

Parking Know How
Electric Vehicle Charge Points
February 2017



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Introduction and purpose of this information

This paper is intended to assist BPA members in the decision-making process regarding installing electric vehicle (EV) charge points.

Road transport contributes around a fifth of man-made greenhouse gas emissions and the sector's share has been growing.

The last three years have seen a remarkable surge in demand for EVs in the UK. There has also been an increase in the number of electric and plug-in hybrid models available in the UK.

The UK Government is committed to reducing carbon emissions and improving air quality, and organisations are encouraged to begin providing EV charge points. Recent consultations, the various grant schemes offered by the Office for Low Emission Vehicles (OLEV), and funding available to individuals, workplaces and local authorities for the installation of charge points are all evidence of this. The significance of EVs is also recognised internationally. A recent example of this is the draft proposals published by the [European Commission](#), which as they stand specifically include that from January 2025 all non-residential buildings (or where such buildings undergo major renovation) with more than ten parking spaces, should ensure that at least one of every ten spaces is equipped with a recharging point although exemptions can be applied for SMEs.

Organisations should be gearing themselves up for a significant increase in EVs. If we look at other European countries we can estimate where we will be heading; for example, in Norway more than 1 in 3 new cars are EVs and the Netherlands and Germany are in the process of implementing regulations to require all new cars to be zero emission by 2025.

Electric vehicle cars are predicted to represent 35% (approx. 9 million) of all car sales by 2040 according to BNEF (Bloomberg New Energy Finance).

This note will explore what EVs are, the key items to consider before installing charge points and the various policy and incentives for you to make a start.

What are electric vehicles?

There's nothing new about using an electric motor to power a vehicle, but technological improvements have increased the distance that can be travelled on a single charge. The range of a typical EV is around 100 miles, though longer range models are now appearing on the market and more are expected soon. Considering the average UK driver only travels around 25 miles a day that should be more than enough to suit the needs of the average driver. In addition to EVs, there are also a growing range of plug-in hybrid electric vehicles (PHEVs), which can be powered both by electrical energy from chargepoints and by a traditional internal combustion engine.

Both EVs and PHEVs are categories of Ultra Low Emission Vehicle (ULEV), which are vehicles that produce less than 75g of CO₂ emissions per kilometre and are capable of a minimum 10 miles of zero-emission driving.

Estimated to be three times more efficient than the internal combustion engine, an EV propels itself using electrical energy stored in a rechargeable battery, which can be charged either at home or at a public charge point.

Current statistics

There are already nearly 40 plug-in car and van models for sale in the UK from a range of major vehicle manufacturers. The industry is expected to double in size over the next few years as EVs become more mainstream.

More plug-in cars were registered from January to September in 2016 year than in the whole of 2015. Approximately [85,000 plug-in cars and 5,000 plug in vans](#) are registered in the UK as of January 2017. Monthly figures published by the [Society of Motor Manufacturers and Traders \(SMMT\)](#) show [that electric car sales in the UK](#) have risen dramatically during the past two years.

According to OLEV and SMMT more than 80,000 claims have been made through the Plug-in Car and Van Grant schemes (as of January 2017).

More and more fleets are being updated to include electric vehicles to save costs and improve the company's environmental policy and image. Parking companies can do the same.

Current challenges

As with everything there are some challenges in getting more motorists to buy and use EVs.

Communication is a barrier with all new technology; as EVs are still relatively new there are some mixed reviews and misconceptions.

In general, the upfront cost of EVs is greater than their petrol or diesel equivalents and they are therefore not affordable for everyone. As with conventional vehicles, the price of EVs varies

significantly depending on the manufacturer, model and the specifications of the vehicle; costs can range anything from £12,500 to £123,500 for a new EV, although the average vehicle is £30-40k. However, since 2011 the [Plug-in Car](#) and [Plug-in Van](#) Grants have subsidised the purchase price of eligible new cars, currently up to a maximum of £4,500 for full battery electric vehicles; for vans, the amount is up to 20%, to a maximum of £8,000.

The running costs associated with EVs are substantially lower. There are additional financial incentives that significantly reduce the costs of running the vehicle: running costs of 2/3p mile; zero-rated car tax (Vehicle Excise Duty); zero-rated fuel tax (electricity also only attracts 5% VAT for private use); and lower rates for company car tax for lower emitting vehicles. For drivers in London, the Ultra Low Emission Discount Scheme (ULED) exempts EVs from paying the London Congestion Charge. Maintenance costs may also be lower for EVs than for internal combustion engine vehicles.

Ensuring that the EV charging infrastructure is sufficient to support the needs of EV users is also a challenge, given that convenient access to charging facilities is a necessity and that not all houses have the capacity to install EV chargers. To address this, OLEV have introduced grant schemes to support homeowners, local authorities and employers with the costs of installing EV charging equipment.

For some though it will be the unfamiliarity with the technology that delays the adoption of EVs, as EVs require a different mentality to recharging than exists for refuelling. The majority of charging takes place at home overnight, with EV drivers needing to find spaces with chargers during the day if necessary to top up the charge. Although trips to the refuelling station may no longer be necessary (there may rapid fuelling hubs in the future), motorists who drive more than 100 miles a day or drive for long periods of time without stopping may find it difficult to adjust. However, incentives are always appearing; some manufacturers will provide you with the ability to swap your car with a petrol one for one-off long journeys. Technology is rapidly improving too, so this may not be an issue in the future as available range increases and as charging time and battery costs decrease.

