

Detailed responses to the CMA Invitation to Comment

Theme one: developing competition while incentivising investment

1. *How is the EV charging sector developing and how will technological or other developments (for example smart technologies) impact sector development and competition?*

The EV charging sector is expanding rapidly, responding to both current and anticipated growth in electric vehicle sales. Department for Transport data indicates that, as of 1 April 2020, there were 17,947 public electric vehicle charging devices available in the UK. Of these, 3,107 were rapid devices. Since 2015, the number of public charging devices has grown by 402%, with a 61% increase from 2018 to 2019. Rapid charging devices have also grown quickly, increasing by 355% since 2015¹.

Recent years have seen a significant expansion in the number and variety of companies seeking a presence in the EV charging sector. These now include:

- Dedicated chargepoint infrastructure providers (e.g. Pod Point, Chargepoint, EV Box, Instavolt, Ubitricity)
- Entrants from the utility sector, building on their links with the electricity system and seeking to take advantage of their expertise in electricity generation, supply, pricing and associated services (e.g. EDF, Centrica, Ovo, EON, Engie)
- Entrants from the oil and gas sector, seeking to take advantage of their existing forecourt presence to provide new options for public EV charging (e.g. BP, Shell, Total)
- Automotive companies (e.g. Tesla, BMW, Volkswagen) offering their own bespoke charging solutions
- Companies focussed on e-mobility service provision and building roaming platforms/services between different EV charging infrastructure (e.g. Virta, Zap-Map)
- New entrants focussed on building a presence in specific aspects of the EV charging market (e.g. Zappi, Gridserv, Instavolt)
- Technology providers, seeking to take advantage of opportunities arising from smart control of EV charging – or new kinds of EV charging (e.g. Siemens, Upside Energy, EV Energy).

The wide variety of new entrants and existing competitors means that most aspects of the EV charging market are already highly competitive. While we cannot forecast exactly how the charging market will evolve, substantial growth in EV sales in coming years should mean significant opportunities for many companies and scope for different business models with differentiated segment focus.

We anticipate that most (but not all) on-street, rapid, destination and en-route EV charging will remain “on-demand” – i.e. charging begins as soon as the EV is connected to the charger. But the emergence of smart technology should enable a more sophisticated range of charging options for home (and to some extent workplace) charging, with greater adoption of time-of-use (ToU) and

¹ DfT: Electric Vehicle Charging Device Statistics April 2020

dynamically priced tariffs allowing consumers to adjust the time of their charging and take advantage of lower off-peak electricity prices. A range of ToU tariffs are already available from electricity suppliers and ongoing reforms to electricity regulation (notably the introduction of half-hourly settlement for residential and lower volume business consumers) will enhance their economics and adoption. Furthermore, smart charging flexibility offers the potential to better integrate EV charging into the electricity system, reducing peak demands on national and local networks and helping to accommodate larger volumes of intermittent generation.

2. How well is competition between EV charging providers working at present in the different sector segments and what are the key risks to effective competition (including any emerging competition concerns)?

We consider each of the main EV charging segments in turn.

Home charging – the market for home EV charging where homeowners have a dedicated off-street parking space is established and competitive. The route to market is diverse and consumers will choose their home chargepoint supplier based on a wide variety of information sources. These include word of mouth, recommendations from automotive suppliers, offers from their electricity supplier, targeted marketing and electric vehicle owner forums and websites. Eligibility for Office of Zero Emission Vehicle (OZEV) grants requires that the chargepoint model is on an approved list but there are more than 50 OZEV approved home chargepoint suppliers. As with any home installation, the home-owner has complete choice over the charger they choose and the timing of their installation. Home chargepoints are not tied to electricity suppliers or specific car models and the homeowner remains free to change their electricity supplier or their EV model.

As noted above, time of use tariffs are a growing feature of the electricity supply market for EV owners and we expect these will increase in popularity over time with increased adoption of smart meters and wider ongoing reforms to electricity settlement. Smart options in this area are also likely to become more sophisticated and dynamic, e.g. through responding to changes in electricity prices and the carbon intensity of electricity generation.

