

A Review of Electric Vehicles, EV Infrastructure and Future Policy Development for the Borough



A review by the Public Safety and Transport Select Committee

Councillors on the Committee: Councillors Keith Burrows (Chairman), Teji Barnes (Vice Chairman), Jan Sweeting (Opposition Lead), Kuldeep Lakhmana, Richard Lewis, Colleen Sullivan and Steve Tuckwell

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HILLINGDON
LONDON

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Chairman's Foreword

On behalf of the Public Safety and Transport Select Committee, I am pleased to present this report to Cabinet. Having identified a need to ensure Hillingdon were prepared for the fast-moving requirement for Electric Vehicle Charging Points as the number of Electric Vehicles increases within our Borough the Select Committee elected to conduct a comprehensive review of Electric Vehicle Infrastructure and future policy direction for the Borough.

Three witness sessions were held during which Committee Members had the opportunity to meet with a wide range of Senior Council Officers, Cllr John Riley, the Cabinet Member for Public Safety and Transport, external experts within the Electric Vehicle Charging Point market as well as a Hillingdon Resident, all of whom gave good evidence on which the Committee has based its findings and recommendations.



The recommendations are split between Short, Medium and Long term. It is anticipated that the Short-term recommendations will be the foundations for moving forward with Hillingdon's Electric Vehicle Infrastructure and that the shaping of the Policies to support this will come through the Medium and Long-term recommendations.

Finally, I would like to take this opportunity to thank those witnesses and officers who gave up their time to assist the Committee and commend officers for their continued hard work in striving to ensure Hillingdon is moving towards an Electric Vehicle infrastructure fit for our residents and future generations to come.

Councillor Keith Burrows

Chairman of the Public Safety and Transport Select Committee

Ward Councillor for Uxbridge South

Summary of recommendations to Cabinet

That Cabinet welcomes the Committee's report and recommendations which seek to both support and provide further strategic direction on the Council's aims to assist in the Borough's transition from Internal Combustion Engine (ICE) Vehicles to Electric Vehicles (EV). Furthermore, that Cabinet welcomes the Committee's support for its recent decision to implement a robust and scalable EV charging infrastructure in the Borough, commencing initially in Council owned car parks.

Short-Term

1

That Cabinet seek to increase the transparency of information available on the Council's website relating to EV charging infrastructure projects and installations to residents.

2

That Cabinet seek to improve levels of engagement with residents through a mechanism to express their interest in local EV charging provision.

3

That Cabinet note the objectives of the Council's Strategic Climate Action Plan, with reference to sustainable transportation and the development of an EV charging action plan that will commit to increasing the availability of EV charge points across the Borough.

4

That a report be prepared for the relevant Select Committee on an annual basis regarding the implementation of the new EV charge point contract, usage and monitoring data from those newly installed charge points where possible, and the development of EV Infrastructure across the Borough as it progresses.

Medium-Term

5

That Cabinet consider the merits of a more proactive enforcement effort to ensure developers make available suitable EV charging provision in their developments to fulfil their planning obligations.

6

That Cabinet explore the viability of a policy to ensure equitable use of on-street residential charge points and incorporate EV considerations into the design of future Parking Management Schemes, in advance of any future decision on the feasibility of introducing on-street EV charging points.

7

In support of the Council's Strategic Climate Action Plan, that Cabinet endorses plans to replace all diesel-powered vehicles 3.5T and smaller within the Council's fleet with EVs before 2030.

Longer-Term

8

That Cabinet concurs with the Committee's findings that, whilst the Council is not wholly responsible at this time for directly providing EV infrastructure or the necessary utilities that support it, with such a societal paradigm shift, the Council should play a leading 'enabling' role to ensure that the Borough is working cooperatively with partners and is well prepared for the growing EV demand and the resultant technological, infrastructure and behavioural changes arising.

9

That Cabinet considers the Select Committee's long-term horizon findings from its review and the variables it has identified in how current and emerging EV technology and infrastructure may develop and change over time. This is so the Council can be both adaptive and responsive to future requirements and its residents - these have been set out in Annex A to these recommendations.

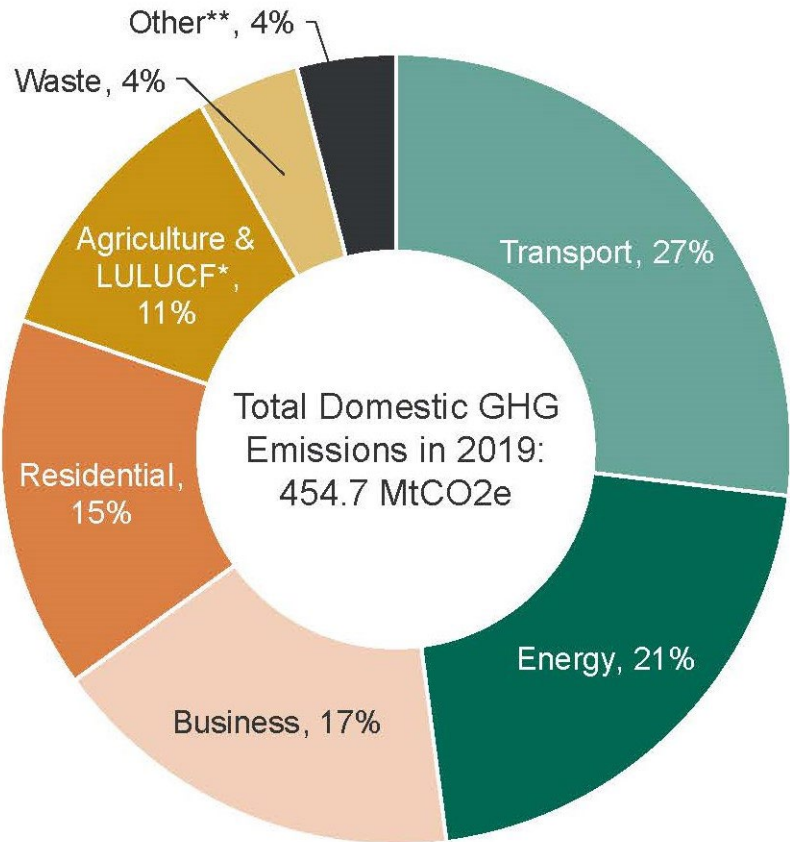
Background to the review

The Electric Vehicle Revolution

The number of newly registered, fully electric EVs in the UK between 2006 and 2010 was just 1,096; this has risen to 190,727 in 2021 alone. EVs have rapidly become commonplace on UK roads although the concept of EVs is far from modern. Early forms of electric cars were developed in the first half of the 19th century, however, with the advent of cheap assembly line ICE cars by the Ford Motor Company in the early 20th century, the popularity of EVs declined significantly until, driven by climate change and recent government mandates to manoeuvre away from fossil fuel-based transportation, interest in providing low and zero emission vehicles has flourished.

