

PUBLIC

Recommendations of the BSC Panel's Settlement Reform Advisory Group

Improving Half Hourly Settlement for smart metered customers and the impacts of export spill from distributed generation



ELEXON
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EXECUTIVE SUMMARY

The Settlement Reform Advisory Group ([SRAG](#)) was established by the BSC Panel in July 2015 to investigate improvements to the Settlement process. This was building upon the previous work of the [Profiling and Settlement Reform Group](#). Their main objective was to identify short term Settlement changes to better facilitate elective Half Hourly (HH) Settlement for smaller energy usage customers. The SRAG focussed on 'enabling HH Settlement for smart Meters read by the Data Communications Company (DCC)'. The aim was to remove any barriers real (or perceived) to enable domestic and smaller commercial customers realise the benefits brought about by HH Settlement, e.g. more accuracy, more timely settlement, enabling dynamic time of use tariffs and access to demand-side flexibility initiatives.

Improved elective HH Settlement process

The SRAG has reviewed the end-to-end HH Settlement process and identified changes to simplify the existing HH arrangements. These arrangements were originally designed for large customers with complex Metering Systems. Therefore the SRAG's focus has been on what is needed from a Settlement perspective for these lower energy usage customers, recognising the different technology changes brought about by smart meters.

The SRAG has made recommendations on a simplified end-to-end elective HH Settlement process for smart metered¹ customers. The new simplified process includes:

- improved data transfer processes for smart Meter data from Suppliers to their Agents;
- removal of processes such as proving² and protocol³ testing which are believed not necessary for smart Meters;
- reduced validation requirements for smart Meter data and data estimation processes where initial, or replacement data, is required for Settlement; and
- changes to address potential inaccuracies in the precision used in data flows that contain HH data. Proposals to increase precision and move to the nearest Watt hour (Wh).

The SRAG believes that no Modifications are required to the Balancing and Settlement Code (BSC) to implement the simplified elective HH settlement process above. These improvements can be delivered through changes to BSC Procedures (BSCPs) via Change Proposals (CPs). ELEXON proposes that two Change Proposals (CPs) to the following BSCPs are raised in early 2016 for implementation as soon as practicable in 2016/early 2017:

- [BSCP 502 'Half - Hourly Data Collection For SVA Metering Systems Registered in SMRS' \(BSCP502\)](#): Changes to HH processes, data validation and data estimation; and
- [BSCP601 'Metering Protocol Approval and Compliance Testing \(BSCP601\)'](#) – Changes to remove requirements for DCC enrolled smart Meters.

There will also be needed a number of associated changes to Master Registration Agreement (MRA) Data Transfer Catalogue (DTC) flows. This is to support the improved end-to-end elective HH Settlement process (including

¹ The scope of the improved process is for smart meters that comply with either Smart Meter Equipment Technical Specification (SMETS) 1 or 2. These meters may be serviced by the DCC. See [DECC](#) for further information on the SMETS.

² Proving Tests are used to 'prove' the data at the Meter matches that collected by the Data Collector

³ Protocol testing ensures that the Meter readings collected by the Data Collector are consistent with the Meter manufacturer's specification.

increased data precision). These will require sponsorship under the MRA. ELEXON working under the Code Administration Code of Practice will seek to promote these changes and work with the relevant Code Administrators. Members of the SRAG who are parties to the MRA will also seek to support these changes.

Impact of Embedded Generation

The SRAG has also considered the Settlement impacts of spill from embedded generation. The SRAG recognises that this is currently an issue for Suppliers and for the accuracy of Settlement. ELEXON has written to DECC to urge that export from embedded generation should be metered and Settlement thereof should be mandatory.

Additionally, the SRAG recommends that a BSC Party raise a BSC Modification to allow aggregated HH export data to enter Settlement for smaller customers (that are in Measurement Class F 'Domestic HH Current Transformer (CT) and whole current (WC) Metering Systems or Measurement Class G for non-domestic HH WC metered Metering Systems). This is due to interaction of the improved HH settlement process above and the implementation of new Measurement Classes with [P300](#) in November 2015.

The SRAG also proposes that ELEXON conducts a review of the application of Grid Supply Point Group Correction Factors (GSPGCFs) to HH consumption values. This is to investigate, identify and seek to remove any perverse barriers to elective HH Settlement that maybe caused by embedded generation on the GSPGCF.

Other considerations and next steps

The SRAG has also identified related improvements to requirements for site visits and security requirements for Code of Practice (CoP) 10 Metering Systems. The report also identifies issues relating to the timing of the interactions between Change of Measurement Class (CoMC), Change of Tenancy (CoT) and data collection timescales, agency and BSC costs as a result, which will require further consideration concurrently or following the assessment/ implementation of the above BSCP changes in 2016.

The SRAG has also recommended that both National Grid and Distribution Businesses look at any related adjustments to Transmission Use of System (TNUoS) and Distribution Use of System (DUoS) charging methodologies. This is in light of the potential increase in the number of customers being settled HH and the impact this may have on the current methodologies for setting charges for NHH and HH customers.

The SRAG has also recognised the potential interactions with Ofgem's Reliable Next Day Switching Significant Code (SCR) Review work, especially with a new centralised registration service. ELEXON is providing expert support to the review and will work with Ofgem to help identify these interactions.

The SRAG notes the recent [Open Letter](#) published by Ofgem on the way forward on HH settlement, including both work on elective HH settlement and a proposal for a Significant Code Review (SCR) on mandatory HH Settlement. Ofgem has recognised the beneficial work of ELEXON and the SRAG in this area and seeks to build upon it. Ofgem has requested support from ELEXON and notified the BSC Panel. The SRAG proposes its outstanding work area on new technology and the impacts on settlement (Work Area 4, see its [ToR](#)), is now taken forward as part of the Ofgem way forward on HH settlement. Therefore, the SRAG recommends to the BSC Panel it is now stood down.

Finally the SRAG recommends that consideration must also be given to any interaction to the review of the Imbalance Settlement Period (ISP) by the Agency for the Cooperation of Energy Regulators (ACER) and this has been highlighted in the report and flagged to Ofgem/DECC.

Recommendations

The SRAG recommendations are:

- a) to improve the elective HH settlement process for Smart metered customers, the following changes are raised by ELEXON (noting that no BSC Modification is required):
 - i) a Change Proposal affecting [BSCP502 'Half - Hourly Data Collection For SVA Metering Systems Registered in SMRS' \(BSCP502\)](#) – to define new processes and requirements for data validation and data estimation;
 - ii) a Change Proposal affecting [BSCP601 'Metering Protocol Approval and Compliance Testing'](#) – to indicate that it is not applicable to SMETS 1 and SMETS 2 smart Meters;
 - iii) MRA Changes to data flows (D0010, D0003, D0275, D0012) to allow the Supplier to send these flows to other Parties;
 - iv) Changes to data flows items (J0177, J0021 and J0281) and HH Agent Systems – to allow HH consumption to be declared to the nearest Watt hour (Wh) (i.e. to three decimal places);
- b) to address the impact of embedded generation and elective HH settlement, a BSC Modification be raised by a BSC Party – to create new Consumption Component Classes (CCCs) for Aggregated HH Export;
- c) that ELEXON progresses other actions:
 - i) to support parties on the new elective HH settlement process, develop associated guidance and communication in line with the changes above;
 - ii) consider the impacts of the new elective HH settlement process on CoMC/CoT processes and CoP10;
 - iii) review the application of GSP Group Correction to HH/NHH settlement quantities, due to the impact of embedded generation;
- d) that National Grid and Distribution Businesses look at any changes needed to the Transmission Use of System (TNUoS) and Distribution Use of System (DUoS) charging methodologies, due to the potential increase in the number of customers being settled HH; and
- e) that the BSC Panel stands down the SRAG, as its outstanding work area on new technology and the impacts on settlement, should now be taken forward as part of the Ofgem work on HH settlement (which ELEXON is supporting).

