



Driving into the future - a guide to electric vehicles

Transport currently makes up 60% of total carbon emissions in the ACT, making it the biggest hurdle to achieving our goal of net zero emissions by 2045. This is due to our reliance on internal combustion engine (ICE) vehicles. With the ACT now being powered by 100% renewable electricity, purchasing an electric vehicle (EV) will eliminate your transport emissions and help achieve net zero for our city. This guide provides information on EVs and charging considerations.

Understanding electric vehicles

EVs use a battery and electric motor to achieve movement. An electric motor is much smaller than an ICE and does not require the use of a transmission, allowing greater interior space and mechanical simplicity. Electric motors provide maximum torque (force or 'pulling power') from 0 RPM (revs per minute) and delivers power smoothly. This means that when you accelerate, you won't experience any delays or jerkiness due to the instant power delivery.

Energy for the motor is stored in a battery installed under the passenger compartment between the front and rear wheels. This battery placement allows EVs to maintain a very low centre of gravity, reducing the risk of a rollover by improving vehicle stability and handling when driving. This helps EVs to remain flat and stable during cornering, ensuring safer driving in all conditions.

EVs use batteries with very high energy density that can be rapidly recharged, either on a standard wall socket like any other electric device or one of the many thousands of public chargers around Australia.

Why should I purchase an electric vehicle?

EVs have many benefits including health and safety, performance, cost of ownership and reliability. These advantages apply for EVs whether you need a safe and practical family car or are after a high-performance car.

Safety: EVs optimise their design for safety, with larger crumple zones any crash impact is less dangerous to the occupants compared to an ICE vehicle. EVs low centre of gravity due to the battery location under the floor helps reduce rollover risk.

Health: EVs do not pollute the air when operating because they do not burn petrol or diesel. This is beneficial for our health as the exhaust build-up from an ICE in enclosed spaces or when idling can be hazardous.

Performance: EVs can accelerate more rapidly than comparable ICE vehicles, ensuring an exciting driving experience with adequate power for overtaking and country driving. From a practical and safety perspective this is helpful as it reduces the time needed to get up to speed on roads and limits overtaking time. For motoring enthusiasts, EVs offer greater acceleration and smooth power delivery, along with excellent handling due to their low centre of gravity and instant torque.

Regenerative braking: An EV can take advantage of regenerative braking, where the electric motor generates energy during braking. This charges the battery instead of wearing down brakes, improving efficiency and reducing brake servicing costs. A bonus if you are doing a lot of stop-start city driving.

Space: As the battery pack in an EV is stored neatly under the floor and electric motors take up very little space. There is generally more interior space on offer than a comparable ICE vehicle, including more front and rear legroom for taller passengers.

Refinement: Internal combustion engines are loud and create vibrations that are sent through the body of a car, reducing comfort for occupants. An electric motor is vibration free and operates in near silence, which provides a more comfortable and luxurious driving experience.

Reliability: There is very little that can go wrong in an EV and almost no susceptibility to drivetrain failure due to the robust nature of batteries and electric motors. EVs also have less servicing requirements, making them cheaper to maintain than an ICE vehicle.

Running costs: An ICE car consuming 10L/100km of petrol at \$1.50/L would cost \$15 per 100km, while an average EV charged with electricity at 26c/kWh would only cost around \$4 per 100km when charged at home. This cost can be much less if charging with off peak electricity or using solar panels. EVs also have very limited servicing requirements, typically only requiring annual safety and functionality checks. This can represent a cost saving of \$500 - \$1,000 per year for the life of the vehicle.

Emissions free: The ACT electricity grid is powered by 100% renewable electricity, so EVs are always emission free when charged in the ACT. Interstate travel may not always be emission free due to gas and coal in the national energy mix but will still have lower emissions than driving an ICE vehicle. Some public EV chargers in other states are powered from 100% renewable energy.

Choosing the right EV

There is a wide variety of new and used EV models currently available in Australia including SUVs, sedans, and hatchbacks, with most reasonably priced EVs achieving ranges of at least 300km on a full battery. There is a variety of EVs ranging in size to satisfy buyers regardless of whether you prioritise range, safety, practicality, or performance. For enthusiasts, there are several EV options offering very high levels of performance, usually for much lower prices than their ICE counterparts.

When it comes to buying an EV in the ACT, you can benefit from the stamp duty waiver and free registration, for more information go to the [Zero Emissions Vehicles web page](#).

Charging and battery considerations

Most lithium-ion battery chemistries have an optimal charging range to maintain the health of the battery. An EV should not have its battery excessively depleted before waiting to charge, as running it all the way down to under 20% can cause more rapid degradation of the battery. Equally, batteries should also not be charged to more than 80% or 90% for daily usage (depending on model), as regular charging to 100% can prematurely degrade the battery and reduce useable range over time.

