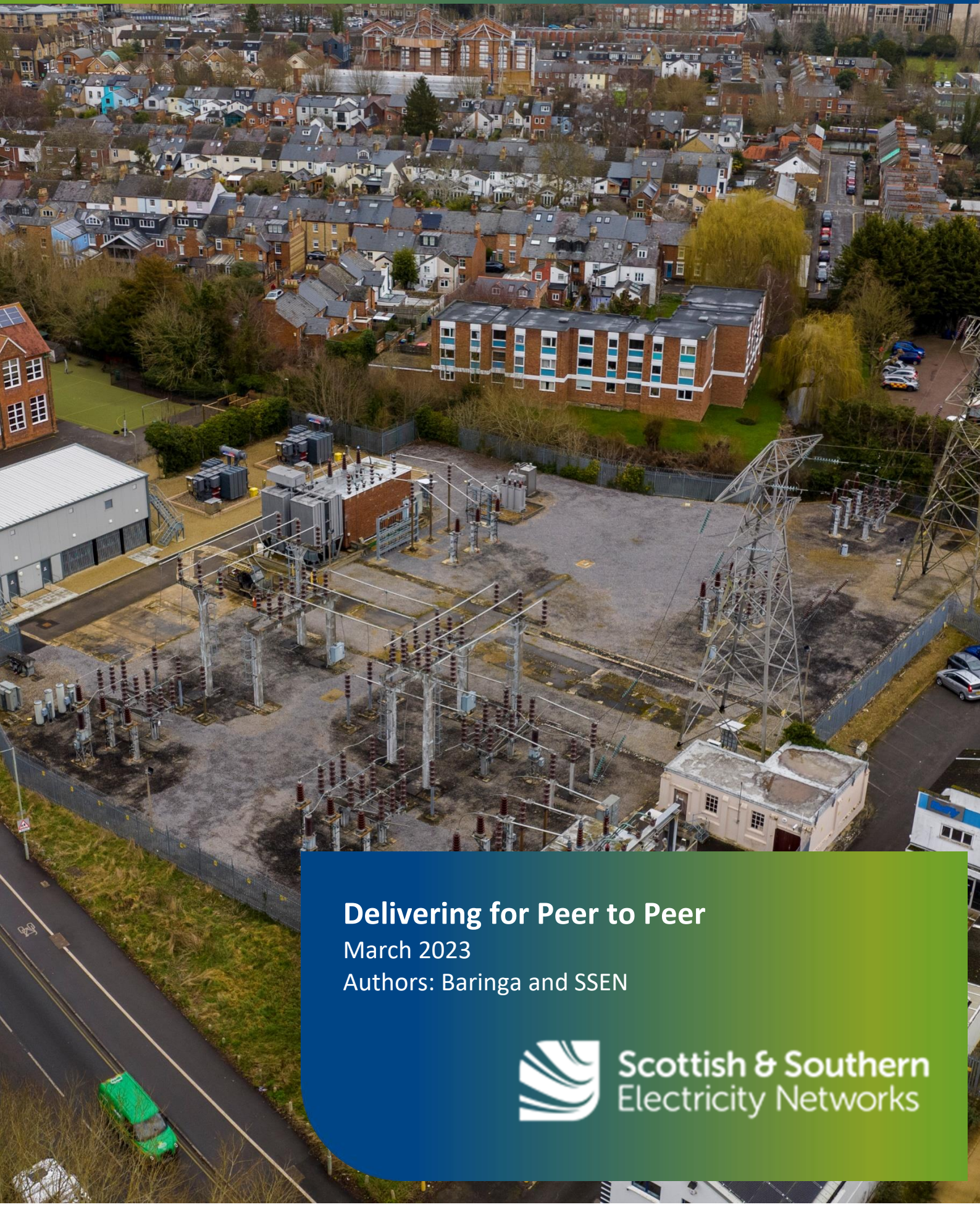


transition

Moving to a smart future



Delivering for Peer to Peer

March 2023

Authors: Baringa and SSEN



Scottish & Southern
Electricity Networks

Introduction

Projects LEO and TRANSITION are conducting joint trials to test the technical operation of a flexibility market based on network needs and developing services that either support the management of network constraints (DSO-Procured) or improve the efficient use of existing capacity (DSO-Enabled) through customer and community engagement.

