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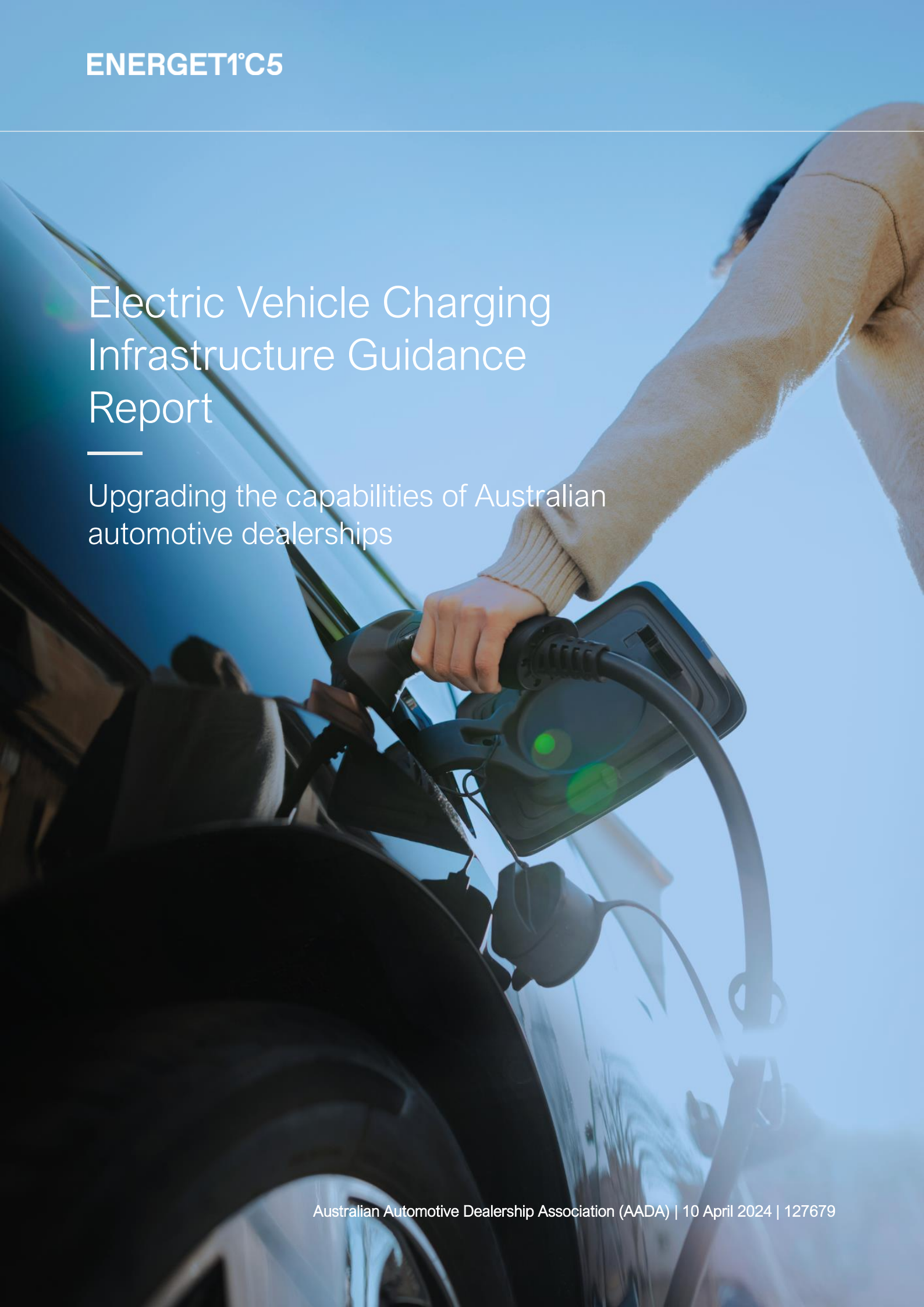
# Electric Vehicle Charging Infrastructure Guidance Report

## Upgrading the capabilities of Australian automotive dealerships



Australian Automotive Dealership Association (AADA) | 10 April 2024 | 127679

# Summary of findings

The Australian Automotive Dealer Association (AADA) is seeking to understand the range of operational changes and costs that will arise for their members from the Australian market's transition to low emissions (LEVs) and electric vehicles (EVs).

Over 2023 the Australian market has seen the share of EV sales double to more than 7%[1]. The factors driving EV uptake in Australia include government emissions reduction commitments, fuel efficiency standards, and the preferences and expectations of consumers.

Dealers will need to facilitate the sale of increasing numbers of EVs over the coming decade. They will also need to respond to Original Equipment Manufacturers (OEMs) which, in line with international markets, are introducing new infrastructure requirements for dealerships to support the sale of LEVs and EVs locally. With that, additional electrical load will be required for charging vehicles at dealerships which in turn will lead to upgrades - both on site for the dealerships, and upstream to the electrical distribution infrastructure.

## Energetics' analysis found that the investment needed in infrastructure is estimated to exceed $1billion for franchised new car dealers in Australia.

With over 3,100 dealers nationwide, the capital investment is expected to range from $130,000 for a typical regional dealer to $580,000 for a typical rural dealer. Note that Energetics' estimate is funding agnostic, as there are multiple potential arrangements for sourcing capital[2].

Other insights include:

- Pace. The rollout of EVs is anticipated to occur in metropolitan areas at a faster rate initially than regional and rural locations. This is mainly due to the availability of the necessary infrastructure. Customer demand is also expected to be greater in metropolitan locations
- Upgrade costs. As rural dealerships are assumed to require the largest upgrades to electrical infrastructure, upgrade costs are higher than those for metropolitan and regional dealerships
- Varying technical requirements. Dealerships need to carefully consider the type of EV chargers installed on-site. Some locations may not need Level 3[3] charging capacity (e.g. metropolitan and regional dealerships), although this will often be determined by the OEM and written into Dealer Agreements
- Lead times to implement. Dealerships may face lead times of up to two years for the installation of certain infrastructure. These include electrical infrastructure upgrades (e.g. installation/ upgrade of transformers) and charging requirements (e.g. Level 3). Rural dealerships can expect longer delays
- Skills. Dealership employees will be supporting the marketing, sale, and service of EVs
- OEM requirements. OEMs may have their own emissions reductions targets. They may also respond to new vehicle efficiency standards globally. Both factors can lead to expectations and requirements of their dealerships with regards to the implementation of EV charging infrastructure and the range of EVs for sale. Noting some OEMs may be able to share the

[1] AADA
[2] See Table 10, section titled 'The indicative cost to transition Australia's dealership network' which summarises the total cost implications for the AADA network.
[3] Refer to table 1 for a detailed breakdown of EV charging types

financial burden of the new EV infrastructure, and dealers should investigate any such potential.

