

Electricity Network Innovation Competition Full Submission
Supplementary Answer Form

Project: Charge: Refuelling Tomorrow's Electrified Transport

Tick if this answer has been provided verbally: ☐

Project code	SPMV1	Question Number	7
Question date	16/08/18	Answer date	20/08/18
Submission section question relates to		N/A	
Topic	Value for money		
Question	Please explain in more detail how Methods 1 and 3 constitute a Direct Impact, rather than being one step removed from the distribution system.		
Notes on question			
Answer	<p>The provision of connections to the distribution network is a core function of a Distribution Network Operator. Any improvement in the ability of a DNO to provide connections in a timely and efficient manner would constitute a measurable Direct Impact.</p> <ul style="list-style-type: none">• Method 1 will deliver a Direct Impact by identifying how capacity on the existing electricity grid aligns to the needs of EV charging, both now and into the future. This will enable the operational and financial impact of EV charging to be correctly quantified and planned for.• Method 3 will enhance this Direct Impact by enabling both Distribution Network Operators <i>and their customers</i> to understand the available, highly localised network headroom for different types of EV charging solutions, enabling customers to make an informed choice between "fit-and-forget" connections or fully flexible connection provisions, according to their needs. <p>Further supporting information on the Methods is provided below.</p> <p>Method 1 The mass electrification of transport is one of the biggest disruptors to today's electricity grids. EVs will cause a change in the demand, which will require investment to resolve. We need to understand, in detail, by how much, where and when, to design and operate an efficient network.</p> <ul style="list-style-type: none">- Charging stations can vary from 7kW to 150kW peak demand, for a single unit, depending on the speed of charging and nature of charging station, each representing a significant and potentially disruptive connection to the network.- To provide such connections efficiently, it is necessary to		

understand where and how people charge (both the peak electrical demand [MW] and the energy to be used [MWh]). To do this, we need to understand how people move - this is not information that is currently available to DNOs. If this information is not available, connections will have to be sized for "worst case" scenarios – resulting in excessive connection costs that will have to be passed on to consumers.

- To date, projects like My Electric Avenue and Electric Nation have provided useful information on diversity for those households with off-street parking, but their scope does not include large-scale public charging. To achieve 100% non-petrol and diesel vehicles (a 2050 backstop, with a strengthening view of this being the case by 2040 or earlier), it is necessary to consider how citizens move today and tomorrow in ALL circumstances: urban, suburban, rural; charging at home, on streets, at work, on the move, etc.
- As we look into the next decade and beyond, EVs alongside other energy system innovation such as storage will add further layers of variability to what is already a complex and dynamic system. We believe innovative projects, such as Charge, will be key to accelerate the learning and understanding required to facilitate the transition to electrified transport, offer significant potential to maximise existing assets, providing improved flexibility and resilience to our system and delivering the lowest cost to solution for all customers.

Method 3:

In addition to excessive costs, there is uncertainty around DNOs ability to provide connections to the network in a timely manner. The DNOs ability to keep up with a rapid uptake of EV connections will become an issue. We need to get better systems in place before the wave hits, ideally giving customers a set of simple-to-use tools to allow them to self-serve.

- The DER bubble saw an unprecedented increase in connection applications to DNOs. Across the SPEN licence areas, conversion rates from query to completed project dropped to 8% and additional staff had to be employed to accommodate the deluge of enquiries.
- There is evidence that DNOs are currently still struggling to reach time to connect targets:



	<ul style="list-style-type: none"> - A significant “wave” of charging connections is expected to come faster than previously anticipated, with increased government focus as identified in two documents launched in July 2018: DfT's Road to Zero strategy and the National Infrastructure Commission's National Infrastructure Assessment (extracts are referenced on pages 20 and 27 of our Charge bid). - We are expecting to see an additional 25,000 charging installations for public and destination charging across Britain. This ignores the number of actual applications, which is likely to be significantly higher as connectees seek to identify capacity for their projects. - Most of these connection applications will be deeply embedded in the distribution network (LV or 11kV), involving computational modelling to assess the impact, coupled with the all-important view of diversity as mentioned above. <ul style="list-style-type: none"> o Heatmaps, or even the tools developed under projects like ARC, are unlikely to suffice. o As Ofgem's own data shows, Connections are one of the few metrics where all DNOs are struggling - Better solutions are needed - ideally giving customers a set of simple to use tools to allow them to self-serve
Attachments	n/a