An important question that some organisations installing charge points ask is *how do we enforce those parking in the space set aside for EVs?* It is a challenge as this technology is currently new and there are various options to choose from. It will also depend on the area involved and the decision you take might change in due course as drivers find out you have installed charge points.

This technology is constantly changing and maturing. It is important to remember that although there are currently funding opportunities available for first installation in some cases, funding must be sought to maintain and replace the technology as it continues to mature.

Charge points

With the increasing demand for EVs comes increasing demand for charging infrastructure and an expectation from EV drivers to be able to charge everywhere they park for an hour or more. This includes their home, workplace and various destinations they visit regularly. While charging at the supermarket or gym can be beneficial, having access to charge points at (or near) home and at work is important.

Charging an electric car is nothing like filling up your petrol or diesel car. In a car with a combustion engine, we are used to driving around until near empty before taking a last-minute detour to the petrol station and spending 10 minutes waiting, filling and paying for our fuel. Charging an electric car is tied

up with the space you park in, it should be seamless and hassle-free. Electric car charging operates on a top up model, be that your home, workplace or regular destinations. Drivers might choose to top up multiple times throughout the day. This top-up model requires a shift in mind-set.

While we think of cars as mobile objects, in reality our cars spend around 95% of their time parked¹. EV drivers can utilise this parking time to charge their battery.

Why install charge points?

EV drivers might make decisions on where to shop, park and stay based on the availability of charging facilities because they need to be able to top up their vehicles. One of the main issue drivers currently face is limited publicly accessible charging infrastructure. Businesses with public charge points have a unique opportunity to **attract and retain this new market segment**.

Implementing EV charging at your business helps **promote your company as a leader in sustainability** and lets your customers choose a more sustainable method of transport. Providing EV charging at your organisation could earn you money and improve your brand reputation among employees and customers alike.

Electric car charging is something to shout about and share. The installation of EV charging is reported in the press, blogged, tweeted, shared and liked online all the time. Drivers are very supportive of locations that choose to install charge points and often show support on social media. This means that there are numerous and sustained opportunities to raise awareness about your brand or business, both online and offline. **The advocacy or coverage you gain can be invaluable for both brand perception and attracting new customers.**

EV charging **can be a revenue generating investment**, by charging drivers a usage fee. This revenue stream can be used to break-even on electricity costs associated with charging or recoup your investment in charge points.

Some sustainability ratings now even require EV charging as a condition of certification. For example, Green Tourism, the largest sustainable certification programme for businesses, counts EV charging as one of the factors considered when awarding **green certification** to an organisation.

Another benefit is the **ability to reward loyal customers and members** with free or discounted charging at your business. This can strengthen customer loyalty and increase dwell time.

Types of charge points

Charging points can be either wall or floor mounted and have variable charge rates. There are three main EV charger types: 'slow' charging units (up to 3kW) which are best suited for 6-8 hours overnight home charging, or charging at the workplace; 'fast' chargers (7-22kW) which can fully recharge in 1-3 hours depending on battery size and installed charger; and 'rapid' charging units (43-50kW) which are able to provide an 80% charge in around 30 minutes². Rapid chargers also come in two charge point types – AC and DC – depending on whether they use alternating current or direct current.

¹ Donald Shoup, May 2005 <http://shoup.bol.ucla.edu/PayAsYouPark.htm>

² Charging time based on a battery capacity of 24 kW e.g. a Nissan Leaf.

There are a number of different chargepoints available on the market that can connect to electric vehicles in different ways. It will be important that any chargepoint you install is capable of charging all EVs available on the market. The most common slow and fast charge point is currently the type2 7kw range. PodPoint, a leading chargepoint network operator (CNO), lists which car requires which charge point on their [website](#). Further information on the current options for EV charging can be found in the UK Electric Vehicle Supply Equipment Association's [procurement guidance](#) for chargepoints.³

To maximise the amount of vehicles that can use your charge points you may want to install a universal socketed unit (with more than one type of socket available). This requires the vehicle to plug into your charge point with their lead rather than you providing the lead to plug into theirs. This is not available for rapid chargers.

The number of charging points has steadily increased, with companies and local authorities carefully calculating investment. There are over 4,000 charging locations, 6,500 charging devices and 11,000 connectors by January 2017⁴.

The online [charging point map](#) Zap Map identifies the publically available charge points across the UK.

The number of charge points to install

The number of charge points to install, will vary depending on what the user requirements are and how fast the industry develops. At this time longer term car parks (two hours plus) should probably be aiming to provide low power charge points. Parking with a shorter turnaround - for example, supermarkets – could consider higher power chargepoints. The [London Plan](#) sets out that at least 20% of parking spaces in new developments in London must have electric car charging facilities.⁵

Things to look out for in procurement

There are varying methods for accessing chargepoints, whether that is by smart phone app, SMS text, card payment, smartcard or similar and in most cases require a subscription or membership.. Hosts should consider the needs of consumers in accessing chargepoints, to ensure it is simple and easily accessible for users. The [Alternative Fuels Infrastructure Directive](#), is due to shortly enter into force, and requires that chargepoints must provide for an “ad hoc access” or “Pay As You Go” option, so anyone can turn up and use the chargepoint, which may be in addition to any other methods of access (e.g. membership) so that the chargepoints can be used by all electric vehicle users.

