Department for Transport Consultation: Electric Vehicle Smart Charging

Centrica plc
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About Centrica

- We are an international energy and services company focused on satisfying the changing needs of our customers.
- We serve our 25 million customer accounts across our businesses through strong brands with distinctive capabilities which include British Gas in the UK, Bord Gáis Energy in the Republic of Ireland and Direct Energy in North America.
- Our business strategy is designed around five offers; energy supply, wholesale energy, energy insight, energy optimisation and energy solutions.
- Our investment has shifted towards our customer-facing businesses, with our areas of focus being Energy Supply & Services, Centrica Home Solutions, Centrica Business Solutions, UK Business, Energy Marketing & Trading (EM&T) and the optimisation of our Central Power Generation.
- This shift towards the customer puts an emphasis on helping our customers transition to a lower carbon future. We will help shape a low carbon future enabling our customers, the energy system and our business to use energy more sustainably.
- Our experience in EV enablement began with early entrant OEMs (e.g. Nissan/Renault/Tesla) supporting the home and dealership charging infrastructure for the first models in 2012.
- We continue to work with OEMs to deliver a dedicated home charging installation service and EV tariffs. Centrica is uniquely positioned to help customers at home and in business to make the shift to electric vehicles, harnessing the power of our global network of over 13,000 technicians and engineers to deliver solutions that are simpler, faster and more affordable for consumers.
- We provide market-leading products and services that give homes and businesses greater choice, control and understanding over their energy. Centrica Home Solutions is the leading provider of smart thermostats in the UK, with around 1.5m sold to date, while we plan to have invested around £700m in new customer-focused technologies and capabilities in Centrica Business Solutions by the end of the decade.
- Our work with EV enablement spans beyond the car and into home energy management solutions, further support the transition to a low carbon future.

Executive Summary

- As the electrification of transport continues, the demand for electricity is set to increase. If the Government's transport aspirations are met, then by 2040 there will be 34 million electric cars on the road requiring about 60TWh of electricity per year, according to National Grid's Future Energy Scenarios[1]. The least cost means of managing this demand is increasing the flexibility of the energy system. EVs will be a key part of contributing to and managing the load especially as smart charging will be an integral part of the system[2]. Analysis by Imperial College London with the Carbon Trust for Government suggested the UK could save £17-40bn across the electricity system from now to 2050 by deploying flexibility technologies. The net benefits (after costs) are predicted to be in the range of £1.4 to £2.4bn per year by 2030. The delivery of flexibility markets by 2023 and the integration of EV chargers into the energy system to provide system flexibility is crucial.
- We agree there is a need for regulation to deliver minimum standards for smart charging infrastructure. This should ensure that the energy system can develop in a flexible manner, where consumers can participate and benefit whilst supporting the development of enabling technologies.
- We agree that charge points should be smart; and that these smart charge points should meet device-level requirements, including for cyber security and interoperability. The key will be to strike the balance between setting standards and foreclosing on innovation.
- However, we do not agree that public charge points should be excluded from smart standards and meeting minimum requirements. Public charge points form an integral part of increasing EV adoption rates given that around 40% of households do not have access to off-street parking and therefore home charge points, so public charge points will play a significant role. Both public and private charge points should be smart to deliver consistency across the energy system and the ability to optimise all charging demand.
- We understand the rationale that non-public charge points are where consumers are likely to be parked for prolonged periods and thus there is a greater opportunity for smart charging. However, this is not a reason to exclude public charge points from meeting smart standards, especially as many on road charge points may be used overnight by those without off-street parking. HMG risk creating a two-tier system and the potential for loop-holes (including abandoned/stranded legacy assets), which could damage competitiveness and consumer convenience in the charge point sector. For example, the ability for a customer to be billed once for use across both public and private charge points would be positive for consumer experience and thus uptake.
- In terms of implementing a long-term approach to smart charging by 2025, a clear direction would be welcomed. However, this should not be at the expense of innovation opportunities. New electric and plug-in hybrid electric vehicle sales are less than 3% of total new car sales year to date in 2019[3], reflecting the early stages of the transition. Therefore, a principles-based approach rather than regulated approach would be helpful at this stage.
- Within the time frame given of 2020-2022 for a decision on the long-term solution for smart charging, we would opt for the latest date of 2022. However, we believe 2020-22 is too early to take a decision on a long-term solution. More consideration and further impact

[1] National Grid Future Energy Scenarios, July 2018, pg.72
[2] National Grid Future Energy Scenarios, July 2018, pg.72
[3] EV & AFV Registrations YTD September 2019

assessments are needed to understand if this timeframe is appropriate. We also believe that the desire for a target should not take priority over delivering the right outcome.

- We agree with the objectives of grid protection, consumer protection and consumer uptake and we make the following observations:

Grid protection

- While we agree with the security concerns around the potential large loads from EV charge points, a 10-minute delay function would disrupt vehicles participating in demand response through an aggregator and should be given an exemption.
- We understand the desire for a default off-peak charging setting and defining off-peak for simplicity, however this would risk creating a new demand peak. Furthermore, within a flexible and dynamic system, the off-peak time would change depending upon demand. We therefore believe encouraging consumer participation based on price signals is preferable.
- The long-term impacts of mass electrification of homes through use of EV chargers and potentially heat pumps need to be considered. Steps such as introducing local flexibility markets to enable balancing services to be monetised, will be key to ensuring demand side response can be used, rather than building new capacity.