The Transition from ICE to EVs

As of 2019, transport was the largest-emitting sector of greenhouse gas emissions, accounting for 27% of UK emissions. Of this, the majority (91%) came from road transport vehicles. The biggest contributors to this were cars and taxis, which made up 61% of the emissions from road transport, followed by Heavy Goods Vehicles (18% of road transport emissions) and vans (17%).



UK greenhouse gas emissions by sector in 2019 (Department for Business, Energy & Industrial Strategy, 2020)

The UK has a target to reduce these emissions to net zero by 2050, to achieve this the Committee on Climate Change has recommended that the sales of electric vehicles (EVs) should scale up to 100% of new sales by 2035. By way of highlighting the rapidly increasing demand for EVs, in 2021, they accounted for around 11% of all new cars sold in the UK; in 2019, this figure was just 0.8%. Petrol powered vehicles were the most popular fuel type in 2021 with a 46.3% market share and diesel vehicles took an 8.2% share. Ultra-Low Emission Vehicles (ULEV) such as plug-in-hybrid, battery electric, range-extended electric or fuel cell electric vehicles still represent a relatively small proportion of the total number of cars licensed, however, the demand for ULEVs, and particularly fully electric EVs, is growing exponentially.

Public awareness of, and interest in, EVs and methods of charging them has also been mounting rapidly, and throughout the 2020s, public expectations and demand will continue to grow ahead of the introduction of legislation to outlaw the sale of pure Internal Combustion Engine (ICE) vehicles by 2030.

The 2030 Deadline

The Automated and Electric Vehicles Act 2018 has two primary objectives. Firstly, the Act establishes that insurers are required to deal with all claims even when the vehicle is operating in automated technology mode. Insurers will also have a right of recovery against manufacturers and the right to exclude liability where the relevant individual fails to keep the software up to date. Secondly, and more pertinent to the Committee's review, the act establishes laws relating to EV charging infrastructure including issues such as availability, compatibility vehicle types, reliability standards and standardising how they are paid for.

In November 2020, the Government brought forward the ban on sales of new petrol and diesel cars and vans from 2040 to 2030 as part of its "green industrial revolution". A two phased approach to the process was also announced.

- Step 1 - the phase-out date for the sale of new petrol and diesel cars and vans brought forward to 2030.
- Step 2 - all new cars and vans be fully zero emission at the tailpipe from 2035.

Between 2030 and 2035, new cars and vans can be sold if they have the capability to drive a significant distance with zero emissions (for example, plug-in hybrids or full hybrids).

The transition to EVs will play a pivotal role in reducing emissions and as the 2030 ban on the sale of new petrol and diesel cars and vans approaches, demand for EVs and the expectations of EV infrastructure will continue to grow. There is pressure on the Government and local authorities, in addition to car manufacturers, infrastructure providers and charging companies, to facilitate the transition from ICE vehicles to EVs where possible.

Charging Infrastructure

Accessibility and convenience to vehicle charging and refuelling is frequently raised by prospective consumers as a key concern in choosing to purchase and use an EV. The number of publicly available EV Charge Points (EVCP) per 100km of road in the United Kingdom has increased from 42 in 2011 to 570 in 2019; in January 2022 alone, ZapMap (the UK's most comprehensive EVCP database) reported a further 645 new public EVCPs. Whilst most charging is expected to take place at home, the Committee for Climate Change have suggested 1,170 EVCPs will be required per 100 km of road by 2030. This is to be supported by £1.3 billion funding, partly covering the strategic road network but also importantly reserved for local authorities (for on-street charging).

Most charging is expected to take place domestically, The Electric Vehicle Homecharge Scheme provides grant funding of up to 75% towards the cost of installing EVCPs at domestic properties across the UK. However, EVCPs cannot be installed in all properties, for instance, terraced or apartments properties may not have allocated off-street parking. In 2016, the government announced the On-Street Residential Chargepoint Scheme aimed at local authorities to increase the availability of on-street EVCPs for plug-in EVs. In February 2021, £20 million of further funding was made available; of the circa 111,476 households in Hillingdon, around 34,419 do not have off-street parking, this represents nearly a third (31%) of all households in the Borough. Although there has been no duty placed upon local authorities to provide electric charging points as of yet, it is up to them to decide based on local priorities, whether to do so. In 2019, the Government urged local authorities to take advantage of the funding available through the On-Street Residential Chargepoint Scheme.

Local and Strategic Context

London leads the way in the transition to EVs, with more than 7,600 public charging points installed across the Capital, a third of the UK's total and a 55% increase since 2019. London also has western Europe's largest zero-emission bus fleet, emissions-based road user charging and the strictest taxi and private hire licensing regulations for vehicle emissions. In December 2021, Transport for London set out their 2030 EV Infrastructure Plan exploring how the public and private sector can do more to facilitate the implementation of EV infrastructure. TfL indicates that in the most likely scenario, where there is increased use of rapid, on-the-go charging, London will need around 40,000 to 60,000 charge points by 2030, of which up to 4,000 will be rapid chargers. The proportion of EVs this infrastructure would support could result a reduction in carbon dioxide emissions of between 1.5 and 2.6 million tonnes per year by 2030.

Throughout 2021 and early 2022, the Council has been making moves to establish wider EV charging infrastructure across the Borough through a tender exercise inviting companies to supply, install and maintain EV charging points across the Borough, initially in car parks. The Council has received a modest but growing volume of requests from residents asking for on-street EVCPs to be provided near to where they live. For residents without a driveway/ garage, if they

are to be able to own an EV, then on-street EVCP becomes a key request. Although it is possible that the situation may change as the desire for EVCP infrastructure grows, it should be noted that, to date, the Council has not received a resident petition asking for communal EVCPs.