When looking at procuring charge points for your car park make sure you have the latest models. Outdated chargepoints use tags and physical keys (like RFID cards) to allow your customers to access a point.

All chargepoint models should have charging cables that lock in place when motorists start to charge, and can only be unlocked by the motorist once they finish using the charge point.

³ <http://ukevse.org.uk/resources/procurement-guidance/>

⁴ <https://www.zap-map.com/>

⁵ <https://www.london.gov.uk/what-we-do/planning/london-plan/current-london-plan/london-plan-chapter-six-londons-transport/pol-27>

Charge points that are networked can be centrally managed, tracked and scaled, this can help you save time and work. Networked solutions record usage data and manage access and fees remotely using backend management software.

Some CNOs offer a dedicated support function for their charge points, which is very useful when it comes to managing them and keeping up with the maintenance, ensuring they are safe for customers to use at all times.

Leasing charge points

You don't necessarily need to buy charge points, as some CNOs provide the opportunity to lease charge points. It is worth mentioning that a number of CNOs are actively looking for sites to host chargers. Some will provide chargepoints for dedicated user groups, whereas others will support any EV.

There are a variety of different combinations available in which the CNO providing the chargepoints split the cost and revenue with the client, designing the solution to meet the specific needs for each client.

If the site owner/agent pays the capital cost and all operational costs, therefore as they own the chargepoint they can then choose who to allow access for and at what rate. Then the provider of the points can collect the revenue for the client.

Other options exist where the provider of the chargepoints pays for the asset, installation and operation and then sets the rate and collects the revenue.

Smart charging & Vehicle to grid

V2G is commonly understood to mean using vehicle battery storage to put energy back into the grid. Other variants of this include vehicle to home (V2H) or business (V2B). Managing the demand from charging (one-way power flow), is commonly known as smart charging.

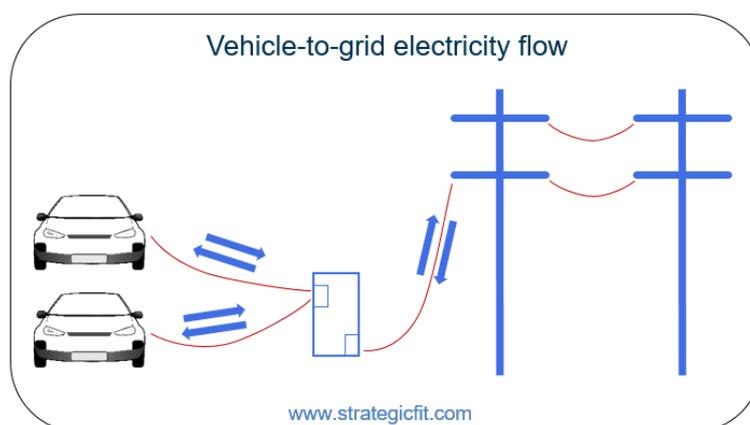
As the number of EVs increases, the demands on the electricity grid will also increase. The need for instantly available high levels of power puts demands on the grid at the local and national levels. At the local level, operators planning to install batches of EV charging points (e.g. multiple rapid chargers) may be required to contribute towards (only pay for the % of the upgrades they will utilise from the installations) local grid upgrades to cater for the increased power demands. At the national level, many thousands of EVs plugging in at similar times of day (arriving at work, arriving home after work) could increase the morning and evening peak.

Smart charging offers a way to alleviate both these challenges and an opportunity for the charging operator to earn a fee for the service. It works by varying the rate or delaying the time when the vehicle is charged and can also send power back to the grid. Vehicle to Grid (V2G) goes further, and with a bi-directional charger and V2G enabled EV, dispatches electricity back to the grid. There are broadly three ways smart charging and V2G can help manage demand on the electricity grid:

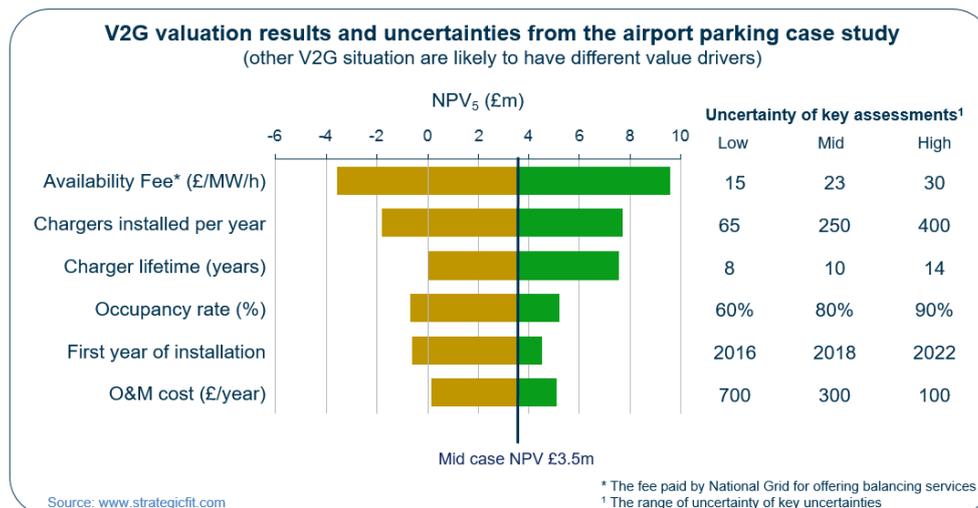
- I. **Smart charging:** A system where the time at which the vehicle is charged is controlled to avoid overloading the local grid connection and avoid spikes in demand nationally. This is not strictly V2G as power is not sent back to the grid. It has two advantages:
 - 1) it allows car owners to charge at times when electricity is cheaper;
 - 2) adjusting the time of charging to avoid local constraints. This might alleviate the need and cost of local grid upgrades.