- Local market shifts. Australia's new National Vehicle Emissions Standards (NVES) will likely increase the demand for plug-in hybrid electric vehicles and EVs, requiring dealers to invest in onsite charging and infrastructure upgrades.

To access the benefits of the transition, dealership facilities not only require significant modifications to support the sale of EVs, they ultimately need strategies to identify and capture a range of opportunities – all at a time when the pace of electrification is gathering speed.

# Contents

# A major shift is underway

Through an examination of the regulatory and market context, and available charging technologies, this report is intended to inform Australian franchised new car dealers about the issues associated with introducing electric vehicle (EV) charging infrastructure at their dealerships.

## The current state of EV infrastructure

### The electric vehicle transition is accelerating in Australia and internationally

According to AADA,7.2% of all new cars sold in Australia in 2023 were EVs compared to 3.1% in 2022. In international markets, the EV share of car sales is also increasing:

- United States - increased to 9% in the first half of 2023
- China - increased to 29% in 2022
- Europe: increased from 18% in 2021 to 21% in 2022[4,5].

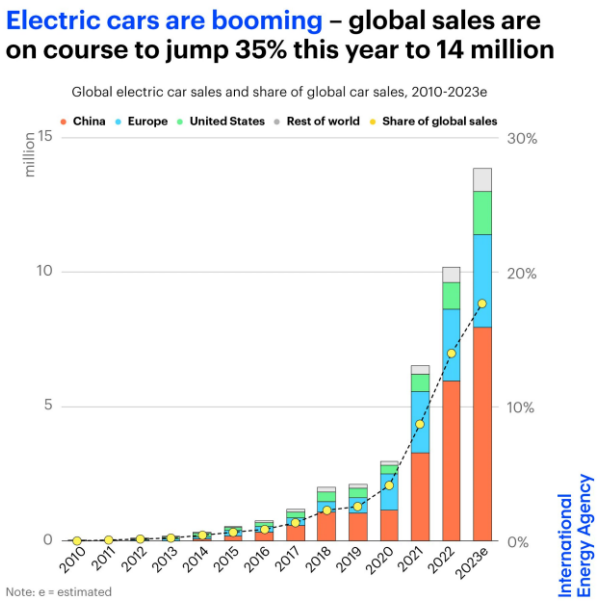



*Figure 1. Global EV uptake is accelerating, figure courtesy of the International Energy Agency[6]*

Over the 10 years from 2012 to 2022, Norway's market share of EVs grew from 3.1%, to 88% of cars sold, making Norway market leaders by EV sales share[7]. The International Energy Agency projects that by 2030 the share of EV sales will be 62% in China, 58% in Europe and 50% in the United States. The Australian Energy Market Operator (AEMO) projects that the 2050 Australian

[4] *California Tops US EV Adoption: 25% EV Share Of Total Sales In H1 2023 (insideEVs.com)*
[5] *Global EV Data Explorer – Data Tools - IEA*
[6] *Global EV update | IEA*
[7] *EV uptake statistics | Norway*

EV sales share will be 99% for the majority of their modelled electricity market scenarios. The assumptions for each scenario are detailed in CSIRO's Electric vehicle projections 2022.

The implications for Australian dealers are:

- The automotive industry is undergoing unprecedented change in the types of vehicles that are being sold and this will continue to evolve rapidly
- Dealers will need to facilitate the sale of increasing numbers of EVs over the next decade while providing services such as charging
- By 2050, it is likely that dealers will be largely selling EVs.

## Australia's regulatory requirements will favour the uptake of EVs and the availability of charging infrastructure

The National EV Strategy[8], released in April 2023, sets a vision to 'increase the uptake of EVs to reduce our emissions and improve the wellbeing of Australians'. Three objectives are to:

1. Increase the supply and range of affordable and accessible EVs by assisting car manufacturers
2. Establish the resources, systems and infrastructure to enable rapid EV uptake, specifically:
    a. increase access to both DC (fast chargers) and AC (destination) public EV chargers
    b. enable recycling, reuse and stewardship initiatives for EV batteries
3. Encourage increased EV demand.

A feature of The National EV Strategy is Australia's first New Vehicle Efficiency Standard (NVES) for new light vehicles. The NVES aims to support EV uptake by establishing the resources, systems and infrastructure required to improve affordability and incentivise increased supply. The Australian Government has stated that the NVES will "save money at the bowser, give more choice of new cars that are fuel-efficient, low or zero emissions and reduce transport emissions."

The NVES has the following implications for dealerships:

- The variety of internal combustion engine (ICE) vehicles that dealerships will be able to supply will fall, as manufacturers are incentivised to supply new car dealers with a wider and more affordable range of zero and low emission vehicles (EVs and LEVs)
- Business models must address potentially lower profitability from conventional after-sales services and parts, as higher maintenance revenue is typically associated with ICE vehicles
- Staff will require training to demonstrate, sell and service the range of new EVs entering the market as per contractual obligations with manufacturers
- Customers will need to understand how their requirements will be met with the EVs available on the market
- Marketing and sales strategies will need to be aligned with the expectations of Original Equipment Manufacturers (OEM) partners.

More EVs will mean more infrastructure is needed, such as community charging. There is a range of State and Territory Government investments to support the charging of EVs including:

- Queensland Government's Electric Vehicle (EV) Charging Infrastructure Scheme aims to improve the commercial viability of EV charging stations and to add more public EV fast chargers to the charging network[9]

[8] *National Electric Vehicle Strategy (dcceew.gov.au)*
[9] *Electric Vehicle Charging Infrastructure Scheme | Queensland (qrida.qld.gov.au)*

- The Driving the Nation Fund will provide $39.3m to connect Australia's capital cities with a nationwide network of 117 fast chargers[10]
- The NSW Government plans to invest $209m to develop a world-class fast charging network[11]
- The WA Government's $23m investment for its EV strategy will include the installation of 98 charging stations, connecting Perth and regional WA[12].

A common theme across National and State/Territory-based EV charging strategies is connectivity between metropolitan and regional areas, limiting 'range anxiety' by providing an accessible fast charging network, and partnering with the private sector, such as dealerships, to build, own and operate charging stations. Certainly, as part of the purchase of EVs, we see some Australian dealerships offering free charging to customers at specific charging stations for a period of time[13,14]. However, for the sake of convenience and to take advantage of lower cost off-peak electricity prices, the Australasian Fleet Management Association highlighted that most Australian EV drivers manage their own charging at home, which is a consideration that dealerships will need to make when installing and managing infrastructure at their facilities[15].

