



NETWORKS



ESB NETWORKS RESPONSE TO STAKEHOLDER FEEDBACK ON MV CUSTOMER CONNECTION STANDARD MODULE - ELECTRIC VEHICLE CHARGING HUBS IN URBAN ENVIRONMENT

ESB Networks Response Paper

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1. Introduction

In order to support the Irish Government's National Climate Action Plan, ESB Networks needs to develop standard options to facilitate faster and optimised connection options for renewable and customer connections to our network.

As part of the Irish Government's Climate Action Plan 2019, there are several targets within the transport sector that must be met by 2030. One such target is to “Build the EV charging network to support the growth of EVs at the rate required and develop our fast-charging infrastructure to stay ahead of demand”. Over the next 10 years EV charging providers are going to require connections to the distribution network as their electrical load requirements increase with the rapid development in fast charging technology.

The aim of this project is to support the EV industry in meeting that target for specific connection scenarios. ESB Networks will be undertaking a pilot of a modular MV connection solution that will allow for a faster connection at the EV charging provider's location, reducing the MV connection building footprint significantly and minimising the amount of on-site work that is required. This pilot will be an opportunity for potential future customers to consult with ESB Networks on our proposed solution and view the standard module at a pilot site.

In the past 6 months ESB Networks have engaged with many stakeholders involved in the EV charging industry. These stakeholders varied from utilities in the United Kingdom, EV charging providers in Ireland, EV charging vendors and retailers.

Based on discussions with all the various stakeholders, ESB Networks published a consultation document ([DOC-010720-FUU](#)) on the ESB Networks public website in August 2020. During our open consultation, the project team held a webinar in September 2020 as part of the ESB Networks Autumn Webinar Series.

Industry and other interested stakeholders participated in the webinar (approximately 200 attendees) to find out in greater detail what ESB Networks were proposing in terms of the modular approach. This response paper details the Menti survey responses from webinar participants (section 2), ESB Networks responses to stakeholder queries/proposals during our consultation (section 3) and finally our proposed next steps in progressing with pilot projects to further develop our proposed solution.

2. Webinar Menti Survey Results

Using Menti, participants answered questions that the ESB Networks project team asked during the webinar. The top priority for participants evident from our survey questions was space saving on site that the module would potentially deliver.

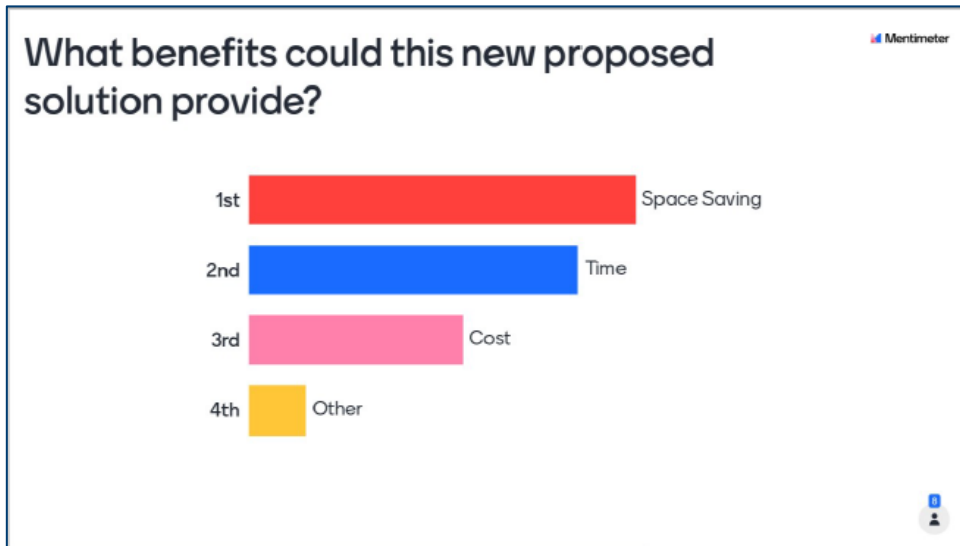


FIGURE 1 - WEBINAR SURVEY RESULTS (Q1)