The intention is for ELEXON to raise the CPs and MRA DTC changes once the report has been presented to the [BSC Panel](#). Guidance will then be provided to BSC Parties on the changes. The proposed BSC Modification will need to be raised by a BSC Party and ELEXON will seek a sponsor.

The [detailed SRAG recommendations](#) are set out in the following sections of the report.

1. Introduction

With the mandated rollout of smart Meters from the second half of 2016⁴ and the introduction of new technology such as storage and more prevalent embedded generation, ELEXON and the BSC Panel recognised that it was time for a refreshed and re-focussed look at Settlement processes.

In July 2015 the BSC Panel established a new Panel Committee, the Settlement Reform Advisory Group (SRAG) to investigate improvements to the Settlement process. This built upon the previous work of the [Profiling and Settlement Review Group](#) and the enhancements made through the work of this group.

The SRAG's focus was to look at a number of aspects of Settlement:

- The HH Settlement of smaller customers (customers currently in Profile Classes 1 to 4) on an elective basis. There are a number of potential issues with using HH data to settle these smaller customers and there is a perception both inside and outside the industry that this cannot be done effectively/efficiently;
- Developing 'guidance note(s)' on elective HH Settlement and identifying any considerations for Suppliers and their customers taking up this option;
- The treatment of unsettled 'export' from distributed generation and the impact on Suppliers and Settlement; and
- Supporting innovation and technology change such as introduction of Demand Side Response (DSR), storage, local energy schemes and virtual balancing.

Due to the nature of the work, there is close interaction with Ofgem, the Department for Energy and Climate Change (DECC), the Smart Energy Code (SEC) Panel, the Distribution Connection and Use of System Agreement (DCUSA) Panel, the Master Registration Agreement Executive Committee (MEC), and other parties as appropriate. The SRAG promotes cross-code coordination and has worked to remove any identified barriers (consistent with the new Code Administration Code of Practice (CACoP) principle 13). The full Terms of Reference (ToR) for the SRAG can be found on the [SRAG webpage](#).

This report sets out the recommendations of the SRAG for Work Area 1: Small Scale Half Hourly Settlement barriers, data estimation and other issues; Work Area 2: Small Scale HH Settlement: Communication and guidance requirements; and Work Area 3: Impact on Settlement of unmetered export from distributed generation.

Further work on new technology and the impacts on settlement is being taken forward as part of Ofgem's work on HH Settlement (which ELEXON is supporting).

The SRAG has met 4 times since its inception in July 2015 to address the work areas defined by its ToR and has identified and recommended improvements to the Settlement process. These include changes for getting the HH smart meter data into the Settlement processes as well as refinements to data validation and data estimation processes. The SRAG has also outlined changes required to Data Transfer Catalogue (DTC) data flows.

The report discusses issues relating to Change of Supplier (CoS), Change of Tenancy (CoT), Settlement Performance and makes recommendations for further work to be undertaken.

This report also sets out the associated risks, assumptions, issues and dependencies identified by the SRAG in [Appendix A](#).

⁴ DCC Go Live is in two phases: Release 1.2 - July 2016 and Release 1.3 – September 2016, see [DCC](#)

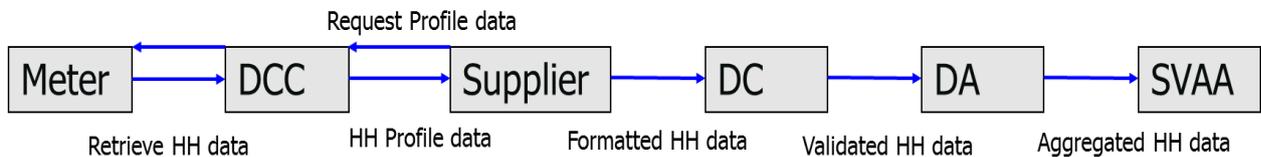
SRAG DISCUSSION AND RECOMMENDATIONS

2. The SRAG discussions on the HH end to end process

- 2.1 At the SRAG's first meeting ELEXON presented the collated responses to the previous consultation on mandating HH Settlement on Profile Classes 1 to 4 ([Profile Class 1-4 Settlement Final Report](#)). The SRAG noted that much of its contents have been superseded since it was produced in 2012.
- 2.2 The SRAG noted that the go-live for the DCC service will be in 2016 and that both Smart Metering Equipment Technical Specifications (SMETS) 1 and SMETS 2 Meters with appropriate working communications should be considered. It noted that no decision has been made on the inclusion of SMETS 1 Meters within the DCC service. Furthermore, there is no requirement for SMETS 1 Meters to be replaced by SMETS 2 at a future point in time. Therefore, ELEXON suggested, and the SRAG agreed, that the main focus of the SRAG be on **enabling HH Settlement for 'DCC enrolled smart Meters'**. In later discussions, the SRAG also agreed that an improved end to end process should be applicable to SMETS 1 Meters that Suppliers use their own agents to service (e.g. their BSC Data Collectors). See assumptions in [Appendix A](#) for further detail.
- 2.3 The SRAG identified the need to look at the end-to-end process for getting the HH data from DCC enrolled smart Meters into Settlement. A detailed description of the SRAG discussions can be found in [Appendix B](#).

Getting the HH data from the Supplier into Settlement - The end-to-end process and strawman model

- 2.4 The SRAG wanted to identify how the end to end process would work from the smart Meter to the Supplier Volume Allocation Agent (SVAA):



- 2.5 ELEXON presented the SRAG with a strawman model for the end-to-end process that set out the data flows and formats that could potentially be adapted for the new process. The strawman model can be found in [Appendix C](#).

In order to understand what data will be received by the Supplier, the SRAG looked at the smart Meter data definitions and formats. See [Appendix C](#) for the formats for Active Import data.

- 2.6 The data is retrieved from the smart Meter in Watt hours (Wh) and is in Co-ordinated Universal Time (UTC). The Active Export data is in the same format. The Settlement data from HH Meters is required in kWh and ultimately in 'Clock Time'. The existing UTC data flow is the D0003⁵ 'Half Hourly Advances'. This flow can already be sent by Suppliers to HHDCs and should contain 'validated' HH data. There is another variant, the D0275, which is in UTC but cannot currently be sent by the Supplier. The 'Clock Time' version of the D0275 is the D0036 'Validated Half Hourly Advances for Inclusion in Aggregated Supplier Matrix' (For information on

⁵ The D0003 is the only flow that the Supplier can send to the HHDC. The D0036 and D0275 don't have a Supplier-HHDC instance. However, the D0003 is only currently referenced in relation to proving tests and there are no Supplier-HHDC instances in the BSCPs, even though the DTC supports it.

these data flows see the [Master Registration Agreement \(MRA\) Data Transfer Catalogue website](#)). These flows also cannot currently be sent by the Supplier to either the HHDC or the HHDA.