Consumer protection

- We agree that consumers and businesses should be able to switch charging operator easily and believe a movement to open protocols would support this.
- In the mid-term, as energy services will likely become bundled as part "home energy management" or "energy as a service, EV charging infrastructure could be part of a service, alongside high-capital products such solar panels, battery and heat pumps. Supporting this decarbonisation strategy requires innovation in these costly asset financing solutions. Government will need to accommodate the consumer's ability to switch provider, with the potential impact of new commercial arrangements for the installation, and potential maintenance of these types of products, which may entail fixed-term contracts.
- Whilst we see the attraction of smart meters as an immediate option to integrate EV chargers into the energy system, we believe it is too early to mandate the use of smart meters. Further innovation needs to be enabled within the market at this early stage. Instead, we should encourage smart meters to develop in a way that allows their integration with smart chargers, which would allow the market to continue to develop and find alternative solutions.
- As the market continues to develop and more installations occur, it will be important to ensure the safety of users of EV chargers, be those in public spaces, workplaces or at home. Therefore, we support oversight by the Office for Product Safety and Standards.
- In addition, we believe that all installations need to be safety compliant. A voluntary certification scheme to ensure installations and installer meet required standards would help with this.

Consumer uptake

- To encourage consumer uptake, experience and convenience is critical. Therefore, it will be important for management of charging to sit with suppliers or other competitive energy service providers and not DNOs. We do not agree with "DNO Managed charging", that is DNOs directly modulating EV charging, as it poses a number of risks: (i) consumer confidence as the DNO's do not manage customer relationships, (ii) undermining flexibility markets as

DNOs would have access to a "free" option that could be used, rather than having to buy flexibility from the market. In this second scenario, the customer is not receiving the benefit for a service and flexibility markets would also be undermined.

- Consumers and businesses will need to benefit from participation in EV smart charging, therefore HMG must ensure that the market is enabled to find the best way to incentivise consumers. For example, TRL[4] research showed that managed charging has a trust barrier for uptake but once overcome customers like these types of tariffs. The Electric Nation study[5] showed demand management is technically feasible and acceptable to the majority of trial participants.
- Increasing the public's understanding of EV charging speeds and the advertised charge speed of a vehicle should be considered to increase consumer confidence in vehicles.
- Customers also need to understand the impact they have on the grid. There is a need to build an understanding of the case for managed charging in terms of direct and indirect (societal) consumer benefits.
- There is a need to build on the case for open protocols. Given that EVs and charge points are global businesses, we should not create an isolated UK market place. Europe, for example, is moving towards implementing open protocols.

Questions

Chapter 1 - Introduction and objectives

1. **Do you agree with the Government's proposed aim (to maximise the use of smart charging technologies)?**
   Yes. Ensuring that smart charging technology can communicate with the energy system will enable greater flexibility. Enabling the move towards technology in the market that is able to support smart charging and time of use (ToU) propositions will be key. It will also help to clarify customer choice on charge points, with one less decision to make, especially for those less knowledgeable consumers or those whom may make decisions based upon cost.

   EV smart charging should contribute to facilitating a smarter and greener grid, reducing the need for expensive grid re-enforcement and encouraging innovation to drive product development with cost savings for customers.

   Smart charging should enable better consumer choice through quicker switching of EV charger operators should the consumer wish. Smart charging should also enable the consumer to choose and pay for different speeds of charge, which should support consumer participation.

2. **Do you agree with the proposed Grid Protection objective?**
   Yes. We agree grid protection is important in a more connected world. Security and protection are critical for the continued success of EV adoption.

   Anecdotal evidence on innovation projects undertaken to date shows that smart charging managed by an energy supplier or similar is acceptable to users of EVs. For

[4] TRL is a global centre for innovation in transport and mobility
[5] Electric Nation "Your Electric Vehicles Your Smart Charge"

example, TRL[6] research showed that managed charging has a trust barrier for uptake but once overcome customers like these types of tariffs. The Electric Nation study[7] showed demand management is technically feasible, and acceptable to the majority of trial participants.

We believe that DNOs should never be responsible for load management at an individual consumer level. Instead, Government should ensure that innovators can develop offerings that allow consumers to choose to participate in smart charging.

Whilst we agree with ensuring EV chargers are smart and connected, further consideration should be given to standards for other connected devices. As more appliances are becoming smart as part of a move towards home energy management, their connection to, and interaction with the system will also be important, as we move along the journey of ever-increasing connectivity.

3. **Do you agree with the proposed Consumer Protection objective?**
Yes. Consumers should be able to switch between energy suppliers and charge point operators. The market should be given time to develop a solution, which could be smart or could be a combination of existing options with further development.

We also need to consider that EVs and charge points are global businesses and we should not create an isolated UK market place. Europe, for example is moving towards implementing open protocols. In the UK, we should therefore consider the same to ensure we do not become isolated, especially in the context of Brexit. Currently, the UK as a market is not prioritised for supply of EVs, further misalignment with other major markets could further exacerbate this.

