

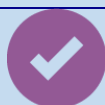
P455‘On-Site Aggregation as a method to facilitate Third Party Access’

This Modification seeks to establish a more cost effective and efficient method for delivering Third Party Access on private networks that include domestic and small business customers. It does so by enabling aggregated meter data from sub meters on private networks to be submitted into Settlement in lieu of data from Settlement meters installed at the Boundary Point.

This Assessment Procedure Consultation for P455 closes:

5pm on Tuesday 16 January 2024.

The Workgroup may not be able to consider late responses.



The P455 Workgroup initially recommends **approval** of P455



The P455 Workgroup **does not** believe P455 impacts the European Electricity Balancing Guideline (EBGL) Article 18 terms and conditions held within the BSC

This Modification is expected to impact:

- BSCCo
- Suppliers
- Generators
- Licence Distribution System Operators (LDSOs)
- Half Hourly Data Collectors (HHDCs)
- Half Hourly Market Operator Agents (HHMOAs)
- Market Half Hourly Settlement Programme (MHHSP) Code Drafting

E L E X O N

Phase

Initial Written Assessment

Definition Procedure

Assessment Procedure

Report Phase

Implementation

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About This Document

You can find the definitions of the terms and acronyms used in this document in the [BSC Glossary](#)¹.

The purpose of this P455 Assessment Procedure Consultation (APC) is to invite BSC Parties and other interested parties to provide their views on the merits of P455. The P455 Workgroup will then discuss the consultation responses, before making a recommendation to the BSC Panel at its meeting on 8 February 2024 on whether or not to approve P455.

There are five parts to this document:

- This is the main document. It provides details of the solution, impacts, costs, benefits/drawbacks and proposed implementation approach. It also summarises the Workgroup's key views on the areas set by the Panel in its Terms of Reference, and contains details of the Workgroup's membership and full Terms of Reference.
- Attachment A contains the P455 Proposal Form.
- Attachment B contains the draft redlined changes to the BSC for P455.
- Attachment C contains the draft redlined changes to the Code Subsidiary Documents (CSDs) for P455.
- Attachment D contains the specific questions on which the Workgroup seeks your views. Please use this form to provide your response to these questions, and to record any further views or comments you wish the Workgroup to consider.



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Not sure where to start?

We suggest reading the following sections:

- Have 5 minutes? Read section 1
- Have 15 minutes? Read sections 1 and 7
- Have 30 minutes? Read all except section 6
- Have longer? Read all sections and the annexes and attachments.

P455

Assessment Procedure Consultation

15 December 2023

Version 0.1

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¹ <https://www.elexon.co.uk/glossary/?show=all>

Why Change?

Where one or more customers on a private wire network (henceforth private network) opt for a third party supply, corrective action is required to avoid the double counting of metered volumes in Settlement. The BSC provides ways to avoid the double counting of metered volumes on private networks via difference metering option and shared SVA metering.

The Proposer believes that these existing options are unsatisfactory when applied to private networks that include domestic and small business (i.e. sub 100kW) customers. This is due to the operational requirements placed on, and the lack of incentive for, Third Party Suppliers (TPSs) to meet such requirements.

Solution

The solution proposes a new 'On-Site Aggregation' methodology for facilitating Third Party Access on private networks to which domestic and small business customers are connected. This methodology can be used instead of difference metering, but requires the BSC to allow aggregated meter data from sub-meters (relating to customers not opting for third party supply) on private networks to be submitted into Settlement (in lieu of data from Settlement meters installed at the Boundary Point).

The proposed solution was originally limited to sub 100kW sites and has since been adjusted to Import only sub100kW sites.

Impacts & Costs

We expect this Modification to impact BSCCo, Suppliers, Generators, LDSOs, HHDCs, HHMOAs, Retail Energy Code (REC) and the MHHSP.

| Costs Estimates | | | |
|-----------------|--------------------|--------------|---|
| Organisation | Implementation (£) | On-going (£) | Impacts |
| Elxon | <£1k | 0 | Document only |
| NGESO | n/a | n/a | No impacts anticipated |
| Industry | <£100k | 0 | Systems and processes – note participation in the scheme is voluntary and costs are only incurred by industry participants who choose to apply the solution |
| Total | 0 | 0 | |

Implementation

The Proposer and Elxon recommend an Implementation Date of:

- 29 June 2024 as part of the standard June 2024 BSC Release if an Authority decision is received on or before 6 June 2024; or

- 5 working days after Authority decision (though no earlier than 4 July 2024), as part of a special BSC Release if an Authority decision is received after 6 June 2024.

This Modification needs to be implemented prior to the end of the Sandbox Application and the Derogation Period which ends no later than 25 September 2024.

Recommendation

The P455 Workgroup initially agreed that P455 is positive against Applicable BSC Objectives c) and e), and neutral against Applicable BSC Objective d).

Therefore, the P455 Workgroup recommends that P455 should be **approved**.

What is the issue?

Customers on private networks (PN) may be supplied electricity from the Boundary Point Supplier. The Boundary Point Supplier is usually appointed by the PNO.

Customers on PN also have the right to switch to a Third Party Supplier of their choice. Under the Electricity and Gas (Internal Markets) Regulations 2011 ([Statutory Instrument \(SI\) 2011 No. 2704](#)), PNOs are obligated to facilitate access to TPSs.

Where one or more customers on a private network opt for a third party supply, corrective action is required to avoid the double counting of metered volumes in Settlement. This is because Third Party Meter readings submitted into Settlement by the TPS Agent also contribute to the aggregate Boundary Point Meter reading submitted into Settlement and allocated to the energy account of the Boundary Point Supplier.

The BSC provides ways to avoid the double counting of metered volumes on private network via difference metering and shared SVA metering.

The Proposer believes that these existing options are unsatisfactory when applied to private networks that include domestic and small business customers² due to the operational requirements placed on, and the lack of incentive for, TPS to meet such requirements.

Difference Metering

A difference metering approach involves the deduction of the consumption through the Third Party Meter(s) from the Boundary Point Meter. This approach is applicable whenever one or more (but not all) customers on a private network have a Settlement Meter with a TPS³.

The operational requirements placed on TPSs enabling them to participate in difference metering arrangements are as follows:

- a) A TPS on a private network must appoint the same HHMOA and HHDC as the Boundary Point Supplier. This requires coordination between appointed TPSs and the Boundary Point Supplier. It may also result in TPSs having to establish new contractual arrangements with HHMOAs and HHDCs of whom they have not previously appointed.
- b) Accurate Settlement requires allocations among Suppliers to be done on a Half-Hourly (HH) basis for difference metering. HH Settlement of domestic and small business customers is not currently mandated or standard practice. TPSs are therefore required to establish voluntary, non-standard arrangements to settle their private network customers on a HH basis.

² The Proposer argues that this issue is felt most prominently in new build housing schemes which is the main focus for private network development currently in the market. Notably, customers move into a home which is supplied by the private network by default, and face barriers to switching away.