2. **Peak-shaving:** charging EVs when electricity prices are low and selling power back to the grid at peak times, in order to move charging away from peak hours. This has the advantage of allowing car owners to charge at times when electricity is cheaper, and the added benefit of earning the charging operator and vehicle owner revenue from the difference in price.
3. **Grid balancing services:** The System Operator National Grid ensures the whole electricity system remains in balance and uses a number of markets for services to help achieve this. One of these markets is in maintaining the frequency of electricity of the grid which can be influenced by the level of demand (for example kettles being turned on at half time during a football match). To maintain a reliable, continuous, service, the National Grid has a regulatory obligation to keep this frequency in a narrow band around 50Hz. Varying the levels of supply and demand to keep close to 50Hz is grid balancing. The National Grid operates markets that reward people for having flexible capacity available, which can be turned on (or off in the case of demand side response) at short notice to help to balance the grid. Traditionally these services have been offered by combustion engine generators or hydro-electric power, but static (battery) storage is beginning to be used. A fleet or network of EVs connected to bi-directional chargers could also provide this service. National Grid is keen to encourage more sources of grid balancing services, particularly as intermittent renewable generation increases.

V2G is an early stage, emerging, technology. There are yet to be any commercial scale applications. But it is developing quickly and attracting much interest with leading automotive manufacturers and universities undertaking trials. Examples include Nissan (in the UK), BMW, Renault, Mini, Mitsubishi and Toyota. Even though V2G is in its early stages, it may be worth factoring in to decisions, as a choice to install one-directional chargers now could mean replacing them if bidirectional chargers become the norm in the near future.



StrategicFit, a strategy consultancy focussed on the energy sector, have reviewed and produced a case study on the V2G business model for a large car park at an airport. The full case study can be found on their [website](http://www.strategicfit.com). The firm modelled the economics of installing 1,080 V2G chargers over 5 years and operating them for 10 years. Offering balancing services (dynamic firm frequency response) at the current National Grid market rates could generate £1,400 to £2,200 in revenue, from V2G enabled parking spaces, per year from a 15kW bidirectional charger. It is not yet clear whether smart charging nor peak-shaving currently offers sufficient revenue to justify the additional investment of V2G chargers in all cases. In the case study capital investment of £9.5m delivered a total nominal cashflow net of all operating costs of £16.8m. The economics over the operating life of the chargers produces a Net Present Value (over five years) (NPV₅) of £3.5m. Deploying V2G in other situations is likely to have different valuations and value drivers.



Given the early stage of V2G there are many uncertainties that could both positively and negatively affect the value. Each individual opportunity needs carefully evaluating to understand the risks and potential value. The figure below highlights the main sources of uncertainty.

The table below sets out the pros and cons qualitatively.

Pros / Opportunities	Cons / Threats
<ul style="list-style-type: none"> • V2G can generate revenue. The economics are attractive, especially as an incremental investment to standard chargers • Leading EV manufacturers are promoting V2G • The government want to encourage schemes, and have highlighted V2G as an area for innovation⁶ • National Grid is looking for battery storage to play a bigger role in balancing services • Growth in renewables increases National Grid's need for balancing services • Opens up potential for EVs to link with solar, static storage and/or replace need for auxiliary power 	<ul style="list-style-type: none"> • There is not yet a commercial scale deployment • Auto-makers need to agree standards • Bidirectional charges are not yet certified to be connected to the public grid • Connections to the grid can be expensive and/or slow to install • There are still a number of key uncertainties, incl. degradation of batteries, attitude of vehicle owners and price of balancing services • V2G may not be suitable in all situations (e.g., car parks with short parking times)

There are currently several studies into smart charging and V2G:

- www.electricnation.org.uk - a 2 year study looking to recruit 500-700 EV owners and monitor how they use smart charging.
- www.sheffield.ac.uk/news/nr/batteriestrainselectricvehicles-1.569224 - an ongoing study at Sheffield University to understand the potential for EVs in station car parks to use V2G to smooth the demand for electricity by the train network.
- <http://www.cenex.co.uk/vehicle-to-grid/> - Cenex has developed a bespoke V2G evaluation tool eva^e which analyses vehicle use and battery impacts providing an economic analysis of V2G based on a variety of grid services.