Consumer safety is also of paramount importance, especially ensuring that installers and installations alike are certified.

4. **Do you agree with the proposed Consumer Uptake objective?**
Yes. Consumers should be at the heart of future development. By encouraging consumers to use smart charging this should reduce grid re-enforcement costs and contribute to carbon reduction.

In turn, the benefits of lower costs should be seen indirectly through reduced utility levies but also directly by allowing them access to products and services, which can reduce the cost of their charging through time of use (ToU) or supplier managed charging incentives.

To encourage consumer uptake, experience and convenience is critical. Therefore, it will be important for management of charging to sit with suppliers or other competitive energy service providers and not DNOs. We do not agree with “DNO Managed charging”, that is DNOs directly modulating EV charging, as it poses a number of risks: (i)

[6] TRL is a global centre for innovation in transport and mobility
[7] Electric Nation “Your Electric Vehicles Your Smart Charge”

consumer confidence as the DNO's do not manage customer relationships. (ii) undermining flexibility markets as DNOs would have access to a "free" option that could be used rather than having to buy flexibility from the market. In this scenario the customer is not receiving the benefit for a service and flexibility markets would also be undermined.

Consumers, whilst keen to engage on the new technology associated with EVs, ultimately need products and services which are convenient, easy to use and provide them with value. Accessibility of products to all customer segments will also mean that affordability is key to drive uptake for the 2040 target.

5. **Do you agree with the proposed Innovation objective?**
   Yes. The market place must be given time to innovate and Government should avoid picking a solution before it is needed.

6. **Please provide reasons why you agree or disagree with the above aim and objectives, including any objectives that you think should be added or removed.**
   See questions 1-5

7. **Do you agree with the proposal to have a phased approach?**
   Yes. A phased approach seems sensible given where the industry is today. More time and analysis is needed to get Phase 2 right and avoid unintended consequences. More direction is required from BEIS and Ofgem to support the transition to electric vehicles. We note the progress to date of the Smart Systems and Flexibility Plan in transitioning to a smarter grid, which would make EV take up easier, however we believe there is still more that needs to be done.

   An agreed and managed approach, overseen by HMG with key stakeholders particularly across the energy and car industries will be critical to success. A key issue is the lack of supply of vehicles into the UK. Supply of these vehicles and purchase of vehicles by customers is needed to support immediate returns on investment and avoid stranded assets.

8. **Please provide reasons why you agree or disagree, including supporting evidence or analysis, and suggesting any alternative approaches**
   See question 7

Chapter 2 - Phase One: Using the AEV Act powers to develop device-level requirements

9. **Do you agree that the smart regulations should apply to charge points, and to charging cables which contain a smart charging-enabling device?**
   Yes.

10. **Please give reasons, including any supporting evidence or analysis, for your answer.**
    We agree these smart regulations should apply to charge points and cables with smart enabling devices. This helps form a standard and allows for updates and improvements to be enabled via regulation changes and updates. We are supportive of technology that supports resilience, flexibility and additional customer services.

11. **Do you agree that the regulations should require that all new charge points except for public charge points (as defined in the AEV Act) are smart?**
No. Regulations should apply to all new charge points, both public and private.

Given that around 40% of households do not have access to off-street parking and therefore home charge points, public charge points will play an important role. In the case of on-street charge points they will also likely have higher dwell times, like private home charge point. Under this definition on-street charge points would be exempt from being smart.

All charge points should meet the same smart standards to enable consistency across the energy system and the ability to optimise all charging demand.

We understand the rationale that non-public charge points are where consumers are likely to be parked for prolonged periods and thus there is a greater opportunity for smart charging. However, this is not a reason to exclude public charge points from meeting smart standards, especially as many on road charge points may be used overnight by those without off-street parking. HMG risk creating a two-tier system and the potential for loop-holes (including abandoned/stranded legacy assets), which could damage competitiveness and consumer convenience in the charge point sector.

If all charge points are smart, this should also enable convenient offers, such as the ability to have roaming tariffs for customers who can charge at home or in public and it all be charged back to their home energy bill, thereby improving the customer experience and supporting consumer uptake objective.

Exemptions could be considered but there would need to be proof that these charge points could never contribute to balancing the energy system nor provide convenience offers to the consumer, as per our earlier example.

12. **Please give reasons for your answer, including explanations of any other types of charge points that you think should or shouldn't be smart and evidence for any exemptions needed.**
See question 11.

13. **Do you agree that public charge points that are smart should comply with the relevant elements of the regulations?**
Yes**.** See question 11.

14. **Please give reasons for your answer, including identifying which of the proposed regulations should or shouldn't apply to public charge points.**
See question 11.

In addition, proposed regulations should apply to new public charge points, except, if a driver has plugged into and is paying for a public charge that is already in action. Regulations must ensure the load they are using is secured from the grid and it is not managed down. If load needs to be managed, a lower maximum charge option should be offered to a subsequent driver. This could be a mechanism to temporarily reduce

overall grid load. We know access to charging is one limiting factor to the adoption of EVs, therefore, convenience and accessibility to charging will be key. Convenience for the customer will mean seamless public and private charging with the ability to link home and public tariffs, as just on example. In addition, we need to ensure that the tariff/charging rate is not disadvantaged in the public domain to ensure equity across society, especially for those without access to private charging.