Home charging for multi-occupancy buildings such as blocks of flats is a much less well-established market, hindered by considerations such as the lack of dedicated parking spaces, required permissions or simple routes to meter and pay for consumed electricity - but installation of chargepoints in the car parks of such buildings is very gradually growing in this sector.

Workplace charging – workplace charging is a vibrant, developing market, with increasing numbers of companies seeking to provide EV charging options for their workforce, company fleets and visitors. Many of the same companies operating in this sector are also active in the home charging market

Any larger scale provision of workplace charging infrastructure is typically determined through a competitive process – e.g. a tender exercise. The workplace (company or group of companies managing the site) also typically determines the electricity price charged to users, with the chargepoint providers further role, if any, limited to operation of billing and data services and, potentially, maintenance of the charging infrastructure. Workplaces have little incentive to charge

their users high prices for electricity – the chargepoint is either a functional necessity for their workplace fleet or a convenience for their employees and site visitors and therefore high pricing will lead all but occasional users to charge elsewhere instead – e.g. at home or alternative public locations where pricing is better.

On-street residential charging – this is an emerging market and one where there is not yet a plurality of established business models or approaches for large scale infrastructure delivery. A range of factors have to date constrained the growth of this market and may continue to do so. These include:

- Those who park on street, rather than on a driveway, are unlikely to have dedicated use of/access to a chargepoint.
- Early EV adopters have typically had off-street parking and can have a home charger installed, or at least have access to a workplace charger. Those who would be reliant on an on-street charger are unlikely to yet have an EV and, as such, the demand for on-street chargers has to date been too diffuse to ensure utilisation that would warrant investment in technical solutions at scale.
- Locations without off-street parking are typically urban higher population density locations where alternative charging options already exist or are emerging (e.g. supermarkets / car parks / shopping centres / other frequently visited destinations / local rapid hubs) – it is possible these will in time reduce the scale of requirement for widespread/universal on-street provision. Local charging in these different ways may offer efficiencies in maintenance and better use of space than a proliferation of on street charge points.
- Delivering large-scale on-street charging provision is a significant undertaking which requires a combination of financing solutions, motivated and resourced local authorities, and incentivised distribution network operators.

If a substantial market in this area is to emerge, these barriers will need to be overcome. There are some risks that infrastructure provided could deliver lower value for consumers, e.g. through low reliability or high electricity pricing. It should prove possible to protect against this outcome through intelligent competitive contracting by a local authority or delivery body – able to ensure that contractual arrangements incentivise high reliability of chargepoints and ensure competitive pricing, with contract lengths based on a reasonable length of time needed to recover the costs of capital investments.

Destination charging – this is a thriving and fast-growing market for EV charging infrastructure. Destination charging sees all kinds of charging infrastructure playing a role, from 7kW AC top-up chargers for sites with longer dwell times and higher-powered DC (particularly 50kW, but potentially some 150kW+) as a paid for faster charging option.

Destination charging takes place somewhere a driver was planning to visit anyway - e.g. a driver may choose a supermarket because it has chargers, but they are primarily going there to do their shopping. Often the primary driver of the provision of charging infrastructure is less the potential for direct revenue from the infrastructure itself, and more the desire of the destination to attract consumers to its facilities or location. This provides downwards pressure on pricing, as uncompetitive pricing at destinations will typically lead consumers to charge and, therefore, visit elsewhere.

As such, Pod Point has had success in this market with its primary model of selling charging infrastructure, data services and, potentially, installation to the business responsible for the destination and then allowing them to set the fee for usage. If the business chooses to set a fee Pod Point takes an increment, if they do not, then these chargepoints are free to use for drivers, but the business secures additional custom. As a result of this model, the majority of Pod Point's public chargepoints are free to use.

However, there are a range of alternative business models for destination charging, with some Charge Point Operators (CPOs) providing funded infrastructure which they (and in some cases their co-investors) own and operate, setting their own fee for usage. In such cases the pricing for the end user will depend on the type of infrastructure and its capital costs, funder return on investment expectations and location (utilisation risk).

