

Electric Vehicle Charging Points

Technical Guidance Note

Introduction

1. The vast majority of vehicles in use on the roads of Lewes District today currently run on petrol or diesel. However, these fuels produce emissions which are known to impact on human health and the environment. For these reasons the UK government are driving a transition to more efficient, lower polluting technologies such as Electric Vehicles (EVs).
2. This technical note aims to provide developers and the public with guidance in relation to how Electric Vehicle Charging Point (EVCP) infrastructure should be provided within development in the District (outside of the South Downs National Park). The Technical Guidance Note also provides a summary of existing technologies and the current situation in the UK, using case studies and examples of best practice.

Expectation for EV Charging Points in New Development

3. In order to encourage the use of EVs, this Technical Guidance Note sets out that any new development application submitted within the area for which Lewes District Council (LDC) is the planning authority¹ is expected to meet the criteria set out below:

Provision of accessible EV charging points for ULEV in New Development	
Flats (developments of 11 or more)	Where flatted development has integrated parking bays (undercroft or parking court) at least one dedicated bay with Fast EV Charging Unit to service the development.
Houses	Where houses are provided with a garage or driveway, one standard EV Charging Unit* per dwelling.

¹ i.e. Lewes District outside the South Downs National Park

Garages	Where domestic garages are provided, new or replacement, one standard EV Charging Unit** per garage.
Commercial	Where commercial development is proposed with 100 car parking bays or more at least 2% of those bays are to be provided with a Fast EV Charging Unit***.

** Minimum requirement: 16 Amp socket located either in a garage or in close proximity to a dedicated car parking place. In the absence of a garage, a wall mounted external socket would be expected.*

*** Minimum requirement: 16 Amp socket located inside the unit.*

**** Minimum requirement; 32 Amp socket. Commercial standalone charging units provide 2 chargers, meaning 100 spaces requires 1 standalone unit.*

4. These expectations are derived from and consistent with the approach taken by a number of other local authorities, some of which are evidenced later in this guidance.

Background

5. In 2017, as a way of significantly reducing emissions and improving air quality, the UK government announced their intention to end the sale of conventional petrol and diesel cars and vans by 2040. The aim by 2050 is for almost every vehicle on the road to be a zero emission vehicle. These targets are driving a revolution in Ultra Low Emission Vehicle (ULEV) technologies, however there are challenges associated with bringing to market technologies that are accepted by the consumer and affordable.
6. The primary benefit of EVs is their ability to significantly reduce emissions of greenhouse gases and other air pollutants locally and so improve air quality. The UK in general struggles to meet legal requirements associated with air pollutants. The Lewes District would benefit from an increase in EV usage particularly in relation to air quality issues within the designated Air Quality Management Area in Newhaven as well as localised congestion issues in the coastal belt, which at times cause air quality to be affected.

7. Evidence collated by Defra, Public Health England and the Local Government Association², published in March 2017, indicates that even short-term exposure to high levels of air pollution can induce a range of adverse health effects. The health implications include the exacerbation of pre-existing conditions such as asthma. Furthermore, the World Health Organisation (WHO) state that long-term exposure to air pollution can reduce life expectancy due to its negative impact on lung, heart and respiratory conditions. Additionally, the Royal College of Physicians has found emerging links between high levels of air pollution and a range of adverse health effects including dementia, diabetes and effects on the unborn child³. In addition to negatively affecting human health, air quality also impacts the environment and climate.

Lewes District Facts and Figures

8. There were a total of 62,417 vehicles registered in the Lewes District in 2017, including 51,498 cars, 2,716 motorcycles, 7,246 goods vehicles and 322 buses and coaches. The number of cars registered in Lewes District increased by 3,188 between 2012 and 2017.
9. A total of 56,148,000 tonnes of fuel was consumed by road transport in the Lewes District in 2015⁴. This is the second highest consumption in East Sussex after Wealden; however when measured against the size of the District and Boroughs, it is the third highest consumption, although still above the average for the County as a whole.
10. Petrol cars made up 37.2% of the total fuel consumption in 2015, with diesel cars making up 30.3% of total consumption. 28.9% of fuel consumption came from all types of Freight Transport, which includes HGVs and LGVs.
11. The total amount of annual fuel consumption in Lewes District has remained relatively consistent in the 10 years between 2005 and 2015; however the amount of consumption by diesel cars has increased whilst consumption by Petrol Cars has decreased. This is a result of diesel-engine cars being promoted by successive UK governments through lower levels of taxation compared to petrol-engine cars.