⁶https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/576367/Smart_Flexibility_Energy_-_Call_for_Evidence1.pdf

Integration with solar

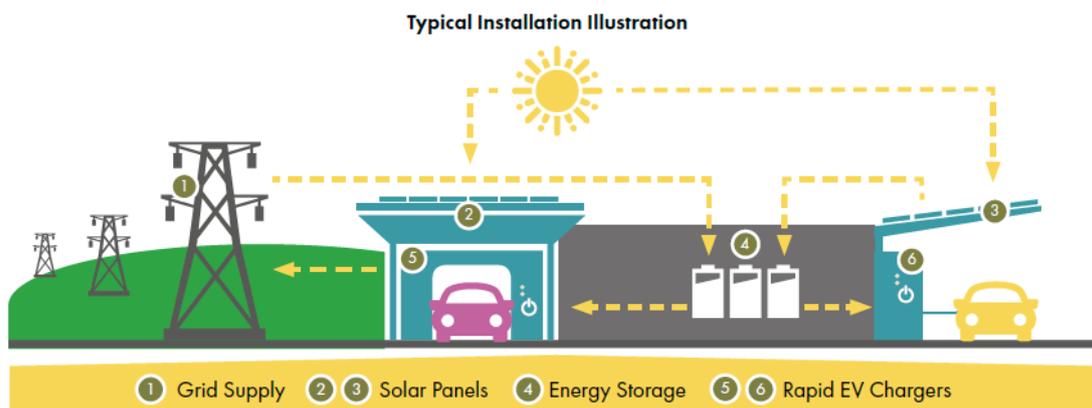
Some companies are exploring the integrating of EV charge points with solar panels/car ports. This integrated approach allows energy to be stored on site and shared from the solar technology with the vehicle.

Introducing local storage can greatly reduce any demand spikes by utilising stored energy to deal with the sudden ramp up of power.

This is a similar model as vehicle-to-grid; when there is more than enough solar energy to charge the cars plugged in then the energy will be provided back to the National Grid for a fee. This is new technology and as such there are few examples. Powerstar, an energy storage and voltage optimisation company have a case study based on a car park on the Isle of Wight.

More information on this is available on their [website](#).

PROJECT IMPLEMENTATION



Current Project Highlights

Isle of Wight Project

An EU grant has been awarded towards the development of 15 Virtue EV systems for use on the Isle of Wight 'InterGRIDy' project

InterGRIDy brings together the latest cutting-edge technologies, solutions and mechanisms in order to connect the Isle of Wight's energy distribution network.

The project will facilitate the dynamic standalone operation of the islands Distribution Grid (DG).

The Virtue EV charging units will provide an uninterrupted power supply (UPS) to users, alongside issuing a fast EV charge to connected cars.

As Virtue EV systems are always connected the energy network, the solution also offers potential income through Dynamic Firm Frequency Response or Enhanced Frequency Response, both of which help manage grid energy supply.

WWW.POWERSTAR.COM/VIRTUE-EV



Installation

Chargepoints should be installed in line with the Institute of Engineering and Technology⁷ [Code of Practice for Electric Vehicle Charging Equipment Installation](#). Installation of charging points should include a fixing detail to ensure the point is adequately fixed to the structure to prevent it from falling or moving.

⁷ <http://www.theiet.org/>

When looking into the installation of the charging points, the structure of the car park should be considered. The life-care plan for the car park is a good place to start in your research as it should be furnished with drawings and details associated with the structure.

The contractor installing the charging points should establish the type of structure they are proposing to fix into as the type of structure will determine the type of fixing that should be adopted. For example if it is a mass concrete ground bearing slab, then a suitable fixing may be a resin anchored bolt, whereas if the structure is a pre-cast plank, then through bolts with a plate on the underside may be better suited.

If the charging point is being installed to a vertical face, such as a wall or column, then an understanding of the quality and form of the structure is again important. If it is a steel column then a form of bracket will most likely need to be fabricated or used, and if masonry the quality of the brickwork should be assessed.

In any case a scan (Ferro scan or similar) for critical reinforcement steel should be carried out (to ensure that this is not struck by the fixing) and a services search (i.e. for electrical cabling) should also be carried out to ensure the works can be carried out safely.

The structural load that the charge point will impose should also be considered but based on most commonly used charge points, it is not likely that the additional load will cause an issue.

It is possible to have some charge point cabling installed underground, dormant, and ready for when you assess the use of the current points and decide further charge points are needed in your car park.

We would recommend that a suitably experienced Structural Engineer should be consulted prior to deciding how to proceed.

It is also of the upmost to comply with all relevant health and safety guidelines and legislation including the CDM Regulations. It will be necessary to record the location of the installation (and any associated cables etc.) to mitigate the risk of these being damaged or creating a health and safety risk in the future.

Charging and Enforcement

There are different options for consideration in terms of charging for parking models:

- Free parking but require payment to charge the vehicle
- Free charging but pay to park
- Free to park and charge the vehicle for an allotted time then require payment once time has elapsed
- Free parking and charging

Bay markings and signage must always be clear.

There are varying methods for accessing chargepoints, whether that is by smart phone app, SMS text, card payment, smartcard or similar and in most cases require a subscription or membership.. Hosts should consider the needs of consumers in accessing chargepoints, to ensure it is simple and easily accessible for users. The [Alternative Fuels Infrastructure Directive](#), is due to shortly enter into force, and requires that chargepoints must provide for an “ad hoc access” or “Pay As You Go” option, so anyone can turn up and use the chargepoint, which may be in addition to any other methods of access (e.g. membership) so that the chargepoints can be used by all electric vehicle users.

In the UK the Ecotricity 'Electric Highway' scheme that has provided all the rapid charging stations at motorways operate a pay-as-you-go network.

If you choose to provide free parking, you should create a policy and clear information on signage regarding enforcement for when an EV parks within the bay but chooses not to charge.