15. **Do you agree that a smart charge point should be defined as being communications enabled and able to respond automatically to remote signals by adjusting the electricity consumption flowing through the charge point?**
    Yes. This can be operator led or customer led adjustment of energy. For example, a customer (driver) should be able to select the speed of charge, which would have varied costs associated with it.

16. **If not, how should it be defined instead?**
    N/A

17. **Do you agree with our approach of having both outcome-based security requirements alongside technical security characteristics from the BSI standard or a proven equivalent?**
    Yes, in principle.

    However, it will be important for industry to gain clarity on the details of the BSI standards as soon as possible before we can support them.

18. **Please give reasons for your answer.**
    The outcome-based security points are valid, but also referencing one, or more standards will allow a catch-all for other requirements.

19. **Do you agree with the proposed list of outcome-based security requirements?**
    Yes – These are a good starting point but may need expansion as the market develops.

20. **Please give reasons for your answer, including any other requirements you think are necessary.**
    We would like to see reference to systems that the charge points connect into on the provider side. In addition, the following outcomes should be considered:
    • Detection when protection measures fail or are bypassed
    • Compliance with regulatory/legislative requirements, such as GDPR and PCI
    • Alignment with Internet of Things (IoT) security principles e.g. Secure boot.

21. **Do you agree with the proposal that charge points should undergo mandated security testing and assurance before they are installed or sold?**
    Yes.

22. **Please give reasons for your answer.**
    Mandated security testing would ensure that there is a baseline for all devices and would encourage security to be built from the onset of the development life cycle.

There should be a drive from vendors to implement technology at a low cost, which would promote application security vulnerabilities.

A defined security testing accreditation would ensure that security is implemented consistently and vendors following good security practise are not penalised. We support the NCSC run Commercial Product Assurance (CPA) scheme that is used for smart metering.

In addition, these are large-draw devices that are connecting into the grid and other IoT devices. As rightly identified in the consultation there is the potential for mass connects/disconnects, which could destabilise the grid. The consultation addresses this for EV chargers, however this needs to be considered for all IoT devices as a lack of security controls is a major issue at present. We understand that EV charging is a starting point and support further work for other appliances.

23. **[For charge point companies only] Which of these outcome-based security requirements do you already comply with? Please explain how you meet them.**

    N/A

24. **Do you think any other data privacy requirements are needed either from these regulations or from other methods?**
    No view

25. **Do you agree with the proposed requirement that the charge point is capable of retaining smart functionality if the charge point operator is changed without the need for a visit to the premises?**

    Yes. We should take learnings from the roll out of smart metering and ensure hardware is smart and enables smart report, management and remote switching of supplier or operator at customer request. Smart functionality must be retained, even if the Charge Point Operator (CPO) goes out of business. Open Protocols for interoperability would assist in this particular challenge.

    We believe it is essential for all charge points to retain smart functionality and in particular have the ability for the charge point operator to be changed. This would prevent the stranding of assets we have witnessed where this is not the case.

    However, regarding the ability to complete this change without visiting the premises, there are practical reasons why this may not currently be feasible.

    Many charge points utilise the Global System for Mobile Communications (GSM) to connect to the cloud and in-turn enable smart functionality, in addition cyber security is typically provided using virtual private networks (VPN).

    Generally, the costs and administration of these items is borne by the charge point operator and included in any service provision offered to the customer. To change service provider these GSM and VPN settings must be physically configured within the charger / sim card which would inevitably lead to a visit to the premises to facilitate the

change. In addition, when adopting existing charge points many charge point operators may be minded to carry out a physical safety and condition inspection of the asset at point of adoption, so the cost would at worst be marginal.

In addition to this, to protect against impacts from any loss of communication of devices, it will be important to have processes and measures to identify and rectify any noncommunicating charge points.

26. **If not then please give reasons for your answer.**
N/A

27. **Do you agree that compliance with interoperability requirements of a BSI standard, combined with a certification and assurance regime, could help ensure interoperability?**
Yes.

Requiring a BSI standard and certification would ensure devices are actually interoperable and support consumer confidence.

In addition, a centrally managed audit process for product claims, advertising standards, operating capabilities, safety and compliance for the hardware needs to enforced. Certification and random checks on installation also need to be implemented; ensuring training is available to enable this will be very important.

28. **If not then please give reasons for your answer.**
N/A

29. **Do you agree that the regulations should include a requirement for a randomised delay function?**
In general, yes for grid stability, but an override or exemption mechanism will be needed.

There is a possible implication on consumer experience and therefore for the consumer uptake objectives if the consumer's ability to obtain charge immediately in urgent situations is impeded. Therefore, considerations of provisions for a physical override function are needed. In addition, there would need to be controls over how long the delay is and how frequently is could occur.

Finally, it should be noted that randomised delay may not be appropriate for those offering ancillary services or other demand response where the response needs to be immediate.