² https://www.local.gov.uk/sites/default/files/documents/6.3091_DEFRA_AirQualityGuide_9web_0.pdf

³ Royal College of Physicians 'Every breath we take the lifelong impact of air pollution' (2016)

⁴ Road transport energy consumption 2005-2015 - Department of Energy & Climate Change (DECC) via East Sussex in Figures

12. The Carbon Dioxide (CO₂) emissions in Lewes District in 2015 were 459,000 tonnes, which equates to 4.6 tonnes per capita⁵. This is the third highest of the Districts and Boroughs in East Sussex, but higher than the average per capita for the County as a whole. However, CO₂ emissions in the Lewes District did show a decreasing trend in the ten year period between 2005 and 2015.
13. Approximately 40% of the CO₂ emissions in 2015 came from Road Transport, whilst 36% came from Domestic fuel use.
14. The 'Lewes District Council 2017 Air Quality Annual Status Report' identifies that nitrogen dioxide (NO₂) monitoring takes place at over 40 locations throughout the Lewes District (including the area within the South Downs National Park). Of these, seven locations exceed the NO₂ annual mean objective of 40µg/m³. All of these locations are within Air Quality Management Areas, where action is being taken to manage the reduction in air pollution.
15. Over the period 2012 to 2016, over half of the monitoring sites have seen a decrease in NO₂ pollutants. However, between 2015 and 2016 38 out of 40 monitoring locations saw an increase in NO₂.
16. The increased usage of Ultra Low Emission Vehicles (ULEVs) will help to reduce fuel consumption in the District, as well as reduce CO₂ emissions and improve air quality. However, the increased provision of infrastructure will be required in order to encourage more people to make the switch to ULEVs.
17. As of April 2018, there were a total of 213 ULEVs registered in Lewes District. This represents 0.41% of the total cars registered in the District, which is the highest proportion of any local authority in East Sussex. However, this is slightly lower than the average across the whole of England, which is 0.53%. The highest proportion in England is in the Isles of Scilly (10.17%), whilst the City of London is the next highest with 6.28%. However, Lewes District has a higher proportion of ULEVs compared to total cars than the median average of England.

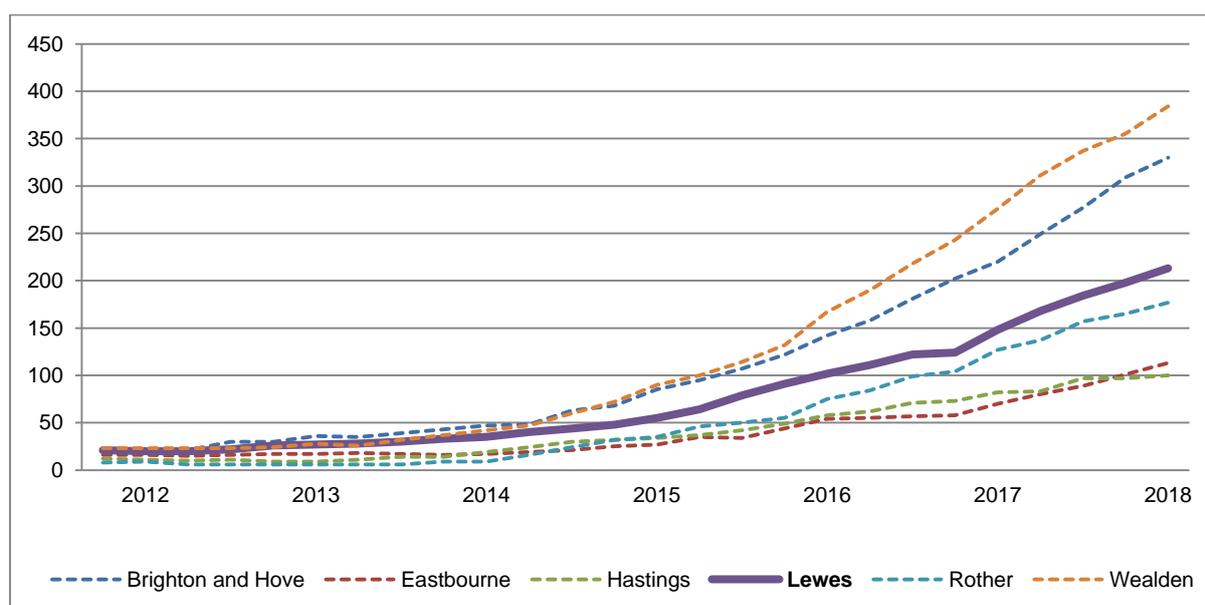
⁵ Carbon dioxide emissions by sector 2005-2015 – Department for Business, Energy & Industrial Strategy, via East Sussex in Figures