³ [BSCP502 'Half Hourly Data Collection for SVA Metering Systems Registered in SMRS'](#) (section 4.9.3) and the Retail Energy Code (REC) Metering Operations Schedule recognises this approach as a Complex Site, which allows a differencing algorithm to be implemented in Settlement.



What is a Boundary Point?

A point at which any Plant or Apparatus not forming part of the Total System is connected to the Total System.



What is a Boundary Point Supplier?

The Supplier with responsibility for flows of electricity from (or to) the licenced distribution network



What is a Third Party Supplier?

A Supplier appointed by a customer on the private network.



What is a Boundary Point Meter?

A BSC Code of Practice (CoP) compliant Metering System located at the Boundary Point.



What is a Third Party Meter?

A Settlement Meter installed for the customer on the private network.

Under the Electricity and Gas (Internal Markets) Regulations 2011, the responsibility for finding a TPS who will participate in difference metering arrangements sits with the customer. This can be very difficult for individual domestic or small business customers to achieve as there is little commercial incentive for Suppliers to establish the bespoke arrangements required, given the relatively low electricity supply volumes that would likely result. It is therefore the Proposer's view that domestic and small business customers face substantial barriers to being able to switch to a Supplier of their choice.

It is also the Proposer's view that inefficiencies arise in the differencing metering approach when there is more than one TPS supplying customers on a private network. For example, where a private network is connected to 100 domestic properties, 50 of which are supplied by a licence exempt Supplier appointed by the PNO and 50 of which are supplied by 20 different TPSs, all 20 TPSs must establish the bespoke arrangements mentioned above to facilitate the scheme.

Shared SVA Metering

Suppliers may establish a Shared SVA Metering Arrangement in which Meter readings recorded at the Boundary Point are apportioned between Suppliers (for example, based on readings from non-Settlement Meters on a private network).

Under this arrangement, an Allocation Schedule must be prepared in accordance with [BSCP550 'Shared SVA Meter Arrangement'](#) which details how the consumption data is split between Suppliers⁴.

The Proposer argues that given the number of potential TPSs involved in the shared arrangement, accurately allocating volumes can be complex. Therefore, the operational requirements placed on TPSs discussed above (which act as a barrier to domestic and small business customers on private networks being able to switch Suppliers) are even more pronounced here.

Full Settlement Metering

Full settlement arrangements are only applicable if every customer on a private network has opted for third party supply. The arrangements involve installing Settlement Meters for all consumption and generation on the private network, and treating each of those metering points as if they were connected to the Total System⁵. It therefore does not create a scenario that risks the double counting of metered volumes.

Nonetheless, while it is important to note the existence of this arrangement, this Modification is focused primarily on private networks with a mix of customers who have

⁴ In line with [Section K2.5.4](#), where the Shared SVA Meter Arrangement is made by two or more Suppliers, the Suppliers shall agree which of them is to act as primary Supplier for the purposes of the Code, failing which the Panel shall nominate one of them to act as primary Supplier. The Primary Supplier shall ensure that an Allocation Schedule and the associated rules for application and maintenance of the Allocation Schedule are established and submitted in accordance with BSCP550.

⁵ The BSC refers to a private network with full Settlement arrangements in place as an 'Associated Distribution System'. Metering Systems on an Associated Distribution System are treated in the same way as any other site connected to the Total System and are subject to the normal LDSO Use of System (UoS) charges. This means that customers connected to the private network cannot benefit from netting against on-site (renewable) generation, and would have to pay system charges for that generation even though they are not using the Total System.

opted for a third party supply and customers who are supplied by the Boundary Point Supplier appointed by the PNO.

Background

Prior to this Modification Proposal, Emergent Energy submitted a Derogation Request to use the BSC Sandbox to trial their proposed solution to the issue outlined above. The request was [approved](#) by Ofgem on 26 May 2021 in line with the BSC Panel's recommendation. The Derogation commenced on 29 September 2021 and will end no later than 25 September 2024. This Modification will need to be [implemented](#) prior to this end date.

Emergent Energy's proposed solution – which is described in more detail in [section 3](#) – involves a new On-Site Aggregation methodology for submitting metered data from private networks into Settlement. This methodology is being trialled across several of its sites. In an [update](#) provided in February 2023, Emergent Energy highlighted that the new methodology has proven to be successful in delivering equivalent Settlement results to the existing methodology of difference metering.

Emergent Energy has submitted a Modification Proposal to make an enduring change to the BSC which takes into account learnings from the Sandbox trial.

Desired outcomes

To establish a new methodology for facilitating Third Party Access (TPA) on private networks to which domestic and small business customers (i.e. sub 100kW customers) are connected. The new method will be one that can be used instead of difference metering, which is the current default method for private networks where TPA is required.

The new methodology will be more operationally efficient than difference metering and provide better outcomes for domestic and small business customers who may wish to switch from their Boundary Point Supplier to a Third Party Supplier (and vice versa).

For example, it will not require TPAs to establish new contractual arrangements with HHMOAs and HHDCs of whom they have not previously appointed. Instead it will be delivered by the PNO in collaboration with the Boundary Point Supplier and Supplier Agents.



What is a Derogation Request?

Innovators may want to trial an activity or arrangement, in a live market environment, that wouldn't normally be allowed by the BSC rules. Through the BSC Sandbox they can seek a temporary BSC Derogation from having to comply with one or more of these rules.

For each application, Elexon assesses the risks and impacts of the requested derogation on behalf of the BSC Panel. The Panel makes a recommendation to Ofgem. Ofgem makes the final decision.

The maximum Derogation Period permitted by the BSC is three years. This comprises two years maximum for the Trial Period where the applicant tests their innovation, and any additional Transition Period during which they exit from the Derogation.

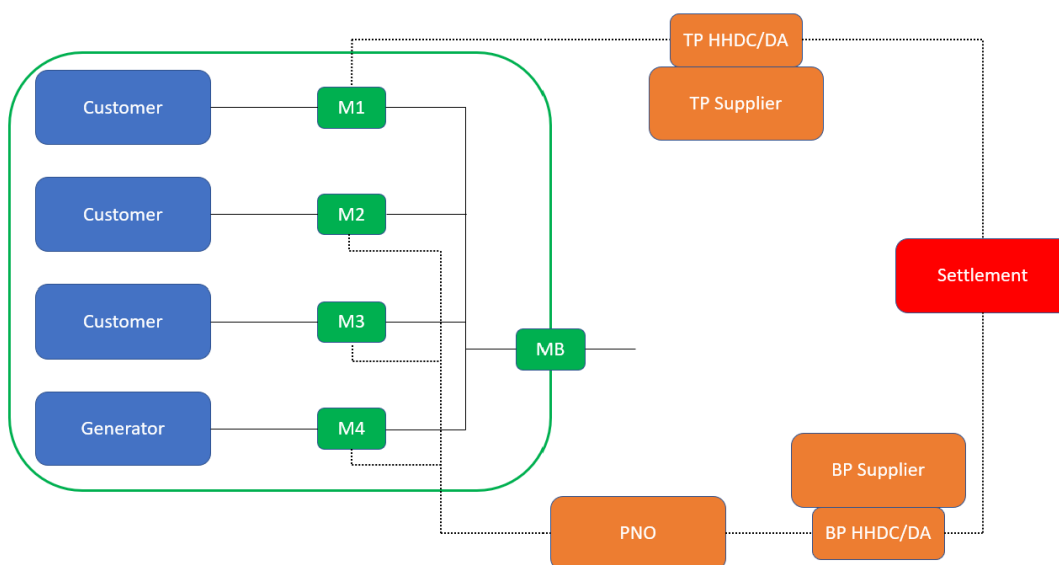
A BSC Modification Proposal to implement a permanent rule change may be submitted during the Transition Period.

