

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?**
 - a. Paragraph 13a states that “around 80% of EV charging is done at home and it is anticipated that this will continue”
 - i. It must be noted that only 66.5% of dwellings in England have a garage or other off-street parking
 1. Source: *Table DA2202 (SST2.5): Parking and mains gas - areas, 2018*
 - ii. Indeed, paragraph 17 states “40-50% of homes across the UK do not have access to off-street parking”
 - iii. Under a fully mature EV parc, therefore, supplying 80% of miles travelled from home charging is not possible and ‘on-route’ charging hubs will need to play a more important role
 - b. In order for on route charging hubs to be effective, multiple high-powered chargers (and car batteries capable of taking that charge) will be required so that the customer re-fuelling experience more closely approximates that of petrol / diesel
 - i. A 150kW charger can provide c.100 miles in 10 minutes, and this charging technology is already readily available. 350kW charging for public vehicles (>200 miles in 10 minutes) is under development and could be rolled out as soon as 2021
 - ii. There has also been an observed increase in electric car batteries and battery charging speeds over time
 - c. However, in order to provide multiple high-powered chargers on-route, points of connection from the local DNO and transformers in excess of 1MVA are required
 - i. Notwithstanding the cost of transformers (c.£40k for 1.5MVA), points of connection are costly and can vary greatly around the country
 - d. This high capex could act as a barrier to entry and stifle competition without Government funding / subsidy
- 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)?**
 - a. Commenting on the on-route segment:
 - i. The capex required for high powered on route charging is significantly greater than for ‘at home’ or ‘destination’ charging (where charge speeds are low – c.7kW – and providers can utilise existing infrastructure)
 1. As such, investment is currently limited to a small number of large multinational corporations (most notably Shell, BP, Tesla)
- 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?**
 - a. As per the Prime Minister’s 10-point plan, funding of £1.3bn has been announced for EV charging in “homes, streets, and on motorways”
 - i. This will help new market entrants and increase competition in these segments
 - b. However, this does not provide for funding in other key charging segments – most notably high-powered charging hubs in city centres and on A-roads
 - i. Dedicated funding for rapid EV charging hubs in urban locations and A-roads would result in an increased consumer offering and would help keep

consumer pricing fair not only within that segment, but also across other segments

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

- a. Not considering the 'at home' segment, the main barrier to entry across all other segments for EV charging providers is the capex required to build the infrastructure
 - i. A particular challenge can be securing points of connection at reasonable costs
 - ii. The capex required is directly correlated to the speed of charge provided, which in turn is directly correlated to customer convenience
- b. As per point 3b (above), the National Infrastructure Strategy issued in November 2020 provides support for motorways (£950m dedicated to future proofing grid capacity) and local EV charging infrastructure (£90m to support the roll-out of on-street charging schemes)
 - i. In order to create a more level playing field with more market entrants it may be beneficial to provide support for on-route charging in urban areas and A-roads
- c. Additionally, and particular to the 'destination' and 'on-route' segments, local planning regulations can obstruct the development of EV charging hubs
 - i. Maximum Parking Standards: EV bays occasionally considered to count towards the maximum allowable on-site parking provision, which is therefore exceeded
 - 1. This is a serious barrier to building high powered EV charging hubs in urban locations.
 - ii. Biodiversity Net Gain: Local planning authorities rejecting EV charging hub planning applications on the basis they do not immediately improve the local bio-diversity
 - 1. Biodiversity net gain requirements seem short-sighted in light of the Government's broader environmental agenda

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?

- a. Overview of current chargepoint landscape:
 - i. c.140,000 home charging points (equivalent to 36% of all EVs)
 - ii. c.9,000 work charging points (equivalent to c.2% of all EVs)
 - iii. c.20,000 publicly available EV chargepoints (equivalent to 1 charger per 20 vehicles)
- b. On points 5a i & ii, Government requires all new residential buildings with an associated car space to have a chargepoint, and requires new non-residential buildings to have one charge point per 5 parking spaces
 - i. While this will help the uptake of EVs, it will not have a huge impact on the overall percentages above given the size of the existing residential / non-residential building stock
 - ii. These chargers also do not help to overcome range anxiety
- c. Publicly available chargepoints will be key to meet future demand as they provide a charging opportunity to consumers who cannot charge at home / work as well as play a critical role in addressing range anxiety for those who can. However, the key to effective deployment is not simply in number of chargers, but in the location and power capacity of those chargers