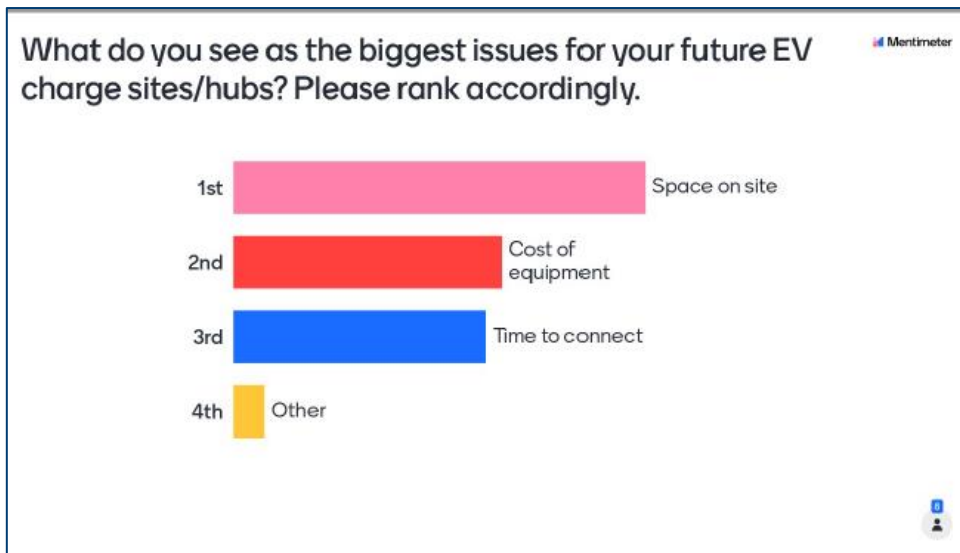


FIGURE 2 - WEBINAR SURVEY RESULTS (Q2)



3. Stakeholder Questions and Answers

During the webinar, attendees asked specific questions which were answered by a panel of project members at the end of the main webinar presentation. Table 1 lists the questions stakeholders raised during the webinar and ESB Networks’ responses to them.

Feedback Received	ESB Networks’ Response
<p>If 200 kVA unit substations are used to provide supplies of up to 200 kVA, why can't 400 kVA substations be used to provide supplies in the 200 kVA to 400 kVA range? Service heads are available with 400 or 630 A fuse ratings that can support.</p>	<p>The Commission for Regulation of Utilities (CRU), under S.I. 280 of 2008, requires ESB Networks to ‘<i>develop, as necessary, a safe, secure, reliable, economical and efficient electricity distribution system...</i>’. We have developed robust network planning standards to ensure we meet this requirement. Unit substations connection options are provided for low to medium density residential developments. 200 kVA is an adequate rating to supply this type of development.</p> <p>While we acknowledge that an LV connection via a unit substation, where 200 kVA system capacity is available, may be cost effective in the short term, when EV charging loads increase (as predicted) a unit substation will not be able to handle the demand. Conversion to MV in the near future from a unit substation connection will require significant connection modifications for both the customer and ESB Networks.</p> <p>As noted in our recently published ‘<i>Electrification of heat and transport strategy</i>’ a Low Emission Vehicle Task force, Working Group 2, chaired by the Department of the Environment, Climate and Communications (DECC) identified 4 broad categories of charging. For rapid charging, <i>it is envisaged that these charge-points currently have a capacity up to 350kW direct current (DC). This is expected to rise in the future as larger capacity batteries in electric vehicles become more common.</i></p> <p>Accordingly, ESB Networks must plan and design the network efficiently for all customers. We deem the optimum solution is to connect EV charging hubs at MV for loads above 200 kVA or possibly lower subject to existing LV capacity.</p>
<p>Why does the ESBN ring main compartment need to be physically attached to the customer CSS? If a fused MV out goer is used on the ESBN</p>	<p>To keep the installation on site simple. The MV feed cables will go “through the wall” to the customers MV circuit breaker.</p>

<p>side, the cable is protected, and the two units don't need to be back-to-back.</p>	<p>This will avoid the need for multiple cabinets on site, and we will endeavour to keep the space requirements for the ESB Networks equipment to a minimum.</p>
<p>With the smaller substation solution, will this still be a permanent structure on the site?</p>	<p>Yes, while it will be a compact solution the substation should be considered a permanent structure.</p>
<p>Have ESBN considered that by moving customer connections < 500 kVA to MV they're losing out on significant amounts of DUoS to the TSO?</p>	<p>ESB Networks will still receive DUoS on MV customer connections.</p>
<p>Pushing connections to MV adds significant cost to the customer by putting the MV ring main and MV/LV transformer into the customer's scope, along with the LV protection & distribution. How will this effect connection costs?</p>	<p>ESB Networks acknowledges that by supplying customers at MV the costs are higher compared to LV. There is a short-term price increase, however, in the long term if an MIC increase is required, the customer will not require an upgrade of their MV switchgear.</p> <p>As noted in our recently published <i>'Electrification of heat and transport strategy'</i> a Low Emission Vehicle Task force, Working Group 2, chaired by the Department of the Environment, Climate and Communications (DECC) identified 4 broad categories of charging. For rapid charging, <i>it is envisaged that these charge-points currently have a capacity up to 350kW direct current (DC). This is expected to rise in the future as larger capacity batteries in electric vehicles become more common.'</i></p> <p>Accordingly, ESB Networks must plan and design the network efficiently for all customers. We deem the optimum solution is to connect EV charging hubs at MV for loads above 200 kVA or possibly lower subject to existing LV capacity.</p> <p>We would also recommend that EV Charging Hub customers seeking an LV connection via a unit substation for connections ≤ 200 kVA consider the long-term benefits of connecting at MV.</p>
<p>In terms of timing for the project, it may be difficult to find a suitable project which aligns to the timeline of the project & has flexibility for delays associated with</p>	<p>ESB Networks will only be undertaking a pilot with customers who have a suitable project program to allow extra time for innovation. This will be communicated to the customer at the beginning of the pilot project. We will not be compensating any partners for any time extensions in what is an innovation pilot project.</p>