### Will dealers play a role in offering charging at their premises?

The National and State/Territory-based EV charging strategies have the following implications for dealers:

- Governments will partner with the private sector to support the establishment of charging stations across Australia. The extent to which dealerships will play a part in the roll out of public charging infrastructure is unknown
- It is expected that a significant portion of EV charging will occur at an EV owner's residence, meaning that public/dealership infrastructure will not bear the sole burden of charging
- There is a range of considerations for dealers with regards to community charging when installing EV charging infrastructure at their facilities, including:
    1. Availability of chargers in close proximity to dealerships
    2. Speed of publicly available chargers
    3. Community charging management
    4. Public perception of organisations impacting availability of community services
    5. Relative costs of charging at dealerships vs public locations
    6. Time cost for dealership staff spent off-site charging

**These factors, alongside OEM requirements for sale of particular vehicle lines, increases the case for self-managed on-site charging in Australian dealerships.**

AADA's dealers will need to be aware of how these external factors may impact their businesses.

## OEM requirements for dealerships are changing to support product availability and EV sales

OEM requirements for dealerships may impact the quantity, type, other features (e.g. accessibility) of chargers and costs associated with charging for customers. In the United States, some OEMs are imposing requirements upon their dealerships for the sale of EVs, and for some brands, the franchised retail model is undergoing changes in an attempt to foster stronger connections with consumers[16]. For example, Ford dealerships are now required to install AC fast chargers and DC ultrafast chargers to be certified to sell EVs (model E range). Costs for this

[10] Driving The Nation - DCCEEW
[11] *Electric vehicle fast charging grants | NSW Climate and Energy Action*
[12] *Electric Vehicle (EV) Strategy | Western Australian Government (www.wa.gov.au)*
[13] *Kia dealers will allow electric car owners to charge for free | CarExpert*
[14] *Charging your EV | Ergon Energy*
[15] *EV Charging at Home In Australia - AfMA*
[16] *Why automotive OEMs need to adapt – and how dealers can benefit | EY - US*

certification typically ranges between USD 1-1.2m, with 90% of the costs attributed to the purchase and installation of charging infrastructure. Dealers have the option to opt-out, however these dealers will not be able to sell EVs beyond 2027[17].

General Motors are also imposing EV charging installation requirements on Buick and Cadillac dealers, who will be bought out if they do not proceed with installing charging infrastructure, estimated to cost each dealer approximately USD200,000[18]. By 2024, Stellantis require its US dealers to be EV certified: a Level 3 DC fast charger (which can be open to charge EVs of third-party manufacturers) must be installed, dealers must have special tools and protective equipment required for repairs, and safety processes/procedures around battery removal, repair and storage must be in place. Employees will undergo training for EVs with the curriculum geared toward specific job functions[19].

Future implications for dealerships may include:

- A growing trend towards OEMs expecting their dealers to install charging infrastructure and bear all costs. However, some OEMs may subsidise dealership electrical infrastructure upgrade costs or provide dealers with an 'opt-out' option
- The amount and types of EV chargers (e.g. Level 2/Level 3 chargers) may differ by OEM, which will have significant cost implications
- The speed at which OEMs are requiring dealerships to have infrastructure installed will vary depending on the OEM
- Dealers should understand what infrastructure is required, what their anticipated capital and operational costs will be, and OEM expectations on timelines relating to the upgrade of dealerships with appropriate electrical infrastructure and charging facilities.
- Deeper engagements with OEM's through franchise agreements to share the financial burden of EV infrastructure
- An opportunity for dealers to transition their revenue model from sales and servicing to include charging, retailing and the on-selling of charging infrastructure and installation for their customers' homes
- Collaboration to share the costs and use of charging infrastructure on a cluster basis, as dealers are often located next to one another.

## Electric vehicle charging infrastructure is available across Australia

The Australian Electric Vehicle Council has documented the three types of EV chargers available through a variety of charging infrastructure providers - JET Charge, NRMA, Schneider Electric. The characteristics and applications of each are outlined in Table 1. In its Industry Recap for 2022, the Electric Vehicle Council stated that there are 1,928 regular EV charging locations, 365 fast charging locations, and 99 ultrafast charging locations across Australia[20].

The different types of EV chargers and their characteristics are set out in Table 1.

*Table 1. Types of EV chargers[21]*

| Parameters | Types of EV chargers | | |
|---|---|---|---|
| | Level 1/Mode 2 ('trickle charging') | Level 2/Mode 3 ('fast charging') | Level 3/Mode 4 ('ultrafast charging') |
| Power | 10-15 Amp, single phase (standard power outlet) | AC EV charger (7-22kW), 32 Amp, 3-phase | DC EV charger (50kW – 350kW), 40-500 Amp, 3-phase |

[17] *EV infrastructure requirements | Ford*
[18] *Dealer buy-back | General Motors*
[19] *Dealer requirements | Stellantis*
[20] *AUSTRALIAN-ELECTRIC-VEHICLE-INDUSTRY-RECAP-2022.pdf (electricvehiclecouncil.com.au)*

| Parameters | Types of EV chargers | | |
|---|---|---|---|
| | Level 1/Mode 2 ('trickle charging') | Level 2/Mode 3 ('fast charging') | Level 3/Mode 4 ('ultrafast charging') |
| Installation | Standalone domestic homes | Homes, apartment complexes, workplaces, shopping centres, hotels | Commercial premises and roadside locations |
| Range | 10-20km range per hour | 40-100km range per hour | 150+km range per hour |
| Charging speed | This method will add between 10 and 20km of range per hour plugged in. | Full recharge overnight (in 4-10 hours depending on the charger)[22] | At the lower end, this method will add up to 150km of range per hour plugged in. At the upper end, this method can fully recharge some electric vehicles in 10 to 15 minutes. |

Dealerships should expect delays with the installation of EV charging infrastructure. Lead times of up to two years may be common[23, 24]. Dealerships that require more extensive upgrades to electrical infrastructure and/or face technical challenges may be subject to extended installation lead times[25], such as with the installation of transformers for Level 3 chargers and/or augmented connections to the network, e.g. rural dealerships who require connection upgrades may anticipate the longest lead times. Supply chain issues are likely to contribute to extended lead times, particularly with ultra-fast charging equipment where availability is limited. Regulatory requirements and approvals (e.g. safety and monitoring) may also impact the installation process – e.g. providing agreement with the network. For individual dealers, being informed of the lead times for their specific site will help them prepare for the transition.

Future electrical infrastructure requirements for dealers have the following implications:

- Dealers will need to consider the associated electrical infrastructure requirements for the types and quantity of chargers to be installed at these facilities
- Dealers will need to consider the charging infrastructure providers that they are to partner with to meet the expectations of their OEMs and customers
- There may be an opportunity for dealers to partner with a third party to build, own and operate the charging infrastructure at their dealerships
- These investments may be optimised if factors such as sales volumes as well as customer behaviours and requirements (e.g. expected charging time, charger accessibility and availability etc.) are considered. This will influence the infrastructure (chargers, management systems and any additional electrical upgrades, e.g. connections to the grid) required to meet these expectations
- Dealerships may be faced with extended lead times for the installation of certain infrastructure (up to ~two years).