- 2.7 It became clear that there will be a requirement to validate and process the data from the smart Meter either into the D0003, D0275 and then into D0036 or straight into the D0036. The profile data will need to be processed into kWh file and the additional fields, e.g. Metering Point Administration Number (MPAN) Core, Meter identifier, will need to be populated.

Options for getting the HH data to the HHDC presented to the SRAG

- 2.8 The strawman process requires the Supplier to either validate the data into the D0003, D0275 or provide raw data (with the additional information) to the HHDC for validation. We identified that other data flows would also be required:
- The D0010 'Meter Readings' is required by the LDSO (DTC change required: A Supplier can only provide this to NHHDC currently);
 - The D0289 'MC/EAC/PC⁶' for data estimation processes by HHDC (if they need to do this); and
 - The D0012 'Confirmation of Inclusion of the Metering point in Reading Schedules' to let HHDCs know when they will receive the data (a DTC change would be required to allow the Supplier to send this flow).
- 2.9 It was suggested that new flows could be developed for the above options which 'piggy back' on existing data flows with minimal change. For example, if the D0003 is only being used for proving tests, a Supplier-HHDC flow would be 'new', and so could be modelled on either the D0003 or D0036/D0275 with a DTC change. The SRAG were invited to discuss the proposed strawman and agree recommendations for the Work Area 1 report.

The SRAG recommendations on HH data flows and changes to BSCP502

2.10 The SRAG agreed that to allow for flexibility, the Supplier should be allowed to send the HHDC:

- i) the raw data file obtained from the smart Meter, together with any supporting data items required (e.g. MSID, Measurement Quantity (MQ)) to allow the HHDC to validate the data and convert into the D0036 'Validated Half Hourly Advances for Inclusion in Aggregated Supplier Matrix'; or**
- ii) the D0003⁷ 'Half-Hourly Advances' – updated to include a validated/non-validated flag; or**
- iii) the D00275 'Validated HH Advances' – updated to allow it to be sent from Supplier to the HHDC include a validated/non-validated flag;**
- iv) the D0010 'Meter Readings' - DTC change required Supplier to LDSO; and**
- v) the D0012 'Confirmation of Inclusion of the Metering point in Reading Schedules' - DTC required to allow the Supplier to send this flow.**

⁶ Measurement Class/ Estimated Annual Consumption/ Profile Class

⁷ The DTC changes could amend these data flows or be new data flows based on the existing flow structures.

2.11 The SRAG recommends that a Change Proposal (CP) should be raised to amend the BSCP502 processes to allow the Supplier to reflect these process options for smart Meters.

3. SRAG recommendations on data validation and proving and protocol testing

- 3.1 The SRAG noted that many of the validation steps will be performed by the Supplier rather than the HHDC. The SRAG commented that the HHDC may be best placed to make decisions on validation alerts as they are more expert in HH Metering issues. The SRAG considered that these alerts could therefore be passed to the HHDC for investigation.
- 3.2 The SRAG discussed proving tests and how they would work with smart metering, and whether these tests should be done at installation. The SRAG agreed that the assumption is that since the Meter is built to specification; there should be no need for a site visit and proving test for a move to HH. This would apply to both SMETS 1 and SMETS 2 Metering (whether they are serviced by the DCC or by the Supplier's DC agent). However, customers with advanced Meters (currently in Profile Classes 1 to 4) would still require proving, protocol testing and follow the existing validation processes if they move to elective HH settlement⁸.
- 3.3 The SRAG discussed protocol testing and the requirements under [BSCP601 'Metering Protocol Approval and Compliance Testing'](#). The SRAG agreed that these were not appropriate for DCC enrolled smart Meters since the method of data collection from the Meter by the DCC is an approved approach. Hence, the SRAG agreed that a CP be raised to remove the requirements for protocol testing from BSCP601.
- 3.4 Details of the SRAG discussions can be found in [Appendix D](#).

The SRAG recommendations on data validation and proving and protocol testing

3.5 The SRAG recommends that:

- i) the Supplier should be responsible for the existing HHDC validation check relating to detected errors in Metering Equipment functionality⁹. Specifically, the Supplier is responsible for addressing 'Alerts' from the smart Meter;**
- ii) the Supplier or HHDC will be responsible for validating the smart Meter profile data against the 'Maximum Permissible Energy by Metering System Code of Practice', i.e. the validation will be carried out the same way as for standard HH Metering, using the relevant COP (CoP10) threshold;**
- iii) the requirements around [site checks for SVA Metering Systems and Site Visit Report](#) should be also applied to the smart Meter sites;**
- iv) proving tests are not needed for SMETS 1 and 2 Meters (both DCC enrolled smart Meters and Supplier Data Collector serviced Meters);**
- v) proving tests should also be backed out from Measurement Class G;**
- vi) a CP for BSCP502 should be raised to address the above changes; and**

⁸ The requirements for proving tests may be removed completely in the near future due to the standardisation and integration of Metering components into a single device.

⁹ There are no specific smart Meter Alerts that relate to the profiling data log.

vii) a CP be raised for BSCP601 'Metering Protocol Approval and Compliance Testing' to remove the requirements for DCC enrolled smart Meters.

4. Data estimation processes

- 4.1 The SRAG discussed the existing HHDC data estimation processes. The SRAG concluded that an Estimated Annual Consumption (EAC) would always be available for customers provided the Supplier sends a D0289 'Notification of MC/EAC/PC'. The SRAG agreed that current HH data estimation processes can be kept, but noted that not all were applicable to smart Meters and should be appropriately amended.
- 4.2 The SRAG identified that for data to be estimated, where other data is not available, new Default Period Profile Class Coefficients (DPPCCs) would be required for Profile Classes 2 and 4. The SRAG also questioned whether there would be any distinction made between flat rate and Economy 7 customers. Initially, the Profile Class will be known from when the site was settled NHH. This issue may need to be revisited at a later date for sites that have never been settled NHH e.g. by setting an identifier in the centralised registration system. Details of the SRAG discussions can be found in [Appendix D](#).