Table 1 - Total Register Cars compared to Number of Registered ULEVs

Local Authority	Total of Registered Cars (31 st March 2018) ⁶	Number of Registered ULEVs (31 st March 2018) ⁷	% ULEVs
Lewes	51,498	213	0.41%
Brighton & Hove	93,316	330	0.35%
Eastbourne	46,304	113	0.24%
Hastings	39,145	100	0.26%
Rother	52,776	177	0.34%
Wealden	95,795	384	0.40%

18. The rate of take-up of ULEVs in Lewes District is increasing. There were 65 new registrations of ULEVs in 2017/18, which is the highest of any year, and over the three year period between 2015 and 2018, growth in ULEVs nearly doubled on an annual basis.

Figure 1 - Change in the number of Registered ULEVs by local authority



⁶ Department for Transport: Vehicle Licensing Statistics, Table VEH0105 - Licensed vehicles by body type and local authority: United Kingdom

⁷ Department for Transport: Vehicle Licensing Statistics, Table VEH0131 - Licensed plug-in cars, LGVs and quadricycles by local authority: United Kingdom

19. EVs will play a vital role in the UK's transportation future, the transition away from fossil fuel to plug-in electric and low-carbon fuel and electricity could reduce greenhouse gas emissions.
20. In order to facilitate the transition of the UK vehicle market from one reliant on petrol and diesel to one based on ULEVs, the supporting infrastructure needs to be provided.

Lewes District Council's EVCP Concept

21. It is desired that the District will have a higher proportion of EVs on the roads, with infrastructure in place to support them. The Council expects that the majority of vehicle charging will occur overnight in a residential setting, however, it is appreciated that this will likely need to be supported by 'top up' charges during the day. Consequently to support this EV charging concept, it is desirable that planning applications should include an 'electric vehicle charging scheme' for housing and business/commercial developments such that it can be determined from the planning application how the development supports the provision of infrastructure necessary to fulfil not only the council's vision, but the governments drive to shift to lower polluting technologies.
22. This Technical Guidance Note has been produced to represent the starting point of the council's journey to formulating policy surrounding EVCP infrastructure, until more detailed evidence can be gathered regarding the technology and Electric Vehicle Charging Points (EVCPs) infrastructure which will lead to the implementation of a prescriptive policy position to reflect the council motion. A review of the Local Plan, which will begin following the adoption of Local Plan Part 2, will include assessment of a comprehensive EVCP policy.

Policy Context

23. The National Planning Policy Framework [NPPF] (revised 2018) encourages the provision of EVCPs in development. Paragraph 110 states that 'applications for development should *(e) be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations*'. It is also stated in paragraph 179 of the Framework that '*Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas*'.

24. East Sussex County Council's Guidance for Parking at New Residential Development (2017) outlines the amount and type of parking that should be provided within new residential development. It encourages developers to include EVCPs at all properties with off-street parking. It also encourages consideration for EVCPs for other parking areas.
25. Additionally, the provision of EVCPs in development will comply with many policies set in the Joint Core Strategy (May 2016), specifically Core Policy 9: Air Quality and Core Policy 13: Sustainable Travel. These expectations would ensure that the District reduces locally contributing causes of climate change and shows the authority is being pro-active regarding climate change initiatives. It will also promote a sustainable system of transport and encourage developers to provide the new and upgraded infrastructure that is required to create and support sustainable communities.
26. Finally, this technical note is introduced in compliance with the recent Automated and Electric Vehicles Bill as brought from the House of Commons on 30 January 2018 (HL Bill 82).