Policy

There are many drivers for increased UK policy and legislation on EVs, not least the Government's goal to ensure nearly every car and van in the UK is a zero emission vehicle by 2050, with the aim to reduce carbon emissions, improve air quality and support the UK economy.

Other drivers for UK policy are:

- Health and environmental impacts
- Trade and economic benefits
- Carbon emission reduction
- European Union limits on NO_x and PM₁₀
- Air Quality

The Government's plan for tackling the UK's air pollution crisis was judged illegally poor at the High Court in November 2016, marking the second time in 18 months that ministers have lost in court on the issue.

Legal NGO [ClientEarth](#), which brought the case, argued that current plans ignore many measures that could help achieve this, placing too much weight on costs. The defeat means that by law ministers must cut the illegal levels of nitrogen dioxide suffered by dozens of towns and cities in the "shortest possible time".

To read the judgement please see The Courts and Tribunals Judiciary [website](#).

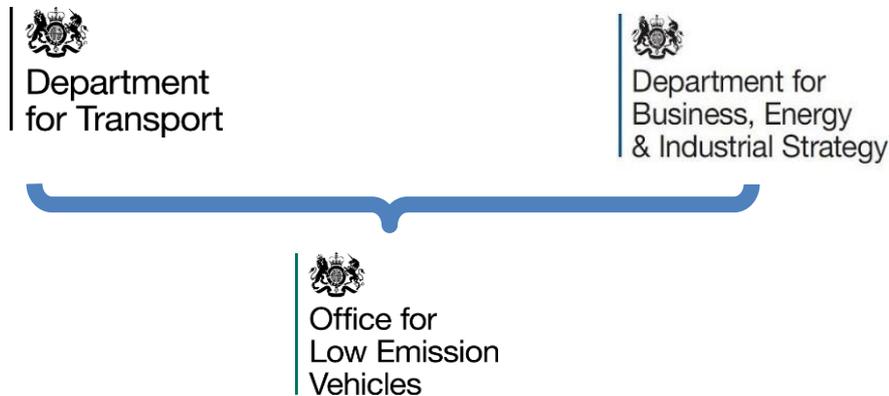
- Increasing fuel prices
- Dependence on volatile external markets
- UK automotive sector worth £15.5bn
- Very high productivity
- 135,000 employees, 140,000 in the supply chain.

There is also currently a Highways England infrastructure programme, spending £15m to ensure that an EV motorist will never be more than 20 miles from a charging point on 95% of the Strategic Road Network.

- UK has largest rapid network in Europe. 96% of MSAs have 1– 6 rapids
- Over 11,000 publicly available charge points (including over 900 rapids; the remainder are 3kw and 7–22kw)
- More than 70,000 residential charge points installed

Office for Low Emission Vehicles and UK Policy

The Office for Low Emission Vehicles (OLEV) is part of the Department for Transport and the Department for Business, Energy & Industrial Strategy. OLEV is a team working across government to support the early market for ultra-low emission vehicles (ULEV). They are providing over £600 million from 2015 to 2020 in funding to position the UK at the global forefront of ULEV development, manufacture and use. An additional £270m was announced at the 2016 Autumn Statement. This will contribute to economic growth and will help reduce greenhouse gas emissions and air pollution on UK roads.



It is also worth noting that there are some deadlines coming into force in the future:

- The [Ultra Low Emission Zone](#) (ULEZ) will come into force in London in September 2020, if not earlier.

All cars, motorcycles, vans, minibuses, buses, coaches and heavy goods vehicles (HGVs) will need to meet exhaust emission standards, or pay a daily charge, when travelling in central London.

The ULEZ standards are in addition to any Congestion Charge or Low Emission Zone (LEZ) charges already applied. The area covered by the ULEZ is the same as the current Congestion Charge Zone (CCZ). It will operate 24 hours a day, every day of the year, including weekends and public holidays. Electric Vehicles will be exempt from this additional charge.

- The UK Government have also announced draft regulations that require five cities (Leeds, Nottingham, Southampton, Birmingham and Derby) to implement their own [Clean Air Zones from 2020](#)

Within these Clean Air Zones (CAZs) buses, heavy goods vehicles (HGVs), taxis and light commercial vehicles (LCVs) will all have to pay a daily charge unless they are ULEV. This initial plan for five cities was deemed insufficient by the High Court and so the government are expected to significantly increase the number of towns and cities required to implement CAZs. Some local authorities are looking to voluntarily adopt CAZs.

European Policy

In November 2016 the [European Commission published a number of draft proposals](#). Presented on 30th November 2016, it aims to keep the European Union competitive as the clean energy transition is changing global energy markets. Specifically it outlines that all non-residential buildings with more than ten parking spaces, should ensure that at least one of every ten spaces is equipped with a recharging point and this must be achieved by January 2025.