## The uptake of EVs has implications for electricity demand across Australia's grids

[22] *Charger Types and Speeds | US Department of Transportation*
[23] *How Long Does it Take to Install Commercial EV Charging Stations? — SparkCharge*
[24] *Plan for extended lead time for EV charging infrastructure - Power Progress*
[25] *chargefox-lessons-learnt-4.pdf (arena.gov.au)*

Under AEMO's leading scenario, it is anticipated that EVs will drive an additional 80 TWh/year (for upwards of 22 million EVs) to the base annual NEM demand of 200 TWh, translating to a 40% increase, see Figure 2. The resulting growth forecast in the Western Australian Wholesale Energy Market (WEM), under the same scenario as for the NEM, is an additional +15 TWh/year in 2050.[26]

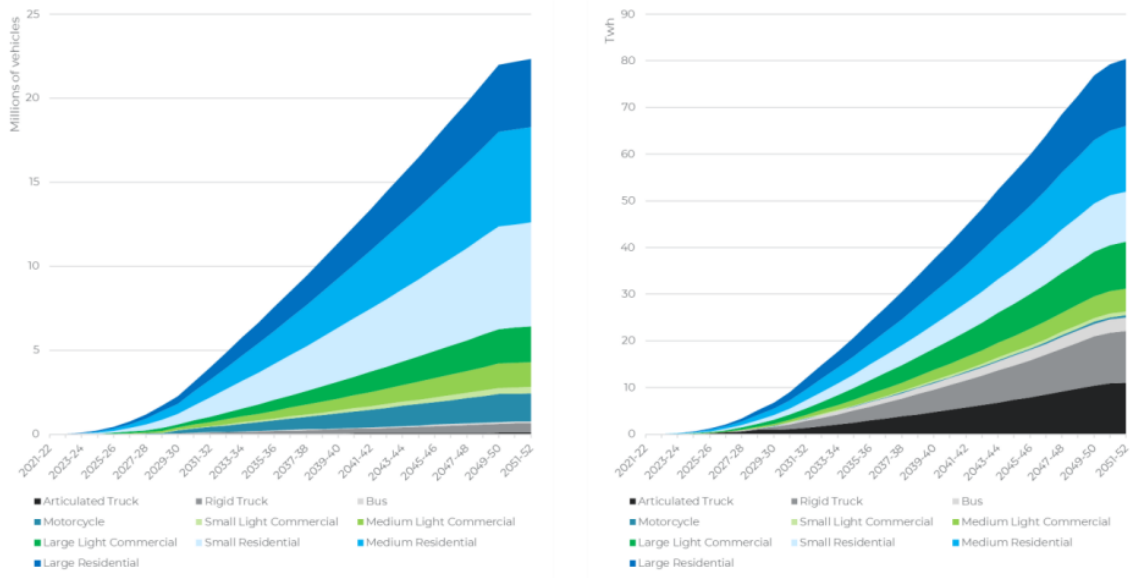



*Figure 2. Forecast BEV numbers and associated annual electricity consumption 2022 to 2052 under AEMO's 2022 ISP Step Change Scenario, courtesy of AEMO*[27]

CSIRO projected that the electricity consumption associated with the charging of batteries and plug-in EVs (PEVs) on the NEM and WEM varies greatly under each scenario outlined – and the range of projections varies further into the future. Currently for the NEM, electricity consumption from the charging of batteries and PEVs for transport purposes is less than 1,000GWh/year, and rising uptake to 2030 may increase this demand to anywhere between 1,000-15,000GWh/year. Currently for the WEM, electricity consumption from the charging of batteries and PEVs for transport purposes is less than 100GWh/year, and uptake to 2030 may increase this demand to anywhere between 100-2,000GWh/year. For the impacts to AADA's network it is reported that by 2030, Australia's electricity grids 'should be able to cope with a 3-4% increase in daily demand', although the possibility of grid overload during peak demand times exists and experts emphasize the need for substantial investment in charging infrastructure (7kW and fast charging stations), along with an appropriate regulatory framework[28].

Charging Management Software (CMS) is used to optimise electric vehicle charging. In markets like the NEM and WEM which operate in a variable energy price market, CMS can reduce consumption when prices are high[29]. The changes in dealerships required to support the uptake of EVs are likely to change energy consumption profiles and demand which may require upgrades to grid connections and the agreements with electricity suppliers[30]. The changing demand profile is likely to be highly variable and dependent on operational factors such as when and how much charging is required. Dealerships have an opportunity to be strategic about their charging behaviours to both minimise their investment requirements in infrastructure and the eventual impact on their electricity bill. Charging management software can be used to optimise charging to limit total load requirements and schedule charging for lower costs or to meet time sensitive availability requirements.

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[26] *Microsoft Word - CSIROEVreport_20221124.docx (aemo.com.au)*
[27] *enx---ev-technical-standards-for-grid-operation---insights-for-the-nem.pdf (aemo.com.au)*
[28] *Can Australia's Power Grid handle the transition to EVs without blackouts? - Carbonhalo*
[29] *Charging management software | Ampcontrol*
[30] *Grid capacity projections | AEMO/CSIRO*

Increased EV charging from the electricity grid has the following implications for dealers:

- It is anticipated that Australia's electricity network will cope with EV charging requirements. However, there is potential for networks to become overloaded during peak demand times. It is critical that AADA's members are equipped to manage these risks and provide high quality services to customers.
- CMS helps mitigate risks associated with charging when demand on the grid is low
- CMS can reduce operational costs for dealers by accessing supply at times of low electricity demand.

# Dealership scenarios

## Background and definitions

A scenario analysis tool was developed to provide insights into the costs associated with the expected installation/upgrade of electrical infrastructure to support EV charging for metropolitan, regional, and rural dealerships. Using assumptions from publicly available resources[31,32], the tool determined the number of car spaces that would be required to support charging at each dealership. This then supported the estimate and scale of associated costs with civil (e.g. landscaping, trenching) and electrical (switchboards, meters) works, as well as the installation/upgrade of transformers to support charging requirements (e.g. Level 3 50kWp chargers with [Electrical Vehicle Supply Equipment] EVSE hardware and software management).

Finally, taking the number of dealers within each of the three location groupings, total capital and operational costs were estimated for dealerships across AADA's network.