Current situation in the UK

Available Technology

27. Electric vehicles are a relatively new development and technologies are constantly developing and improving due to high levels of investment from the automotive and other industries. As a result of this investment the capability of chargers and batteries are expected to significantly improve over the coming years.
28. There are currently three main electrical vehicle charging types⁸:
 - **Standard** (up to 3kW) - Best suited for 6-8 hours overnight, these charges are most commonly used for home or workplace overnight charging cycles. Most EVs can be slow charged; in most cases a standard single-phase 13A supply is used to draw up 3kW of power, the EV usually takes approximately 6 to 8 hours. In most cases a standard 3-pin plug (BS 1363) at the charging point outlet is used, along with a gun shaped Type 1 (J1772) or 7-pin Type 2 (Mennekes) connector for coupling with the vehicle inlet. Although slow charging was initially the most common form of EV chargers they are now

⁸ Innovative on-street EV charging solutions (Ecolane 2015) <http://www.ecolane.co.uk/wp-content/uploads/2015/01/Ecolane-Innovative-on-street-EV-charging-solutions.pdf>

being replaced by fast and rapid charging units. These units cost circa £800 to install to an existing property.

- **Fast (7-22kW)** - Fast charging more than doubles the available current of standard chargers to 32A (7kW), giving these units the ability to fully charge some EV models in 3-4 hours. The practicality of a shorter charging time means that many commercial and public on-street charges already utilise this technology. Although not all EVs are capable of accepting a phase-1 fast charge at 7kW, the majority can be connected to them and will draw 3 or 7kW, capability dependent. These units cost between £800 and £1700 to install.
- **Rapid (43-50kW)** - provide a high power alternating current (Ac) or direct current (DC), this provided a power supply of at least 4kW (AC) or 50kW (DC). This level of power enables an EV to reach 80% charge in 30 minutes. The most common type of rapid chargers is DC chargers. These chargers are equipped with a non-removable JEVS (CHAdEMO) or a 9-pin CCS (Combo) connector which is coupled with the appropriate inlet socket which is fitted to some EV models. Rapid AC charges are relatively new to the market and are currently only available on a small number of EV models in the UK.