Proposed solution

Each customer supplied by the private network's Boundary Point Supplier has their own non-settlement (sub) meter with HH data available. This data is used for retail billing.

The proposed solution will enable this data to be aggregated and submitted into Settlement in lieu of the reading from the site's Boundary Point Meter. This volume will therefore not include the volumes supplied by the TPSs. Volumes for third party supplied customers on the private network will be settled directly by the TPS (HH or Non-HH as per the discretion of the TPS), avoiding any double counting of Settlement volumes than can result from third party supplied arrangements.

It will also account for on-site generation as per the diagram below.



In this example:

1. Customer 1 (top) is supplied by a TPS. The supplied volumes are metered by Settlement meter M1 and submitted into Settlement by the TPS.
2. Customers 2 and 3 are supplied by the PNO (or an entity associated with the PNO) who uses non-Settlement (sub-meters) M2 and M3 to bill these customers.
3. The PNO supplies electricity from an on-site generation source (e.g. solar PV panels⁶) to customers 2 and 3, as well as electricity imported from the Distribution Network (grid). The generated volumes from the on-site generation source are metered by non-Settlement (sub-meter) M4.
4. The PNO uses this data from M2, M3 and M4 to produce a net import or net export figure for every HH period. For example, $M4 - (M2 + M3)$ ⁷. This figure is then submitted into Settlement in place of the readings from the Boundary Point Meter (MB).

⁶ i.e. solar photovoltaic panels

⁷ the on-site customer will always consume from the on-site generation source before taking demand from the Distribution Network

Operational Requirements

To ensure the above On-Site Aggregation methodology results in accurate Settlement outcomes for private networks, procedural arrangements will need to be established as part of the solution. The Proposer suggests the following:

1. The private network Import only sub-meters will be required to conform to [Code of Practice \(CoP\) 10: The Metering of Energy via Low Voltage Circuits for Settlement Purposes](#).
2. The HHDC associated with the PNO will be responsible for retrieving, aggregating and submitting the necessary data and into Settlement. The HHDC may, at their discretion, choose to coordinate with a PNO to fulfil the requirements, so long as the operating standards required of HHDCs are maintained. The standard requirements on HHDC activities (e.g. in relation to data validation and estimation) shall apply.
3. It will be the HHMOA associated with the PNO who is responsible for identifying and fixing faults on the private network sub-meters. The HHMOA may choose to coordinate with a PNO to fulfil the requirements, so long as the operating standards required of HHMOAs are maintained. The standard requirements on HHMOA activities (e.g. in relation to faults and installation) shall apply.
4. For each private network that adopts this approach, a test akin to a Complex Site Validation Test⁸ will be required to ensure that the aggregation methodology is being applied correctly. This will require the HHDC and HHMOA to establish the data integrity of the individual meters involved and the overall aggregation methodology that is being applied to these meters. This point is discussed further in [section 4](#)).
5. The solution will be restricted to private networks with TPS Metering Systems and with Import only sub-meters that are sub100kW capacity.
6. Metering System Identifiers (MSIDs)⁹ of private network customers supplied by the PNO (or an associate) will be required to be logically disconnected.

Benefits

This Modification will benefit domestic and small business customers (sub 100kW) on private networks. It will do so by reducing the operational requirements on potential TPSs which enable them to take part in private network arrangements where difference metering is or would be used. It should therefore be easier for these customers to find TPSs willing to supply their energy¹⁰. It should also be easier for Suppliers to attract new domestic and small business customers who are connected to a private network and are currently being supplied by the Boundary Point Supplier (meaning greater competition which can lead to improved outcomes for the market as a whole).

It will have environmental benefits as private networks provide a mechanism for locally generated (renewable) electricity to be generated and supplied to customers. On-site

⁸ See BSCP504, paragraph 3.5.6

⁹ also known as Metering Point Administration Numbers (MPANs)

¹⁰ This is particularly relevant given today's focus on new build housing, where private networks can be established at the point of construction. Customers who move into new build homes are often a customer of the PNO by default.

renewable generation (e.g. solar PV) remains an option for private networks operating under the proposed methodology.

Integrated with other decarbonisation technologies such as heat pumps, electric vehicle chargers and storage, private networks have potential to reduce capacity strains on the Distribution Network and unlock value flexibility for the overall energy system.

Assessment Consultation Questions

Do you agree with the Workgroup's initial unanimous view that P455 does better facilitate the Applicable BSC Objectives than the current baseline?

Please provide your rationales

The Workgroup invites you to give your views using the response form in Attachment D

Alternative solution

The P455 Workgroup did not identify any alternative solutions.

Assessment Consultation Question

Do you agree with the Workgroup that there are no other potential Alternative Modifications within the scope of P455 which would better facilitate the Applicable BSC Objectives?

Please provide your rationale and, if 'No', please provide full details of your Alternative Modification(s) and your rationale as to why it/they better facilitate the Applicable BSC Objectives.

The Workgroup invites you to give your views using the response form in Attachment D

Legal text

The proposed redlined changes to the BSC and its subsidiary documents to deliver the intent of P455 can be found in Attachment B and C.

Assessment Consultation Question

Do you agree with the Workgroup that the draft legal text in Attachment B delivers the intention of P455?

Please provide your rationale.

Do you agree with the Workgroup that the draft amendments to the CSDs in Attachment C deliver the intention of P455?

Please provide your rationale.

The Workgroup invites you to give your views using the response form in Attachment D

Estimated costs of P455

Costs will be assessed during this consultation. However, for those roles the Workgroup believe will be impacted, the Workgroup have indicated whether it believes the costs are likely to be high, medium or low based on the following categories. We invite you to validate and refine these estimates via this consultation:

- High: >£1 million
- Medium: £100-1000k
- Low: <£100k

| Implementation costs estimates | | | |
|--------------------------------|---------------------|--------------------------|--|
| Organisation | Item | Implementation costs (£) | Comment |
| Elexon | Documents | Low | |
| NGESO | Systems | None | |
| | Other | None | |
| Industry | Systems & processes | Low | Participation in the scheme is voluntary and costs are only incurred by industry participants who choose to apply the solution. Those who do participate will need to make small changes to their systems and processes. |

| On-going costs estimates | | |
|--------------------------|--------------------|---------|
| Organisation | On-going costs (£) | Comment |
| Elexon | None | |
| NGESO | None | |
| Industry | None | |