30. **Do you agree that a randomised delay function for smart EV charge points should have a maximum delay of 10 minutes?**
We agree a randomised delay would help to avoid potential scenarios where security systems were breached and, for example, all charge points were switched on at once. In this scenario, a relatively short delay, potentially less than 5 mins, should be sufficient to enable the system to flag a simultaneous switch on of all chargers. This could then be

investigated/ overridden rather than as a default randomly lagging customers' charging by 10 minutes.

31. **Please give reasons for your answer, including evidence for any impacts on benefits to consumers and any suggested exemptions.**
As above, a 10-minute delay on some chargers maybe longer than the actual expected charge time itself, it could also affect the ability to monetise demand shifting.

There must be exemptions for vehicles participating in demand response through an aggregator, as a delay would damage the ability to monetise demand response.

32. **What other methods could achieve the same outcome of ensuring electricity system stability in response to numerous charge points turning on or off at the same time?**
Another method could involve predictive technology that analyses when grid instability may occur and therefore would reduce available charging power to chargers not in use. This would then ensure that prior to plugging in, the driver would be aware of the charge that could be delivered. Therefore, having the ability to initiate and wait the longer time or not.

The concept, if introduced, should be widened to other connected electrical devices and not just implemented in the EV charger network to ensure a level and fair approach, i.e. enabling large reductions in demand through small reductions in supply to a large cohort of appliances.

33. **Do you agree that the regulations should include a requirement for a minimum charging current (or power)?**
The minimum recommended installation for a domestic property is a 16A 3.6kW charge point, which is a sufficient minimum, providing the ability for 6-10 hours of overnight charging. Any lower charging power would make it hard to deliver any meaningful charge into the battery over a reasonable time frame. A longer charge time then makes planning charging within certain energy tariff bands more difficult.

Although we think it's preferable to install 7kW chargers, some homes may only be able to take a 3.6kW charger without significant electrical work being undertaken, so in the interests of maximum accessibility we agree with the 3.6 kW minimum.

It may also be worth considering different minimum recommendations for different situations. For example, a 7kW minimum for new build homes as there is the flexibility to build sufficient capacity upfront. In the case of public charging, a higher minimum of 22kW could be considered to reduce dwell time.

Any minimum requirements may need to be periodically reviews as battery sizes and charging technology advances.

34. **If so, please provide suggestions for an appropriate minimum amount of current or power.**
See question 33.

35. **How else do you think this issue could be addressed?**
Longer-term addressing increased power demands need to be considered. For example, in new builds, which from 2025 may also have additional electric heating and transport loads attached to the homes.

A broader issue relates to the direction of travel with competing technologies. We are moving to a place where there will likely be smart chargers, smart cables and smart cars but an unclear protocol on which one should override which. It will be imperative for OLEV to coordinate and bring together the wide-ranging sectors of the market to ensure solutions are developed and to mitigate any risks of poor customer experience that could damage the objective consumer uptake.

36. **Do you agree that the regulations should include a requirement for a default off-peak charging mode?**
No. By regulating/mandating Time of Use (ToU) and off-peak charging modes you limit future innovation and also customer choice. Product innovation should have the flexibility to continue to develop as technology and customer needs evolve.

Defaulting to off-peak, risks creation of a new peak at midnight when the regulation switches all charge points on for overnight charging, as seen in the WPD Electric Nation research. The further problem with a default is defining what off-peak is. If the chargers all turn on at 11pm, then a new peak is created. It would be better to incentivise through ToU tariffs.

Finally, default modes do not deal with the underlying issue of consumer participation. In fact, it could damage participating as consumers may believe they are automatically receiving the highest benefit without interaction.

37. **Alternatively, would it be better for the regulations to require reduced peak charging by default?**
No. See question 36.

38. **Please give reasons for your answers, including your consideration relating to a combination of the two options.**
See question 36.

39. **What time should be the specified off-peak period?**
In a flexible future, off-peak will likely move dependent upon demand and supply. To define it would create an artificial reflection of the market, which in turn would reduce the ability of companies to innovate. For example, using demand response capability to generate additional revenues to reduce the cost of energy for customers**.**

40. **Do you agree that charge points under these Regulations should be required to be safe, with due regard to the existing safety framework?**
There are existing clear regulations in place. However, we believe the challenge is ensuring consistency in their use by installers. We believe there needs to be a focus on safety on the following key areas:
    - Earthing
    - Simultaneous contact

- Buried services (ground survey to identify)
- Strike risk
- Installation of new wires correctly and at sufficient depth
- Surge protection risk assessments and RCD

It should be noted that not all chargers have RCDs. This is particularly an issue in the replacement of chargers. For example, if the initial charger installed had an RCD and therefore the rest of the install did not need the eRCD. However, if the new charger has no RCD inside then this would need to be recognised and an RCD needs to be installed in line in the system somewhere. This is an important safety concern.

As previously mentioned, we support a centrally managed audit process for product claims, advertising standards, operating capabilities. Safety and compliance for the hardware also needs to be enforced, as well as certification and random checks on installation quality.

41. **Please give reasons for your answer.**
See question 40.