There are a series of important considerations associated with on-street EVCP which should be noted:

- **Cables across the footway:** It would be an offence under the Highways Act 1980 and could provide an obvious trip hazard if residents were permitted to trail a charging cable from their property out on to the public highway in order to charge their EV. A typical scenario might be an electric vehicle left on charge overnight and a cable, even if 'guarded' by a proprietary sleeve, would form a trip hazard. In the case of an injury and subsequent accident claim, the Council would be likely to be held liable if it could be shown to have sanctioned such an arrangement. A variation on this theme which has sometimes been suggested is to allow a private cable to be laid through a duct or a channel across the footway, thereby avoiding the trip-hazard issue; here the risk is of uncertain electrical safety, because the Council would be at risk if it sanctioned untested electrical equipment across its highway, with the risk of electrocution, especially in wet weather.
- **Lamp column chargers:** Some councils have installed on-street EVCP on existing or sometimes where necessary all-new lamp columns. The challenge here is competition for kerb-side space to access a charger not already in use or blocked by another parked vehicle that may not even be using the charging facility. Clearly lamp columns are generally spaced in accordance with the appropriate lighting design standards, and this means there will never be a lamp column adjacent to possible parking spot in any given street. There is potential for some neighbourly friction, and there is also a certain risk of trailing cables proving hazardous.
- **Kerb-side chargers:** Broadly similar to the concept of lamp column chargers, some suppliers have created kerb-side charging bollards. There is clearly scope for more of these to be installed than with lamp column chargers, but the costs remain considerable, and some designs appear likely to be trip hazards in themselves.
- **Dedicated parking bays intended solely for electric vehicles:** There are challenges in providing dedicated EVCP parking bays within typical high street and residential parking schemes, where parking capacity may already be at a premium; empty bays will be viewed critically by other stakeholders. Over time this will become a moot point as more vehicles become hybrid or electric. Practical considerations include the implications of taking on-street parking away from neighbouring residents that own an ICE car, or indeed rivals for the same limited on-street charging facilities.

These points show that delivering on-street EVCP in a safe, equally accessible and financially viable manner is a challenge at present.

On matters of air quality, although electric vehicles offer clear benefits for local air quality due to zero exhaust emissions at street level, they still emit particulate matter from road, tyre and brake wear. This means EVs cannot entirely eliminate issues of air pollution in urban areas. The total emissions from an EV are known as the “lifecycle emissions” and combine the emissions from manufacturing the vehicle, powering it through its life, and decommissioning. The Council’s Air Quality Action Plan 2019-2024 identifies the issue that road vehicle emissions contribute significantly to pollution levels in the Borough. Just over half of the road traffic emissions are associated with vans, heavy goods vehicles and buses with just under half from cars, including taxis. Recognising this, the air quality action plan includes specific action measures aimed at promoting the use of EV infrastructure to bring about a reduction in pollution emissions. These are detailed below:

- Action 15 - Council procurement policies to promote the use of cleaner vehicle technologies via contract tendering process;
- Action 16 - opportunities taken in new developments and town centre improvement workstreams to reduce emissions from deliveries to local businesses and residents;
- Action 17 - reducing emissions from the Council fleet;
- Action 24 - installation of ULEV (Ultra-Low Emissions Vehicle) infrastructure e.g. EV charging points, fast chargers, rapid chargers (where feasible)

A Rapidly Evolving Industry

In a recent Policy Exchange think-tank report, it was stated that the UK will need 400,000 public Electric Vehicle Charging Points by 2030, up from 48,000 currently. What is still relatively new technology, albeit evolving rapidly, provides many challenges in terms of the necessary support infrastructure. Whilst investment is clearly needed, it needs to be carefully focused, aided with the right partnerships and in a manner which allows room for the development of all the equipment – vehicles and charging infrastructure – so that they can evolve in tandem and not leave key stakeholders, the Council in particular, owners of equipment which is no longer fit for purpose after significant capital investment has been made.

The rise in demand for EVs and associated infrastructure is inevitable and as with almost any area where the technology involved is developing at a rapid pace, it is important to avoid on the one hand being left behind but on the other being left with an expensive legacy of rapidly outdated infrastructure. The Local Government Association has stated that they “...do not anticipate that councils either want, or need, to become the long-term default provider for electric vehicle

chargepoints. For the transition [from ICE to EVs] to be successful, the chargepoint market will have to strengthen. This is the only way we will reach the level of coverage envisioned by the Governments 2018 Road to Zero strategy. However, many councils are already showing that they have a role to play in catalysing this market and helping in its early stages.

Evidence & Witness Testimony

Hillingdon's EV Infrastructure Landscape

Through witness sessions with Council officers, EVCP Operators, a Hillingdon resident and the relevant Cabinet Member, the Select received information as to the current EV charging landscape across the Borough. Members were informed that the Borough's current charging infrastructure was insufficient, the EVCPs currently in Council operated car parks were installed some ten years ago as part of a research project with the Ford Motor Company, Strathclyde University and Scottish and Southern Electricity; a number of residents were given the opportunity to drive an early form of commercially available EV and provide feedback to the project. Following the project, the charge points were operated by Transport for London's Source London company, when that network was sold on, the Hillingdon charge points were not included. Since that time, the charge points were repaired on a piecemeal basis by the manufacturers and had since become outdated and required replacing.

Although it was noted that a mixture of government, both local and national, car manufacturers and private charging operators would be assisting in the general transition from ICE vehicles to EVs, in order to keep on top of the ever-growing public demand for EV charging infrastructure, the Select Committee understood that the Council would need to play its part and put measures in place very soon to help ensure that a more robust charging offer was in place.

