be justified with reference to wholesale prices, with input from the local authority and the CIP dependent on the commercial model.[251]

[246] United Kingdom Government, *Apply for Local Electric Vehicle Infrastructure (LEVI) funding*, 7 September 2023, available at: https://www.gov.uk/guidance/apply-for-local-ev-infrastructure-levi-funding, accessed 14 July 2025.

[247] United Kingdom Government, *Local Electric Vehicle Infrastructure (LEVI) funding allocation methodology*, 17 January 2025, available at: https://www.gov.uk/government/publications/local-ev-infrastructure-levi-funding-amounts/local-electric-vehicle-infrastructure-levi-funding-allocation-methodology, accessed 14 July 2025.

[248] United Kingdom Government, *Local Electric Vehicle Infrastructure (LEVI) funding allocation methodology*, 17 January 2025, available at: https://www.gov.uk/government/publications/local-ev-infrastructure-levi-funding-amounts/local-electric-vehicle-infrastructure-levi-funding-allocation-methodology, accessed 14 July 2025.

[249] Energy Saving Trust, *Local Electric Vehicle Infrastructure (LEVI) Capital Fund Information Pack 2023-2025*, August 2024, p 18.

[250] Energy Saving Trust, *Local Electric Vehicle Infrastructure (LEVI) Capital Fund Information Pack 2023-2025*, August 2024, p 14.

[251] Energy Saving Trust, *Local Electric Vehicle Infrastructure (LEVI) Capital Fund Information Pack 2023-2025*, August 2024, p 18.

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