The SRAG recommendations on the data estimation processes

4.3 The SRAG recommends that:

- i) the existing estimation processes are suitable with the exception of methods that mentioned check Meters, the use of PC6 as backstop default for smart Meters, references to Reactive Energy, or the use MOP data;**
- ii) new Default Period Profile Class Coefficients (DPPCCs) be calculated for Profile Classes 2 and 4 and are added to the Market Domain data for use in the back-stop data estimation processes; and**
- iii) a CP is raised to address these changes to BSCP502.**

5. HH data flow precision

- 5.1 The SRAG identified that the current level of precision (one decimal place, 0.1 kWh) is insufficient to accurately store HH period data for the lower annual consumption values typical of domestic customers, typically 3,000 kWh per annum and below. Details of the SRAG discussions can be found in [Appendix E](#). The data items affected are in Table 1 below:

Table 1. Affected Data items and flows on improved data precision

Data Item	Used in Data Flow(s)
J0177 'Period Meter Consumption'	D0036 'Validated Half Hourly Advances for Inclusion in Aggregated Supplier Matrix' D0275 'Validated Half Hourly Advances'
J0021 'Meter Period Value'	D0003 'Half Hourly Advances'
J0281 'Total kWh (and kVArh) of Estimated Periods'	D0022 'Estimated Half Hourly Data Report'

- 5.2 The SRAG noted that making similar changes to NHHDA flows (D0040 'Aggregated Half Hour Data File' and D0298 'BMU Aggregated Half Hour Data File') would add further complexity. The SRAG believed that as the flows used by NHHDAs contain totals across multiple Metering systems, the existing period precision of one decimal place will remain sufficient, and so no changes to these flows will be required.

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- 5.3 The SRAG noted that changes to HH Agent systems could take up to 12 months to implement. We will work with other Code Administrators and Panels to ensure these changes are raised and implemented in a timely manner.

The SRAG recommendations on data precision

- 5.4 **The SRAG recommends that the data items in Table 1 above are amended to provide meter data to Watt hour resolution (three decimal places).**

6. Change of Supplier, Change of Tenancy and data privacy

- 6.1 ELEXON highlighted the issues relating to the timing of the interactions between Change of Measurement Class (CoMC), Change of Tenancy (CoT) and data collection timescales. It was noted in particular that on CoT or Change of Supplier (CoS) the Supplier may have collected data prior to the customer providing appropriate permission. The DECC representative commented that these consent arrangements may be reviewed post DCC go-live¹⁰. Details of the SRAG discussions can be found in [Appendix F](#).

- 6.2 **The SRAG has not made any specific recommendations in this area and have noted that DECC stated that customer consent arrangement maybe reviewed post DCC go-live.**

7. Work Area 3 - Impact on Settlement of unmetered export from distributed generation

- 7.1 Work Area 3 of the Terms of Reference states that 'the SRAG shall estimate volumes of unmetered Export affecting Settlement calculations. The unmetered export from micro-generation is having a significant impact on Suppliers' ability to forecast and purchase energy accurately. The 'unmetered' exports re-allocated to Suppliers operating within a Grid Supply Point Group (GSPG) via the GSPG Correction process, potentially causing cross-subsidies.
- 7.2 ELEXON built a simple model ([See SRAG03_01A](#)) to estimate the level of Photo-Voltaic (PV) Export spill onto the Distribution Networks. Details of the SRAG discussions can be found in [Appendix F](#).

DECC Consultation Response on review of the Feed-in Tariff scheme

- 7.3 ELEXON used the model data to respond to the DECC consultation on the review of the FITs scheme saying that it believes that not only all micro-generation export should be metered, but that it should also be required to be registered for electricity balancing and Settlement purposes.
- 7.4 ELEXON also stated that it believes that this approach will facilitate innovation, dynamic time of use tariff development and help with demand side response initiatives.
- 7.5 The [response to the FITs review consultation](#) (December 2015) confirms the Government's commitment to moving to metered FITs export tariff, though no decision has yet been taken on the timing of this.¹¹ The DECC representative has since confirmed with ELEXON that the Government recognises the importance of

¹⁰ The Government response to consultation on the timing of the review of the smart Meter Data Access and Privacy Framework (December 2015) notes that it may be necessary to propose amendments to the current Framework to ensure that the benefits of Settlement reform are delivered, whilst maintaining appropriate privacy safeguards. See: [DAPF Consultation Response](#).

¹¹ See: [FITs Review Govt response Final](#).

settling export and will consider it as part of the joint work with Ofgem, on the move to a smart energy system.

Changes required supporting the Settlement of aggregated HH Export using Measurement Classes F and G

- 7.6 The SRAG identified an issue with settling the HH export energy if it were to be metered and be required to be settled on a HH basis. Modification P272 identified issues with Distribution and Use of System (DUoS) billing which led to the raising of the Distribution and Connection Use of System Change Proposal (DCP179). DCP179 provided new aggregated HH tariffs for both domestic and non-domestic customers and changed the name of the existing Generation (Export) tariff to include HH Aggregated generation. However, the changes introduced by BSC Modification [P300 'Introduction of new Measurement Classes to support Half Hourly DCUSA Tariff Changes \(DCP179\)'](#) were focussed on Active Import to resolve the P272 DUoS issues and did not include changes to facilitate the aggregation of HH Export data.
- 7.7 New Consumption Component Classes (CCCs) for Active Export are required, together with, new Licensed Distribution System Operator (LDSO) Line Loss Factor Class ids (LLFC ids) mapped to export Standard Settlement Configurations (SSCs). There would also be some central system changes to facilitate the aggregation of the HH export data for output on the D0030 'DUoS Report'. This would require a BSC Modification, specifically to Section X2, which sets out the CCCs and the Measurement Classes with which they can be used.
- 7.8 The SRAG agreed that Work Area 3 was complete and that it was within DECC's remit to address the issue relating to the Metering and Settlement of Export spill when they set out whether export should be metered following the smart rollout. The SRAG noted that the ability to settle the aggregated HH Export data would need to be addressed.
- 7.9 The SRAG recommends that a BSC Party raise a BSC Modification to address this issue as soon as possible.**

8. The SRAG recommendations on HH read performance

- 8.1 The current performance level for Measurement Classes E, F and G introduced by BSC Modification P300 are that Suppliers should achieve 99% of energy on 'Actual Reads' by the First Reconciliation Run (R1). This run occurs at approximately 33 working days after the Settlement Day. The SRAG believe that Suppliers should be able to meet this requirement since data can be obtained remotely from the smart Meter. Hence the SRAG are not proposing any changes to the requirements.
- 8.2 Performance levels will also interact with smart metering performance levels which will appear in the SEC (SEC H13.1) when published.
- 8.3 The SRAG recommends no changes are made to the HH read performance requirements for Measurement Classes¹² E, F and G.**

9. TNUoS and DUoS Charging

¹² Measurement Class E: Half Hourly Metering Equipment at below 100kW Premises with current transformer, Measurement Class F: Half Hourly Metering Equipment at below 100kW Premises with current transformer or whole current, and at Domestic Premises. Measurement Class G: Half Hourly Metering Equipment at below 100kW Premises with whole current and not at Domestic Premises. See [Change of measurement and profile class guidance](#).

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- 9.1 The SRAG noted that some beneficial changes to DUoS Charging arrangements had already been implemented under DCUSA DCP179 'Amending the CDCM Tariff Structure'. TNUoS issues with double charging of customers changing Measurement Class had arisen in the implementation of P272 and are currently being addressed.
- 9.2 The SRAG has also recommended that both National Grid and Distribution Businesses look at any related adjustments to Transmission Use of System (TNUoS) and Distribution Use of System (DUoS) charging methodologies. This is in light of the potential increase in the number of customers being settled HH and the impact this may have on the current methodologies for setting charges for NHH and HH customers. The recommendation also takes into account the long lead in periods normally applied before changes can be implemented to Network charges.

