Request for Information – Local Electric Vehicle Energy Loop
1  Glossary

<table>
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<tr>
<th>DNO</th>
<th>Distribution Network Operator</th>
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<td>DSO</td>
<td>Distribution System Operator</td>
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<td>EV</td>
<td>Electric Vehicle</td>
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<td>LEVEL</td>
<td>Local Electric Vehicle Energy Loop</td>
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<tr>
<td>MCMS</td>
<td>Metered Central Management System</td>
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<td>NIA</td>
<td>Network Innovation Allowance</td>
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<td>RFI</td>
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2  Project Overview

A Network Innovation Allowance (NIA) funded project the Local Electric Vehicle Energy Loop (LEVEL) is part of the transition to a Distribution System Operator (DSO) model, which requires the electricity network to be managed smarter and with more flexibility. This project is defining and demonstrating the use of a mobile electric vehicle (EV) charger incorporating onboard electric vehicle supply equipment (EVSE), which would provide roadside charging capabilities, to assist with the transition to low carbon technologies and improve network resilience to meet short term demand.

The Scottish Government have committed to phasing out petrol and diesel vehicles by 2032, eight years ahead of the rest of the UK. EVs and the supporting charging infrastructure will be critical to delivering this ambition. Increased use of EVs requires greater resilience of the electricity network. During one off events (such as bank holidays, Highland Games, Gala Days etc.) and faults, temporary EVSEs may be required to meet demand.

This project will develop a standard and specification for a temporary and mobile EVSE infrastructure device to provide capacity to meet short term demand in a location. The project is looking to purchase physical devices and demonstrate the process and policies required for provision of temporary roadside charging with recharging by connection to the live network within the SHEPD area. This moveable charging device could be pre-deployed to locations ahead of bad weather forecasts to support local network resilience or reactively deployed until supply restoration is achieved.

A mobile charging device would also be beneficial in use cases such as:

- Unplanned incidents on the road network which could lead to traffic delays and therefore provides contingency for EV drivers along main roads e.g. A9/ A82 / A85 etc; and

- Smart low voltage connection combined with smart charging located in public car parks to boost capacity during summer tourism period e.g. to trickle charge battery storage during times of low demand to provide ability to meet peaks and to deploy fully charged devices.
This project will be delivered under the EV Strategic Partnership SSEN has with Transport Scotland and the Scottish Government and will consider the ownership model of this infrastructure whilst taking account of the needs of key stakeholders i.e. is SSEN best placed to own or is it more suitable for the local authorities or Scottish Government.

The purpose of this document is to outline a functional specification for a Mobile Charging System complete with EVSEs to provide roadside charging during abnormal events on the Scottish road network or provide short term resilience for the electricity network.

The project will be delivered under the NIA framework which requires all information to be shared widely with other Distribution Network Operators (DNOs). For further information, the governance document is available here: https://www.ofgem.gov.uk/publications-and-updates/version-30-network-innovation-allowance-governance-documents

The NIA project registration document is available here: https://www.smarternetworks.org/project/nia_ssen_0046

3 Submission Answer Themes

This section aims to set the scene and some of the challenges as well as the high-level requirements with specific ‘asks’ which must be included in the submission response.

The Mobile Charging System requirements may be split into the following sections:

1. Input Connections
2. Input Metering Arrangements
3. Battery Capacity and Type
4. EVSE
5. Output Metering arrangements
6. Operator/Owner of System
7. Service Level Agreement
8. Security

Input Connections

The Mobile Charging System will be dispatched from its storage location (likely to be a depot) where it will be kept continuously trickle charged so that the batteries are at maximum capacity in order to service many cars when dispatched. Note: the storage location connection may require upgrading to facilitate this charging. At the dispatched location it is required that a source of energy is available to replenish the Mobile Charging System as it discharges. In line with the Scottish Government’s commitment for net zero greenhouse gas emissions by 2045 this cannot be achieved by a diesel generator. Whilst novel renewable solutions are encouraged in the request for information (RFI) response, SSEN will make available a secure network connection point available equipped with Powerlock connectors (500A) or BS4343 connectors rated at 63/125A. If an alternative connection point is required please include details in the submission.
The submission should clearly state the required input connections together with the efficiency of the power electronics conversion stage.