P455 impacts

| Impact on BSC Parties and Party Agents | | |
|--|--|----------------|
| Party/Party Agent | Impact | Estimated cost |
| Supplier | Suppliers will need to be aware of the new On-Site Aggregation methodology and be able to support it should they choose to partner with PNOs who implement it. | L |

| Impact on BSC Parties and Party Agents | | |
|--|--|----------------|
| Party/Party Agent | Impact | Estimated cost |
| Generator | If an independent generator partners with a PNO offering On-Site Aggregation they will need to understand the methodology and how it interacts with any other subsidies they may receive. This impact relates primarily to non-BSC (independent) Generators, but due to their interaction with the BSC in this scenario, it is important to capture here. | L |
| Licensed Distribution System Operator (LDSO) | LDSOs will need to be aware if an On-Site Aggregation methodology is being used on a particular site as this may impact the DUoS charges levied on Suppliers to the site. The specific charging methodology LDSOs should apply in the event of a scheme being in place is the subject of a second Sandbox trial by Emergent, which is expected to lead to a DCUSA Modification being raised in 2024. The current working assumption is that the BSC Modification and potential DCUSA Modification are independent. If the DCUSA Modification is not implemented, this will not materially impact the BSC Modification. | L |

| Impact on the NETSO | |
|------------------------|----------------|
| Impact | Estimated cost |
| No impacts anticipated | |

| Impact on BSCCo | | |
|------------------------|--------|----------------|
| Area of Elexon | Impact | Estimated cost |
| No impacts anticipated | | |

| Impact on BSC Settlement Risks |
|--|
| There are potential risks to Risk 1 (Registration), 7 (Retrieval), 18 (revenue protection). This is largely due to the threat that unmetered loads are on private network are not identified. This has been reviewed and discussed in the group. The potential impact is expected to be low, given the frequency of sites and the limitation to being sub-100kW. Unmetered load tests are not required on other sites, so this is not unique. There is a further risk around Risk 16 (Energisation status), through the disconnection process. |

| Impact on BSC Systems and process | |
|-----------------------------------|--------|
| BSC System/Process | Impact |
| No impacts anticipated | |

| Impact on BSC Agent/service provider contractual arrangements | |
|---|--|
| BSC Agent/service provider contract | Impact |
| HHDCs | <p>HHDCs associated with the PNO's Supplier will be responsible for retrieving, aggregating and submitting the necessary metered data into Settlement for Boundary Point Supplied customers and on-site generation sources.</p> <p>They will also need to work with HHMOAs associated with the PNO's Supplier to establish the data integrity of the individual meters involved and the overall aggregation methodology that is being applied to these meters.</p> |
| HHMOAs | <p>HHMOAs associated with the PNO's Supplier will be responsible for identifying and fixing faults on private network sub-meters.</p> <p>They will also need to work with associated with the PNO's Supplier to establish the data integrity of the individual meters involved and the overall aggregation methodology that is being applied to these meters.</p> |

| Impact on Code | |
|---|--|
| Code Section | Impact |
| Section K: Classification and Registration of Metering Systems and BM Units | P455 adds 2.9 Registration of On-Site Aggregation SVA Metering Systems |

| Impact on MHHS |
|--|
| <p>Operationally, P455 sits apart from MHHS and there are no impacts on the MHHS Design or the TOM. However, there are impacts on the delivery of the MHHSP Code Drafting, because unless P455 is included within that, the changes made to the BSC on deployment of MHHS are likely to exclude P455.</p> <p>In addition, MHHS delivers some changes that may impact P455, such as replacing MDD, removing Data Collectors, so if the intent is to deliver P455 before MHHS goes live, two slightly different sets of code changes need to be written.</p> |

| Impact on EBGL Article 18 terms and conditions |
|---|
| <p>Elxon and the P455 Workgroup does not believe that this Modification impacts on any of the EBGL Article 18 Terms and Conditions held within the BSC.</p> |

| Impact on Code Subsidiary Documents | |
|---|--|
| CSD | Impact |
| BSCP502 'Half Hourly Data Collection for SVA Metering Systems Registered in SMRS' | P455 adds 3.5.7 the On-Site Aggregation Validation Test and On-Site Aggregation Form, 4.9 Guide to Complex Sites and On-Site Aggregation |

| Impact on other Configurable Items | |
|------------------------------------|--------|
| Configurable Item | Impact |
| No impacts anticipated | |

| Impact on Core Industry Documents and other documents | |
|---|---|
| Document | Impact |
| Ancillary Services Agreements | n/a |
| Connection and Use of System Code | n/a |
| Data Transfer Services Agreement | n/a |
| Distribution Code | n/a |
| Grid Code | n/a |
| Retail Energy Code | This Modification proposes to place a requirement on the SVA MOA appointed by the Boundary Point Supplier to rectify any faults found with the sub meters used in the On-Site Aggregation methodology. As SVA MOAs are governed under the Retail Energy Code (REC), there is in place a REC Code Manager's subsequent change (R0150). |
| Supplemental Agreements | n/a |
| System Operator-Transmission Owner Code | n/a |
| Transmission Licence | n/a |
| Use of Interconnector Agreement | n/a |

| Impact on a Significant Code Review (SCR) or other significant industry change projects |
|---|
| There is no impact on any open SCR. Ofgem confirmed this view on 9 October 2023. |

Assessment Consultation Question

Do you agree with the Workgroup's assessment of the impact on the BSC Settlement Risks?

Please provide your rationale.

Will P455 impact your organisation?

If it will impact, please provide a description of the impact(s) and any activities which you will need to undertake between approval and implementation (including any necessary changes to your systems, documents and processes) and any on-going operational impacts. Where applicable, please state any difference in impacts between the Workgroup's proposed solutions.

How much will it cost your organisation to implement P455?

If any, please provide details of these costs, how they arise. Please also state whether it makes any difference to these costs whether implemented as part of or outside of a normal BSC Systems Release. Where applicable, please state any difference in costs between the Workgroup's proposed solutions and if applicable, between the different roles.

What will the ongoing cost of P455 be to your organisation?

If any, please provide details of these costs, how they arise. Please also state whether it makes any difference to these costs whether P455 is implemented as part of or outside of a normal BSC Systems Release. Where applicable, please state any difference in costs between the Workgroup's proposed solutions and if applicable, between the different roles.

How long (from the point of approval) would you need to implement P455?

Please provide an explanation of your required lead time, and which activities are the key drivers behind the timescale. Please also state whether it makes any difference to this lead time whether implemented as part of or outside of a normal BSC Systems Release. Where applicable, please state any difference in lead times between the Workgroup's proposed solutions.

The Workgroup invites you to give your views using the response form in Attachment D



What are the consumer benefit areas?

1) Will this change mean that the energy system can operate more safely and reliably now and in the future in a way that benefits end consumers?

2) Will this change lower consumers' bills by controlling, reducing, and optimising spend, for example on balancing and operating the system?

3) Will this proposal support:

i) new providers and technologies?

ii) a move to hydrogen or lower greenhouse gases?

iii) the journey toward statutory net-zero targets?

iv) decarbonisation?

4) Will this change improve the quality of service for some or all end consumers. Improved service quality ultimately benefits the end consumer due to interactions in the value chains across the industry being more seamless, efficient and effective.