42. **Do you think any other safety requirements should be included in these Regulations?**
Yes. A separate accreditation scheme for installing chargers could be considered. A similar scheme was introduced for solar installation called the Micro Generation Certification scheme. An accreditation would be an addition to regulations and would assist a base level of standard to the installation. This could include a data base of where the chargers were installed for traceability purposes. A registration scheme can help track faulty installs to identify if any particular installing entity is performing sub-standard.

43. **Please give reasons for your answer.**
See question 42.

44. **Are you aware of any important safety factors that are not being sufficiently considered in relation to EV charging?**
We believe that it would be advantageous to ensure there are regular safety inspections of chargers, similar to the annual boiler safety checks that are mandated for landlord properties. For owner occupied properties, this could be an annual voluntary recommendation but for semi-public e.g. work places or tenanted properties, this should by mandatory. Safety checks should be introduced for public chargers as well. In addition to this, the separate charging cable a driver carries in the vehicle should have a periodical safety check (e.g. at service or during MOT).

45. **Do you agree that any smart charging regulations should provide adequate space for V2G solutions and other advanced smart charging, such as flexibility and balancing services, to develop?**
It is important that innovation in this area is not adversely impacted. There is a risk that if the regulations are applied too rigidly, this would prevent the use of EVs for flexibility and balancing services.

46. **Do you believe that smart charging regulations should include specific requirements for V2G solutions and other advanced smart charging, such as flexibility and balancing services, to develop?**
Until V2G develops more fully it is difficult to be clear on impacts. It is potentially too early to specify requirements. If V2G is to be included in regulation, it may be worth considering an override for V2G to enable these services to develop.

47. **Please provide reasoning for your answer, including reference to any consultation proposals that could potentially conflict with V2G or other smart charging services and suggest any specific requirements.**
See questions 45 and 46.

48. **Do you agree that these regulations should include a requirement to monitor and record electricity consumed and/or exported, and that this information should be available for the consumer to view?**
Yes. Customers should have the ability to access information regarding their electricity consumption, to create consistency with their ability to monitor consumption for their home. This information should be accessible for the customer to review at their discretion.

    Data accessibility for the utilities will also help to build a more accurate personal projection calculation for consumers. In addition, making the data available will help drive innovation through the ability to analyse anonymised trends, which could also be used to support GHG trading. There would of course need to be careful consideration of GDPR implications and the data burden on utilities. There will be a cost implication with additional data requirements, which could require additional systems and even hardware depending on how the information is made available to the consumer.

49. **Please give reasons for your answer and specify what format should be required for the consumer to view the information.**
See question 48.

50. **Do you agree that the Office for Product Safety and Standards should be the enforcement authority for the regulations?**
Yes.

51. **Please give reasons for your answer.**
We support this body as it was created to reinforce the UKs product safety systems and provide customer confidence. However, there is a complication as the installation of products like EV chargers would normally fall under the jurisdiction of the building regulations (or building standards). Enforcement of these standards fall under the local authority building control and the various electrical competence scheme administrators. This current process therefore needs to be considered.

52. **Do you agree that the penalty for non-compliance should be a fine for each non-compliant charge point sold or installed?**
Yes, to ensure consumer safety. Fines are a good way to drive compliance, provided they are proportionate and meaningful.

53. **Please give reasons for your answer.**
    See question 52

54. **How long should sellers or installers have to comply with the requirements once the final version has been published?**
    Twelve months is a good aim, to reduce the number of non-compliant devices in market. However, the time should be determined and enforced from the point at which the BSI standards are agreed. Given there is no clarity on the BSI standards it is difficult to understand the time that would be needed to implement them.

55. **Please give reasons for your answer.**
    See question 54.

56. **[For charge point companies only] What would the impact be on your business**
    N/A

57. **[For charge point companies only] Subject to passing the testing schemes for security and interoperability, are any of your charge points likely to comply with these requirements either currently or with minor modifications?**
    N/A

58. **Are there any suggested requirements that you think could disadvantage people with particular protected characteristics, as defined by the Equality Act 2010, or could otherwise cause equality issues? Please explain any issues and any potential solutions.**
    Yes. BSI standards should ensure that smart charge points can be utilised by all. For example, randomised delays to charging of managed charging may not be acceptable in households with disabilities or vulnerable customers who need access to their car at all times, in case of emergency.

59. **Do you think we should have specific energy efficiency requirements for charge points?**
    Yes.

60. **Please give reasons for your answer, including suggestions for any specific requirements.**
    Energy efficiency is a key component of meting net zero and should therefore apply to all appliances.

61. **How will different parties be affected by the proposed measures outlined in the first two chapters of this consultation? For your answer, please consider consumers, charge point manufacturers, DNOs, energy suppliers, charge point operators, government (local/national) and any other relevant party. Please provide evidence and analysis to support your answer where appropriate.**
    See previous answers

Chapter 3 - Phase Two: Smart charging long-term approach

62. **Do you agree that, in order to implement a long-term approach to smart charging by 2025, Government should make a decision between 2020 and 2022? Noting the**

example stages in the chart set out in paragraph 3.6.
A clear direction would be welcomed, however not at the expense of closing down innovation opportunities. New electric and plug-in hybrid electric vehicle sales are less than 3% of total new car sales year to date in 2019[8], reflecting the early stages of the transition. Therefore, a principles-based approach rather than regulated approach would be proportionate at this stage. There is a risk that HMG makes the wrong decision if it is too target driven and does not give innovative market-based solutions the time develop and deliver.