The Council's Short-Term Plans

When researching what local authorities were doing in terms of implementing EV infrastructure, the Select Committee came across two common approaches; to move headlong into installing as many EVCPs as possible, and to be more cautious in approach to ensure that the technology being installed did not become obsolete within a relatively short time. Hillingdon had been favouring the cautious approach but the Select Committee, and the relevant Cabinet Member who had attended a meeting as a witness for the review, recognised the importance in now moving forwards. The Select Committee were also updated on the work that had been ongoing with regard to short-term future charge point provision in the Borough. Members were informed that, where one in 16 new cars registered in London were EVs in 2019, one in eight new cars registered in the capital were EVs in 2021. In response to the growing need, the Council had, in October 2021, published an invitation to tender using the Crown Commercial Services framework. The tender was inviting companies to supply, install and maintain EV charging points in public car parks and to establish wider EV charging infrastructure across the Borough. The three primary strands of the tender were replacing and updating the existing EV charge points in Council operated car parks, assessing 43 other car parks in the Borough for charge point provision, and the provision of on-street EV charge points along residential streets utilising either stand-alone units or existing lamp columns. Amongst a number of factors, companies applying would need to

demonstrate their awareness of grant funding and ability to apply for said funding (including On-street Residential Charging Scheme ORCS funding), how they would ensure that any installed charge points offer appropriate network coverage for users, their fault reporting process and how quickly any faults would be repaired when they occur.

The Committee were also informed that a further part of the tender included provision of a dashboard to be made available for officers to, in real time, see which charge points were operational at any one time. The data from this dashboard could prospectively be used to estimate demand and areas for future provision, the information could also be reported back to the Select Committee periodically.

Barriers to purchasing and operating an EV

A number of factors may deter prospective owners from transitioning from an ICE vehicle to an EV including outright cost, range anxiety, charge times and accessibility to charging points. The Select Committee heard from a Hillingdon resident who was considering the purchase of an EV but remained cautious due to the lack of EV charging infrastructure available locally. Whilst discussing these factors with the resident, a key point was raised; although most EV charging was expected to take place at home, those without access to at home charging required a viable and reliable alternative method of charging an EV. The current local availability of publicly accessible EV charge points was minimal, although growing in areas such as retail parks and supermarket car parks, and not enough to rely on for an individual with no off-street parking. The reality of owning an EV in the resident's current situation would mean regularly finding a public car park with EV charging provision that would also be open overnight. This would induce 'range anxiety' which was a major barrier to purchasing an EV.

Further to range anxiety, returning home after any long trips would mean charging the EV just before finally reaching home, this was seen as a common inconvenience for those without access to home charging. The battery component of EVs was still the largest signifier of cost, if an EV had a larger battery, it would be significantly more expensive to purchase; therefore, if there was access to an EV charge point within walking distance, residents would have the option of purchasing a more affordable EV with a lower battery capacity.

Resident Engagement

Through discussions with witnesses, the Select Committee wished to emphasise the importance of resident engagement regarding the implementation of EV charging infrastructure. It was noted that some central London Boroughs were actively encouraging residents to express their interest in having a publicly accessible EVCP installed on or near their street as a way of monitoring resident demand. The Committee supported a method of emulating such a tool for Hillingdon's residents to suggest potential charging locations.

Further to this, the availability of information pertaining to the proliferation and installation of EVCPs in the Borough was highlighted as a potentially incredibly useful tool. By having this

information publicly accessible via the Council's website, residents would be reassured and better informed when considering the purchase of an EV. Information regarding prospective EVCP installations would also go further in assuring residents that sufficient charging infrastructure would, in due course, become publicly available. Combined with data on publicly available EVCPs from ZapMap, the UK's most comprehensive EVCP database, residents could easily attain up to date information on charging infrastructure in their area.

With regard to on-street residential charge points, concerns were raised that residents had frequently complained about the quantity of street furniture on residential pavements in the Borough and adding a large volume of EVCPs on residential streets could exacerbate the issue. Whilst it was acknowledged that in some cases charge points could be integrated with existing street furniture, engagement with residents would be key in maintaining a desirable street environment.

Equitable Use of Public EVCPs

Over the course of the review, the Select Committee repeatedly highlighted the need for equitable use of publicly available charging infrastructure. As ICE vehicles are eventually phased out and people transition to EVs there would be a number of societal and behavioural changes with regard to the way vehicle owners recharge or refuel their vehicles. In terms of charging speeds, the review highlighted that people who were generally not affiliated with the EV industry had a tendency to stress an importance on the availability of rapid and ultra-rapid chargers. This was attributed to the general public mostly looking to recreate the experience of filling up their ICE vehicle at a petrol station, which would usually take five minutes. Rapid chargers were considered those with a power of above 22kW and ultra-rapid chargers had a power above 100kW. Faster charging speeds would play an important part in any national EV charging infrastructure; however, the need for faster chargers would primarily be at service stations on motorways for longer journeys, when drivers would wish to recharge their EV battery as quickly as possible to get back on their way. This was considered to be in contrast to urban and suburban areas, where it was understood that a cultural change would take place whereby EV owners who could not easily charge at home would become accustomed to the concept of grazing for everyday EV use and using chargers with regular charging speeds. Grazing was seen as charging the EVs battery by a relatively small percentage during shorter stays, for example when visiting supermarkets, shopping parades and car parks.

A specific concern raised by the Select Committee pertained to the prospect of neighbourly disputes over the use of residential on-street charge points. Members highlighted that there were already many instances of parking disputes in the Borough unrelated to EVs and by adding in the requirement for residents to sufficiently charge their EVs in future, potentially at a frequently used on-street residential EV charge point, it could lead to an increase in more complex neighbourly disputes. Throughout the review the Committee heard that other local authorities had already begun experiencing a small number of neighbourly disputes over the equitable use of on-street

publicly available EVCPs. The review emphasised the importance in adequately preparing Council policy if and when these disputes over EV charge points arose. Further to this, proper consultation with residents ahead of any EV charge point installation would be likely to improve outcomes. EV battery technologies were continuously evolving and with larger capacities and ranges, could come the need to charge less often, perhaps once every fortnight; which could alleviate some neighbourly disputes.