5) Are there any other identified changes to society, such as jobs or the economy.

P455

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Consultation

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| Impact of the Modification on the environment and consumer benefit areas: | |
|---|-------------------|
| Consumer benefit area | Identified impact |
| 1) Improved safety and reliability No impact | Neutral |
| 2) Lower bills than would otherwise be the case This Modification should lower bills for customers on private networks who wish to be supplied by TPSs. TPSs will no longer incur costs as a result of establishing bespoke arrangements in these circumstances. | Positive |
| 3) Reduced environmental damage This Modification will support growth in the use of private networks to support the financing of decarbonisation technologies for housing and small business customers. Private networks involving storage and other means of demand control will also deliver reductions in grid capacity constraints and unlock value flexibility. This will support the overall transition to a Net Zero emission electricity grid. | Positive |
| 4) Improved quality of service This Modification will make switching easier for customers on private networks. | Positive |
| 5) Benefits for society as a whole This Modification will result in benefits for society by supporting innovation in the delivery of statutory Net Zero targets and creating jobs. | Positive |

| Assessment Consultation Question |
|--|
| <p>Do you agree with the Workgroup's assessment of the consumer benefits? Please provide your rationale.</p> |
| <p>The Workgroup invites you to give your views using the response form in Attachment D</p> |

Recommended Implementation Date

The Workgroup recommends an Implementation Date for P455 of:

- **29 June 2024** as part of the standard June Release BSC Release if an Authority decision is received on or before 6 June 2024; or
- **5 Working Days** after Authority decision, as part of a special BSC Release.

Assessment Consultation Question

Do you agree with the Workgroup's recommended Implementation Date?

Please provide your rationale.

The Workgroup invites you to give your views using the response form in Attachment D

The P455 Workgroup met five times on 12 September, 31 October, 22 and 27 November and 12 December 2023 to consider the Terms of Reference.

ToR a) Does the proposed On-Site Aggregation methodology result in accurate settlement outcomes (particularly in relation to difference metering)?

Workgroup discussions

The proposer started by reviewing the ToR and presenting the methodology for on-site aggregation to facilitate Third Party Access on private networks. BSCP502 was reviewed, with particular emphasis on the Difference Metering methodology, and how on-site aggregation achieves the same outcomes while making it easier for Customers to choose Third Party Suppliers.

A workgroup (WG) member asked if this solution applies to all meter types, including non-half hourly. It was clarified that the Import only sub Meters involved in the On-Site Aggregation Method are proposed to be Code of Practice (CoP) 10 compliant and would all be operated on a half hourly basis. Plant/Apparatus capable of generation comprised within an on-site aggregation Metering System should be compliant to the relevant CoP

Outcome

The Workgroup concluded that the aggregated methodology produces the same settlement results as Difference Metering, but using a simplified method that, by not requiring involvement of Third Party Supplied Customers, their Suppliers, or their Suppliers' agents, makes it easy for Customers to choose Third Party Suppliers.

ToR b) What testing should be required to validate the solution is correctly implemented, and should this include an unmetered load tests?

Workgroup discussions

The proposer presented the findings from Emergent's Sandbox trial of the On-Site Aggregation method, which required a so-called 'proving test' to be conducted, to check for unmetered loads, as these cause adverse and incorrect Settlement. The test was shown to have presented many difficulties, due to the requirement for the Private Network Operator to access meters for which it has no responsibility for as these are registered against the Third Party Suppliers Metering Systems.

The proposer also argued that Difference metering does not in practice capture existing unmetered loads on the smaller sites that are the focus of the mod, because, since the solution does not work as a means to facilitate Third Party Access, it is not used in the industry. On this basis, the proposer argued it was wrong to require the On-Site Aggregation method to achieve an outcome that is not required of other settlement processes.

Outcome

The Workgroup concluded that, in addition to the proposed test being extremely costly to implement for negligible gain, since Difference metering does not solve instances of

existing unmetered loads, P455 should not have to solve them either. A site comparable in scope to a Complex Site Validation Test was argued to be sufficient to test the On-Site Aggregation Method and should be applied to P455.

The Aggregation Method is not proposed to apply to large I and C schemes and so it was noted that the risk of unmetered loads could still be picked up in larger Metering Systems where difference metering is applied more often and correctly.

ToR c) Is it right that the boundary meter HHDC and HHMOA are responsible for operations related to the sub-meters, given private network operators are responsible for these meters on a day-to-day basis, and given the move to new arrangements under MHHS?

Workgroup discussions

The proposer argued that this was the most straightforward arrangement for the industry to adopt, and should be uncontroversial.

The proposer noted that Ofgem has confirmed that P455 is exempt from the Significant Code Review (SCR). A consequential Change Request to the Market Half Hourly Programme (MHHP) will be needed, to adjust the Code to this solution, and align both the BSC and MHHS Code Artefacts to the same terminology.

It was asked if P455 will have impacts on the MHHS migration, but it was explained by Elexon that the P455 solution is simpler than the Difference Metering and would be simple to migrate.

A WG member asked if P455 will force Private Network Owners (PNO) to join the BSC. Since no new roles are proposed under this solution and so the PNO will need to work with a registered Supplier and qualified Supplier Agents.

Outcome

The Workgroup agreed that it is right that the boundary meter HHDC and HHMOA are responsible for operations related to the sub-meters.

ToR d) Is it right that the sub-meters should conform to COP10 standards?

Workgroup discussions

Elexon explained that the On-Site Aggregation method will be required to be compliant to Code of Practice relevant to that sub metering (I.E not the Boundary Point connection). As explained above, Import only Metering Equipment must be CoP10 compliant.

Plant/Apparatus capable of generation comprised within an on-site aggregation Metering System should be compliant to the relevant CoP.

The use of Smart Metering Equipment Technical Specifications (SMETS) Meters, which have been adopted by the Data Communications Company (DCC), is allowed in the on-site aggregation Metering System. These SMETS Meters meet the requirements of Code of Practice 10 (CoP10). However, it is important to inform the Half-Hourly Data Collector (HHDC) about which Meters have been adopted by the DCC. This is to ensure that the HHDC does not try to access the raw data from these specific Meters, which is done via the On-Site Aggregation Form.

Outcome

The Workgroup agreed with limiting P455 to Import only sub-meters that are CoP10 compliant.

ToR e) Should there be a requirement for Elexon to maintain a central database of sites where On-Site Aggregation is applied? Do the benefits of maintaining a central register outweigh the costs of creating and maintaining his central register? Do PNOs/DNOs have all the necessary data to manage schemes?

Workgroup discussions

The Proposer identified need for a data solution for industry to know with confidence which TPS meters are associated with which On-site Aggregation schemes. A central repository of License Exempt Networks and where on those networks On-Site Aggregation is being used achieves this.

Outcome

Similar to the Complex Site Supplementary Information Form, Elexon created an On-Site Aggregation Metering System Form. This form will be required to be sent to BSCCo by the MOA so that we can create the central repository.

A copy of is within the Attachment C.

ToR f) Is there an impact on BSC Metering Dispensations?

