Aberdeenshire COUNCIL

From mountain to sea

Electric vehicle charging

Manual

March 2022

Revision Date	Previous revision date	Summary of changes
-	-	-

Contents

1 Introduction

With the sale of new petrol and diesel cars and vans due to be phased out across the United Kingdom by 2030 the growth in sales of electric vehicles (EVs) is predicted to accelerate. EVs offer a number of benefits to both the owners and the wider community including lower running costs and reduced air and noise pollution. Concerns over vehicle range and the availability of charging facilities however may be a concern for those considering the transition to an EV, particularly where charging at home may not be a practical option.

This Electric Vehicle Charging manual is provided to guide staff in the implementation of the *Electric Vehicle Charging Policy*.

1.1 Legal & Policy Background

Across Scotland it is estimated that transport accounts for over 35% of the nation's greenhouse gas emissions and 39% of these emissions are due to car use. Lifetime emissions from electric cars have been calculated to be around 30% lower than those from petrol cars[1] so while electrification doesn't offer a complete solution to the problem of transport related emissions it still widely supported in local and national plans and strategies.

Figure 1.1: Electric Vehicles Registered in Aberdeenshire

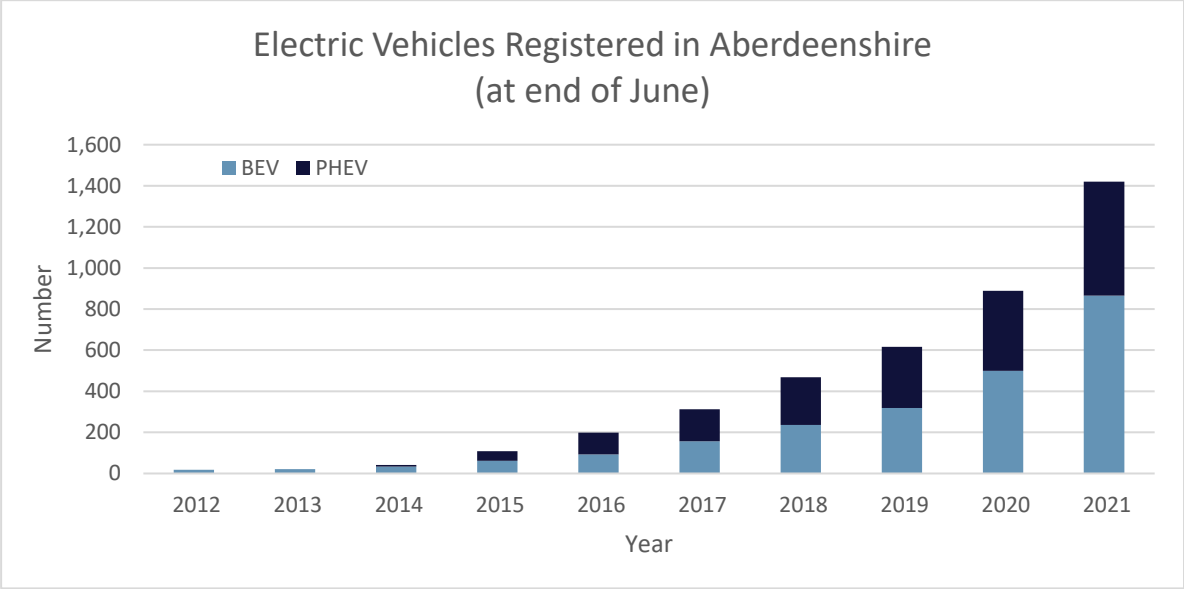


Figure 1.1 shows the rapid growth in EVs in Aberdeenshire however the combined number of battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV) still only makes up around 0.75% of the total number of registered vehicles in Aberdeenshire. Significantly greater numbers of EVs in Aberdeenshire would obviously require a far larger network of charging points than currently exists (see Table 1.1) and while the provision and operation of a large-scale charging network

[1] Knobloch, F., Hanssen, S., Lam, A. et al. Net emission reductions from electric cars and heat pumps in 59 world regions over time. Nat Sustain 3, 437–447 (2020). https://doi.org/10.1038/s41893-020-0488-7

cannot be the sole responsibility of local authorities it is clear that Transport Scotland see an important role for them in servicing the early market.

Table 1.1: Estimated requirement for publicly available EV chargers in Aberdeenshire[2]

year	on-street/local	inter-urban	total
2020	68	2	70[#]
2030	1,070	34	1,104
2040	1,882	40	1,922
2050	2,060	42	2,102

[#] Actual total at July 2020 was 76 of which 15 were rapid chargers[3]

This *Electric Vehicle Charging Manual* is directly referred to in the Policy and the requirements contained within this manual shall be mandatory for all non-trunk roads in Aberdeenshire and other public spaces controlled by Aberdeenshire Council.

[2] Table M2.3 in https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Surface-transport.pdf factored by relative populations.
[3] https://www.gov.uk/government/statistics/electric-vehicle-charging-device-statistics-july-2021/electric-vehicle-charging-device-statistics-july-2021

2 Charger Types and Locations

2.1 Charger Types

2.1.1 Slow chargers

Slow chargers (7kW or lower) are typically available in 3.5kW or 7kW variants and can recharge a BEV in around four to eight hours. Slow chargers are most appropriate where EVs are parked overnight or for longer periods.