Public rapid charging – this is a growing market and one with some existing and emerging competitors. While widespread provision of public rapid charging is an important element in addressing “range anxiety” and ensuring that EVs can be confidently used for the longest of journeys, the commercial business case for private investment in public rapid charging is more challenging – for the following reasons:

- Rapid 50kW or higher rated chargers are many times more expensive than the lower rated chargers typically installed in home, workplace or destination locations.
- A large new connection to the transmission or distribution network will be needed for sites with a collection of rapid chargers and the costs of this, while different for each site, will in most cases be very substantial.
- There are often land related costs and charges.

These considerations, along with the 20% VAT rating for electricity sold commercially (vs 5% VAT on electricity consumed at home) explain why electricity prices for public rapid charging will inevitably be significantly higher than for home charging – and why drivers who can charge at home will be incentivised to do so whenever possible.

Recovery of the up-front investment and future profitability of rapid charging infrastructure relies on charge event sales from rapid charging, plus potentially revenues from associated services at the site (shops / cafes etc) – and is thus entirely linked to the level of utilisation of the site. Today only a small minority of rapid EV charging sites have utilisation rates sufficiently high to recover costs and make a return in a reasonable timeframe. While utilisation rates will grow with increased EV adoption, the rate of turnover of the UK vehicle fleet means that, even with rapid growth in EV sales, it will take many years before large numbers of rapid charging sites can be profitable operations on an ongoing basis. There is also a balance to be struck in the growth of rapid EV charging infrastructure as, while more infrastructure will undoubtedly support EV adoption, it will also reduce the utilisation on each site.

In this context EDF and Pod Point strongly welcome the announcements by HMG to provide significant investment into the UK's rapid charging infrastructure and the indications that this will primarily be used to help underpin the large connection costs needed for significant rapid charger provision at key Strategic Road Network locations. This funding has the potential to significantly

accelerate provision of rapid charging infrastructure and to bring forward the point at which more rapid charging sites become viable propositions – to the benefit of EV adoption and EV driver experience.

However, maximising the benefits that could come from HMG funding in this area and the wider roll-out of rapid charging, will require well-designed interventions and associated government policy measures. We elaborate on these points in our response to Q3 below.

3. *How can competition in the different sector segments be strengthened as the sector develops, either by building on current policies and/or through other approaches?*

As set out above, we consider that most aspects of EV charging infrastructure provision today are already highly competitive, with many existing companies and significant recent new entrants. With rapidly growing sales of EVs and a clear government direction to electrify cars and vans, we expect competition to remain robust and choice for consumers on their charging options and the range of charging locations and providers to grow.

As noted above, proposals expected from HMG in the near future, relating to the consumer experience of EV charging, have the potential to positively enhance competition and choice.

With respect to the public rapid charging network, particularly as it relates to existing motorway service areas (MSAs) and other key locations on the motorway and strategic road network, there are a number of ways in which we consider competition and provision of charging options for consumers should be enhanced over time. These are:

- Careful and considered use of HMG's planned public rapid charging funds to expand competition and provision in this area – ensuring both new and existing sites have the potential to be developed.
- Ensuring support is structured so that EV drivers have a growing number of different providers of en-route rapid charging available to them within reasonably close distance. Our view is that the best solution here is not to mandate competition at the same site (which risks deterring investment as infrastructure providers face much larger utilisation risks) but to ensure competition in providers between sites within close proximity of each other.
- Bringing forward new sites for rapid charging will be important to extend choice, and in this context it will be important that wider government and regulator decisions (such as those relating to the charging arrangements for new distribution and transmission connections) are balanced and proportionate, allow for timely and fairly priced connection costs and do not effectively act to prevent the development of new sites.

Introducing more driver choice for MSA rapid charging will bring downwards pressure on rapid charging pricing and upwards pressure on reliability and ease of use - significantly helping to address remaining consumer barriers to adoption of electric vehicles.