Workgroup discussions

Elexon explained that the BSC Settlement CoPs require Metering Equipment to be located at the point of connection to the Total System (Defined Metering Point).

Currently where Metering Equipment is located away from the Designated Metering Point (DMP) then a Metering Dispensation is required; either generic (D/380) or site specific. The only method of facilitating Third Party Access that currently requires a Metering Dispensation is difference metering. This is because the Metering Equipment associated with the Third Party Customer's MSID(s) is located away from the DMP at the asset.

However under the full Settlement solution, a Metering Dispensation is not required as all the entry and exits points of the Licence Exempt Network (i.e. PN) are metered. This effectively moves the DMP to the point of connection to the LEN as opposed to the Total System.

The On-Site Aggregation method more closely resembles the full Settlement solution as each aggregated customer is sub-metered and each Third Party Supply customer is also independently metered. For this reason it is suggested that a Metering Dispensation is not required for the MSIDs related to the On-Site Aggregation method.

Outcome

The Workgroup concluded that there are no impacts on BSC Metering Dispensations.

ToR g) Is this proposal independent from any DCUSA change?

Workgroup discussions

It was explained that P455 can be implemented independently of the current DCUSA Sandbox and consequential changes.

Outcome

The Workgroup agreed that P455 is independent from any DCUSA change.

ToR h) Is a Cost-Benefit Analysis required?

Workgroup discussions

The Workgroup discussed that a Cost-Benefit analysis does not seem to be required. However, Ofgem may need one to assess its decision regarding P455.

Outcome

The Proposer and Elexon are engaging with Ofgem to see if they would need a Cost-Benefit analysis for their decision.

ToR i) Is it right that the scheme is limited to sub-100kW sites?

Workgroup discussions

The Workgroup discussed that the summation of all Metering Equipment under the on-site aggregation Metering System is likely to exceed 100kW and so a 100kW limit may not be appropriate.

Outcome

The Workgroup agreed that it is not the scheme that is limited to 100kW, but the Import only Metering Equipment comprised within the on-site aggregation Metering System.

ToR j) Is it right that the MSIDs of Customers of a PN should be de-energised instead of logically disconnected, in order to minimise barriers to the Customer subsequently choosing a third party supply? Are there other ways in which the need to swap customers meters when they move in and out of schemes could be reduced/avoided?

Workgroup discussions

The Proposer started by explaining the differences between de-energisation and disconnection. De-energisation means de-energisation in relation to any Boundary Point or Systems Connection Point (or the Plant or Apparatus connected to any System at such a point) the movement of any isolator, breaker or switch or the removal of any fuse whereby no electricity can flow at such point to and from a System; and "de-energised" shall be construed accordingly.

Once complete, the MSID is expected to be re-energised. Disconnection implies the total removal of an MSID from industry systems and removal of registration data from industry systems.

For a Customer with an existing MSID who chooses to be supplied by a PN, the correct process today is a logical disconnection, such that the MSID is removed from industry systems, while the physical electrical connection to Customers property is left intact.

The Workgroup then considered whether de-energisation might be better for the Customer rather than logical disconnection, where the Customer must request creation of a new MPAN. However, since we expect the physical meters associated with the MSID to be removed, de-energisation is likely to create confusion within industry, since there is no meter left in place that can simply be de-energised.

Outcome

The Workgroup agreed that logical disconnection seems to be the best procedure to follow.

ToR k) Is it right for the solution not to be captured under the complex site arrangements within BSC?

Workgroup discussions

Elexon explained that a Metering System is defined as Complex where the primary Meter Technical Details flow is insufficient to allow the HHDC to correctly interpret and process the metered data for Settlement purposes.

In almost all cases a Complex Site is concerned with the differencing of one or more Meters from another (X-Y). Under BSCP502 On-Site Aggregation is very similar to a process called off-site totalisation which the BSCP makes explicitly clear should **not** be considered Complex. The Workgroup discussed different implementation examples under totalisation and its interaction with the On-Site Aggregation method, and both work under P455.

Outcome

The Workgroup agreed that the On-Site Aggregation method should not be considered a Complex Site, and that implementation notes will be added to the P455 documentation.

ToR l) Is a physical boundary meter required to implement the solution, and should it be?

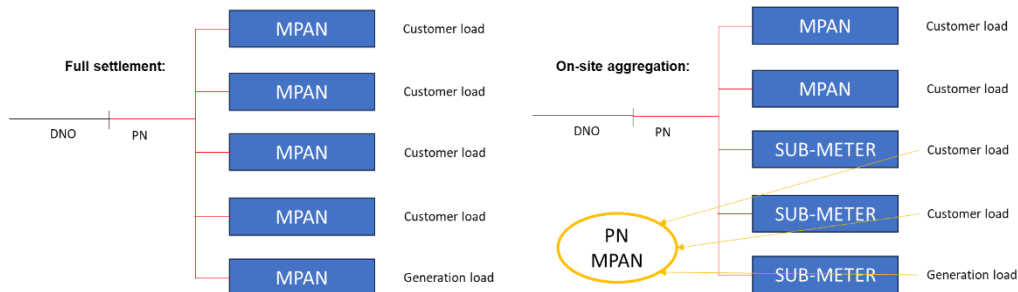
Workgroup discussions

The proposer explained why he does not believe a boundary meter is required. He consulted with several DNOs and reviewed the BSC, and he concluded that the proposed solution is a simple and straightforward method for allocating measurement class to the PN aggregation MPAN.

Definitions within the BSC appear to allow implementation of the solution without a boundary meter, since each exit/entry from the PN will have a metering point, which will be associated with an MPAN (i.e. for the PN as a whole).

A PN with on-site aggregation applied is metered in the same way as a PN with full settlement applied. The only difference is the sub-meters are aggregated to make the 'PN MPANs' (i.e. import and export).

An implication from not having a physical boundary meter was identified for how the measurement class of the On-Site Aggregation is set, because Measurement Classes E and G are differentiated by physical Meter type (i.e. Current Transformer and Whole Current respectively). To accommodate this, sites with On-site Aggregation applied would be differentiated between Measurement Classes E and G in relation to a maximum demand limit of 69kW, which reflects the point at which a CT Meter would need to be installed instead of whole current.



Outcome

The Workgroup agreed that a physical boundary meter is not required.

ToR m) What are the arguments for and against creation of a new market role for PNOs (e.g. access to industry data access; market competition)?

Workgroup discussions

The Workgroup discussed how P455 proposed a voluntary solution. Applying the On-site Aggregation method will not be a requirement. Therefore, the creation of a new market role seems unnecessary and would cause a larger amount of work and delay to implementation.

Outcome

The Workgroup agreed that there should not be a new market role for PNOs.

Assessment Consultation Questions

Does the proposed On-Site Aggregation methodology result in accurate settlement outcomes (particularly in relation to difference metering)?

Please provide your rationale.

What testing should be required to validate the solution is correctly implemented, and should this include an unmetered load tests?

Please provide your rationale.

Is it right that the boundary meter HHDC and HHMOA are responsible for operations related to the sub-meters, given private network operators are responsible for these meters on a day-to-day basis, and given the move to new arrangements under MHHS?