Figure 2 – Common AC and DC connector used for EV charging in the UK⁹

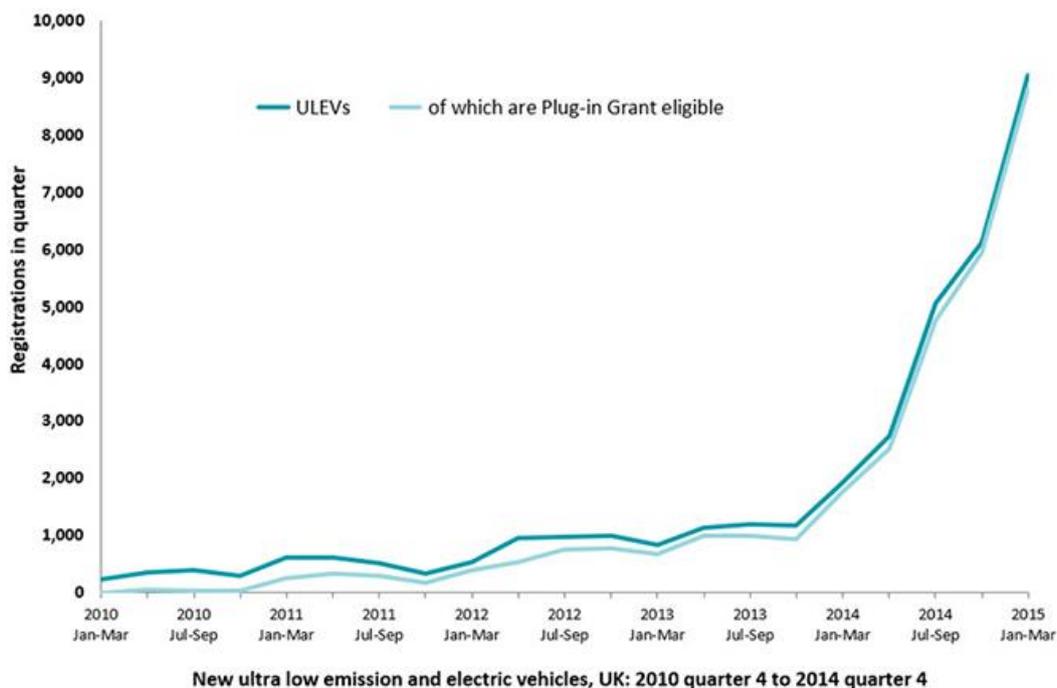


⁹ <https://www.zap-map.com/charge-points/basics/>

Examples of what other Local Planning Authorities are doing

29. Currently the number of people using electrical vehicles is far outweighed by the number using petrol or diesel vehicles, however, the UK are already a leader in Europe in terms of electric vehicle manufacture and uptake. In their 2017 Air Quality Plan¹⁰ Defra states that the UK had the highest sales of battery electric and plug-in hybrid vehicles in the European Union. The uptake of electric vehicles is likely to increase in the coming years due to improvements in technology and increased affordability. This is supported by the £2.7 billion the UK government has committed to investing in air quality and cleaner transport. Included in this is nearly £100 million which will be invested in the UK's charging infrastructure and funding the Plug-In Car and Plug-In Van Grant Schemes. Figure 3 below highlights the increase in growth and popularity seen in the use of electric vehicles across the UK.

Figure 3 - UK plug in vehicle uptake, by quarter¹¹



30. The Government wants to see the majority of charging occur at home, overnight, to avoid occurring during peak electricity demand. Whilst home recharging can be supported by workplace recharging, electric vehicles are expected to predominantly be charged residentially. Consequently, this technical paper focuses on the technologies available for home recharging.

¹⁰ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/633269/air-quality-plan-overview.pdf

¹¹ <https://chargedevs.com/newswire/uk-plug-in-sales-start-to-accelerate/>

London

31. The OLEV 'Go Ultra Low City Scheme' (GULCS) scheme has resulted in funding for four exemplar cities to develop innovative EV policies and schemes. London is one of these cities and is also one of the leading European cities for EVs.
32. The London Plan states in policy 6.13 that residential, retail and employment developments should provide electric vehicle charging points (EVCPs). The policy requires developers to provide active spaces as well as passive provision. Active spaces must have fully wired and connected charging points and be ready to use on completion of the development. Passive provision requires the necessary underlying infrastructure for example capacity in the connection to the local electricity distribution network and electricity distribution board, as well as cabling to parking spaces to be in place. This enables simple installation and activation of a charge point at a future date, thus future proofing developments.
33. The Land for Industry and Transport SPG (written by Greater London Authority) specifically Annex 6, sets out the 'Typical Charge Points Technical Standards'¹².

Table 3 – Typical Charge Points Technical Standards

	Voltage (V)	Current (Amps)	Nominal charge power (kW)	Typical Application
Standard	230 AC	13-16, single phase	3	Residents Parking Employees Parking
Fast	230 AC	32, single phase	7	Retail/leisure parking Residential & employment visitor parking
Rapid	400 AC and 500 – 600 DC	32-63A three phase and up to 125 DC	20-50	Specialist applications

¹² Greater London Authority - Land for Industry and Transport – SPG 2012 Annex 6: <https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/supplementary-planning-guidance/land-industry-and>

Scarborough Borough Council

34. In July 2017, Scarborough Borough Council (SBC) adopted their Local Plan, which contained a new policy on EVCPs:

Policy DEC 2- Electric Vehicle Charging Points

'There will be a requirement that every new residential garage and dedicated marked out residential car parking space within the curtilage of the property should include an electrical socket suitable for charging electric vehicles. For non-residential developments providing 100 car parking bays or more, it is required that at least 2% of those bays should provide well managed rapid charging points for electric vehicles, where the local electricity network is technically able to support this. An exemption would be made for residential apartments with communal parking areas'.