Rather than excessively depleting the battery by driving your EV all week and letting its battery drop down, simply plug it in each day when not in use and maintain the battery near or at its manufacturer's recommended daily charge limit. You can then limit the charge of the battery to 80% or 90% (depending on manufacturer's specifications) to prevent over-charging. The exception to this is LFP (lithium iron phosphate) batteries which use a different type of lithium-ion chemistry that allows them to be charged to 100% regularly.

Charging your EV at home

The biggest difference in owning an EV is they can be charged at home or at public chargers, which can provide greater flexibility in 'refuelling' and avoids the need to visit service stations at all. Home charging speed and cost is dependent on what charging infrastructure you will use. All new electric vehicles come with a portable charging cable that can simply be plugged into a standard household wall socket. For most people installing dedicated charging infrastructure won't be required.

A standard 10A wall socket will produce 2.4 kilowatts (kW) of power and will take 15 – 30 hours to fully recharge an EV depending on battery size. A standard 10A wall socket will provide about 150km of range from 10 hours of overnight charging, so is suitable for people not regularly driving long distances. If a higher charge rate is required, other options include a faster 15A wall socket or a dedicated EV charger. A 15A wall socket upgrade will cost around \$300 and outputs 3.6kW, enough for adding about 220km from an overnight charge. Both options are adequate for most Canberra drivers who travel an average 38km a day, while still being able to easily facilitate longer drives when needed, such as weekend getaways or road trips.

If faster home charging is needed a dedicated EV charger can provide 7kW, enough to fully charge a standard EV in about 6 – 9 hours and allow for up to 500km of travel per day from an overnight charge. These chargers cost around \$2,000 - \$3,000 installed and are included as an eligible product under the Scheme. While a standard 10A or 15A socket is adequate for most daily driving needs, a 7kW dedicated EV charger upgrade is beneficial if you regularly drive long distances or have an EV with a large battery capacity. People living in apartments will need to seek permission from their body corporate to install a dedicated EV charger or utilise car park power points for charging.

Going further using public chargers

For long distance driving or where home charging is not possible there are over 2,500 public charging stations across Australia found on the [PlugShare website](#). Most of these output between 7-22kW and many are often free or very cheap to use. When quicker charging is required, there is a growing number of fast chargers providing charge rates of 50kW – 350kW, enough to fully charge most EVs in 30 – 60 minutes. Many of these charging stations are located along highways and major roads, allowing EVs to charge for short bursts each time you take a rest stop. Not all EVs can charge at the same rate, with some only supporting 50kW fast charging, so you will need to check the maximum charging rate of your potential EV with the manufacturer or dealership.

The final consideration for charging is the type of charging plug you will need, which can vary between makes and models. The plug types used today are typically CCS, CHAdeMO and Type 2. Although you will be provided with a cable for home charging, you may need an adapter or cable for some types of public chargers, especially some public destination chargers. Depending on your model of EV there may also be restrictions on which type of fast chargers are compatible.

How to apply for a loan under the Sustainable Household Scheme

Firstly, check you are eligible to participate in the Scheme by reviewing the [Scheme Guidelines](#). It's also a good idea to review the Scheme **terms and conditions**. If you've decided an electric vehicle is right for you, just follow these easy to steps to apply for your zero-interest loan:

- > Use the [Brighte marketplace](#) to see the accredited vendors that you can purchase an EV from. This includes all participating ACT dealerships and online sellers and covers all EV models currently available in Australia.
- > Select several vendors that sell EVs you are interested in and request a quote or call back regarding your EV options.
- > You can also visit participating dealerships directly and simply ask about the Sustainable Household Scheme interest free loans for EVs.
- > Once you have selected an EV to purchase, the dealership can arrange the finance application with Brighte on your behalf or you can apply directly with Brighte. Brighte will then contact you to go through the loan application process.

Some important things to note

- > You must select an EV under the luxury car tax threshold (LCT) for fuel efficient vehicles, this figure is adjusted each financial year and can be found on the [ATO website](#).
- > Dedicated EV charging equipment can be included in the \$15,000 loan.
- > Any requirements to upgrade to 3-phase power can be included as part of your loan, this may be required for EV chargers with outputs above 7kW.
- > Only battery electric vehicles are included, plug-in hybrids (PHEV) vehicles are not eligible for an interest free loan
- > Only one loan can be provided to each household, so you cannot access another loan for an EV if you have already used \$15,000 for other products under the scheme.

Need some free advice?

Contact our team for general and free energy advice on 1300 141 777 or actsmartadvice@act.gov.au



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