Unlike DSO-Procured Services, DSO-Enabled Services are not procured by the DSO but are traded between two peers on the network. In the LEO-TRANSITION trials (Trials), these are the trading of export or import capacity on a Peer-to-Peer basis, as shown in the table below.

Appendix A Table 1: DSO-Enabled Services tested in the Trials

Service	Description
Maximum Export Capacity (MEC)	Two market participants in a network area with limited (or no) spare export capacity trade a portion of their export capacity for an agreed period without affecting the network. The Buyer can increase their export level by the traded amount and the Seller must reduce their export level by the traded amount.
Maximum Import Capacity (MIC)	Two market participants in a network area with limited (or no) spare import capacity trade a portion of their import capacity for an agreed period without affecting the network. The Buyer can increase their import level by the traded amount and the Seller must reduce their import level by the traded amount.

During the Trials, TRANSITION worked with SSEN's BAU teams to develop a simple process that varied the capacity in participant connection agreements over the trial periods. This created a safe space to trial innovative trading arrangements for network access, while ensuring that the real network is not put in danger. This process is detailed in Appendix A.

The enablement and use of DSO-Enabled services has a range of use cases and benefits including:

- Providing additional revenue from generation above existing export capacity.
- Maximising the export of low carbon and renewable generation to the network.
- Releasing unused network capacity to increase network efficiency.
- Enabling business operations which require short term or short duration increase in import capacity.

Despite the wide range of benefits and use cases identified, successful trades of MIC and MEC were limited during the Trials. This short note explores the interpretative view of the DSO and Customer to identify issues and suggest recommendations for further investigation to enable DSO-Enabled services in a future market.

Barriers to DSO-Enabled Services and Recommendations for Further Investigation

This section dissects the current barriers restricting the use of DSO-Enabled services as raised by both SSEN and the LEO partners during the Trials.



DSO COSTS TO ENABLE MIC / MEC TRADES

The DSO is required to undertake system studies to enable MIC / MEC trades and may have to install monitoring devices on their network. This is time consuming, resource intensive and expensive. Further, the DSOs in Great Britain use the same settlement system to determine and charge for Distribution Use of Service (DUoS) charges (see Section 0). Changes to this system are expected to be costly and timely to implement.

Any costs to enable MIC / MEC trades would be shared between the participating DSOs which could become a barrier to progress if very few DSOs agree to these services.



DSO VIEW

Costs should be attributed to applicants only.



CUSTOMER VIEW

Costs should be recovered by all customers as society will benefit from efficient use of the distribution network.



RECOMMENDATIONS FOR FUTURE INVESTIGATIONS

- Explore the extent to which system studies can be automated to reduce staff costs / time.
- Consider whether the cost for this service is best recovered from participants of from the full DSO customer base. socialising the associated additional costs through this process.



PROCESS – TECHNICAL

Customers who install more generation capacity than their export capacity need to comply with Engineering Recommendation G100, a control protocol that restricts generation output and prevents exporting more than the agreed export capacity. A further code modification has extended this to include import capacity limits¹. There may be some DERs (if their installation date is before 2017) that do not have this equipment installed, although this is likely to be a small number of installations.



DSO VIEW

Control systems are required to ensure the safe operation of the network.



CUSTOMER VIEW

Installing control systems to DERs whose technical export capacity is marginally above that of the connection is unduly costly and time consuming.