<p>innovation. Do you see this as a risk and how would you compensate partners?</p>	
<p>From your Menti questions, it sounds like you have limited data regarding planned rollout/uptake of fast chargers. How does this impact your planning for the future network and what are you doing to improve your understanding of future uptake?</p>	<p>ESB Networks strategy identifies the need to support the electrification of transport. ESB Networks have a number of innovation projects, including this consultation, as well as Network reinforcement projects, to ensure the Distribution Network is ready for future fast charger connections.</p> <p>Please visit: https://www.esbnetworks.ie/who-we-are/innovation/esb-networks-innovation-projects for more details.</p>
<p>Many sites in urban areas don't and won't ever have the space to accommodate more than 1 or 2 chargers, so future capacity is generally less of / not a concern.</p>	<p>In locations where the combined MIC requirement is 200 kVA or less, and where the local Network capacity is suitable, a unit substation connection option may be considered. However, each customer's connection options depend upon several factors including the site owner's existing connection arrangements.</p>
<p>"Other" referred to in Q7 was in relation to public acceptance of hubs in urban areas e.g. Planning objections etc... Has ESB Networks experience in UK EV CP deployment in terms of this issue?</p>	<p>ESB Networks do not engage in projects in the United Kingdom.</p>
<p>When investigating locations for EV charging stations, what is the quickest means of determining grid capacity availability at specific locations with an MIC ranging from 200 kVA – 600 kVA?</p>	<p>A new connection request can be made online on the ESB Networks public website at https://www.esbnetworks.ie/help-centre/new-connections</p> <p>As part of our online application process there is now a heatmap available that gives potential available capacity at LV, MV and HV voltage levels. https://www.esbnetworks.ie/network-capacity-map</p>



	<p>For this load range an MV substation is normally required, however, if any customer has any specific queries contact details for our local area offices can be found on our website also:</p> <p>https://www.esbnetworks.ie/tns/contact-us/map-of-regions</p>
<p>Given the close proximity of the MV & LV, would cast resin be better?</p>	<p>MV and LV separation for MV supplies is an electrical design risk for the customer and their electrical consultant to consider.</p>
<p>On having the ESB and customer equipment in one container, what if the customer's CSS supplier is different to ESN's?</p>	<p>For the proposed pilot projects in 2021, ESB Networks will be using our existing MV switchgear term contract supplier. Provided the ESB Networks integrated cabinet has adequate space and suitable layout, we would not have any specific requirements on the customer's equipment provider. The customer should still ensure they meet our normal MV connection requirements.</p>
<p>When it was mentioned that it would be a permanent structure, do you mean its toll built with concrete rather than a prefab solution?</p>	<p>The proposed modular solution will not be concrete and will be a prefabricated solution.</p>
<p>If the MV cable feeding the customers installation was protected by an ESN circuit breaker can the ESN substation and customer substation be separate?</p>	<p>For MV customers fed from a Ring Main Unit (RMU) we use an LBFM (Load Break Fault Make) switch.</p> <p>The pilot will be designed on the basis that the customer module will have an integrated cabinet for ESB Networks equipment. As such, the ESN substation cabinet and the customer room will be immediately adjacent to each other as our current design standards require.</p>
<p>If the ESN RMU and metering module is separate and considered permanent, could that not be installed permanently under existing</p>	<p>The proposed pilot projects will be using a customer module with ESB Networks equipment housed in an integrated cabinet. It will be the responsibility of the customer to ensure that they adhere to planning requirements.</p>



<p>exemptions? The customer's CSS could then potentially be considered modular and non-permanent from a planning perspective.</p>	<p>As our connection is solely for the EV Charging Hub Module, we would not recommend that any customer assumes splitting a module (project) will result in a planning exemption.</p>
<p>Project in UK: Modular Approach to Substation Construction might have useful learning (although it was at HV).</p>	<p>ESB Networks have been engaging with other utilities to share learnings from similar projects. We consulted with one UK DNO adopting a High Voltage supply for UK charging hubs.</p>
<p>Assuming a modular solution emerges from this process, can it be used outside of urban environments for charging hubs?</p>	<p>If the planned pilots provide an enduring connection option, the module could be used outside of urban environments. The aim of this pilot project is to address the difficulty of connecting an EV charging hub in a compact site regardless of location. We appreciate there was a reference to urban in the consultation title which may have given the impression that it was solely for that location scenario.</p>



4. Next Steps

During the consultation period a number of customers expressed an interest in participating in a pilot project. ESB Networks had to carefully select which customers would be the most suitable to participate in a pilot with. ESB Networks have written to all the unsuccessful customers and have invited them to visit one of the pilot projects this year. The project team will now start engaging with the 2 successful customers and plans will be put in place to progress the pilot projects. We will provide updates to stakeholders as the pilot's progress.

For any additional information, please contact the innovation team via email:
innovationfeedback@esbnetworks.ie