Please provide your rationale.

Is it right that the sub-meters should conform to COP10 standards?

Please provide your rationale.

Should there be a requirement for Elexon to maintain a central database of sites where on-site aggregation is applied? Do the benefits of maintaining a central register outweigh the costs of creating and maintaining his central register? Do PNOs/DNOs have all the necessary data to manage schemes?

Please provide your rationale.

Is there an impact on BSC Metering Dispensations?

Please provide your rationale.

Is a Cost-Benefit Analysis required?

Please provide your rationale.

Is it right that the scheme is limited to sub-100kW sites?

Please provide your rationale.

Is it right that the MSIDs of Customers of a PN should be de-energised instead of logically disconnected, in order to minimise barriers to the Customer subsequently choosing a third party supply? Are there other ways in which the need to swap customers meters when they move in and out of schemes could be reduced/avoided?

Please provide your rationale.

Is it right for the solution not to be captured under the complex site arrangements within BSC?

Please provide your rationale.

Is a physical boundary meter required to implement the solution, and should it be?

Please provide your rationale.

What are the arguments for and against creation of a new market role for PNOs (e.g. access to industry data access; market competition)?

Please provide your rationale.

[The Workgroup invites you to give your views using the response form in Attachment D](#)



The Workgroup have taken an informal vote on the Applicable BSC Objectives before reviewing the proposed redlining. These initial views are demonstrative and may change after the Assessment Procedure Consultation.

| Does P455 better facilitate the Applicable BSC Objectives? | | |
|--|-------------------|--|
| Obj | Proposer's Views | Other Workgroup Members' Initial Views ¹¹ |
| (a) | • Neutral | • Neutral |
| (b) | • Neutral | • Neutral |
| (c) | • Positive | • Positive |
| (d) | • Positive | • Neutral |
| (e) | • Positive | • Positive |
| (f) | • Neutral | • Neutral |
| (g) | • Neutral | • Neutral |

The Proposer and Workgroup believe that P455 is positive against the overall arrangements and should therefore be approved.

The P455 Proposer believes that the Modification better facilitates Applicable Objectives (c), (d) and (e). The Workgroup discussed

Applicable BSC Objective (c) - Promoting effective competition in the generation and supply of electricity and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity

The proposed Modification improves access to TPSs for small customers on private networks. Removing this barrier therefore supports increased competition between TPSs. It also improves the overall viability of private networks, increasing market competition from PNOs and Boundary Point Suppliers who may be associated with PNOs.

Applicable BSC Objective (d) - Promoting efficiency in the implementation of the balancing and settlement arrangements

As above, the facilitation of TPS arrangements on private networks with domestic and small business customers will no longer require erroneous operational activities to be undertaken by TPSs. Instead, the required activities are undertaken by the Boundary Point Supplier and Supplier Agents, working in coordination with the PNO, who are already accessing and processing the relevant data as part of their day to day activity.

However, since 'efficiency' is regarding the BSC and not industry efficiency, the Workgroup initially believes that P455 is neutral against the Applicable BSC Objective d).

The fundamental problem that P455 aims to solve is that the current arrangements work ineffectively for smaller customers, but that is captured under the Applicable BSC Objective c).

What are the Applicable BSC Objectives?

(a) The efficient discharge by the Transmission Company of the obligations imposed upon it by the Transmission Licence

(b) The efficient, economic and co-ordinated operation of the National Electricity Transmission System

(c) Promoting effective competition in the generation and supply of electricity and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity

(d) Promoting efficiency in the implementation of the balancing and settlement arrangements

(e) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency [for the Co-operation of Energy Regulators]

(f) Implementing and administering the arrangements for the operation of contracts for difference and arrangements that facilitate the operation of a capacity market pursuant to EMR legislation

(g) Compliance with the Transmission Losses Principle

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¹¹ Shows the different views expressed by the other Workgroup members – not all members necessarily agree with all of these views.

Applicable BSC Objective (e) - Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency for the Co-operation of Energy Regulators

The Proposer believes that, due to a legally binding decision of the European Commission, domestic and small business customers on private networks have the legal right to switch Supplier. Currently, this is not being effectively facilitated by the BSC. The legal right for customers to access a TPS arrangements was established in the UK via Schedule 2ZA to the Electricity Act 1989, which implemented the position as clarified in the EU's Third Package of internal EU electricity market measures in Directive 2009/72/EC (Electricity Directive).

Self-Governance

The Proposer and Workgroup agree that P455 should not be progressed as a Self-Governance Modification, on the basis that it should be considered by the Authority in the context of other DCUSA and MHHS consequential changes.

EBGL Article 18 Terms and Conditions

The Proposer and Workgroup agree that P455 does not impact EBGL Article 18 Terms and Conditions.

| Assessment Consultation Questions |
|---|
| Do you agree with the Workgroup's initial unanimous view that P455 does better facilitate the Applicable BSC Objectives than the current baseline? <i>Please provide your rationale with reference to the Applicable BSC Objectives.</i> |
| Do you agree with the Workgroup's assessment that P455 does not impact the European Electricity Balancing Guideline (EBGL) Article 18 terms and conditions held within the BSC? <i>Please provide your rationale.</i> |
| The Workgroup invites you to give your views using the response form in Attachment D |

Workgroup's Terms of Reference

| Specific areas set by the BSC Panel in the P455 Terms of Reference | Conclusion |
|--|--|
| a) Does the proposed On-Site Aggregation methodology result in accurate settlement outcomes (particularly in relation to difference metering)? | The conclusion was that the aggregated methodology produces the same settlement results as Difference Metering, but using a simplified method that, by not requiring involvement of Third Party Supplied Customers, their Suppliers, or their Suppliers' agents, makes it easy for Customers to choose Third Party Suppliers. |
| b) What testing should be required to validate the solution is correctly implemented, and should this include an unmetered load tests? | <p>The conclusion was that, in addition to the proposed test being extremely costly to implement for negligible gain, since Difference metering does not solve instances of existing unmetered loads, P455 should not have to solve them either. A site comparable in scope to a Complex Site Validation Test was argued to be sufficient to test the On-Site Aggregation Method and should be applied to P455.</p> <p>The Aggregation Method is not only proposed to apply to large I and C and so it was noted that the risk of unmetered loads could still be picked up in larger Metering Systems where difference metering is applied more often and correctly.</p> |
| c) Is it right that the boundary meter HHDC and HHMOA are responsible for operations related to the sub-meters, given private network operators are responsible for these meters on a day-to-day basis, and given the move to new arrangements under MHHS? | The Workgroup agreed that it is right that the boundary meter HHDC and HHMOA are responsible for operations related to the sub-meters. |
| d) Is it right that the sub-meters should conform to COP10 standards? | The Workgroup agreed with limiting the P455 to Import only sub-meters CoP10 compliant. |