4. *What are the main existing and potential barriers to entry and expansion for EV charging providers and how can these be addressed?*

The EV charging sector is in general one of relatively modest barriers to entry – a position supported by the significant number of competitors and recent new entrants. Relative to many sectors, the hardware/capital investments needed to enter the sector are not huge and the software capabilities needed are widespread and can be developed in-house or externally procured. Clearly investment is needed over time to build customer relationships, market products and ensure both equipment and support and servicing remains of high quality and competitive, but these elements are common to most businesses, and new entrants to the EV charging sector have a range of options as to how they grow their business, which could range from large scale national roll-out to more focussed offerings within regions or sub-sectors of the market as a whole.

There are several caveats to this overall picture. There are some existing barriers to entry into the UK public rapid charging network mentioned in our response to Q3 above. The more challenging business case for public rapid charging (see our response to Q2 above) also requires investors into this part of the market to have longer-time horizons and deeper pockets given the larger initial capital investment outlay and the need for high levels of charger utilisation to make sites economic.

At individual sites and locations, the costs and difficulties associated with securing timely network connections can make charging projects more difficult to develop. As well as the welcome support of the Rapid Charging Fund for the costs of connections to rapid charging sites, an evolution of network regulation is required to ensure that connections do not become a barrier to the widespread roll-out of charging infrastructure. This should include greater allowance for anticipatory investment by networks and changes to distribution network operator (DNO) connection processes for new charging infrastructure such as vehicle-2-grid.

5. How can chargepoints be effectively deployed to ensure there is sufficient supply to meet future demand? What factors need to be taken into account?

As noted in response to Q1, chargepoint provision is expanding rapidly. We see no fundamental reason why, across most segments of the market, that the supply of charging infrastructure will not continue to rise quickly to meet growing demand.

As noted above, there are some existing barriers to early large-scale deployment of new rapid charging facilities at a range of existing or potentially suitable sites along essential motorway and A-road corridors. Addressing these will significantly reduce the risk of consumer harm from reduced provision and choice in rapid charging options. The much more challenging economics of public rapid charging at scale also create the case for government intervention to grow infrastructure provision more quickly than would occur without such assistance, thus helping to aid a faster transition to EVs across the general population.

6. What incentives are there for private investment in EV charging infrastructure including within the different sector segments? How might incentives need to change for the future growth of the sector and development of competition?

HMG offers a number of grants for charging infrastructure, though these are generally targeted at consumers or local authorities, they can support private sector sales activity to these segments. In particular these are the Electric Vehicle Homecharging Scheme (EVHS), Workplace Charging Scheme (WCS) and On-street Residential Charging Scheme (ORCS). From time to time there is assorted innovation funding as well, e.g. through Innovate UK, typically targeted at particular segments.

- 7. What impact does public subsidy have on private investment incentives; are there any areas/gaps where public support is most likely to be needed?*
- 8. What is required in order to ensure that rural / remote communities and those without off-street parking are well served by charging infrastructure?*

The principal factor behind the growth of EV infrastructure is growth in the sales of electric vehicles. Currently EV sales are growing strongly with the market share of both pure electric and plug-in hybrid models expanding almost every month. If the government retains an overall favourable incentive regime and regulatory framework for EV sales, we expect market growth to continue to be strong and to encourage further private investment in the market. In this context we strongly welcome the government's recent announcement of the continuation of funding for plug-in car grants and the home and workplace EV charging support schemes until March 2022.

We recognise that, over time, as the cost of new electric vehicles continues to fall and the market continues to expand, the case for maintaining these grant support measures is likely to diminish and it would not be realistic to see them operate in perpetuity. As long as this process is managed gradually, and the overall regulatory framework remains supportive of EV adoption, we do not expect it to damage continuing growth of the EV charging infrastructure market and continued private investment. New regulatory interventions may however be needed to ensure that growth in EV sales rises at the pace necessary to deliver a smooth transition to the phase out of petrol and diesel vehicles from 2030 onwards.

In the area of public rapid charging, government assistance, working alongside private investment, through the rapid charging fund is likely to be needed for some further time yet to deliver widespread and future proofed rapid charging infrastructure, including for sites and locations where forecast utilisation levels will make for more challenging economics.

