EV CHARGING FACT SHEET — AT HOME —

Types of Electric Vehicles (EVs)

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There are 3 main types of EVs which are:

- Battery Electric Vehicle (BEV) fully electric vehicle which uses only electricity and needs to be recharged
- Plug-in Hybrid Electric Vehicle (PHEV) can run on petrol or electricity and can be both refuelled and recharged
- Hybrid Electric Vehicle (HEV) runs on petrol and electricity and the vehicle will use electricity when it's more efficient to do so. The battery is charged by 'regenerative braking' and can't be recharged.

Types of Electricity

EVs can be charged by either AC or DC electricity. All BEVs and PHEVs can charge using AC electricity. AC chargers are generally found at home or at private businesses.

DC electricity is higher voltage and is delivered from high speed public chargers. Only cars that can convert DC to AC electricity (battery electric vehicles) can use these chargers.

Charging Speeds

Charging speeds can be broken down to 3 different speeds:

Level 1 (slow) AC - Delivers 2.4–3.7kW of power and is the same as plugging into a wall socket.

Level 2 (medium) AC - Delivers 7–22kW of power and is powered by a dedicated charging unit installed at home or at businesses.

Level 3+ (fast) DC - Delivers 50–350kW of power and is powered by public DC charging stations. These units are very expensive to install, require lots of power and are only suitable in public spaces.

	Power	Range Added Per Hour	Charging Time	Where
Level 1	2.4 - 3.7kW	10 - 20km range/hour	5 - 6 hours	Home
Level 2 – single	7kW	30 - 45km range/hour	2 - 5 hours	Home/work
phase				
Level 2 – three	11 - 22kW	50 - 150km range/hour	30 mins – 2	Home/work/public
phase			hours	
Level 3+	50 - 350kW	250 - 1000km range/hour	10 – 20 mins	Public



EV CHARGING AT HOME

Types of EV Connectors

Unfortunately there is no one standard connector type which connects the charging cable to the vehicle. However, the industry is becoming more standardised. The type 2 connector is now the most common for AC charging and fits popular models such as Tesla Models 3 and Y, Hyundai IONIQ 5 and BYD Atto 3. The CCS connector incorporates the type 2 connection but also has an additional 2 electrical contacts to facilitate DC charging.

The CHAdeMO connector is the other popular option for DC charging. Very few new EVs have this port. Fortunately, this is now being phased out in Australia and most manufacturers are using CCS.

There are adaptors available on the market to allow the adaptation of different connector ports.

EV Charging at Home

Level 1 vs Level 2 Charging

The majority of EV owners charge their EVs at home as it is the most convenient but also generally the cheapest option. Many EV owners also have solar panels installed onto their roof and are able to take advantage of this power source. Provided that you have off-street parking, the installation of an EV charging unit is generally straight-forward with the help of an electrician.

Level 1 AC charging is the easiest but also the slowest option is to plug your EV directly into a standard 240v wall socket. This is also the cheapest option as it doesn't require a dedicated charging unit to be installed.

Level 2 AC charging (7-22kW) is the other option for charging at home which is much quicker and more convenient. This requires the installation of a dedicated charging unit but will unlock charging speeds at least 3 times quicker.

The first thing to consider when looking at Level 2 charging is the maximum charging speed that your EV can use. The maximum charge speed of many PHEVs is only 7kW. Whilst the max AC charging speeds of most BEVs is between 11 and 22kW.

Single Phase Level 2 Charging

A single phase level 2 charging unit costs between \$1000 to \$1500 plus installation costs by an electrician. Most residential buildings use single phase power. Each installation is unique and the costs may vary.

3-Phase Level 2 Charging

A 3-phase level 2 charging unit costs between \$1000 to \$3000 plus installation costs by an electrician. Most residential buildings won't have access to 3-phase power so the electrician may be required to do some additional work to connect the residence to the nearest 3-phase connector on the grid. These installation costs also vary from site to site but generally will be a lot more than a single-phase installation.



EV CHARGING AT HOME

EV Charging in Apartments

EV charging in an apartment building can be difficult if your building doesn't have the necessary electrical capacity to facilitate this. So the first question to ask is, *"is there existing electrical infrastructure to facilitate the installation of an EV charging unit?"*

Many new buildings are built with the capacity for chargers to be installed without any further upgrades required. Many old buildings are at capacity and significant upgrades will be required. An electrician is required to assess the site and provide advice.

Electrical Infrastructure-ready Buildings

Once the building has been assessed and sufficient power has been confirmed at the site, a discussion with body corporate must be had to gain support and approval of the installation. There are a few options available to residents including:

- Installing a charger dedicated for your property
- The installation of shared chargers which all EV owners could use

Renters will also need the support of their landlord to install a unit at their property.

Buildings Requiring Upgrades

Buildings without existing electrical infrastructure will require an electrician to upgrade the infrastructure within the building. This will require the approval and support of body corporate to pay for the costs to upgrade the power supply.

Once this is complete, the process of procuring and installing an EV charging unit can commence.

Residents without Off-Street Parking

Currently, there's no legal option for residents without off-street parking to charge their EVs at home. Residents are not permitted to run an electrical cable across the footpath to charge their vehicle as it is a tripping and safety hazard.

Residents without off-street parking are encouraged to use public chargers. This space is constantly evolving to solve this complex issue to find a solution to allow these residents to safely charge their vehicles kerbside.

General EV Charging Information Online

- Plugshare: <u>https://www.plugshare.com/</u> shows all public accessible EV charging locations
- MyNRMA: <u>https://www.mynrma.com.au/electric-vehicles/charging/how-much-will-it-cost-</u> <u>to-install-an-ev-charger-at-home</u> - outlines how to install EV chargers at home
- RACV: <u>https://www.racv.com.au/on-the-road/electric-vehicles/home-charging.html</u> EV charging installation guide