| Specific areas set by the BSC Panel in the P455 Terms of Reference | Conclusion |
|---|--|
| e) Should there be a requirement for Elexon to maintain a central database of sites where on-site aggregation is applied? Do the benefits of maintaining a central register outweigh the costs of creating and maintaining his central register? Do PNOs/DNOs have all the necessary data to manage schemes? | Similar to the Complex Site Supplementary Information Form, Elexon created an On-Site Aggregation Metering System Form. This form will be required to be sent to BSCCo by the MOA so that we can create the central repository. A copy of is within the Attachment C. |
| f) Is there an impact on BSC Metering Dispensations? | The Workgroup concluded that there are no impacts on BSC Metering Dispensations. |
| g) Is this proposal independent from any DCUSA change? | The Workgroup agreed that P455 is independent from any DCUSA change. |
| h) Is a Cost-Benefit Analysis required? | The Proposer and Elexon are engaging with Ofgem to see if they would need a Cost-Benefit analysis for their decision. |
| i) Is it right that the scheme is limited to sub-100kW sites? | The Workgroup agreed that it is not the scheme that is limited to 100kW, but the Import only Metering Equipment comprised within the On-Site Aggregation Metering System. |
| j) Is it right that the MSIDs of Customers of a PN should be de-energised instead of logically disconnected, in order to minimise barriers to the Customer subsequently choosing a third party supply? Are there other ways in which the need to swap customers meters when they move in and out of schemes could be reduced/avoided? | The Workgroup agreed that logical disconnection seems to be the best procedure to follow. |
| k) Is it right for the solution not to be captured under the complex site arrangements within BSC? | The Workgroup agreed that the On-Site Aggregation method should not be considered a Complex Site, and that implementation notes will be added to the P455 documentation. |
| l) Is a physical boundary meter required to implement the solution, and should it be? | The Workgroup agreed that a physical boundary meter is not required. |
| m) What are the arguments for and against creation of a new market role for PNOs (e.g. access to industry data access; market competition)? | The Workgroup agreed that there should not be a new market role for PNOs. |

Assessment Procedure timetable

| P455 Assessment Timetable | |
|---|------------------------------------|
| Event | Date |
| Panel submits P455 to Assessment Procedure | 8 June 2023 |
| Workgroup Meeting 1 | 12 September 2023 |
| Workgroup Meeting 2 | 31 October 2023 |
| Workgroup Meeting 3 | 22 November 2023 |
| Workgroup Meeting 4 | 27 November 2023 |
| Workgroup Meeting 5 | 12 December 2023 |
| Assessment Procedure Consultation | 15 December 2023 – 16 January 2024 |
| Workgroup Meeting 6 | End of January 2024 |
| Panel considers Workgroup's Assessment Report | February 2024 |

Workgroup membership and attendance

| P451 Workgroup Attendance | | | | | | |
|---------------------------|--------------------------------|-----------|-----------|----------|-----------|-----------|
| Name | Organisation | 12 Sep 23 | 31 Oct 23 | 22 Nov23 | 27 Nov 23 | 12 Dec 23 |
| Non-voting members | | | | | | |
| Ivar Macsween | Elaxon (Chair) | ✓ | ✓ | n/a | n/a | n/a |
| Patrick Matthewson | Elaxon (Chair) | n/a | n/a | ✓ | ✓ | ✓ |
| Cecilia Portabales | Elaxon (Lead analyst) | ✓ | ✓ | ✓ | ✓ | ✗ |
| Jacob Snowden | Elaxon (Lead analyst) | n/a | n/a | n/a | n/a | ✓ |
| Christopher Day | Elaxon (Subject Matter Expert) | ✓ | ✓ | ✓ | ✓ | ✓ |
| Lee Walker | Elaxon (Market Design) | ✓ | ✓ | ✓ | ✓ | ✓ |
| Rosalind Archer | Elaxon (Lead lawyer) | ✓ | ✓ | ✓ | ✓ | ✓ |
| Voting Members | | | | | | |
| Reg Platt | Emergent Energy (Proposer) | ✓ | ✓ | ✓ | ✓ | ✓ |
| Andrew Colley | SSE plc | ✓ | ✓ | ✓ | ✓ | ✓ |
| Cathy Mulliss | Eon.Next | ✗ | ✗ | ✗ | ✗ | ✗ |
| Damon Rand | Clean Energy Prospector Ltd. | ✗ | ✗ | ✗ | ✗ | ✗ |
| Gary Watts | Gateshead Council | ✓ | ✓ | ✓ | ✓ | ✓ |
| Ian Hall | IMServ | ✗ | ✗ | ✗ | ✗ | ✗ |
| James Page | Joju Solar | ✓ | ✓ | ✗ | ✓ | ✓ |

| P451 Workgroup Attendance | | | | | | |
|--------------------------------|------------------------------|-----------|-----------|----------|-----------|-----------|
| Name | Organisation | 12 Sep 23 | 31 Oct 23 | 22 Nov23 | 27 Nov 23 | 12 Dec 23 |
| Marcus Wood | Clean Energy Prospector Ltd. | ✗ | ✓ | ✓ | ✓ | ✓ |
| Nik Willis | Stark | ✓ | ✓ | ✓ | ✓ | ✓ |
| Rachael Prosser | National Grid | ✓ | ✓ | ✗ | ✗ | ✗ |
| Non-voting Participants | | | | | | |
| Alex Travell | BUUK | ✓ | ✓ | ✗ | ✓ | ✗ |
| Bilal Qaiser | Sembcorp Energy UK | ✗ | ✗ | ✗ | ✗ | ✗ |
| Brian Boswell | Eon Energy Solutions Ltd | ✓ | ✓ | ✗ | ✗ | ✗ |
| Callum Chalmers | Energy UK | ✗ | ✗ | ✗ | ✗ | ✗ |
| Chris Ong | UK Power Networks | ✗ | ✗ | ✗ | ✗ | ✗ |
| Chris Welby | MHHS Programme | ✗ | ✗ | ✗ | ✗ | ✗ |
| Dan Nicholls | SNRG | ✓ | ✗ | ✗ | ✗ | ✗ |
| Dan Rynne | IMServ | ✗ | ✓ | ✗ | ✗ | ✗ |
| Emily Waters | BUUK | ✗ | ✓ | ✗ | ✗ | ✓ |
| James Hardy | REC | ✗ | ✗ | ✓ | ✓ | ✓ |
| Jenny Rawlinson | BUUK | ✗ | ✗ | ✓ | ✓ | ✓ |
| Kevin Walker | Eon Energy Solutions Ltd | ✓ | ✗ | ✗ | ✗ | ✗ |
| Kristina Leary | SMS Plc | ✗ | ✗ | ✗ | ✗ | ✗ |
| Matthew Hall | MHHS Programme | ✗ | ✓ | ✓ | ✓ | |
| Neal Baird | ENGIE | ✗ | ✗ | ✗ | ✗ | ✗ |
| Paul Bedford | Drax | ✗ | ✗ | ✗ | ✗ | ✗ |
| Paul Roden | SNRG | ✗ | ✓ | ✓ | ✓ | ✓ |
| Sally Musaka | SSE Enterprise | ✗ | ✗ | ✗ | ✗ | ✗ |
| Steward Spink | Sembcorp | ✗ | ✗ | ✗ | ✗ | ✗ |