On-street charging infrastructure, in mainly urban locations, where off-street parking is not available, is also a market where incentives for investment, or at least public sector/local authority driven contracting may be needed on a longer-term basis – given the various economic, planning and regulatory barriers to rolling out new infrastructure in these locations at scale.

In developing both of these markets it will be important to ensure that public interventions operate to encourage fair and open competition, with respect to the choice of locations and the choice of infrastructure providers and that they use intelligent procurement and contracting arrangements to ensure that competitive pricing and ongoing reliability considerations are given due account in the selection of successful providers.

As an alternative or compliment to grant funding of public charging infrastructure in future, government could consider approaches where HMG underwrites a minimum projected return from charging infrastructure investments. This might be used to support rapid DC charger investments, but may also include other AC investments (e.g. larger scale on-street charging or overnight 7kW hubs in urban car parks). This approach would remove or substantially reduce utilisation risk and thus make the charging infrastructure market far more attractive to private investments, allowing it to attract financing at a lower cost of capital – a benefit that would feed through into lower costs for consumers.

10. What can be learned from the different policy approaches taken in the devolved administrations for the EV charging market's development?

The main noteworthy difference in approach is the provision of public rapid charging infrastructure in Scotland – here the Scottish authorities have taken a much more strongly public sector led and planned approach to the provision of early rapid charging facilities. This is delivering some positive impacts with respect to provision and ease of use of the rapid charging network for Scottish EV owners. However the decision by ChargePlace Scotland to offer free or very low cost charging at many public sites, and to operate these under a single platform, inhibit the further entry of private investment into the Scottish public charging network, as it would be impossible for solely privately funded infrastructure owners and operators to offer charging rates which were competitive with those available at ChargePlace Scotland sites. We consider that ChargePlace Scotland should therefore move quickly to a more commercial model for the pricing of its electricity – as well as allowing other providers to participate in or link to aspects of the ChargePlace Scotland network without requiring use of a common platform. This would encourage more new entrants into the EV charging market in Scotland, expanding the range of options available to drivers.

Theme two: effective consumer interaction with the sector

1. *What challenges or difficulties related to chargepoints might act as a barrier to consumers switching from a conventionally fuelled passenger vehicle to an EV and how might these be overcome?*

For potential EV owners, the biggest concerns around EV charging most often relate to whether there will be sufficient public chargepoints available to them, especially to support longer journeys. Many such consumers have relatively low awareness of the existing scale of chargepoint provision and the rate at which it is expanding – in part because chargepoints are today often less visible than their petrol/diesel forecourt equivalents. Communication activity such as the Go Ultra Low campaigns can play a role in this area in promoting wider appreciation of the extent of the charging network which is already available.

As discussed in the previous questions the most challenging drivers to bring into EVs are those with no off-street parking who can't home charge and for whom workplace charging is not viable. Provision of a mix of significant charging infrastructure throughout the other segments (destination, on-street, en-route) are likely to resolve this challenge, though the mechanisms discussed above. Finally, MSA rapid charging is currently somewhat underdeveloped for all drivers. Addressing this challenge has been discussed earlier in this response.

2. *What are the key challenges for consumers already interacting with the sector and how might these change over time as the sector grows?*

For those that already own EVs, knowledge of the wide range of existing chargepoints is much greater. Increasingly chargepoint locations are available on car navigation systems and the majority of EV owners have also downloaded or have access to applications such as Zap-Map, or CPOs equivalents, which provide information on chargepoint locations. Many are also familiar with using several public charging networks.

Concerns around chargepoint reliability and ease of use continue to be raised. Both are improving, for example Pod Point has a dedicated Network Assurance team to ensure the network is reliable as well as a very easy to use system for its chargepoints, and the experience is improving. However, there is some specific concern over the reliability and downtime of charging infrastructure in key locations - in particular en-route charger reliability is critical for confidence in longer journeys.

Identifying suitable regulatory or policy interventions which would address the issue of public chargepoint reliability is not easy but measures to increase competition in the provision of public rapid charging would bring the greatest benefit, and over time competitive pressures and the phasing out of older technology should bring improvements in reliability.