The relevant text is:

Article 8 is amended as follows:

(a) in paragraph 1, the third subparagraph is deleted;

(b) paragraph 2 is replaced by the following:

'2. Member States shall ensure that in all new non-residential buildings and in all existing non-residential buildings undergoing major renovation with more than ten parking spaces, at least one of every ten is equipped with a recharging point within the meaning of Directive 2014/94/EU on the deployment of alternative fuels infrastructure 10, which is capable of starting and stopping charging in reaction to price signals. This requirement shall apply to all non-residential buildings, with more than ten parking spaces, as of 1 January 2025. Member States may decide not to set or apply the requirements referred to in the previous subparagraph to buildings owned and occupied by small and medium-sized enterprises as defined in Title I of the Annex to Commission Recommendation 2003/361/EC of 6 May 2003. 3. Member States shall ensure that newly built residential buildings and those undergoing major renovations, with more than ten parking spaces, include the pre-cabling to enable the installation of recharging points for electric vehicles for every parking space. 4. Member States may decide not to set or apply the requirements referred to in paragraphs 2 and 3 to public buildings which are already covered by Directive 2014/94/EU.'

The description of the proposed change:

Article 8 is updated to take into account the revised definition of technical building systems.

A new paragraph introduces requirements as regards:

(a) *Infrastructure for electro-mobility; new non-residential buildings with more than ten parking spaces, and non-residential buildings with more than ten parking spaces undergoing major renovation will have to equip one parking space per ten for electro-mobility. This will apply to all non-residential with more than ten parking spaces buildings as of 2025; including buildings where the installation of recharging points are sought under public procurement. New residential buildings with over ten parking spaces, and those undergoing major renovation, will have to put in place the pre-cabling for electric recharging. Member States will be able to choose to exempt buildings owned and occupied by SMEs, as well as public buildings covered by the Alternative Fuels Infrastructure Directive 7;*

(b) *reinforcing the use of building electronic monitoring, automation and control in order to streamline inspections; and*

(c) *the introduction of a 'smartness indicator' rating the readiness of the building to adapt its operation to the needs of the occupant and of the grid, and to improve its performance.*

Alternative Fuels Infrastructure Directive

The UK is required to transpose [Directive 2014/94/EU](#) on the deployment of alternative fuels infrastructure. This Directive introduces a number of requirements relating to publicly accessible recharging points including;

- mandating specific connector types which must at least be available
- ensuring provision of ad hoc access to publicly accessible charging points
- the provision of intelligent metering systems
- ensuring availability of data on geographic location of chargepoints, and where available detail on real-time accessibility, as well as historical and real-time charging information

Compliance with this requirements is mandated by Statutory Instrument with a compliance deadline of 17 November 2017.

Funding opportunities available

With the Government's push on ULEVs and work to improve air quality there are many funding opportunities, competitions and initiatives available that can greatly assist when you install charge points or buy EVs.

In October 2016 the Government announced new investment of £10 million in charging infrastructure. £7.5m will be invested in workplace charging, and £2.5m will go towards on-street residential charge points.

This investment is set to enhance motorists' confidence in being able to charge their electric car when out and about, and comes as monthly registrations figures reveal the ever-increasing popularity of EVs.

A further £80m of funding for charging infrastructure was announced at the 2016 Autumn Statement.

For local authorities installing charge points

The Government (as of January 2017) has committed almost £1bn to support Ultra Low Emission Vehicles (ULEVs) over the 2015-2020 period. Of this funding, £32m has been committed for infrastructure. This is broken down into the following schemes:

- The Electric Vehicle Homecharge Scheme
- The Workplace Charging Scheme
- The On-street Residential Charging Scheme.

Please see OLEV's [website](#) for further details on these grants⁸.

Highways England have committed £15m to install rapid chargepoints on the Strategic Road Network.

The following grants are available for local authorities:

- The On-street Residential Charging Scheme.

⁸ <https://www.gov.uk/government/collections/government-grants-for-low-emission-vehicles>

To access these grants a local authority must apply for funding for residential on-street charging for plug-in vehicles.

European Regional Development Funding

Certain UK Local Authorities have applied for and received European Regional Development Funding (ERDF) to install EV charging points. The availability of this funding is very dependent upon the Local Authority's bid. Corby Borough Council is a good example. Please note that the ERDF application is not a quick process.

For companies installing charge points

First year allowance:

Announced in the Autumn Statement in 2016. The measure provides a 100% first-year allowance for expenditure incurred on electric charge-point equipment. The allowance will have effect for expenditure incurred on or after 23 November 2016 and will expire on 31 March 2019 for Corporation Tax purposes and 5 April 2019 for Income Tax purposes.

Legislation will be introduced in Finance Bill 2017 to provide this new first year allowance for just over 2 years and 4 months⁹. The legislation will be backdated to 23 November 2016. HM Revenue & Customs (HMRC) will publish guidance after Royal Assent about the operation of the relief

Further details and contact details for any questions are available on the [gov.uk website](http://gov.uk).

Workplace charging scheme:

The Workplace Charging Scheme is a voucher-based scheme that provides support towards the up-front costs of the purchase and installation of electric vehicle charge points for employee and fleet use

The contribution is limited to £300 for each socket up to a maximum of 20 across all sites for each application.

The voucher will be valid for four months (120 days) from the date of issue, (expiry date printed on the voucher). Once the charge point(s) have been installed, the authorised installer will claim the grant from OLEV on the applicant's behalf by submitting a PDF claim form via OLEV's portal.

Please note you must use [authorised OLEV installers](#) to be applicable for the grant.

For the guidance please visit the [Gov.UK website](#).

For the Grant claim form please visit the [Gov.UK website](#).

For motorists looking to buy an electric vehicle

Car grant:

⁹ <https://www.gov.uk/government/publications/capital-allowances-first-year-allowance-for-electric-charge-points/capital-allowances-first-year-allowance-for-electric-charge-points>

If you are looking to buy EVs either for yourself or to replace your company cars/fleets then the Government's [Plug-in Car Grant](#) is currently available to you.