Concerns were raised during the review as to a potential disparity in the costs that would be incurred by residents who had the ability to charge their vehicle at home and those who would need to charge publicly at car parks, on-street chargers or EV forecourts. It was understood that those charging publicly would likely end up paying more to charge their vehicles; however, there was still a significant cost associated with the purchase and installation of home chargers which offset the disparity. It was also noted that all charging options were likely to be a cheaper alternative than fuelling an ICE vehicle. Officers highlighted that other local authorities had been known to, as a temporary measure, charge cheaper parking rates, or have free parking altogether, for EVs in public car parks to help alleviate some of the prospective cost disparity as these spaces were likely to be used more frequently by residents with no off-street parking as a means of charging their vehicle. The Select Committee also heard how the Council's Domestic Vehicle Crossover Policy may require updating to enable at-home charging where feasible.

Discussions were had regarding the way in which parking spaces in public car parks may be allocated to EVs in future and significance was placed on getting the balance right when ensuring that both ICE vehicles and EVs were accommodated as the 2030 deadline for the sale of new ICE vehicles approached. A number of methods whereby equitable parking could be managed were highlighted, specifically that some supermarket car park operators issued fines to individuals who parked in an EV space with an ICE vehicle. Ultimately it was noted that, as long as enough EV charge point spaces were provided for, both ICE vehicles and EVs would be able to park in any space within a public car park.

Charging Provision within New Developments

The Select Committee were informed that central government were introducing building regulations requiring all new developments to feature EV charging provision. Review witnesses had explained that new developments formed a fraction of existing dwellings and retrofitting old developments with EVCPs would be necessary for the majority of homes. Locally, the London Plan carried the most weight with regard to what was currently requested from developers around EV charge points; there were different standards based on the use class of the development, however, commonly developers were required to provide 20% active EV charging spaces and 80% passive. Active spaces were ready to use EV charge points and passive spaces, though not immediately ready to use, were connected to the grid and could be easily retrofitted with a charge point at a later date. It was noted that the National Infrastructure Commission had recommended the 20% figure until 2025, at which point, it would be expected to increase.

With regard to enforcement and ensuring that developers were installing the required EV charge points, the Committee were informed that there were currently two mechanisms in place; the standard planning enforcement procedure requiring a case officer or resident to highlight the non-adherence and a Transport for London funded project carried out by West Trans who would monitor the travel plans of new developments ensuring that they included sustainable travel. Due to TfL funding issues stemming from the COVID-19 pandemic, the West Trans officer responsible for West London was not currently funded; it was hoped that this would be restored in future. Concerns were raised throughout the review that enforcement officers may be reliant on residents knowing that new developments should have EV charge points provided and reporting when developers have not met planning requirements. The Committee were minded to ensure that, going forward, the Council was proactive with regard to enforcing this aspect of new developments.

New and Emerging Technologies

Looking to future technologies within the EV sector, the review highlighted that future developments and evolutions of battery and EV technologies were being developed at pace and it would be incredibly difficult to predict how the EVs of 2050 would function compared to the EVs of today. A number of emerging technologies were discussed and noted which could, depending on future applications, fundamentally shift the way in which EVs are operated. Annex A to the review recommendations features a breakdown of the Select Committee's long-term horizon findings and emerging technologies that may prove to overhaul the direction that the sector is moving including rapid charging hubs, solid state batteries, hydrogen fuel cells, induction charging and battery swapping.

The review also highlighted a larger debate, not necessarily under the Committee's purview, over the production of lithium-ion batteries which were currently the most common means of powering EVs. The mining of lithium, and other materials associated with lithium-ion batteries such as cobalt, was noted to have a detrimental environmental impact on the countries where it was mined, and the development of more sustainable and socio-economically friendly battery technologies was seen as imperative to improving production practices as the EV sector was expected to grow rapidly.

Capabilities of the Electricity Grid

With regard to the capacity of the electricity grid to handle future electricity demand associated with EV infrastructure, the Select Committee heard how each charge point installed would require a significant amount of electrical installation and a tremendous amount of power to operate. Major concerns were raised over whether the electricity grid in the UK would be sufficient to cope with the increased demand going forward, however, it was noted that there were regional differences and it was expected that aggregate development of the power grid in the future should compensate for the increased demand. Further to this the adoption of EVs was expected to be a

gradual process over the next two decades, therefore the new demands and stresses on the electricity grid would not materialise overnight.

Relative concerns were also raised that some Original Equipment Manufacturers, including Toyota, Porsche and Subaru were developing ever more efficient synthetic fuels for ICE vehicles that were moving towards carbon neutrality. The Select Committee noted that, in 2030, when the ban on the sale of new petrol and diesel vehicles would come into force, ICE vehicles would remain on the roads for some years to come. The development of carbon neutral and even carbon negative technologies was welcomed, particularly where wider scale energy production was concerned, and particular emphasis was placed on the fact that the transition to EVs was expected to be a part of the solution, not the complete solution, to the climate emergency.

The Council's own fleet of vehicles

Although the Select Committee's review was more outward facing, the Committee ensured that reference was made to the Council's own fleet of vehicles. At present there are:

3 x Fully Electric Pool Cars

5 x Self Charging Hybrid Pool cars

5 x Fully Electric small size vans on order

271 x Diesel Internal Combustion Engine powered vehicles.

The Select Committee were encouraged to hear of plans to replace all diesel-powered vehicles 3.5T and smaller with electric vehicles before the 2030 ban on the sale of new petrol and diesel powered cars. There were however challenges with the purchase price and the charging infrastructure required for larger heavy goods vehicles. For example, a diesel powered 26T Refuse Collection Vehicle would have a purchase price of around £159K and the equivalent EV version was more akin to £480K and was only designed to travel at 38mph. It is hoped that future developments in heavy good EVs will allow their purchase to become a more viable option.

Hillingdon's Strategic Climate Action Plan

Throughout the review it was highlighted that a key objective of any EV strategy would be to assist the Council in achieving its carbon reduction targets. Hillingdon's Strategic Climate Action Plan sets out the Council's overarching plan to respond to the climate emergency. The plan details a clear and simple vision for Hillingdon and identifies the activities the Council will undertake in relation to the climate emergency declaration. These activities are guided by six corporate climate commitments and aligned to nine themed areas of activity set out in the plan. Theme 8 is in relation to Sustainable Transportation; within this theme is strategic objective C8.6 – "To develop an electric vehicle charging action plan that will commit to increasing the availability of electric charging points across the Borough." The Select Committee strongly felt that further endorsing strategic objective C8.6 would bolster the importance of facilitating the transition to EVs and highlighting that, abandoning the frequent use of petrol and diesel powered vehicles will be key factor in curbing the effects of climate change.