Some commentary on the consumer experience of EV charging has also focussed on the variety of payment mechanisms, applications and pricing applying to different public EV charging locations

and services. In order to fully understand the market mechanics it is important to appreciate the difference between AC and DC charging.

DC charging is typically more akin to refueling a conventional car. Indeed all en-route chargers are DC and their usage often represents a “distress purchase”, without which drivers are unable to complete their journeys. The movement to contactless cards as an option for DC charging has proven hugely popular with drivers and resolved a lot of the concerns in the market around the complexity of charging. Different providers may often still see their apps used instead of contactless cards as this can avoid transaction fees, making the experience cheaper in some instances.

AC charging takes place at destinations, with longer dwell times, and the experience is much more comparable to paying for parking. In addition, the cost of adding contactless card readers (and the resultant transaction fees) would likely prove prohibitive for many applications. Instead a plurality of solutions are available, just as they are with parking. However, it is important that solutions are easy to use and pricing is clear.

With the increased adoption of pay-as-you-go options for public chargepoints we expect that the payment experience will continue to improve – not least because it is firmly in the interests of CPOs to ensure their systems are simple to use and popular. HMG should not seek to enforce disruptive measures in this area that undermine innovative business models in this early stage market, but instead seek to ensure there is a minimum level of accessibility (e.g. in line with the Alternative Fuels Infrastructure Regulations (AFIR))– and allow alternative app, voluntary interoperable partnerships, memberships or other services to remain as additional options which consumers can adopt for accessing wider benefits or billing services etc, as they see fit.

As noted in our discussion of the different charging segments, pricing of public electricity chargepoints will inevitably vary depending upon circumstances and the motivations of the chargepoint provider – and there are clear reasons why public rapid charging will be more expensive than most alternatives. Transparency of pricing is certainly important, though absolute uniformity (e.g. pence per kWh pricing in all circumstances) may not be optimal, e.g. a one-off fee to use public chargers may deter those who hardly need any charge occupying a charger overnight, as it would not make economic sense. Again, we encourage HMG to proceed with caution before mandating measures that may have unforeseen detrimental impacts

3. How do consumers decide which chargepoint services and providers to use? What information do consumers need to make this decision and at what stage in the decision-making process?

We commented on the different factors consumers use to decide which kind of home chargepoint to install in our response to Q2 of the Theme 1 questions.

With respect to public chargepoint services and providers, our experience is that consumers use a wide variety of information sources. These would include:

- The providers of chargepoints located closest to where they live or on the longer-distance routes that they regularly travel

- The providers of chargepoints at locations or destinations to which they regularly travel
- The EV that they drive (e.g. Tesla users tend naturally to use the Tesla charging network)
- Word of mouth and EV owner web forums and discussion groups
- Website information and marketing provided by chargepoint operators
- Online information available from websites or applications.
- Prices charged by different chargepoints

Most EV buyers will do some research on this prior to purchasing an electric vehicle but will continue to up-date and amend their public charging behaviour and preferences over time in line with the provision of chargepoints and new information available to them. No public CPOs operate with exclusivity in the sense that they in any way prevent EV owners joining other schemes or using other chargepoints – hence consumers ability to “shop around” for their public charging is limited only by the extent of provision of chargepoints and in some circumstances (particularly longer distance journeys) by the need to more urgently charge a vehicle to extend its range.

4. Can consumers easily understand and compare charging tariffs in this sector and what barriers, if any, do they face?

With respect to public charging, increasing amounts of easily accessible information are available for consumers to compare the cost of charging their electric vehicle. Websites and apps for different charging networks and aggregator resources provide readily accessible pricing information.

With respect to public rapid DC charging sites at over 50kW, pence per/ kWh charging prices for pay as you go/payment card purchases should be easily visible and available to EV drivers, in a similar way that petrol/diesel forecourts display their prices today in pence per/litre. Over time, as the EV market expands, we expect drivers to understand charging prices in pence per /kWh, particularly for DC charging, in the same way the general public is familiar with the prevailing price of petrol and diesel in pence per/ litre.