63. **What is your preferred year for a decision?**
Within the time frame given, we would prefer the latest date of 2022, however we believe that more consideration and further impact assessments are needed to understand if this date is appropriate to avoid foreclosing on innovation, in line with HMG's stated objectives. We also believe that the desire for a target should not take priority over delivering the right outcome.

64. **Please provide reasons for your answer, including evidence (where relevant) of the impact that an earlier or later decision could have.**
Technology is advancing quickly and therefore clear regulation needs to be brought to market as soon as possible and reviewed regularly to ensure it is addressing emerging technology and customer needs. Clarity will also help to drive investment in the market.

65. **Do you agree that the factors listed in paragraph 3.5 are the key criteria to consider in determining a decision point?**
Yes. We agree that there is not yet enough evidence to decide on a long-term approach. Although having an implementation date of the 2025 is useful to focus efforts, HMG should be careful not to focus on the date, above giving innovation in the EV space enough time to develop.

66. **Please provide reasons for your answer, including a consideration of additional key criteria we should consider in determining the timing of the decision point.**
No additional criteria.

Using smart meters for EV smart charging

67. **Do you agree that smart metering system offers a viable solution for the smart charging of EVs, with appropriate system changes in terms of access and functionality?**
We note the recent publication of the "Smart Meter policy framework post 2020" and are considering the detail.

We recognise the attraction of using smart metering, as it as an immediate solution that could deliver on HMG's objectives around cyber security, solves the switching/ interoperability issue and data protection issues. However, we believe 2020-2022 is too early to mandate the use of smart chargers.

We note HMG's view that a decision will likely be needed between 2020 and 2022 and that HMG does not wish to preclude innovation. Therefore, we should encourage smart meters

[8] EV & AFV Registrations YTD September 2019

to develop in a manner that allows their integration with smart chargers, but it should be at the discretion of the smart charger installers/manufactures, not a mandatory requirement. In this scenario, if smart meter functionality proves to be the best option for customers, the market will gravitate towards it. However, if other solutions develop that are cheaper and more flexible, then those will not be precluded from uptake.

We do not want to inhibit future innovation around the charge point itself or alignment to global charge point production standards. At present, the way to obtain the 30-minute disaggregation of usage is with the use of a smart meter, but this needn't be the case, and could take place within the smart charger itself. Smart meters could be an enabler for smart charging, especially in the mid-longer term, where it is less defined as to what 'smart' charging functionality might be developed. Given smart charge point infrastructure will need to be deployed regardless of presence of a smart meter, there is an opportunity to increase the capability of smart charging outside of the scope of what smart meters can do.

To expand, whilst we support the smart meter being able to handle information from EV chargers and we do encourage the smart meter and EV charger installation as a joint proposition, for customers to maximise the opportunities of time of use tariff benefits and V2G benefits. Mandating this could risk uptake of the EV through further complicating the customer journey. Creating an unintended consequence of additional barriers to entry for the nationwide adoption of EV's.

In addition, it is worth noting that DNO-managed charging of EVs should only be considered as a temporary measure where there is an immediate local risk to system security until the DNO can carry can out reinforcement. As regulated monopolies DNOs must not be active in contestable markets. The EV Energy Taskforce has been considering circumstances under which DNO managed charging could be carried out, whilst minimising any adverse impacts on consumer and the market. This would be a useful starting point for future consultation.

68. **Please provide the reasons why you agree or disagree.**
See question 67.

69. **In relation to smart charging, how would the smart meter system need to be improved in order to meet reasonable customer expectations of the use of their vehicle? What would be required to do this?**
Robust identification of meter communications failures will be key and back-up systems to ensure control can still be retained and vehicles still charged. If consumers must have a Smart Meter in order to buy an EV, more consumer communication must be undertaken. Above all there must be a guarantee that a smart meter would not negatively impact the charging of an EV.

70. **What would you think would be the implication of the UK not following developing international standards in this area and requiring the GB based smart meter rollout for the control and operation of smart EV chargers?**

As the UK smart metering network is UK-specific, there needs to be due consideration given to the direction of travel globally and we need to create alignment. For example,

in Europe more generally they are moving towards open protocols, this is something we should consider, to ensure that the UK does not become isolated. There is a risk of less innovation and as a result higher prices for consumers. We may also see the UK becoming a later/secondary launch market for manufacturers. At present the UK is not prioritised for EV imports.

Alternative options

71. **Do you think that an alternative approach, as outlined above, could deliver the Government's objectives on smart charging by 2025, with similar outcomes to the smart meter system on cyber security and interoperability?**
    As discussed in question 67, it is too early to lock in a solution. Priority should be given to creating a market environment that incentivises EV users to move usage voluntarily and ensure users are rewarded for helping the system. DNOs should be neutral facilitators of flexibility markets. Granting DNOs access to free household flexibility through the smart meter would distort flexibility markets.