35. SBC state that although a single phase 13 amp three-pin domestic socket is adequate for home charging, a dedicated EV unit should be installed. SBC recognise that it is much easier to set up a dedicated charging unit during construction of a property. The cost of installing an EVCP to an existing dwelling is circa £800, this cost is decreased if the unit is installed as part of the construction process. In their assessment, SBC found that installation of an EVCP is very unlikely to impact the viability of a development scheme.

LDC Expectations

36. Delivering an accessible network of EVCPs will play a critical role in facilitating the purchase of electric vehicles. Increasing EVCP provision should ensure residents and businesses have increasing confidence in utilising and purchasing EV's as their preferred and most convenient choice of vehicle in the Lewes District.

37. Any new development application submitted within the area for which LDC is the planning authority is expected to meet the criteria set out below:

Provision of accessible ¹³ EV charging points for ULEV in New Development	
Flats (developments of 11 or more)	Where flatted development has integrated parking bays (undercroft or parking court) at least one dedicated bay with Fast EV Charging Unit to service the development.
Houses	Where houses are provided with a garage or driveway, one standard EV Charging Unit* per dwelling.
Garages	Where domestic garages are provided, new or replacement, one standard EV Charging Unit** per garage.
Commercial	Where commercial development is proposed with 100 car parking bays or more at least 2% of those bays are to be provided with a Fast EV Charging Unit***.

* *Minimum requirement: 16 Amp socket located either in a garage or in close proximity to a dedicated car parking place. In the absence of a garage, a wall mounted external socket would be expected.*

** *Minimum requirement: 16 Amp socket located inside the unit.*

*** *Minimum requirement; 32 Amp socket. Commercial standalone charging units provide 2 chargers, meaning 100 spaces requires 1 standalone unit.*

38. These expectations are derived from and consistent with the approach taken by a number of other local authorities. As mentioned throughout this document, this guidance note has been created to encourage EV infrastructure in new development.

¹³ Ensuring that the infrastructure provided is accessible to all people.

Background Papers

39. The background papers used in compiling this report were as follows:

- Automated and Electric Vehicles Bill 2017-19 - House of Commons Library <http://researchbriefings.files.parliament.uk/documents/CBP-8118/CBP-8118.pdf>
- Automated and Electric Vehicles Bill 2017-19 – Explanatory Notes <https://publications.parliament.uk/pa/bills/cbill/2017-2019/0112/en/18112en.pdf>
- Charging Points Statistics, 2018 <https://www.zap-map.com/statistics/>
- Finding Value in the Electric Vehicle Charging System [http://www.ey.com/Publication/vwLUAssets/Finding_value_in_the_electric_vehicle_charging_ecosystem_pdf/\\$File/Beyond%20the%20plug%20-%20Finding%20value%20in%20the%20electric%20vehicle%20charging%20ecosystem.pdf](http://www.ey.com/Publication/vwLUAssets/Finding_value_in_the_electric_vehicle_charging_ecosystem_pdf/$File/Beyond%20the%20plug%20-%20Finding%20value%20in%20the%20electric%20vehicle%20charging%20ecosystem.pdf)
- Full list of Electric Vehicle Home charge Scheme approved charge point model list, 2017 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/655120/evhs-approved-chargepoint-model-list.csv.csv/preview
- Land for Industry and Transport – SPG 2012. Annex 6: <https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/supplementary-planning-guidance/land-industry-and>
- Learn about plug-less charging <https://www.pluglesspower.com/learn-about-plugless/>
- Lewes District Local Plan, Joint Core Strategy, 2016 <http://www.lewes-eastbourne.gov.uk/planning-policy/lewes-core-strategy-local-plan-part-1/>
- National Planning Policy Framework (NPPF), 2012 <https://www.gov.uk/government/publications/national-planning-policy-framework--2>
- East Sussex County Council, Guidance for Parking at new residential development, <https://www.eastsussex.gov.uk/media/9311/escs-guidance-for-parking-at-residential-developments.pdf>