EV Charging and Travelling Basics

Disclaimer: The Vic Branch of the AEVA has tried to ensure all information is correct. However, as individual circumstances vary, it is important that you undertake your own research to best cater for your situation and preferences.

AEVA Vic Branch
July 2023
secretary@vic.aeva.asn.au

AC Charging

Using Standard Power Points (Trickle Charging)

Every normal power point is a potential charging point. Between 80% and 90% of all charging is done at home or at work using standard 10amp or 15amp power points. Overnight charging for 12 hours at 15 amps usually tops up the battery sufficiently for a long trip the next day.

		
Male 10amp 3 Pin Plug	Male 15amp 3 Pin Plug (large earth pin)	15amp charging cable with male 15amp 3 pin plug and female Type 2 plug for plugging into the car

Using Faster AC Charging

For a single phase electrical system, a wall charger can be installed which charges at 32 amps delivering 7.2kW (see overleaf for units and charging rates).
Destination wall chargers at public facilities, shopping centres, hotels or wineries are similar and are often untethered.

		
Tethered Wall Charger (lead provided)	Untethered Wall Charger (no lead provided)	Type 2 lead with male and female plugs (required for untethered supplies)

Properties with a 3 phase electrical system can install a wall charger which is 3 times faster than those with single phase (ie 22kW). However, this cannot currently be fully utilised as most EV cars now available in Australia have a maximum AC charging rate between 7kW and 11kW (see AEVA Fact Sheets).

DC Fast Charging

Stopping to recharge on a long day trip is done at DC fast charging stations. Some DC fast chargers are 25kW but the majority are between 50kW and 350kW. Check using the Plugshare site (link below) or charging network operator sites. For Tesla owners, the Tesla charging network is extensive, user friendly and reliable. Planning ahead is often required, especially the first time a particular journey is undertaken.

Chargefox Euroa DC 50kW chargers on the right. DC 350kW chargers on the left.
All have a choice of CCS Type 2 or CHAdeMO tethered leads.

		Almost all EV cars currently on sale in in Australia are fitted with CCS Type 2 plugs and have a maximum DC charging rate between 40kW and 270kW. (see AEVA Fact Sheets) Owners of cars with plugs other than CCS Type 2 and CHAdeMO need to carry adaptors.
Female CCS Type 2 Plug	Female CHAdeMO Plug	

Important Recommendation – Whether you use 10amps, 15amps or a wall charger, it is recommended that you have a qualified electrician install a dedicated circuit for your car charging point. This is due to the high volumes of energy involved.

Understanding Range and Planning a Trip

Terminology and Units

Electrical Energy	Kilowatt hour	kWh
Electrical Power	Kilowatt	kW

Using 3kW of power for 2 hours uses 6 kWh of electrical energy.
Charging at 3 kW for 2 hours stores 6 kWh of electrical energy in a battery.

Energy Consumption Petrol	Litres per 100 kilometre	L/100km
Energy Consumption Electric	Kilowatt hours per 100 kilometre	kWh/100km

Theoretical Range Calculation

Hyundai Kona	Speed	Consumption	Full Range (64 kWh Battery)
City Driving	60-80 km/h	12 kWh/100km	64/12*100 = 533 km
Highway Driving	100 km/h	15 kWh/100km	64/15*100 = 426 km

Actual Range Calculation

When undertaking a trip, the battery is often not fully charged at departure and should normally not be allowed to go below ten or twenty percent capacity. To guarantee sufficient range and to maximize battery life (see Maintaining the Car Battery) drivers may need to include a safety margin. For some models, this may mean lowering your expectations by 20 or 25 percent.
Thus, for the Hyundai Kona the sensible highway range with a full battery is 320 - 350km and is 250 – 280km with an 80% battery.

Using the Car's Range Meter

These are sometimes unreliable and can overestimate your range. At the beginning, it is probably wise to deduct 25% (as described above) from the range shown on the range meter. Your range estimations and confidence will improve as you gain experience with your particular model, different driving conditions and your driving style. It is important to know where you will stop to recharge if the range meter predicts that the battery charge will drop to an unacceptable level.

Planning a Trip

When undertaking a long day trip, the location and status of fast charging stations and the distance between them must be researched. Plugshare is a free website which shows most charging stations, their details and status. Fast charging network operators have sites and apps which show locations, details and status of the stations and chargers on their network. For some EVs, onboard software will direct you as needed, if you wish.

Other Useful Information

Maintaining the Car Battery

- Normal practice is to restrict charging to between 20% and 80% of capacity.
- Trickle charging to 100% is allowable just prior to undertaking a long day trip.
- Fast and frequent DC charging can affect long term battery life.
- For courtesy and battery longevity, stop DC fast charging at 80% battery capacity.

Tips for Planning a Trip

- Driving style, road and weather conditions can greatly increase energy consumption.
- Once a trip has successfully been completed, there is less planning next time.
- At busy times there may be queues at fast charging stations.
- Caravan parks have 15amp power points on their powered sites.
- Planning is essential when travelling to remote places. Ringing ahead and carrying extra adaptors (depending on the power points provided) may be required.
- It can be better to charge more often (4 times for 30 mins vs 3 times for 40 mins).
- Reducing speed reduces energy consumption thus increasing range.

Time Taken to Charge

		Amps	kW	Add 25kWh	Add 50kWh	Add 75kWh
AC	**Trickle**	**10**	**2.4**	**10.4 hrs**	**20.8 hrs**	**31.4 hrs**
	Trickle	**15**	**3.3**	**7.6 hrs**	**15.2 hrs**	**22.8 hrs**
		32	**7.2**	**3.5 hrs**	**7 hrs**	**10.5 hrs**
DC			**25**	**1 hr**	**2 hrs**	**3 hrs**
	Fast		**50**	**30 minutes**	**1 hr**	**1.5 hr**
	Fast		**100**	**15 minutes**	**30 minutes**	**45 minutes**

Useful Sites and Links

- **AEVA EV Fact Sheets – Summary Sheet + 2 detailed pages on 50 current and 25 EVs soon to be available in Australia** https://www.aeva.asn.au/battery-electric-vehicle-models-bevs/
- **AEVA Vic Branch Page** https://www.aeva.asn.au/VIC/
- **AEVA Membership Page** https://www.aeva.asn.au/memberships/applications/aeva-membership/
- **AEVA Vic Branch Non Member Email List** https://www.aeva.asn.au/accounts/register/
- **Plugshare** https://www.plugshare.com/map/australia
- **A Better Route Planner** https://abetterrouteplanner.com/

Last updated: 6/6/2023