### Defining the locations

AADA provided data on the number of dealerships in each demographic classification: 'Inner-metropolitan', 'Outer-metropolitan', 'Provincial', 'Rural', and 'Remote'. For the purposes of the scenario analysis detailed in the 'Dealership scenarios' section of this report, the following associations were made where dealers are categorised by the Rural, Remote and Metropolitan Area (RRMA) zone in which they are located:

1. Metropolitan dealerships include those in 'Inner-metropolitan' and 'Outer-metropolitan'
2. Regional dealerships include dealerships in 'Provincial' locations
3. Rural dealerships include those in 'Rural' and 'Remote' locations.

*Table 2. Scenarios by RRMA zone*

| Location | RRMA zone | Urban centre population |
|---|---|---|
| Metropolitan | Classes 1 and 2 (M1 and M2): capital cities and other metropolitan centres | >100,000 |
| Regional | Classes 3-5 (R1-R3): Large rural centres; and small rural centres; and other rural areas | 25,000-99,999; and 10,000-24,999 and <10,000 |
| Rural | Classes 6 and 7 (Rem1 and Rem2): remote centres and other remote areas | <5,000 |

[31] *CNSWJO Regional Charging Infrastructure in Central NSW*
[32] *NSW-destination-charging-list-v1_3.pdf (electricvehiclecouncil.com.au)*

# Assumptions for scenario analysis

A summary of the major assumptions distinguishing each dealership scenario is outlined in Table 3. Please note that there are dealerships located in each geographic zone that have a fleet size, services, and electrical infrastructure upgrade requirements that do not closely match these assumptions. The scenarios reflect a 'model' dealership in each geographic zone, so care must be taken when interpreting the outcomes (e.g. capital and operational costs) in this report.

*Table 3. Summary of dealership scenario assumptions*

| Location | Relative fleet size | Relative service volume | Relative extent of electrical infrastructure upgrades required |
|---|---|---|---|
| Metropolitan | Large | Large | Medium |
| Regional | Medium | Small | Small |
| Rural | Small | Large | Large |

Energetics' analysis used the National Construction Code (NCC) minimum enabling infrastructure requirements for building classes to determine a suitable ratio of vehicles in a dealership to chargers required. Dealerships are defined as Class 6 buildings[33] and section 'J9D4 Facilities for electric vehicle charging equipment' of the updated NCC for 2022[34] outlines specific requirements for this building class.

To align with these requirements for Class 6 buildings, the analysis assumes that 10% of the assumed model dealership fleet size (number of vehicles) will feature EV charging capabilities (of at least 7kW) – see Table  and
Table  for further details. This analysis also assumes that the number of vehicles at each dealership location is equivalent to the number of car parking spaces, and therefore all spaces are occupied.

*Table 4. Scale of assumed dealership fleet size and allocations for charging*

| Large | Medium | Small |
|---|---|---|
| >80 vehicles/car spaces<br>8 car spaces for charging | 80-20 vehicles/car spaces<br>5 car spaces for charging | <20 vehicles/car spaces<br>2 car spaces for charging |

*Table 5. Scale of assumed dealership service volumes*

| Large | Medium | Small |
|---|---|---|
| >30 vehicles/day<br>8 car spaces for charging | 10-30 vehicles/day<br>5 car spaces for charging | <10 vehicles/day<br>2 car spaces for charging |

[33] *Register of BCA Classification Determinations (C/18/29025) (esc.vic.gov.au)*

[34] *Part J9 Energy monitoring and on-site distributed energy resources | NCC (abcb.gov.au)*

A number of assumptions (as detailed in Table ) are applicable to the electrical infrastructure upgrades for each dealership scenario. These assumptions govern a large proportion of the capital costs as outlined in the 'Scenario analysis outcomes' section of this report.

*Table 6. Scale of assumed dealership electrical infrastructure upgrades*[35]

| Large | Medium | Small |
|---|---|---|
| Detailed engagement with utilities and engagement of ASP L3/L2 for design and construction.<br><br>Requires high voltage and transformer modifications.<br><br>Assumed that a Level 3 DC step down transformer is required to accommodate for longer distances driven in rural locations and less availability of publicly available infrastructure – this is selected by default in the scenario analysis tool. | Moderate engagement with utilities and modification of supply cabling into facility, and likely requires engagement of ASP L3/L2.<br><br>Low voltage mains upgrade or high voltage transformer upgrade/modification may be required.<br><br>Assumed that a Level 3 DC step down transformer is not required by default, however this can be added to the costs if selected within the scenario analysis tool. | No engagement with utilities, requiring upgrade of onsite infrastructure to support additional load without modification to supply – i.e. modifications to transformer is not required.<br><br>Assumed that a Level 3 DC step down transformer is not required by default, however this can be added to the costs if selected within the scenario analysis tool. |

# Implications of market evaluation and scenario modelling for AADA dealers

## Limitations and how to interpret the results

As the tool was built using 'representative dealers' to provide high-level capital and operational cost estimates according to geographic location and the AADA network, there are a number of limitations to note when interpreting results.

- There will be many dealers within a geographical location that do not align with the assumptions. Therefore associated costs for a representative dealership may not accurately reflect the costs for other dealerships in the same geographic location. For example:
    - If a particular dealer has a smaller fleet size than described above, then costs may be lower
    - If an individual dealer requires greater electrical infrastructure than their relevant scenario outlines, then costs may be higher.
- The analysis is conducted on three specific models applied to the total dealership base within these scenarios. Therefore the calculated total cost to AADA reflects a range of expected Australia-wide cost impacts.

[35] 'ASP' refers to Accredited Service Provider. ASP L2 refers to 'Provide professional service work and connection services'. ASP L3 refers to 'Network asset design'.

# What did we learn from the scenario analysis?

## Metropolitan dealers

The intention of the National EV Strategy is to facilitate the uptake of EVs, notably increasing access to DC and AC public charging. In the strategy, more chargers are planned in metropolitan areas and so metropolitan dealers may benefit more from the National EV Strategy, compared to rural dealers. Also, if OEMs manufacture a larger number of EVs due to a NVES, this is likely to have a more immediate impact on metropolitan dealers as there will be greater demand in these areas and greater pre-existing infrastructure.

Metropolitan dealers are expected to have comparatively larger fleet sizes (>80 vehicles) due to higher population density. Customers are likely to want a wider range of EVs available for purchase and that dealerships will support large scale servicing (>30 vehicles/day).

As metropolitan areas are likely to have a greater level of pre-existing electrical infrastructure, it is assumed that less will be required to upgrade the network, compared to regional and rural dealers. It is expected that a minimum of eight parking spaces will need EV charging capability to support the charging needs of 80 vehicles, split between four Level 2 7kW EVSE, and four Level 2 22kW EVSE.

Note that the scenario analysis tool includes an option to include one Level 3 50kW EVSE. However the default selection in the tool does not include this in the baseline costs. Modifying this selection to include a Level 3 charger will increase the costs shown in Table 7 and Figure 3 by more than 300%.