10. Europe and Imbalance Settlement Period (ISP) issues

- 10.1 The Network Code on Electricity Balancing (NC EB) covers major aspects of balancing. The Agency for the Cooperation of Energy Regulators (ACER) is to make a recommendation on the Imbalance Settlement Period (ISP), which is to be assessed by a [cost benefit analysis \(CBA\)](#). The CBA is to be undertaken by European Network of Transmission System Operators for Electricity (ENTSO-E) before the NC EB enters the 'Comitology' process. ENTSO-E has issued a consultation to gather information to support the CBA.
- 10.2 ELEXON has responded to the ENTSO-E consultation ENTSO-E on the costs and benefits of changing the ISP and moving towards harmonisation across the EU. The consultation assesses a number of scenarios; those relevant to Great Britain are reducing from the current 30 minute ISP to 15 or 5 minutes. Both 15 and 5 minute ISP changes would result in significant changes being required to BSC processes and systems.
- 10.3 In ELEXON's response, we have provided an assessment of the possible costs of implementation to our central BSC arrangements. See [ELEXON's response to ENTSOE's cost-benefit-analysis](#) for further details.
- 10.4 The SRAG noted that this change could reduce the ISP from 30 minutes to 15 or even 5 minutes by 2020. If implemented this could impact the move to elective HH Settlement since Metering would be required at the new ISP for all non-profiled customers. It is not clear at the present time if all Settlement Metering will be required to match the ISP. The SRAG identified a risk that this could impact the changes recommended in this report and incentive to move to elective HH settlement.

11. Other related changes

- 11.1 There are other related BSC changes that are being progressed that may also remove potential barriers to HH Settlement:
- [CP1450 'Security Requirements for CoP10 Metering Equipment'](#) - CP1450 proposes to amend CoP10 Section 5.6 to state that Metering Equipment shall either comply with the SMETS, and therefore the security requirements; or allow for at least the levels of access currently defined. This will remove a barrier to elective HH Settlement for domestic and small non-domestic Metering Systems. The change will ensure that Meters that comply with the SMETS will also meet the CoP10 security requirements; and
 - [CP1452 'Aligning BSCP502 with amendments to the Electricity Supply Licence'](#) - There is currently an Electricity Supply Licence requirement (Standard Licence Condition (SLC) 12.14-16) for NHH Meters to be inspected every two years. There is also a requirement in BSCP502 'Half Hourly Data Collection for Systems Registered in SMRS' to inspect 3-phase HH Meters every year and single phase HH Meters every two years. Ofgem recently consulted on its proposal to remove SLC 12.14- 6 and has issued its revised licence condition wording. The licence change is due to take effect from April 2016. ELEXON raised CP1452 on 18 November 2015 in order to align the BSC with the proposed SLC amendments and to clarify the requirements for Measurement Classes C, E, F and G.

12. Agency costs

12.1 One potential barrier is HHDC agency costs. However, under the DCC the HHDC role is much reduced to receiving and processing data which should be cheaper than the current processes for larger customers. Currently, we understand (from one independent Supplier) the price can be approx. £50 per HH MSID compared to £2 per NHH MSID. The SRAG believe these prices to serve will reduce with increased numbers, by the introduction of P272. This is as HHDC fixed costs will be spread over a larger portfolio. As customers move to elective HH Settlement the costs are expected to reduce further.

12.2 The SRAG believe this potential barrier is outside of the BSC arrangements and is the matter for Suppliers and their agents.

13. The BSC cost recovery mechanism

13.1 BSC costs are recovered through the [BSC Specified Charges](#). The charge is currently £0.6 per month per HH Metering System Identifier (MSID, otherwise known as MPAN) and a NHH equivalent would be around £0.06 per month per NHH MSID. This is based on the current HH portfolio of around 130K HH MSIDs. P272 will move 155K of the Profile Class 5 to 8 MSIDs to HH by 2017. This would reduce the HH Charge to around £0.24 per month per HH MSID (once reviewed). As customers move to Measurement Classes E, F and G regular reviews of the BSC changes should address this cost issue.

13.2 The SRAG recommends that the regular review of the BSC cost recovery mechanism should address this issue.

14. Recommendations for further work and next steps

14.1 The SRAG has also considered associated guidance for parties and related improvements to requirements for site visits and security requirements for Code of Practice (CoP) 10 Metering Systems. The SRAG identified issues relating to the timing of the interactions between Change of Measurement Class (CoMC), Change of Tenancy (CoT) and data collection timescales. We also identified potential issues with agency and BSC costs that could impact customers moving to HH Settlement.

14.2 The SRAG recommend that concurrently or following the assessment/ implementation of the above BSCP changes in 2016, further work can be undertaken to refine what the CoMC processes should be for DCC enrolled smart Meters.

14.3 The SRAG have agreed that the changes defined in this document will facilitate elective HH Settlement under the existing infrastructure. However, during the SRAG discussions it was noted that new Market Roles such as a Smart Meter Settlement Agent which could perform HH and NHH and both DC/DA functions. This work should also look at the costs and benefits of centralising elements of the process such as data processing or data aggregation. Also, there will be a subsequent piece of work on the effect on the remaining NHH customers. These issues should be taken forward by Ofgem in its work on HH Settlement.

14.4 The SRAG notes the recent Open Letter published by Ofgem on the way forward on HH settlement, including both work on elective HH settlement and a proposal for a Significant Code Review (SCR) on mandatory HH Settlement. Ofgem has recognised the beneficial work of ELEXON and the SRAG in this area and seeks to build upon it. Ofgem has requested support from ELEXON and notified the BSC Panel. The SRAG propose its outstanding work area on new technology and the impacts on settlement (Work Area 4, see its ToR), is now taken forward as part of the Ofgem way forward on HH settlement. Therefore, the SRAG recommends to the BSC Panel it is now stood down.

14.5 The SRAG considered the impact of the above improvements to the elective HH settlement process, noting the interaction with spill from embedded generation. They agreed that a review should take place to look at

the implications of changes to the GSPGCF methodology to remove any perverse barriers to elective HH Settlement caused by micro-generation on the GSPGCF.

14.6 The SRAG recommends that:

- i) ELEXON consider the impacts of the new elective HH Settlement process on CoMC/CoT processes and CoP10;**
- ii) ELEXON review the application of GSP Group Correction to HH/NHH settlement quantities, due to the impact of embedded generation; and**
- iii) the BSC Panel stands down the SRAG, as its outstanding work area on new technology and the impacts on settlement should now be taken forward as part of the Ofgem work on HH settlement (which ELEXON is supporting).**

15. Work Area 2: guidance and communication

- 15.1 The SRAG has agreed that once agreed this report should be published and agreed changes are highlighted to the Industry. Alongside the changes, guidance notes giving an overview of the new processes should be published on the [BSC Website](#).
- 15.2 The SRAG agreed that when the new processes are agreed the SRAG should look at the DCC enrolled smart Meter CoMC process and that a Guidance Note on the new process be published on the BSC Website.
- 15.3 **ELEXON develop associated guidance and communication in line with the changes to the elective HH settlement process.**

16. Timescales and next steps

- 16.1 The SRAG notes that some of the changes recommended in this report may take some time to implement. Specifically, it noted the lead times that maybe required for changes to the Data Transfer Catalogue (DTC) and consequential changes to industry participant systems which may take up to a year. The proposed BSC Modification to facilitate HH aggregated export would take approx. 6 months to assess, and gain Ofgem approval to implement. Hence, the SRAG recommends that the changes are raised as soon as possible after they are agreed, noting that a BSC Party will need to raise the BSC Modification. This report will be presented to the BSC Panel on 11 February 2016.