**Input Metering Arrangements for Mobile Device**

When arriving at the site it is anticipated the energy within the Mobile Charging System will have been metered during the trickle charging at the storage location.

However, when recharging from the SSEN connection point the energy consumed will need to be accounted for. It is envisaged this will be achieved using a Metered Central Management System (MCMS). The submission should investigate the requirements of this methodology for quantifying energy consumed. Note: it is widely used within the street lighting sector and by EVSE providers. A method of differentiating roadside consumed energy and storage location consumed energy is required to avoid double counting of storage location energy. Most energy suppliers offering a half hourly unmetered tariff should be familiar with MCMS.

The metering arrangement will be standard, and this project does not require customised software at the input metering.

**Battery Capacity and Type**

Balance is required between the input charge rate, battery capacity and EVSE outputs. With more EVSE outputs a greater number of cars can be charged together, however this will deplete the battery more quickly requiring a higher input capacity to maintain charge. Larger batteries would ease this situation but at the expense of logistical issues in dispatching the unit to the situation site which at times will be rural, single track etc. Recognising this conundrum, the submission should include proposals detailing dimensions, weight and battery types for consideration.

The submission should include an overview of the differing driving license requirements for transporting the equipment e.g. Heavy Good Vehicle, towing etc.

**Electric Vehicle Supply Equipment**

In view of the essential nature of this service it is anticipated the Mobile Charging System will be complete with on-board EVSE equipment allowing immediate use on arrival at site. The location of the EVSE equipment requires consideration – e.g. height of charging port, safety of personnel using equipment both in terms of ease of handling and in terms of adjacent traffic etc.

Type 2 chargers with 7kW are becoming the standard household provision however charging at this rate would not achieve the necessary timescales to dispatch cars – it is anticipated multiple 22kW AC and 50kW DC outputs will provided as a minimum (Type 2, Chademo and CCS.) The efficiency of the selected EVSEs should be clearly identified in the submission.

It will be necessary to limit the charge taken by any single vehicle and the submission should detail methodology for providing this functionality. It is recognised this could be accommodated in the following metering section below.
Output Metering Arrangements

It is recognised that the owner of the Mobile Charging System will require to recover the input energy costs. It is anticipated, but not mandated, that this will be carried out in collaboration with the EVSE charge point providers. The Mobile Charging System owner would bill each car accessing energy via the EVSEs by proprietary systems. The breakdown of the recovered costs would require to be visible as part of the submission.

The metering system chosen will record normal EVSE parameters and include functionality to limit the energy drawn during each charging event.

Ownership

The Distribution Network Operators (DNOs) are unlikely to be the owners of the system although they will purchase the initial unit(s) as part of the NIA project.

Consequently, indicative costs should be provided as part of this submission and both purchase and rental options would be of interest to the partnership.

Service Level Agreement

In view of the essential nature of this service a high degree of availability will be required of the unit. Accordingly, the submission should provide cost details of the suggested Service Level Agreement.

Security

Although the metering of the device will be managed by the Energy Supplier. An overview of the cyber security policies and procedures should be indicated in the submission. Additionally, the device may be left unattended between charging events, the solution must include appropriate security measures in place.

Additional Information

The submission should also include a view on the following:

Is there an interest in developing mobile charge points further through collaboration?

Where do you foresee the direction of travel for this type of infrastructure?

4 Response Details

The submission response should be limited to 5 pages (2.5 sheets of A4 paper). The submission should be emailed to fn.procurement@sse.com by close of business on Tuesday 28 July 2020.