*Table 7. Summary of costs involved with EV charging facilities for a model metropolitan dealership*

| Total Capital costs: EV infrastructure (excl. GST, with 50% upper uncertainty) – see Figure 3 for costs by item category | Capital costs: Infrastructure upgrades for *medium scale upgrades* (excl. GST, with 50% upper uncertainty) | Operational costs (per annum): electricity for charging |
|---|---|---|
| $210,000 | $44,000 | $100,000 |

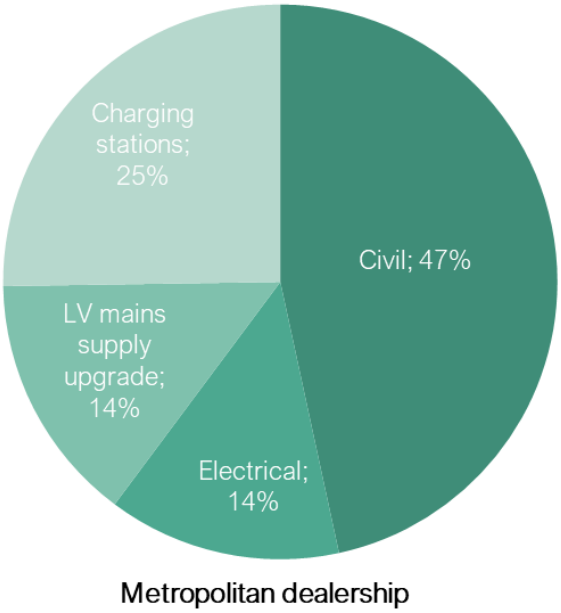


*Figure 3. Breakdown of capital costs for a model metropolitan dealership*

## Regional dealers

Compared to the outlook for metropolitan dealers, customers in regional areas are likely to expect a smaller range of EVs available for purchase and lower servicing levels. With less demand, the growth in EVs is anticipated to be slower with a less immediate impact on regional dealers. OEMs are not likely to distribute a large number of EVs in these areas. Regional dealers are therefore expected to have smaller fleet sizes (20-80 vehicles) and should be able to support small scale servicing volumes (<10 vehicles/day).

It is assumed that the default electrical infrastructure upgrades required will involve limited network engagement, i.e. modifications to transformers are not required by default, a Level 3 50kW EVSE is not needed (per assumptions in Table ). It is assumed that four car spaces with Level 2 EV charging capability will be required – two Level 2 7kW EVSE, and two Level 2 22kW EVSE. However, in the instance that Level 3 charging capability is needed (and a Level 3 DC step down transformer), the scenario analysis tool can include one Level 3 50kW EVSE. However the default selection in the tool does not include this in the baseline costs. Modifying this selection to include a Level 3 charger will increase the costs shown in

Table *8* and Figure 4 by 500%.

Note: to account for additional costs of shipping, availability of labour and cost premiums typically encountered with services provided in regional locations, a 10% premium has been placed on all components of capital works.

*Table 8. Summary of costs involved with EV charging facilities for a model regional dealership*

| Capital costs: EV infrastructure (excl. GST, with 50% upper uncertainty) – see Figure 4 for costs by item category | Capital costs: Infrastructure upgrades for *small scale upgrades* (excl. GST, with 50% upper uncertainty) | Operational costs (per annum): electricity for charging |
|---|---|---|
| $130,000 | $20,000 | $50,000 |

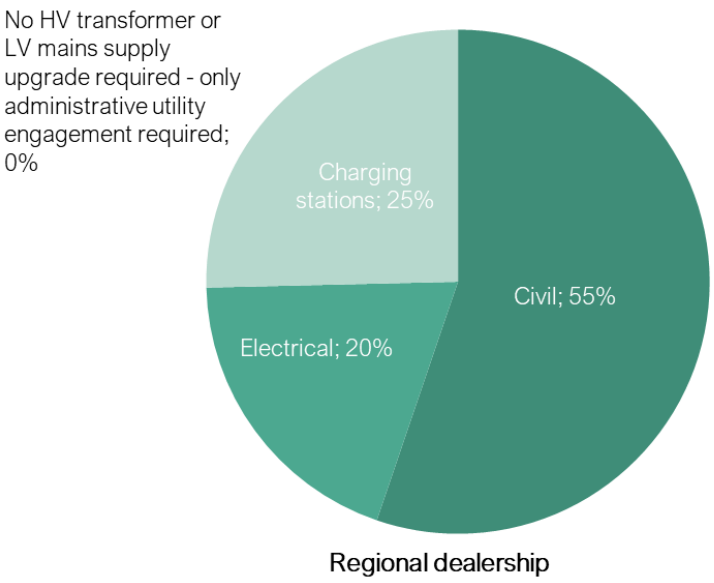


*Figure 4. Breakdown of capital costs for a model regional dealership*

## Rural dealers

The National EV Strategy and the NVES are going to have a limited impact on fleet composition in the near term for rural dealers. However, in the medium term (5-10+ years) it is expected that more EVs will be suited to rural locations and become available.

Due to lower population density, poorer public perception of EVs and lack of suitability currently, rural dealers are expected to have comparatively smaller fleet sizes (<20 vehicles). However, rural locations will be expected to support large scale servicing volumes (>30 vehicles/day) as the resources are more centralised in rural locations. In the near term however, customers will expect a smaller range of EVs available for purchase and servicing.

It is assumed that a typical rural dealer will need extensive electrical infrastructure upgrades, and therefore high voltage and transformer modifications. Rural dealers are expected to offer Level 2 and 3 charging capabilities. Energetics' analysis assumes the availability of a Level 3 DC fast charger due to the lack of investment in community infrastructure. It is also assumed that five car spaces will need to be enabled for charging – with one being a Level 3 DC fast charger, and four car spaces with Level 2 EV charging capability (two Level 2 7kW EVSE, and two Level 2 22kW EVSE) to meet the potential need of maintenance services and the shorter duration charging for limited test driving.

Note: to account for additional costs of shipping, availability of labour and cost premiums typically encountered with services provided in rural locations, a 20% premium has been placed on all components of the capital works.