APPENDIX A: SCOPE AND RISKS, ASSUMPTIONS, ISSUES AND DEPENDENCIES (RAID)

The SRAG recognised the importance of having a clear understanding of the basis of its analysis work. This section sets out the scope and associated risks and key assumptions along with relevant issues and dependencies. The SRAG's recommendations are built upon these assumptions

Scope

The scope of the SRAG's work on improving Settlement is to enable HH Settlement for 'DCC enrolled Meters' (see Assumption A01 below). The SRAG believes that the improvements identified will also be applicable to customers with smart Meters whose Meter data is collected via HHDCs (for customers who are currently in Profile Classes 1-4).

Risks

No.	Risk	Mitigation
R01	The risks and challenges that may arise from next day switching and resultant impacts on both NHH and HH Settlement process timings.	There would be no issue if HH Settlement was mandated, but in an elective environment, this may result in a Meter going from HH to Non Half Hourly (NHH) and potentially back again; this presents a challenge as it would also require CoMC in similar timescales. ELEXON is supporting Ofgem's work on Reliable Next Day switching and will highlight any interdependencies.
R02	Centralisation of registration might impact the roles and responsibilities which in turn changes the Settlement process.	New processes will need to accommodate changes for centralised registration. The registration system may require new identifiers for customers to map to legacy Profile Class or to identify domestic customers from non-domestic. ELEXON is supporting Ofgem's work on Reliable Next Day switching and will highlight any interdependencies.
R03	European legislation may change the Imbalance Settlement Period (ISP).	The proposed solutions would be impacted by any move to an ISP other than 30 minutes. ELEXON has highlighted the impacts in ELEXON's response to ENTSOE's cost-benefit-analysis . We will continue to monitor European developments and ELEXON will be supporting Ofgem's work on HH Settlement and will highlight any interdependencies.
R04	The risk that Meter Technical Details (MTDs) cannot be obtained from a faulty smart Meter.	Ideally, MTDs should be held centrally and the centralisation of the registrations systems could provide an opportunity to include this information. ELEXON will feed this view into Ofgem's work on Reliable Next Day switching.

Assumptions

No.	Assumption	Notes
A01	The main focus of the SRAG's work is on enabling HH Settlement for 'DCC enrolled smart Meters'. This will include SMETS 1 and SMETS 2 smart Meters.	The aim is also for customers with Smart Meter Equipment Technical Specification (SMETS) 1 Meters that have data collected via a traditional Half Hourly data Collector (HHDC), will also be able to use the improvements identified in this report. Customers with advanced Meters (currently in Profile Classes 1 to 4) would still require proving, protocol testing and follow the existing validation processes if they move to elective HH settlement.
A02	Once a Meter is settled HH, it will not necessarily always be HH and may move back to Non Half Hourly (NHH), e.g. on a CoS.	Until HH Settlement has been mandated, Suppliers will have the freedom to choose how they settle their customers, NHH or HH (except of >100 kW or fall under the jurisdiction of Modification P272).
A03	That the work scope does not look at the backing out or closure of NHH Settlement.	It looks at the steps than can be taken to enable an effective move to HH Settlement.
A04	That DCC enrolled SMETS 1 and SMETS 2 Meters with working communications are within scope.	It has not yet been confirmed that the DCC will be required to service SMETS 1 smart Meters.
A05	That there will be a subsequent piece of work on the effect on the remaining NHH customers.	Approach and analysis to be considered in Ofgem's work on HH Settlement.
A06	Customers will allow access to their HH data for Settlement purposes, or that regulation permits this access	Since the SRAG was established to look HH for those who elect to move to HH Settlement, it is assumed that such customers would also allow access to their HH data.
A07	That initially the HHDC will obtain data via the Supplier for DCC enrolled smart Meters.	It is assumed that new changes to the Supplier Hub principle and Supplier agent roles would be considered in Ofgem's work on HH Settlement.
A08	That since smart Meters are built to the SMETS specification, and there should be no need for a site visit and proving test for a move to HH.	Sufficient assurance for Settlement is delivered through the SMETS and DCC set up (see Section 2)
A09	That smart Meters will not require protocol testing since the data will be collected via the DCC.	Sufficient assurance for Settlement is delivered through the SMETS and DCC set up (see Section 2)

Issues

No.	Issue	Mitigation
I01	It is likely that Supplier Agents will have volume constraints on the number of elective HH customers that their system or processes can accommodate.	This issue is not within the scope of the SRAG to resolve. Removing the barriers to elective HH Settlement may encourage more Agents into the HH market and existing Agents to update their systems. This can be considered through Ofgem's work on HH Settlement.
I02	Increased precision of HH data flows to three decimal places is required for domestic and smaller non-domestic customer data.	This issue was originally identified under BSC Modification P272 'HH Settlement for customers in Profile Classes 5 to 8' . This issue has been addressed in the recommendations up (see Section 2).
I03	Current application of GSP Group Correction Factors (GSPGCF) to NHH volumes provides Suppliers a benefit where there is micro-generation spill. This is potentially a barrier to elective HH Settlement.	When customers move to HH, the GSPGCF is not applied to their volume. This creates a barrier to HH Settlement since there is a benefit to Suppliers where NHH settled consumption is reduced due to a drop in GSPGCF values during the periods where there is distributed generation spill. This will be addressed in a review of application of GSPGCF (see Section 14).
I04	On CoT or CoS, customers may have HH data collected prior to providing consent for this data to be collected.	DECC have commented that these consent arrangements may be reviewed post DCC go-live.

Dependencies

No.	Dependency	Notes
D01	The DCC services will need to be live.	It is currently understood that DCC Go-Live in 2016. DCC Go Live is in two phases: Release 1.2 - July 2016 and Release 1.3 – September 2016.
D02	That any changes for the centralisation of the registration system will not impact the proposed solutions.	Ofgem led SCR on Reliable Next day switching proposes a new centralised registration service for 2018. This may impact the CoMC process. ELEXON is supporting Ofgem's work on Reliable Next Day switching and will highlight any interdependencies

APPENDIX B - SRAG DETAILED CONSIDERATION OF HH SETTLEMENT PROCESS

At the [SRAG's first meeting](#) ELEXON presented the collated responses to the previous consultation on mandating HH Settlement on Profile Classes 1 to 4 ([Profile Class 1-4 Settlement Final Report](#)) and noted that much of its contents have been superseded since it was produced in 2012. The conclusions from that consultation are as follows:

- There was overall support for the principle of HH Settlement. However, the majority of respondents felt that it was too early to consider mandating HH Settlement for the 29 million Metering Systems in Profile Classes 1 – 4, as the structure of the smart rollout and the scope of the DCC were not clear;
- The majority of respondents were unable to quantify the costs to their company from such a mandate as the future business process could not be defined in sufficient detail at this stage; therefore it was not possible to carry out a full cost benefit analysis as there is too much uncertainty around the smart Metering solution and particularly the scope of the DCC ; and
- The majority of respondents felt that there could be benefits in using HH data in Settlement, particularly in terms of data accuracy and in relation to customers on time of use tariffs. However it was not clear that these benefits would outweigh the costs of mandating HH Settlement so a firm conclusion was not possible.