The Committee's Findings

General Conclusions

From the early stages of the review the Select Committee had expected that many of the findings and recommendations arising would be presented to Cabinet not for immediate implementation but to offer guidance and direction in helping to shape future policy. Towards the closing stages of the review, it was determined that the Committee's findings could be grouped into short-term recommendations, for implementation in the next 6 to 12 months, medium-term recommendations, for implementation and consideration over the next few years, and longer-term recommendations, for implementation and consideration throughout the next decade as the 2030 ban on the sale of new petrol and diesel powered vehicles approaches.

Short-Term

Through the Select Committee's witness sessions, Members found the current level of engagement with residents regarding the prospective implementation of EV infrastructure to be lacking. The Select Committee felt that the need for residents to have access to consistent information and to have their expectations managed regarding the provision of EV charge points in their area was vital; it was suggested that a standard operating procedure for when residents expressed interest in a prospective on-street charging point could be introduced to avoid any confusion and a mechanism allowing residents to suggest locations for publicly available EVCPs should be developed. The Council's website was seen as an integral tool for improving resident engagement and a useful platform for displaying any necessary information on the implementation of EV infrastructure in Hillingdon, both under the Council's purview and infrastructure installed by the private sector.

The primary motive for the impending societal shift towards EVs is climate change and the need to reduce our reliance on fossil fuels. The Select Committee felt that the Council's Strategic Climate Action Plan was an important instrument in outlining the necessary actions the Council should take in playing its part to reduce fossil fuel use and sought to endorse strategic objective C8.6 – "To develop an electric vehicle charging action plan that will commit to increasing the availability of electric charging points across the Borough".

Throughout the review, the Select Committee repeatedly heard about the Council's current plans to establish a commercial partner with technical expertise and knowledge of the sector to install publicly available EVCPs commencing initially in the Council's own car parks. The Committee had highlighted that there were currently very few publicly available EVCPs to cater for the projected amount of future EVs in Hillingdon; Members sought to monitor this ongoing project through its scrutiny functions in the form of an annual report.

Medium-Term

The Select Committee's medium-term findings related to the prospective introduction of policies to ensure the availability and equitable use of charging infrastructure. Having heard about the current enforcement approaches used to ensure planning developers install the required EVCPs in their new developments, the Select Committee sought to bolster the Council's enforcement methods to become more proactive when new developments come online. This was seen as a way of helping to facilitate at home charging for residents who will have access to off-street parking. With regard to the equitable use of EVCPs, the Select Committee found that the Council should appropriately prepare for the inevitability of residential disputes over the use of EVCPs, particularly in relation to any on-street, pavement mounted chargers. Members sought to establish the needs of EV owners within the future implementation of parking management schemes.

The Select Committee were also encouraged to hear of plans to replace all diesel-powered vehicles 3.5T and smaller within the Council's own fleet with electric vehicles ahead of the 2030 ban on the sale of new petrol and diesel powered cars.

Longer-Term

The Select Committee's longer-term findings related to two factors, the evolution of the EV sector and the enabling role that the Council should adopt in facilitating the transition to EVs. The review prompted discussions from the Committee on the ever-changing landscape of EVs and how new and emerging technologies may alter the way in which EV infrastructure is laid out and accessed in the future. A number of emerging EV technologies could prove to fundamentally shift the industry and these were touched upon by the Committee during their witness sessions; the Committee sought to highlight the importance of being both adaptive and responsive to long-term future EV infrastructure requirements. Additionally, the Committee also discussed the fact that the provision of EVCPs was not a statutory requirement placed upon local authorities, however it was noted that this could change in the future. With regard to the Council's obligations, it was found that the Council should be doing what it can to support the transition to EVs by playing an enabling role and working cooperatively with partners from the private sector to ensure residents have access to robust EV infrastructure.

The Committee's Recommendations to Cabinet

Through the witnesses and evidence received during the detailed review by the Committee, Members request that Cabinet welcomes the Committee's report and recommendations which seek to both support and provide further strategic direction on the Council's aims to assist in the Borough's transition from Internal Combustion Engine Vehicles to Electric Vehicles (EV). Furthermore, that Cabinet welcomes the Committee's support for its recent decision to implement a robust and scalable EV charging infrastructure in the Borough, commencing initially in Council owned car parks.

Short-Term Recommendations (for implementation in the next 6 - 12 months)

The Select Committee ensured an emphasis was placed on resident engagement going forward and found that, by having easily accessible and up to date information regarding the implementation of new EV charging infrastructure, residents considering the transition to an EV would be reassured that they could own and operate their EV with ease. On the basis of engaging residents in the implementation of EV infrastructure across Hillingdon, it is recommended that:

1

That Cabinet seek to increase the transparency of information available on the Council's website relating to EV charging infrastructure projects and installations to residents.

Through discussions with residents considering the purchase of an EV, the Select Committee sought to implement an online expression of interest facility for residents to suggest possible EVCP locations across the Borough as a way of helping the Council collect data concerning demand for EVCPs. On that basis, it is recommended that:

2

That Cabinet seek to improve levels of engagement with residents through a mechanism to express their interest in local EV charging provision.

Hillingdon's Strategic Climate Action Plan sets out the Council's overarching plan to respond to the climate emergency, and an integral part of wider society's move away from the use of fossil fuels will be the promotion of sustainable transport. The Committee strongly felt that further endorsing strategic objective C8.6, the development of an EV charging action plan, would bolster the importance of facilitating the transition to EVs. On that basis, it is recommended that:

3

That Cabinet note the objectives of the Council's Strategic Climate Action Plan, with reference to sustainable transportation and the development of an EV charging action plan that will commit to increasing the availability of EV charge points across the Borough.