*Table 4. Summary of costs involved with EV charging facilities for a model rural dealership*

| Capital costs: EV infrastructure (excl. GST, with 50% upper uncertainty) – see *Figure 5* for costs by item category | Capital costs: Infrastructure upgrades for *large scale upgrades* (excl. GST, with 50% upper uncertainty) | Operational costs (per annum): electricity for charging |
|---|---|---|
| $580,000 | $411,000 | $100,000 |

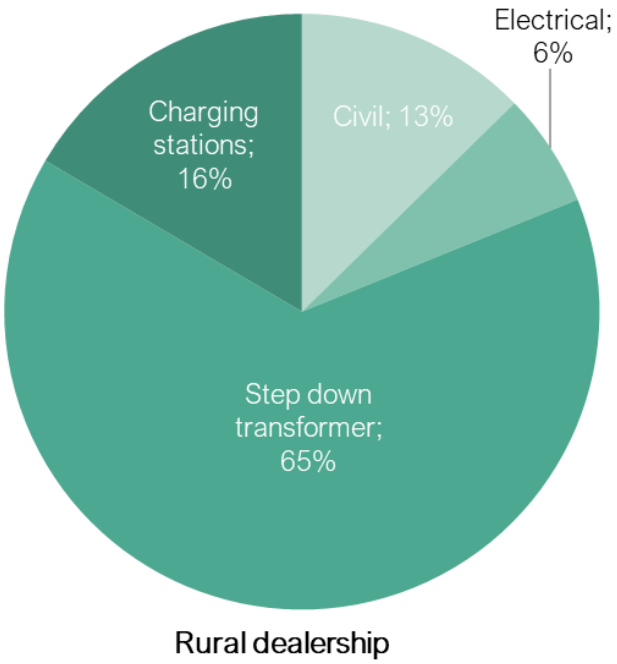


*Figure 5. Breakdown of capital costs for a model rural dealership*

# What does the future hold for Australian dealers?

## Indicative costs for transitioning Australia's dealership network

The range of cost impacts to each dealership type and the total cost impact to Australian dealerships was developed from scenario analysis. The intent is to guide AADA in their policy development and advocacy work on behalf of members.

The comparative capital and operational costs for each dealership scenario are outlined in Figure 6, while a summary of total costs has been estimated in Table  based on the number of dealerships within each geographic zone (as described in Table 2).

**The infrastructure investment is estimated to exceed $1billion for franchised new car dealers in Australia as an upfront capital cost.** With over 3100 dealers nationwide, the capital investment is expected to range from $130,000 for a typical regional dealer to $580,000 for a typical rural dealer.

*Table 10. Total EV infrastructure and power requirement costs for all dealers in the AADA network*

| Dealership location | Number of dealers | Capital costs: EV infrastructure (excl. GST, with 50% upper uncertainty) | Operational costs (per annum): electricity for charging |
|---|---|---|---|
| Metropolitan | 1,345 | $282,450,000 | $134,500,000 |
| Regional | 678 | $88,140,000 | $33,900,000 |
| Rural | 1,153 | $668,740,000 | $115,300,000 |
| **Total** | 3,178 | $1,039,330,000 | $283,700,000 |

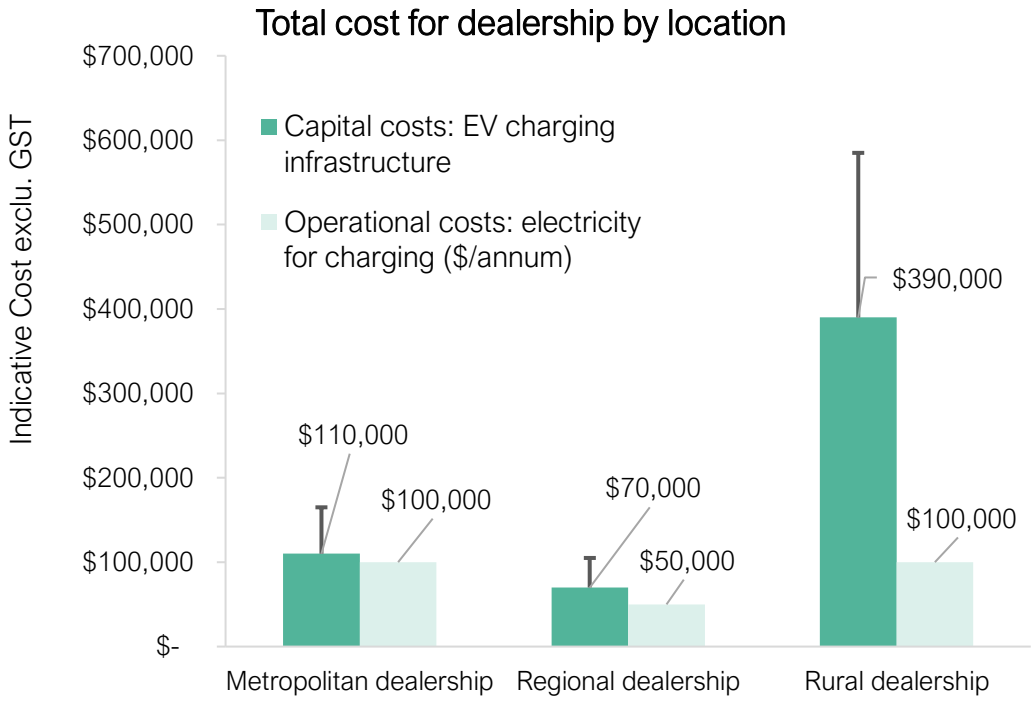


*Figure 6. Comparative capital (with 50% upper uncertainty) and operational costs for each model dealership scenario*

# Conclusions and next steps

There are a number of factors external to dealerships that are driving the acceleration of EV uptake in Australia: government emissions reduction commitments, fuel efficiency standards, OEM emissions reduction commitments, and the preferences and expectations of consumers. While the transition presents significant impacts to the automotive dealership industry, there are also opportunities to capitalise with more EVs in the market, and new touchpoints with customers such as EV charging facilities and servicing.

Other takeaways from Energetics' analysis include:

- Pace. The rollout of EVs is anticipated to occur in metropolitan areas at a faster rate initially than regional and rural locations. This is mainly due to the availability of the necessary infrastructure. Customer demand is also expected to be higher in metropolitan locations
- Upgrade costs. As rural dealerships are assumed to require the largest upgrades to electrical infrastructure, upgrade costs are higher than those for metropolitan and regional dealerships
- Varying technical requirements. Dealerships need to carefully consider the type of EV chargers that need to be installed on-site. Some locations may not need Level 3 charging capacity (e.g. metropolitan and regional dealerships), though this will often be determined by the OEM and written into Dealer Agreements
- Lead times to implement. Dealerships may face lead times of up to two years for the installation of certain infrastructure. These include electrical infrastructure upgrades (e.g. installation/upgrade of transformers) and charging requirements (e.g. Level 3). Rural dealerships can expect longer delays
- Skills. Dealerships will need to upskill employees to support the marketing, sale, and service of EVs

OEM requirements. OEMs may have their own emissions reductions targets. They may also respond to new vehicle efficiency standards globally. Both factors can lead to expectations and requirements of their dealerships with regards to the implementation of EV charging infrastructure and the range of EVs for sale.

- Local market shifts. Australia's new National Vehicle Emissions Standards (NVES) will likely increase the demand for plug-in hybrid electric vehicles and EVs, requiring dealers to invest in onsite charging and infrastructure upgrades.