RECOMMENDATIONS FOR FUTURE INVESTIGATIONS

- **Changes to capacity via a MIC / MEC trade would need to be flagged on PROMIS (an internal SSEN system) and the network access ledger so that no corrective action is taken on market participants (e.g., they are not disconnected due to the trade).**
- **Customers who have the G100 control protocol installed would need to be able to disable / change the setpoint limits for the duration of the trade.**
- **Consider whether the G100 control protocol is fit for purpose for all sizes of DERs.**

¹ ENA ER G0 Issue 1 2012 (energynetworks.org)



PROCESS – PSA

BAU system studies are conducted using recent loading data, not the aggregate of the customer MIC / MEC. Customers have the right to use their MIC / MEC in accordance with their connection agreement but if every customer used their full MIC / MEC (directly or via trading), the network could be overloaded.

During the trials, system studies were performed using the total capacity over a full year using recent loading data. If the total capacity cannot be provided over the full Trial period, the total capacity was assessed for specific time periods in which the increased capacity could be used. In some system studies the increase in capacity were considered with a specific trading partner, further restricting the trades.



DSO VIEW

The existing BAU process is the easiest and safest way of enabling MIC / MEC trades as assuming all customers use their MIC / MEC may put the network at risk, be costly to address and risks overloading the control room.



CUSTOMER VIEW

The customer has the right to use their MIC / MEC in accordance with their connection agreement. The current modelling assumptions do not recognise the capacity available outside of the periods normally modelled.



RECOMMENDATIONS FOR FUTURE INVESTIGATIONS

- Explore the extent to which system studies can be automated to reduce staff costs / time
- Consider adapting the TCVN process for BAU
- Consider offering TCVN's based on seasonal capacity with a month ahead or week ahead increase if the system modelling permits.
- Consider using the actual maximum demand or export instead of MIC and MEC limits as the trading capacities, which may alleviate the need for TCVN.
- Review the data requirements to enable the control room to have visibility of sites that could put the distribution network at risk.



PROCESS – BILLING

Customers who trade their MIC / MEC will change their DUoS charging liability. This is particularly relevant to Capacity Charges (based on the MIC / MEC) and the Exceeded Capacity Charges (a higher charge paid by half-hourly metered customers based on the maximum monthly usage when it is above the connection limit). These charges tend to be insignificant for Export connections but can be substantial for demand connection customers. The trial connection capacity variation process updates connection capacity for the purposes of DUoS billing over either a continuous period (for buyers) or not at all (for most sellers). Updates to the billing in only revised on a monthly basis, this will use the notified capacity value on the last working day of the month to base the capacity / exceeding capacity charge.



DSO VIEW

Changes to DUoS charge liability should be reflected in the customers trading prices.



CUSTOMER VIEW

Changes to DUoS should be automatically adjusted to make trading MIC / MEC easier.



RECOMMENDATIONS FOR FUTURE INVESTIGATIONS

- **Determine if there is a workaround to enable DSO-Procured services without changing the settlement system. Such workarounds may include:**
 - educate market participants to include reflect such charges in their trading prices.
- **Consider means of penalising organisations that trade their MIC / MEC but who exceed their revised MIC / MEC. Such penalties may include.**
 - rescinding the approval for the existing trades, the ability to trade for a period or removing the ability to trade (for significant infractions)



MARKET NEED AND MARKET LIQUIDITY

There was limited opportunity to test the DSO-Enabled services due to the lack of counterparties to make a real trade.



DSO VIEW

Large market pulls, especially at a BSP / GSP level, although not for a day ahead service.



CUSTOMER VIEW

Large market pull for selling MIC / MEC over various timescales from week ahead to season ahead, but there is a lack of trading counterparties.



RECOMMENDATIONS FOR FUTURE INVESTIGATIONS

- Consider if DSO- enabled services could be an alternative process for connections requests, allowing applicants for increased of new capacity. This should be considered alongside changes DSO are making based on the Network Access Significant Code Review (Access SCR) (DSOs to consider how to stimulate market development and provide visibility of potential counterparties to enable potential counterparties to identify one another.