In an effort to monitor the ongoing implementation of EV infrastructure in the Borough, the Select Committee were minded to receive an annual report detailing the progress made with the Council's EVCP provision. Members sought to also receive monitoring data from those EVCPs already installed in addition to general information pertaining to the development of EV infrastructure across the Borough. It is recommended that:

4

That a report be prepared for the relevant Select Committee on an annual basis regarding the implementation of the new EV charge point contract, usage and monitoring data from those newly installed charge points where possible, and the development of EV Infrastructure across the Borough as it progresses.

Medium-Term Recommendations

The Select Committee heard how new building regulations obliging developers to install EVCPs in their developments with on-site parking would help to facilitate at home charging for residents who have access to off-street parking. After hearing about current enforcement methods regarding the installation of EVCPs in new developments, Members sought to bolster the Council's enforcement response. On that basis, it is recommended that:

5

That Cabinet consider the merits of a more proactive enforcement effort to ensure developers make available suitable EV charging provision in their developments to fulfil their planning obligations.

Throughout the review the Select Committee highlighted the importance of equitable use regarding publicly available EVCPs. There would be a likely potential for neighbourly disputes occurring over the use of on-street chargers as the proportion of EV owners in the Borough increases. As a way of mitigating these disputes the Committee felt that the Council should put in place EV considerations when designing future parking management schemes and establish an EVCP equitable use policy. On that basis, it is recommended that:

6

That Cabinet explore the viability of a policy to ensure equitable use of on-street residential charge points and incorporate EV considerations into the design of future Parking Management Schemes, in advance of any future decision on the feasibility of introducing on-street EV charging points.

The Select Committee were encouraged to hear of plans to replace all diesel-powered vehicles 3.5T and smaller with electric vehicles before the 2030 ban on the sale of new petrol and diesel powered cars. To help ensure that this work is carried out, it is recommended that:

7

In support of the Council's Strategic Climate Action Plan, that Cabinet endorses plans to replace all diesel-powered vehicles 3.5T and smaller within the Council's fleet with EVs before 2030.

Longer-Term Recommendations

The provision of EVCPs is not a statutory requirement placed upon local authorities, however, the Select Committee repeatedly highlighted over the course of the review that, with regard to the Council's responsibilities, it was a duty of the Council to do what it can to support the transition from ICE vehicles to EVs. This will include working cooperatively with partners in the public and private sector to ensure an appropriate and robust charging infrastructure is implemented and maintained in the Borough. On that basis, it is recommended that:

8

That Cabinet concurs with the Committee's findings that, whilst the Council is not wholly responsible at this time for directly providing EV infrastructure or the necessary utilities that support it, with such a societal paradigm shift, the Council should play a leading 'enabling' role to ensure that the Borough is working cooperatively with partners and is well prepared for the growing EV demand and the resultant technological, infrastructure and behavioural changes arising.

The review also highlighted the rapidly evolving nature of the EV industry and made clear that the EV sector was still in its relative infancy. Annex A to the main recommendations focusses on the emerging technologies and future developments discussed and identified by the Committee, and key matters that Cabinet may wish to consider over the longer-term.

9

That Cabinet considers the Select Committee's long-term horizon findings from its review and the variables it has identified in how current and emerging EV technology and infrastructure may develop and change over time. This is so the Council can be both adaptive and responsive to future requirements and its residents - these have been set out in Annex A to these recommendations.

About the review - witnesses and activity

The following Terms of Reference were agreed by the Committee from the outset of the review:

1. To understand the Council's current stance with regard to the prospective uptake in the use of Electric Vehicles (EV) and requirement for specific EV infrastructure.
2. To explore the national setting and initiatives undertaken by other local authorities to facilitate future EV infrastructure.
3. To understand the growing demand for EVs and explore any limitations residents may encounter in accessing suitable EV requirements.
4. To explore future evolutions with regard to EV battery and charging technology.
5. To investigate what grant funding may be available to local authorities relating to EV infrastructure.
6. To influence or propose any emerging Council plans, guidance or policies with respect to the future of EV use and the Borough's transportation and highways infrastructure.
7. Subject to the Committee's findings, to make any conclusions, propose actions, service and policy recommendations to the decision-making Cabinet.

The Committee received evidence from the following sources and witnesses:

<p>Witness Session 1 – 21 September 2021</p>	<p>Council officers in attendance:</p> <ul style="list-style-type: none"> • Poonam Pathak, Head of Highways
<p>Witness Session 2 – 19 October 2021</p>	<p>External Witnesses present:</p> <ul style="list-style-type: none"> • Adam Heritage, Hillingdon resident looking to purchase an EV <p>Council officers in attendance:</p> <ul style="list-style-type: none"> • Alan Tilly, Transport Planning and Development Team Manager • Tom Campbell, Planning Policy Team Leader

**Witness Session 3 –
17 November 2021**

External Witnesses Present:

- Brian Renwick, UK Operations - Qwello GmbH
- Dr Henrik Thiele, Managing Director - Qwello GmbH

Cabinet Members Present:

- Councillor John Riley, Cabinet Member for Public Safety and Transport

References

Review photo – rawpixel.com / Chanikarn Thongsu – No changes were made to the image

[Provisional UK greenhouse gas emissions national statistics 2019](#) – Department for Business, Energy & Industrial Strategy, March 2020

[Electric cars: What will happen to all the dead batteries?](#) – BBC, April 2021

[Air Quality Action Plan, 2019 – 2024](#) – London Borough of Hillingdon, May 2019

[Strategic Climate Action Plan](#) – London Borough of Hillingdon, July 2021

[London's 2030 electric vehicle \(EV\) infrastructure strategy](#) – Transport for London, December 2021

[Where can I buy hydrogen and where is my nearest hydrogen filling station?](#) – Driving Electric, January 2022

[Norwegian Taxis, Wirelessly Charging While They Wait for a Fare](#) – NY Times, August 2020

Annex A photos – No changes were made to these images

[MyLondon - Rapid Charging Hub](#)

[Wikimedia Commons - Electric car wireless parking charge closeup](#)

[Wikimedia Commons – Nissan Leaf](#)

Appendices

Annex A to the Electric Vehicle Infrastructure and Future Policy Direction for the Borough Review Recommendations

Electric Vehicle Infrastructure and Future Policy Direction for the Borough

Annex A to the Review Recommendations

For the Council to best serve its residents, and to effectively play its part in facilitating the transition from Internal Combustion Engine (ICE) Vehicles to Electric Vehicles (EVs), it must be both adaptive and responsive to future EV infrastructure requirements. The EV sector is changing rapidly, and emerging battery technologies, future developments and government policy could prove to overhaul the direction that the sector is moving. The Public Safety and Transport Select Committee specifically wish to highlight some of the long-term horizon findings from its review and the variables it has identified in how current and emerging EV technology and infrastructure may develop and change over time.