- i. By way of example: Of the c.20,000 EV chargepoints available in the UK, only c.3,500 of those are 'rapid' (50kW DC +). There are even fewer 150kW+ chargers in the UK and only 10 sites within the M25 have publicly available 150kW+ chargers
 - ii. The combination of charge speed and location is crucial and promoting the deployment of high powered chargers in urban locations will help future proof supply

- 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?**
 - a. Due to the lower capex requirements for 'at home', destination' and low powered 'on-route' charging (50kW and under), there is already significant private investment in these markets given the speed at which that investment can be paid back
 - b. However, current pre-tax pay-back periods for high powered (150kW) EV charging hubs is c.8 years.
 - i. As such, private investment in these chargers has been concentrated in only a few large corporations (as above)
 - ii. In order to meet future demand, the investment economics for high powered charging hubs need to improve

- 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?**
 - a. Subsidy helps improve investment pay back periods (as per point 6b)
 - b. Funding is earmarked for motorways and local authorities. There do not appear to be any provisions for rapid EV charging hubs outside these locations

- 8. What is required in order to ensure that rural / remote communities and those without off-street parking are well served by charging infrastructure?**
 - a. In rural areas, c.85% of dwellings have access to private garages or other off-street parking
 - i. It is expected that the majority of charging will therefore take place at home but there will need to be good 'on-route' charging availability to reduce range anxiety
 - b. In city and urban areas, under 38% of dwellings have access to private garages or other off-street parking
 - i. As such, these consumers need good access to the other EV charging segments – 'at work', 'destination' and 'on-route'

- 9. What role should local authorities play to help deliver EV charging in a way that promotes competition? What support would they need?**
 - a. -

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

Theme two: effective consumer interaction with the sector 47 Including on whether the CMA should make a market investigation reference under section 131 of the Act. 18

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?**
 - a. Key barrier to consumers switching: Lack of high-powered charge points 'on-route', resulting in 'range anxiety'
 - i. Regardless of whether a consumer charges at home or at destination, a significant increase in the number of high powered (150kW+) chargers is required to ensure consumers a.) have the confidence they can complete their journey, b.) have the ability to fuel their vehicle if they do not have access to at-home charging, and c.) are able to charge their vehicles in a time efficient manner (150kW chargers supply roughly 100 miles in 10 minutes).
 - b. This is overcome through investment in the 'on-route' charging segment
 - i. Specifically, in order to supply more than 2 bays of high powered chargers a charge point operator must request a point of connection from the local DNO
 1. This can be costly and vary dramatically depending on location
 - ii. Government can help to ensure that the high capex required does not deter private investment by helping fund these points of connection
2. **What are the key challenges for consumers already interacting with the sector and how might these change over time as the sector grows?**
 - a. The key challenge is to promote 'interoperability' between charge point operators
 - i. Typically, each charge point operator's network is accompanied by an app, detailing the location and characteristics of charge points on that network. Currently, those apps are 'closed', meaning consumers need to download multiple apps in order to have appropriate network coverage
 - ii. As new entrants come on the market, this problem may be exacerbated
 - b. Charge point reliability is also a key challenge
 - i. This requires stable electricity supply and distribution
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?**
 - a. Decision factors:
 - i. Convenience of location
 - ii. Availability of chargers
 - iii. Speed of chargers
 - iv. Connector types
 - v. Other on-site amenities
 - b. All the above can be gathered through charge point operators own apps or websites, or through aggregators such as zap-map
 - i. Ideally, this information would be made available through the in-car dash
 1. This would require vehicle OEMs to integrate with charge point operators
4. **Can consumers easily understand and compare charging tariffs in this sector and what barriers, if any, do they face?**
 - a. Tariffs are mostly focused around a simple flat cost per kWh electricity dispensed, which is easily understandable and comparable

- b. As the market matures it is expected that pricing may be more dynamic, though that is no different to current petrol / diesel pricing market
- 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?**
 - a. A low level willingness to engage in 'tech' is required
 - i. Charge point discovery is typically through mobile devices, while payment is either through mobile or contactless
- 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?**
 - a. Interoperability has been increased as chargepoints are now required to accept contactless payments (rather than relying on payment through an app)
 - b. Real time data aggregation (as per point 3b) is also vital
- 7. Are existing protections offered by consumer law and other measures (such as sector regulations) sufficient?**
 - a. -
- 8. What, if any, open data measures are needed to support consumer interaction, such as through the growth of comparison sites and apps?**
 - a. See Qu.6
- 9. What else is required to help ensure that the EV charging sector develops in a way that is responsive to consumer needs?**
 - a. -