GAMING

If the billing system are not updated to allow for dynamic changes to connection capacity, there is a potential for participants to use capacity that due to a trade or lack of trade is not available to them. Data can be requested to ensure trades are complied with, but this can be manipulated and will not capture capacity breaches outside of trades.



DSO VIEW

DSO would require further resource to monitor capacity usage to ensure trades are being complied with.



CUSTOMER VIEW

DSO have the capability and authority to monitor network capacity usage and should ensure compliance.



RECOMMENDATIONS FOR FUTURE INVESTIGATIONS

- Consider monitoring usage of traded capacity and whether parties exceed their adjusted capacity in BaU.
- Consider if actual maximum export and import usage instead of limits can be used for trades.

- Review if excess capacity charges are fit for purpose to ensure compliance.
- Consider if there is a role for the network access ledger, national terms of connection and terms of the connection agreement.



DURATION AND FREQUENCY OF TRADES

There are three mechanisms that exist in BAU that could restrict the growth of the DSO-Enabled market:

- I. BAU does not limit the number of increases of MIC / MEC in a year but only allows one reduction in a month
- II. There is a 65-day approval process for changes to MIC / MEC.
- III. Technical requirements may mean that day ahead trades may not be possible.



DSO VIEW

The same process is applied to all customers that apply for a permanent change to their existing capacity or new capacity and to those requesting a temporary change to make a P2P trade.



CUSTOMER VIEW

Service needs to be responsive to different and changing market needs and to support the growth of DSO-Enabled services which could be fundamental to the delivery of Net Zero.



RECOMMENDATIONS FOR FUTURE INVESTIGATIONS

- Investigate if a mechanism can be developed to reduce the 65-day approval process and enable a temporary increase or decrease to MIC / MEC, even for a maximum duration.
- Explore if within certain operating limits system studies can be automated.
- Determine the market need for different service durations to inform the priority of their release

Appendix A– Current Processes Steps for DSO-Enabled Services

Process step	Description
1. Participant asset registration	<p>Potential participant submits site information for MIC / MEC trading including:</p> <ul style="list-style-type: none"> - Site location/connection agreement - Asset type - Maximum MIC/MEC required (buy) - Maximum MIC/MEC available (sell) - Time period over which capacity is required/available (day, month) - Agree and Sign the P2P Term Sheet
2. DSO review	<p>DSO reviews the asset registration data for location suitability and verifies connection agreement information. If site is requesting to buy capacity, DSO requests participant submit a temporary capacity variation request.</p>
3. Participant temporary capacity variation request	<p>Participant submits temporary capacity variation request using template. This constitutes a formal request to vary the site's connection agreement.</p>
4. DSO review and start technical assessment	<p>DSO reviews formal request and initiates technical assessment. The technical assessment is performed according to the BAU technical processes, using applicable system studies tools.</p>
5. DSO reports technical assessment outcomes	<p>Based on the result of a technical assessment, DSO identifies whether the increased capacity can be supported:</p> <ul style="list-style-type: none"> - without any other site actions or - conditional on another site decreasing capacity. <p>The assessor identifies for the latter case any sensitivity factor(s) for the site decreasing capacity (e.g. 2MW reduction for every 1MW increase in buyer).</p>
6. DSO issues temporary capacity variation agreements	<p>DSO creates temporary capacity variation agreement(s). These vary the existing connection agreement capacity (in kW) for the buyer (and seller if applicable) site(s) over specified time periods. The agreement specifies the duration as either a continuous period or regular intervals (e.g. Weekdays 12-2 during June).</p>
7. Participant executes agreement and DSO countersigns	<p>Participant executes the temporary capacity variation agreement and the DSO countersigns. The participant capacity for the purposes of billing is updated for the duration of the trial periods.</p>
8. Trades executed on the Neutral Market Facilitator (NMF) and approved by the DSO	<p>The participant can either offer to sell or buy capacity at a maximum price on the NMF. The trading peer need to respond to the sell or buy request on the NMF. If the requesting participants accepts the response the DSO them must approve the trade for a contract to formed,</p>