Started in 2011, the EV grant (also known as the plug-in car grant), helps car buyers with the cost of buying a new electric car.

EVs are now split into three categories based on their CO₂ emissions and their zero emission range. The higher the zero emission range and lower the CO₂, the more afforded by the grant. Cars that have a shorter zero emission range will receive less.

It slightly changed on 1st March 2016 to update the categories and extend the grant until at least March 2018.

The new categories:

- **Category 1:** Cars with a zero emission range of over 70 miles will receive a grant of £4,500 (covering pure electric cars such as the BMW i3 and Nissan LEAF)
- **Category 2:** Cars that have CO₂ emissions of less than 50g/km and a zero emission range of between 10 and 69 miles (typically hybrids such as the Audi A3 e-tron and Toyota Prius Plug-in) will receive £2,500.
- **Category 3:** Cars with CO₂ emissions of 50 to 75g/km and a zero emission range of at least 20 miles will also receive £2,500.

Cars priced over £60,000 that fall into Categories 2 or 3 will no longer be eligible for the grant.

To find out more, including a list of eligible vehicles and FAQs, please visit [the announcement page on gov.uk](#). If purchasing a car please speak to your local dealer to check availability of the grant before you make your purchase.

The amount of your grant should be automatically deducted from the price of your car when you buy it. The dealership will complete the paperwork, so there are no application forms for you to fill in, but you may be asked to complete a short questionnaire.

Van grant:

The plug-in van grant offers 20% of the cost of electric vans and trucks, up to a maximum of £8,000. Electric trucks above 3.5tonnes are currently eligible for grants of up to £20,000.

The scheme will be reviewed once 5,000 grants have been processed, or in March 2018, whichever is earlier.

To find out more, including a list of eligible vehicles and FAQs, please visit [the announcement page on gov.uk](#). If purchasing a van please speak to your local dealer to check availability of the grant before you make your purchase.

The amount of your grant should be automatically deducted from the price of your van when you buy it. The dealership will complete the paperwork, so there are no application forms for you to fill in, but you may be asked to complete a short questionnaire.

Home charging point grant:

The Office for Low Emission Vehicles is currently part-funding electric vehicle charging points for domestic installation.

To help private plug-in vehicle owners offset some of the upfront cost of the purchase and installation of a dedicated domestic recharging unit, the Government is running the Electric Vehicle Homecharge Scheme. Customers who are the registered keeper, lessee or have primary use of an eligible electric vehicle may receive up to 75% (capped at £500, inc. VAT) off the total capital costs of the charge point and associated installation costs

Customers must provide evidence of keepership, lease, be named as the primary user of an eligible electric vehicle or have a vehicle on order in order to be able to qualify for the grant.

The date of installation must not be more than 4 months ahead of the date of delivery or start date of vehicle use.

Individuals who are assigned an eligible company vehicle must not take ownership of their vehicle more than four months prior to the date of installation, from 1 April 2015 onwards

Please note you must use [authorised OLEV charge point models](#) to be applicable for the grant.

For the guidance please visit the [Gov.UK website](#).

For a full list of eligible vehicles please visit the [Gov.UK website](#).

Case studies

There are many opportunities to learn from others, this is not an extensive list.

Go Ultra Low Cities Scheme case studies

The Go Ultra Low Cities scheme is part of a wider £600 million investment from the Government to encourage electric vehicle uptake in the UK.

OLEV announced the availability of £40m for eight cities to cause a step change in ULEV car uptake in their locality. Other criteria for the bids included improvements in air quality, innovation, and linking with other OLEV schemes.

Further details of this scheme can be found on the OLEV website [here](#).

Some of the winners include:

- Milton Keynes: From July 2016 EV drivers in Milton Keynes now have the privilege of parking for free in 15,000 parking spaces across the city with a new “Green Parking Permit. Including drop off bays at railway stations and short stay shopping bays.

Future plans in Milton Keynes include:

- Charging Hubs, where electric vehicles can be fully recharged in around 30min
- Charging posts close to residential areas
- An EV experience centre where potential owners can try before they buy
- Priority for EVs in bus lanes

- Destination charging at popular locations including supermarkets, hotels and leisure facilities
- Dundee City Council: funding will enable the city to expand its network of charging hubs, while also opening up large parts of the wider region to plug-in car owners and improving the city's air quality.
- Oxford: the largest pilot of its kind in the UK will begin when electric vehicle (EVs) charge points of differing kinds will be installed in pavements and lampposts. .

Further Information

For information on electric company cars and fleet vehicles visit the [Go Ultra Low website](#).

Go Ultra Low's blog [Busting the myths around electric cars](#)

To book an electric car test drive visit the [Go Ultra Low website](#).

With thanks to POD Point, StrategicFit, Powerstar and Electric Blue for their contributions to this information.

As a membership services association the BPA is keen to ensure that members follow best practice and comply with the law; in support of this we share knowledge and provide a range of meetings and information services for members. In doing so we use our best endeavours to keep members informed of the law.

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BRITISH PARKING ASSOCIATION

British Parking Association
Stuart House
41-43 Perrymount Road
Haywards Heath
West Sussex
RH16 3BN

www.britishparking.co.uk

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