Emerging Technologies

Rapid Charging Hubs

With inevitable improvements in EV charging times, rapid charging hubs may form an integral part of the future charging network, especially for individuals who are unable to charge their EV at home. Taking much the same form as petrol stations, EV owners will be able to add a significant amount of charge within a relatively short time using rapid charging speeds. Rapid charging hubs have already sprung up at motorway service stations across the UK and it is likely that private companies currently operating petrol stations will seek to gradually transform some of their existing petrol stations into rapid charging hubs.



Solid State Batteries

Solid state batteries represent a paradigm shift in terms of battery technology. In today's lithium-ion batteries, ions move from one electrode to another across a liquid electrolyte. In solid state batteries, the liquid electrolyte is replaced by a solid compound vastly improving safety and sustainability. Solid electrolytes are non-flammable when heated, unlike their liquid counterparts. With regard to sustainability, solid state batteries permit the use of innovative, high-voltage high-capacity materials, enabling denser, lighter batteries with a better shelf-life. Although still in development at the scale required for EVs, solid state batteries can exhibit a high power-to-weight ratio and may be ideal for use in future EVs.

Hydrogen Fuel Cells

In simple terms, a hydrogen fuel cell vehicle uses hydrogen to power an electric motor. Hydrogen fuel cells have an energy to weight ratio ten times greater than lithium-ion batteries. This means that hydrogen powered vehicles have the potential to offer much greater range, while being lighter. Additionally, whereas lithium-ion batteries have a limited lifespan and need to be replaced, hydrogen fuel cells do not degrade in the same way. Further benefits to hydrogen powered EVs is that they can be refuelled in a similar manner to ICE vehicles, emulating the times currently experienced by traditional vehicle owners.

There are a number of downsides to hydrogen fuel cell vehicles however, there are currently only two hydrogen fuel cell cars commercially available in the UK: the Hyundai Nexa and the Toyota Mirai. There are also only 11 publicly available hydrogen filling stations in the UK (5 being within Greater London). Additionally, it takes more energy to produce hydrogen than it does the electricity to charge a lithium-ion battery; this is a major barrier in the widespread proliferation of hydrogen fuel cell vehicles. If the production of hydrogen becomes more viable in future, it could have a significant impact on the EV industry, and the charging infrastructure required. Large commercial fleets, such as those operated by Transport for London are likely to be early adopters of hydrogen fuel cell vehicles.

Induction / In-road Charging

Although limited in its charging capacity, induction charging may offer a hassle-free alternative to cable charging. Charging plates are installed under the road or an individual's driveway which would then begin delivering a charge to an EV once it was appropriately positioned on top of it. It's uses are currently being applied in Oslo, Norway for a fleet of taxis to enable charging whilst they are stationed at a taxi rank. Albeit in very early stages of development, induction charging could evolve into a useful component of EV infrastructure.



Bi-directional Charging

For those able to charge their EV at home, bi-directional charging may play a huge part in future charging behaviours. Bi-directional charging can not only take power from the grid to charge the EV battery, but it can also supply power back to the grid, or power a home, using energy from the EV battery. Effectively it enables an EV to act as a home battery, storing energy that can be used to power a home or sold back to the grid.

Battery Swapping

By eliminating recharging times, battery swapping has emerged as a possible alternative to traditional EV charging. Battery swapping is a process by which an EV's depleted battery is changed, often at an automated battery swapping station, for a fully charged one. Whilst theoretically seeming like an ideal solution to long EV charge times; there are a number of downsides to the implementation of battery swapping on a large scale. Namely that vehicle manufacturers are likely to be against standardising battery sizes to make them interchangeable at public battery swapping stations. Additionally, there would be logistical issues with ensuring a sufficient, fully charged stock of batteries at times of peak demand. There is, however, potential for battery swapping to be applied at scale for fleet vehicles with a shared depot such as delivery and transport companies.

Whilst heavily dependent on the future development of more portable EV batteries, there is the possibility that future EV owners may have multiple batteries for their EV. One may be in use whilst the other is charging elsewhere, eliminating a large proportion of the need for public charging.

Future issues with current technologies

Many of the technologies utilised by the EV industry today may become obsolete in the mid to long term future as a result of future technological developments. This has the potential to fundamentally alter people's EV charging behaviours and the way in which EV infrastructure is laid out across the country.

Current Lithium-ion Batteries

The vast majority of today's EVs make use of lithium-ion battery technology, the same battery technology that has been used in mobile phones for a number of decades. Developments in lithium-ion battery technologies are expected to continue for the foreseeable future and will be set to improve range and charge times. However, many EV manufacturers are already looking to move away from some of the materials used in today's lithium-ion batteries such as cobalt; a material where current mining practices are often environmentally damaging and ethically unsound. Further to this, lithium-ion batteries that have come to the end of their usable life are notoriously difficult to recycle. Currently only around 5% of the world's used lithium-ion batteries are recycled. Sodium-ion batteries have been touted as a possible future replacement for EV batteries utilising more abundantly available materials, however the use of sodium-ion batteries within the EV industry is in its infancy.



Charging Behaviours and Pavement Mounted Chargers

People's charging and refuelling behaviours are expected to change as the transition to EVs takes place and behavioural charging concepts such as 'destination charging' and 'grazing' grow in popularity, particularly for individuals without the facility to charge at home. Destination charging is utilising the charging infrastructure available at an individual's destination where they intend to stay for a number of hours, for example their workplace. Grazing is the concept of delivering a smaller amount of charge during shorter, frequent trips such as when using public car parks, supermarkets and leisure facilities. Whilst it will be important to facilitate the availability of on-street residential charging, concerns have been raised with regard to the potential addition of a high volume of pavement mounted EV charge points and the possible overloading of footways and pavements with street furniture.