The SRAG noted that the go-live for the DCC service will be in 2016 and that both Smart Metering Equipment Technical Specifications (SMETS) 1 and SMETS 2 Meters with appropriate working communications should be considered. It noted that no decision has been made on the inclusion of SMETS 1 Meters within the DCC service. Furthermore, there is no requirement for SMETS 1 Meters to be replaced by SMETS 2 at a future point in time. Therefore, ELEXON suggested, and the SRAG agreed, that the main focus of the SRAG is on enabling HH Settlement for 'DCC enrolled smart Meters'. In later discussions, the SRAG also agreed that an improved end to end process should also be applicable to SMETS 1 Meters that Suppliers use their own agents to service (e.g. their BSC Data Collectors). See [Assumptions](#) for further detail.

ELEXON clarified that the work scope does not look at backing out of NHH Settlement, but rather the steps that can be taken to enable an effective move to HH Settlement.

The group discussed privacy issues relating to access to customers' HH data and noted that this should be considered sensitive information. ELEXON commented that since the SRAG was established to enable HH for those who elect to move to HH Settlement, it is assumed that such customers would also allow access to the data. The data would not be collected in real time, and so would be less sensitive. The access to data question would need to be reviewed at a later stage if HH Settlement is mandated for all customers.

The SRAG discussed potential BSC and external barriers to HH Settlement of smaller customers. The SRAG considered whether post DCC, NHH and HH Data Collectors (DCs) would still be relevant, or if there should be a generic DC role. It noted that there could be a significant cost to current NHH agents to edit systems to handle HH data and comply with the current regulations. It was noted that since the DCC would retrieve all data, the role of a DC may be simplified and hence less costly.

The SRAG felt there should be flexibility such that Suppliers can perform the DC and Data Aggregator (DA) roles in house, and to remove these Party agent roles.

The review of BSCP502

ELEXON undertook a review of [BSCP 502 'Half - Hourly Data Collection For SVA Metering Systems Registered in SMRS' \(BSCP502\)](#) to identify the key issues and changes required to settle HH data from smart Meters.

Key issues and options identified in the review

The big-ticket issue identified was whether the HHDC role is still appropriate for DCC enrolled smart Meters. The question was: 'Will the proposed changes mean that the revised DC role could be undertaken as a function of the Supplier?' The review identified that smart Meter data validation, estimation of data prior to collection (e.g. if only monthly read), and estimation for invalid data and defaulting need to be agreed and are to be discussed later in the meeting.

The other changes that will require consideration (subject to the answers to above) are summarised as follows:

- Changes to Meter Operator Agent (MOA) activity on sending initial reads from smart Meter;
- Changes to reflect smart Meter read schedule from the Supplier;
- Changes to reflect smart Meter data receipt from Supplier;
- Changes to carve out proving test / Meter technical Details (MTD) requirements for smart Meters;
- Changes required to carve out fault investigation processes for smart Meters where data is collected via the DCC;
- New Supplier requirements for fault investigation and resolution; and
- Proving tests and MTD requirements were a recurring theme from the review.

SRAG views

ELEXON questioned whether in a smart world both a DC and DA were necessary, or whether the roles could easily be performed by the same agent (or even by the Supplier). ELEXON noted that there was the potential for customers to move from being settled HH to NHH. Therefore, it considered that it may be sensible to create a new agent to take on the role of 'Smart Meter Settlement Agent' which would perform both DC and DA roles for HH and NHH customers. ELEXON noted that in this case it would be preferable to create a new BSCP to define the role and its responsibilities.

The SRAG agreed that the role of Smart Meter Settlement Agent (SMSA) may be performed by a Supplier, but noted that some Suppliers may wish to procure this service from a separate agent. The SRAG agreed that creating a new agent role would require new agents to become qualified, and believed that some parties may be reluctant to develop new systems to do this initially.

It was agreed that the SRAG should focus on how current HH processes could be used (or adapted) to enable HH Settlement for DCC registered smart Meters in the short term. For the long term there should be the goal of redefining the HH processes for smart Metering.

The SRAG confirmed that in the long term a new process/agent (and new BSCP) was required for HH smart Metering, but noted that in the short term investigating (and simplifying) current processes may help with defining these new processes. The SRAG decided that any new BSCP should cover both the HH and NHH processes for DCC enrolled Meters, as this would help with the transition to HH in the long run. The Panel Sponsor referenced the SRAG's Terms of Reference (ToR) and noted that as a priority the SRAG should be looking at the short term gains. However, he considered that these should be informing and hopefully leading into the long term goals, rather than acting as standalone 'quick wins'.

The SRAG agreed the assumption that initially the HHDC will obtain data via the Supplier. The SRAG identified the need to understand the format in which the DCC will provide smart Meter data, and asked what Suppliers (or any relevant agent) would need to do with this data. The SRAG also agreed the assumption that the Supplier will set the read schedule of each smart Meter.

The SRAG discussed proving tests and how they would work with smart Metering, and whether these tests should be done at installation. Another Member responded that proving tests were not part of Meter installation. It was noted that tests will be undertaken when a smart Meter is installed to check that the communications are working

correctly. The SRAG agrees that the assumption is that the Meter is built to specification; there should be no need for a site visit and proving test for a move to HH. The SRAG agreed the working assumption that no proving tests for smart Meters will be required.

The SRAG discussed where Meter Technical Details (MTD) should be held. It was suggested that it would make sense for these to be stored in the Meter and that they can be easily obtained by interrogating the Meter. The SRAG noted that MTDs would be useful for replacing aging Meters. However, the SRAG identified a risk that if a Meter was faulty it may not be possible to interrogate the Meter to obtain the MTDs. The SRAG agreed that the MTDs should be held in a central location and that the central registration system could hold this information.

The SRAG discussed protocol testing and the requirements under BSCP601. The SRAG agreed that these were not appropriate for DCC enrolled smart Meters since the method of data collection from the Meter by the DCC is an approved approach. Hence, the SRAG agreed that a CP be raised to remove the requirements for protocol testing from BSCP601.

A SRAG Member noted that for a DCC enrolled smart Meter, no Parties have physical access to the Meter, and so only a Supplier will be able to judge when a Meter is faulty, based on unexpected results.