72. **Are there other alternative approaches that could deliver the Government's objectives on smart charging by 2025, with similar outcomes to the smart meter system on cyber security and interoperability?**
    See question 67 and 71

73. **Please provide reasons for your answer, including what technologies and approaches to regulation could be used and information and evidence on how any alternative options would deliver similar outcomes to the smart meter system on cyber security and interoperability. Please say how much time you think developing the approach would take and what costs may be incurred.**
    See question 67 and 71

74. **What are your views on smart charging via the vehicle rather than charge point? How do you think government should approach regulating this area?**
    The charge point would be strongly preferred, due to the possibilities this provides of wider integration within home energy management (HEM). We see HEM as a micro-system of energy assets including generation such as solar panels, storage and EV charging managed at the customer's home through a platform that can utilise flexibility services (grid-services).

Smart meters as the current lead option for a long-term solution

75. **Do you agree that requiring the use of smart meters for smart charging should be the lead option for Phase Two?**
    See question 67 and 71

76. **Please provide the reasons why you agree or disagree.**
    See question 67 and 71

Chapter 4 - AEV Act Powers - Transmission of data relating to charge points

77. **What do you consider the benefits of introducing regulations under this section could be?**
    The benefits would be:
    - Fairer pricing for consumers
    - Insight into EV customer behaviour and demand
    - Geographical insight for future infrastructure build
    - The potential for shared charging points between companies to reduce infrastructure costs, for example mast sharing
    - Better insight on grid distribution and demand forecasting as well as peaks and troughs of usage

    It is important that data about individuals should not be shared directly with the DNO/TSO. This could compromise data protection of consumers and moreover, it remains to be seen what the benefit of such data would be to the DNO given that they do not have LV connectivity models.

78. **What do you consider the disadvantages of introducing regulations under this section could be?**
    There will be a cost related to providing a data feed that needs to be considered and accounted for. In addition, we should protect consumers from data use for unintended purposes, although we are unclear what benefits would accrue from its dissemination.

79. **Do you agree with the views on the minimum data to be made available? If not, what should or should not be included?**
    This should be aligned broadly with the smart data minimum requirement e.g. charge point location, installation date, power rating, live consumption data and Geographical location. The DNOs should not have sight of detailed EV charging data as this is sensitive and should only be between consumer and energy services provider.

    Energy customers should be able to share their personal data subject to them giving explicit and unambiguous consent so they can access better, more tailored energy deals and get richer insight into their energy usage and how to control it.

    There need to be appropriate checks and balances on such a system to protect confidentiality and data security, as well as the interests of vulnerable customers, while at the same time offering an easy to use system.

    We consider there are some fundamental principles which should underpin this, i.e. ensuring:
    - Full compliance with GDPR.
    - Customer consent, through explicit and unambiguous opt-in consent requirements
    - Data is limited to non-propriety data[9]

[9] By propriety data we refer to data legitimately created by companies, often as a result of system investment. Such data is not appropriate for sharing, as to do so would undermine the incentive to invest in the creation of such data, to the detriment of consumers. This data is distinctly different to personal or consumer data which should be easily available for consumers.

- Operational challenges are factored in, for example acknowledging that 'live' data reads cannot be shared cost-effectively.
- Customers are well informed of the potential consequences of sharing personal data with third parties.
- Data sharing is for a time limited period only, requiring active re-consent after a specified period, without which all data is deleted.
- A level playing field, by requiring all actors in the market to have the same duties, including all intermediaries.
- Clarity about where liability sits in the event of data loss or misuse.
- Customers are clear about what data they are sharing, why and with whom. Customers need to be actively engaged with the decision to share data in this way.

80. **What criteria do you think should be used to determine when these regulations should be introduced?**
No view at present

81. **Please give details of any approaches to implementing these regulations that would be either helpful or unhelpful. For example, preferences for when, how and in what form the data is transferred.**
It will be important to ensure there are no clashes with current Ofgem requirements for other regulatory data transfers**.** These regulations of course will need to be GDPR compliant and also complementary to the findings of the EV taskforce.

82. **What data privacy considerations do you think would be relevant and how do you think they could be resolved? For example, consumer preference.**
In addition to the principles set out in our response to the minimum data question 79, we believe consideration needs to be given consumer rights under GDPR i.e. up to date privacy notices, customer consent, minimum standard on data transfers, who is the data controller vs the data processor.

    Data sharing will also be very important, for example detailed charging patterns with third parties may lead to misuse of data.

83. **Who should have access to this data? What processes should be in place to access the data to ensure safeguarding?**
We need to strike a balance between supporting network operators having better visibility of the system and protecting commercially valuable data and also protecting consumers' rights to control who has access to their data. We believe that detailed charging data should only be given to consumers and it should not be shared with other parties without the express permission of the consumer. We do not believe that DNOs should have access to it as they have no existing consumer relationship.

84. **Please give details of any alternative arrangements that could be used to achieve similar benefits to those outlined above.**
It would be useful to gain further clarity on Ofgem/BEIS' ambition to create data clouds for various other initiatives. Ultimately there could be duplication and therefore we could avoid multiple copies of the same consumption and customer data being held in multiple environments.