2.1.2 Fast chargers

Fast chargers are rated between 7kW and 22kW although most are 22kW. These can recharge a BEV in around two to four hours and are most appropriate for destinations where vehicles are parked for a few hours.

2.1.3 Rapid chargers

Rapid chargers are rated between 43kW (AC) and 50kW (DC). These can recharge a BEV to 80% in around 20 to 40 minutes and are most appropriate for destinations where vehicles are parked for a quick break.

2.1.4 Ultra-rapid chargers

Ultra-rapid chargers are rated at over 50kW with 100kW and 150kW being the most common. These chargers can add up to 100 miles of range in as little as 10 minutes and are useful for topping up charge levels when on longer journeys.

2.1.5 Connector Types

Each charger type uses its own set of connectors for low or high power and for AC or DC charging. These are shown below in Table 2.1.

Table 2.1: Charging connector types

Charging connector type	Power rating	Charging cable features
 UK three pin plug	2.3-3 kW AC Single Phase (Standard Charge)	Standard UK domestic electricity outlet but very slow and not designed for the prolonged use needed to fully charge an electric car
 Type 1	3-7 kW AC Single Phase	Less common in modern electric cars Has no locking mechanism when car is connected to supply
 Type 2	3-43 kW AC Single Phase/Three Phase	Is becoming the standard European EV charging cable connector type Has an in-built locking mechanism when connected to power supply
 CHAdeMO	50 kW DC Three Phase	An older type of rapid charging cable compatible with Japanese vehicles
 Combined Charging System (CCS)	50 kW - 350 kW DC	The most versatile rapid charging connector, enabling a higher power rating to support larger ultra-rapid chargers

2.2 Locations for Provision of EV Chargers

When targeting resources for future provision of EV charge points the following should be considered:

- While around 81% of dwellings in Aberdeenshire have dedicated off-street parking provision, in some communities the arrangement of housing on the street means that many residents do not have off-street parking and would be unable to charge an EV at home (e.g. fishing villages).
- Transport hubs (such as bus or train stations) can provide opportunities for commuters to recharge their vehicles. Commuters generally leave their vehicles at such locations all day. While 7kW chargers may be adequate for this use, given the small difference in cost, 22kW chargers would normally be provided unless there were constraints with the power supply.
- Similarly, town centre car parks can provide recharging opportunities for commuters and also visitors to the town centre. 22kW chargers would be appropriate in such locations.

- Drivers undertaking long journeys may need to top up quickly enroute without spending time away from their vehicles. The provision of rapid chargers convenient to strategic routes and destinations would be beneficial for this market.

3 Private on-street charging

Aberdeenshire Council do not consent the on-street charging of electric vehicles where this would involve cables (either with or without cable protectors) crossing the footway or any other part of the road.

Similarly, we would not permit the installation of charging apparatus in the public road where this was for private rather than public use.

Potential purchasers of electric vehicles who do not have access to off-street parking at home or charging facilities at work should base any decision on utilising publicly available charge locations in the same way that petrol and diesel are currently accessed.

4 Public charging locations

4.1 On-street

There are a number of issues around installing public chargers within the public road and, at current levels of EV ownership, Aberdeenshire Council favour off-street locations wherever possible. If EV ownership levels continue to grow rapidly however the case for permitting on-street charging may have to be reviewed. Where the installation of chargers in the public road is being considered the following criteria shall apply:

1. The installation shall not detrimentally impact pedestrians (including those who are visually or mobility impaired) or cyclists using the road;
2. The charging facilities shall be available for use by all EV users with no preferential treatment given to any group or individual:
3. The rate charged must not exceed Aberdeenshire's standard tariff by the following percentages:
   - Standard chargers: +20%
   - Fast Chargers: +40%
   - Rapid Chargers: +100%
4. The owner of the charger must have adequate public liability insurance:
5. Consent under Section 109 of the New Roads and Street Works Act 1991 shall be required for all apparatus in the public road; and
6. Maintenance schedules and fault response targets must be agreed with the council and adhered to.