With respect to pricing information for home EV charging and supplier tariffs, as well as being available from suppliers own websites, these can be accessed at the government sponsored [Go Ultra Low website](#), and via a number of commercial websites. Price comparison is typically on the basis of p/kWh but alternative price comparison approaches could allow drivers to select their typical time of day charging patterns and be presented, for any given EV supply tariff, with costs expressed in terms of pence per mile, cost for a full charge or an annual bill based on assumed mileage. Further innovations in how to present pricing information to consumers are likely over time.

5. Do particular groups of consumers face additional challenges to interacting with the sector and if so, who and why? How might these be overcome?

Car owners without access to off-street dedicated EV charging are the category of consumers who are today most likely to be reticent in purchasing an EV. They are also more at risk of paying more

for their charging, particularly if they are to do the bulk of their charging at rapid charging locations. See our earlier comments on these sub-sectors of the EV charging market.

While charging infrastructure for more remote rural areas is quite frequently raised as a potential barrier, and may indeed need specific enhancement in some areas, it is relevant that the large majority of consumers in more rural locations do have access to home off-street EV charging, Improvements in the provision of rapid charging infrastructure would give additional confidence for these consumers in relation to longer journeys – see our earlier comments on the rapid charging sector.

6. Are there any technological developments or tools that could support consumers to navigate the sector, for example by helping to make more informed choices?

In our response to Q4 above we comment on the range of sources already providing extensive information to consumers on EV charging, both in public and home contexts.

With the continuing roll-out of smart meters, and wider ongoing regulatory reforms which will improve the commercial case for time-of-use tariffs, we expect a greater range of more sophisticated smart EV charging options to emerge in the market, allowing EV owners to easily select options which will automatically vary their EV charging in varied ways – e.g. to optimise price, support electricity system services or choose charging times linked to the lowest carbon intensity of electricity supply. Vehicle-2-Grid options where customers can resupply power to the network or support electricity system services will also be more widely adopted. Ultimately it will be for innovative businesses to develop the technical solutions that prove most valuable to drivers seeking to navigate the sector.

7. Are existing protections offered by consumer law and other measures (such as sector regulations) sufficient?

With respect to electricity supply tariffs tailored for home EV charging, these products and offers are already subject to the requirements of licensed electricity supply and associated regulatory oversight by Ofgem, in addition to the general provisions of consumer law.

EV charging at public locations is not regulated in the same way. HMG will shortly bring forward proposals to improve the consumer experience for public EV charging, drawing on powers it has taken in the 2018 Automated and Electric Vehicles Act. Assuming suitably designed and proportionate measures are implemented through this process, which ensure a level playing field between different providers of public charge-points, we consider these measures (alongside normal protections of consumer law, and powers of intervention held by competition authorities) are likely to be sufficient to ensure a thriving competitive sector which operates for the benefit of consumers.

8. What, if any, open data measures are needed to support consumer interaction, such as through the growth of comparison sites and apps?

As noted above, much and growing data is already available allowing consumers to easily compare tariffs and charging options. In relation to public charging, an ongoing government workstream called the Open Public Chargepoint Data (OPCD) project is considering issues around sharing of data. Issues raised by the sharing of private chargepoint data have yet to be discussed widely but would likely require careful consideration and raise some questions similar to that for other detailed home or workplace energy consumption data, including matters of data confidentiality.

An area where more open data is highly desirable relates to the state of charge and remaining capacity of batteries in electric vehicles. At present this data is owned and often protected by vehicle manufacturers – however non-discriminatory access to battery data including state of charge is needed if more smart and sophisticated EV charging solutions are to be developed for the benefit of EV owners, the electricity system and electricity consumers more generally. Flexibility services delivered through smart charging technologies will be essential to enable a cost-efficient energy system and to assist with the integration of very high shares of renewables in the energy mix in the near future.

9. What else is required to help ensure that the EV charging sector develops in a way that is responsive to consumer needs?

We have no further comments to make beyond those set out above in response to the previous questions.