OEM requirements will vary depending on the manufacturer and dealers may not need to invest immediately. However dealers should investigate the potential onsite obligations that their OEMs would impose if they were to sell EVs, and be aware of lead times associated with the installation of EV charging infrastructure. Dealers should conduct further feasibility studies including requesting quotes from their service and electricity network providers for a more accurate assessment of the costs to upgrade their dealership to facilitate the sale of EVs. The costs presented in this report act as a guide to reflect model dealership scenarios by location – there may be significant variation in the expected costs of EV charging installation for dealerships in the same geographic zone, and the uncertainty estimates provided aim to reflect this.

To capitalise on the transition to EVs, dealers need to understand what will change in their operations and the capital outlay required for upgrades. Once potential costs have been identified, dealers can determine the proportion for which they are responsible and investigate if their OEMs will bear any of the costs.

# Appendix

## Scenario analysis inputs

The assumptions in light blue cells throughout the tool can be updated as required. The calculated data in light red cells is a placeholder and can be manually overwritten where required. On the 'Scenario inputs' tab of the tool, the user can make selections on the following parameters:

1. HV transformer or mains supply upgrade
2. Main Distribution Board/Switchboard requirements
3. Type of Level 2: 7kWp EVSE (wall mounted chargers, pedestal mounted chargers)
4. Make/model of Level 2: 7kWp EVSE
5. Type of Level 2: 22kWp EVSE (wall mounted chargers, pedestal mounted chargers)
6. Make/model of Level 2: 22kWp EVSE
7. Whether one Level 3: 50kWp EVSE should be included in the costs (also requiring a site inspection)
    a. Type of Level 3: 50kWp EVSE (wall mounted charger, pedestal mounted charger)
    b. Make/model of Level 3: 50kWp EVSE.

The following items are included in all scenarios as a requirement for each facility:

1. Switchboard
2. Meter
3. HV transformer or LV mains upgrade/step down transformer
4. EVSE hardware
5. Connection fee.

Electricity costs ($/annum) were also estimated assuming that vehicles were connected to all charging stations for eight hours per day, with an electricity shoulder cost rate of 28 cents/kWh. These assumptions can be updated as required. The capital (EV charging infrastructure) and operational electricity costs associated with each scenario, and assumptions regarding the number of each type of charger (e.g. 7kW Level 2 chargers), are detailed in the 'Scenario analysis outcomes' section of this report. An upper default cost uncertainty of 50% is also included in the capital costs.

## Item categories involved with capital costs in scenario analysis

The 'Civil' category in the scenario analysis tool includes the following items:

1. Road marking
2. Vehicle safety
3. Wayfinding
4. Landscaping
5. Trenching
6. Concrete

7. Installation.

The ‘Electrical’ category in the scenario analysis tool includes the following items:

1. Switchboard
2. Meter
3. Step down transformer/HV transformer upgrade)/electrical upgrades/administrative utility engagement.

The ‘Charging stations’ category in the scenario analysis tool includes the following items:

1. EVSE hardware
2. EVSE management
3. Connection fee
4. Level 2: 7kWp EVSE
5. Level 2: 22kWp EVSE
6. Level 3: 50kWp EVSE
7. Site inspection.

# References


1. *Net Zero - DCCEEW*
2. *A region-based examination of electric vehicle take-up rates in Australia | Department of Treasury and Finance Victoria (dtf.vic.gov.au)*
3. *California Tops US EV Adoption: 25% EV Share Of Total Sales In H1 2023 (insideEVs.com)*
4. *Global EV Data Explorer – Data Tools - IEA*
5. *Global EV uptake | IEA*
6. *EV uptake statistics | Norway*
7. *Microsoft Word - CSIROEVreport_20221124.docx (aemo.com.au)*
8. *National Electric Vehicle Strategy (dcceew.gov.au)*
9. *Electric Vehicle Charging Infrastructure Scheme | Queensland (qrida.qld.gov.au)*
10. *Driving The Nation - DCCEEW*
11. *Electric vehicle fast charging grants | NSW Climate and Energy Action*
12. *Electric Vehicle (EV) Strategy | Western Australian Government (www.wa.gov.au)*
13. *Kia dealers will allow electric car owners to charge for free | CarExpert*
14. *Charging your EV | Ergon Energy*
15. *EV Charging at Home In Australia - AfMA*
16. *Why automotive OEMs need to adapt – and how dealers can benefit | EY - US*
17. *EV infrastructure requirements | Ford*
18. *Dealer buy-back | General Motors*
19. *Dealer requirements | Stellantis*
20. *Circumnavigating dealer franchise agreements | Volvo*
21. *EU OEM to consumer | Audi*
22. *Direct to consumer | Tesla*
23. *5 Key Trends Shaping the Future of the Automotive Industry - Infomedia*
24. *AUSTRALIAN-ELECTRIC-VEHICLE-INDUSTRY-RECAP-2022.pdf (electricvehiclecouncil.com.au)*
25. *Types of EV chargers | Electric vehicle council*
26. *Charger Types and Speeds | US Department of Transportation*
27. *Microsoft Word - CSIROEVreport_20221124.docx (aemo.com.au)*
28. *enx---ev-technical-standards-for-grid-operation---insights-for-the-nem.pdf (aemo.com.au)*
29. *Home-EV-charging-2030.pdf (electricvehiclecouncil.com.au)*
30. *Can Australia's Power Grid handle the transition to EVs without blackouts? - Carbonhalo*
31. *Charging management software | Ampcontrol*
32. *Grid capacity projections | AEMO/CSIRO*
33. *Register of BCA Classification Determinations (C/18/29025) (esc.vic.gov.au)*
34. *Part J9 Energy monitoring and on-site distributed energy resources | NCC (abcb.gov.au)*
35. *CNSWJO Regional Charging Infrastructure in Central NSW*
36. *NSW-destination-charging-list-v1_3.pdf (electricvehiclecouncil.com.au)*
37. *How Long Does it Take to Install Commercial EV Charging Stations? — SparkCharge*
38. *Plan for extended lead time for EV charging infrastructure - Power Progress*
39. *chargefox-lessons-learnt-4.pdf (arena.gov.au)*

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Quality assurance covers all dimensions of Energetics' customer offering. All documents produced are reviewed by senior subject matter expert before being presented to clients. Below is a record of the consultants and subject matter expertise involved in the development and quality assurance of this document.

| Description | Prepared by | Reviewed by | Approved by | Approval date |
|---|---|---|---|---|
| First version | Alex Kyloh, Angus McKenzie, Brei Endean | Trent Hawkins | Trent Hawkins | 21/02/2024 |
| Final version | Alex Kyloh, Angus McKenzie, Brei Endean | Andrew Tipping, Helen Wetherell | Andrew Tipping, Helen Wetherell | 10/04/2024 |

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