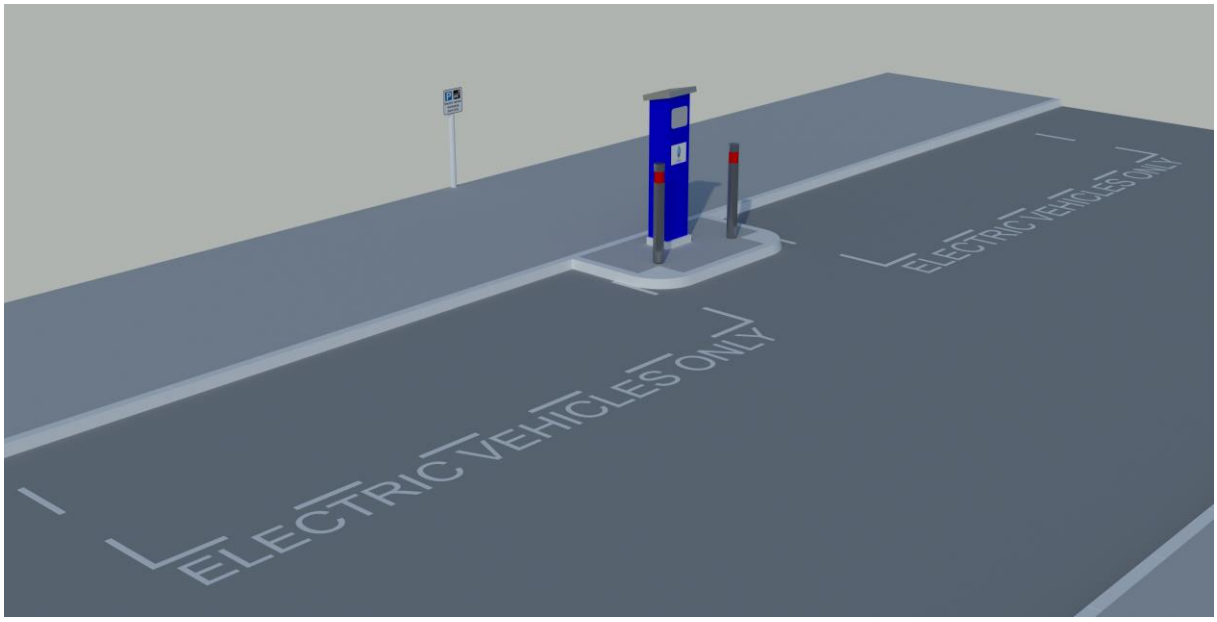
4.1.1 Issues with earthing systems

Current requirements for earthing of electrical installations would not permit the installation of an EV charge point where a charging vehicle might be within 2.5m of a street lighting column with an incompatible earthing system. Similarly, proximity issues may arise with buried metalwork and earth electrodes of different earthing systems. All new installations should be assessed for potential risks from simultaneous contact between exposed conductive parts, striking buried services when driving earthing rods, and below ground separation of earthing systems.[4]

4.1.2 Signing and lining

Where on-street bays are to be reserved for electric vehicle charging all road markings and signs must comply with the prescriptions in the Traffic Signs Regulations and General Directions 2016. Markings shall be diagram number 1028.4 (Sch.7, Pt.4, Item 6) with the wording “ELECTRIC VEHICLES” or another of the appropriate permitted variants. Signs shall incorporate the electric vehicle charging symbol (Sch.4, Pt.5, Item 7).

Dedicated on-street charging bays must be covered by a traffic order limiting the use of the bays to electric vehicles only while these are being charged. Parking exemptions for blue badge holders should not apply. Depending on the type of charger provided restrictions on length of stay may be appropriate to ensure turnover and increase availability.



[4] https://electrical.theiet.org/wiring-matters/years/2020/80-may-2020/the-iet-code-of-practice-for-electric-vehicle-charging-equipment-installation-4th-edition/

4.2 Off-street

We continue to favour off-street locations for the provision of EV charging points for both existing and new developments.

4.2.1 New Developments

Aberdeenshire Council's Proposed Local Development Plan 2020 encourages the provision of home and workplace chargers and states "Electric vehicle charging points should be provided in car parking spaces used by the public, including those for major leisure and retail uses. Their provision will be managed by the application of the Standards for Road Construction Consent and Adoption."

More recently the Scottish Government has undertaken consultation on proposed changes to the Scottish Building Regulations relating to electric vehicle charging provision in new buildings and those subject to major renovation.

Aberdeenshire Council's Parking Standards document will be maintained and updated as appropriate to reflect these changes and promote the provision of charging points in new developments.

4.2.2 Aberdeenshire Council Car Parks

While the Traffic Signs Regulations and General Directions do not apply to off-street car parks we will still use its EV recharging point sign to give consistency across all our locations. For markings however the use of a symbol within the space may be more appropriate than the worded markings used at on-street spaces. Off-street parking orders should include relevant provisions to ensure dedicated charging spaces are only used by recharging vehicles.

5 Charging for EV Charging

After an initial period of offering free charging, at the start of 2021 Aberdeenshire Council introduced a charge based on a rate per kWh of electricity provided to cover the costs of energy, maintenance, administration and management. Transport Scotland now advise that, with chargepoints having a potential life of 10 years, local authorities face rising costs in just continuing their current level of service provision and should consider factoring in these costs along with an allowance for future technology upgrades when setting tariffs.

A tariff should be set for use of publicly available EV charging infrastructure hosted by Aberdeenshire Council and this tariff should allow for full cost recovery. Where EV charging infrastructure is install in a Pay and Display car park, the standard terms and conditions will apply to the EV spaces.

6 Reporting Faults

Aberdeenshire Council's EV chargers are operated by ChargePoint Scotland and faults should be reported using their online form at https://chargeplacescotland.org/report-a-fault/ .

7 Useful Weblinks

https://chargeplacescotland.org/

https://energysavingtrust.org.uk/advice/charging-electric-vehicles/

http://www.eva.scot/