The SRAG:

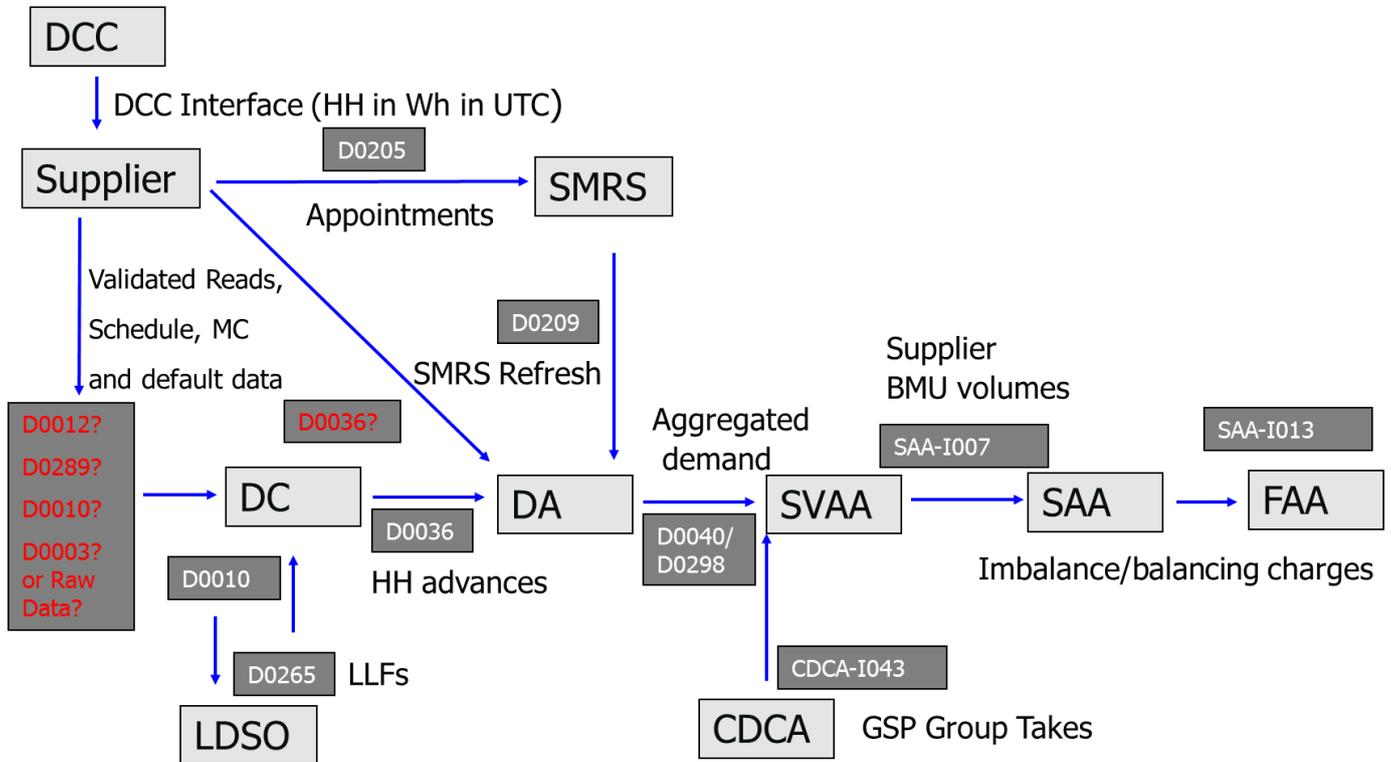
NOTED the issues and options identified in the review of BSCP502;

AGREED that a walkthrough maybe needed to identify areas for simplification for the HH Settlement process for the short term;

AGREED that a new process and agent role is needed in the longer term (data collection and aggregation); and

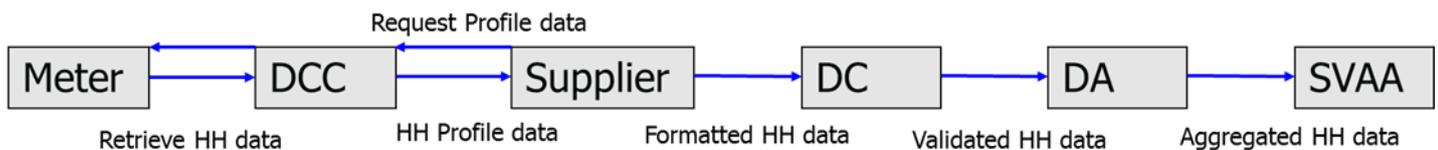
AGREED the next step of setting out the end-to-end process for DCC enrolled smart Meters.

APPENDIX C – STRAWMAN END TO END PROCESS



Getting the HH data from the Supplier into Settlement - The end-to-end process and strawman model

The SRAG wanted to identify how the end-to-end process would work from the smart Meter to the Supplier Volume Allocation Agent (SVAA):



ELEXON presented the SRAG with a strawman model for the end-to-end process that set out the data flows and formats that could potentially be adapted for the new process.

In order to understand what data will be received by the Supplier, the SRAG looked at the smart Meter data definitions and formats. These can be found in the DCC Message Mapping Catalogue. Table 71 (of the catalogue) below gives the formats for Active Import data:

Data Item	Description / Valid Set	Type	Units	Sensitivity
PrimaryValue	The total active energy imported in this 30 minute period (if a twin element Meter, this is for the primary element; if on a polyphase Meter, it is cumulative across the phases) Optional within the schema, although may be mandatory within the business process.	xs:integer	Wh or m ³	Encrypted
Timestamp	The date-time stamp at the end of the 30 minute period to which the value relates Optional within the schema, although may be mandatory within the business process.	xs:dateTime	UTC	Encrypted
Electricity	XML Block for Electricity only items			
SecondaryValue	The total active energy imported in this 30 minute period on the secondary element Relevant to Electricity only Optional	xs:integer	Wh	Encrypted

Table 71 : Read Active Import Profile Data MMC Output Format Body data items

The data is retrieved from the smart Meter in Watt hours (Wh) and is in Co-ordinated Universal Time (UTC). The Active Export data is in the same format. The Settlement data from HH Meters is required in kWh and ultimately in 'Clock Time'. The existing UTC data flow is the D000313 'Half Hourly Advances'. This flow can already be sent by Suppliers to HHDCs and should contain 'validated' HH data. There is another variant, the D0275, which is in UTC but cannot currently, be sent by the Supplier. The 'Clock Time' version of the D0275 is the D0036 'Validated Half Hourly Advances for Inclusion in Aggregated Supplier Matrix' (For information on these data flows see the Master Registration Agreement (MRA) Data Transfer Catalogue website). This flow also cannot currently be sent by the Supplier to either the HHDC or the HHDA.

It became clear that there will be a requirement to validate and process the data from the smart Meter either into the D0003, D0275 and then into D0036 or straight into the D0036. The profile data will need to be processed into kWh file and the additional fields, e.g. Metering Point Administration Number (MPAN) Core, Meter identifier, will need to be populated.

Options for getting the HH data to the HHDC presented to the SRAG

The strawman process identified requires the Supplier to either validate the data into the D0003, D0275 or provide raw data (with the additional information) to the HHDC for validation. We identified that other data flows would also be required:

- The D0010 'Meter Readings' is required by the LDSO (DTC change required: A Supplier can only provide this to NHHDC currently);
- The D0289 'MC/EAC/PC' for data estimation processes by HHDC (if they need to do this); and

¹³ The D0003 is the only flow that the Supplier can send to the HHDC. The D0036 and D0275 don't have a Supplier-HHDC instance. However, the D0003 is only currently referenced in relation to proving tests and there are no Supplier-HHDC instances in the BSCPs, even though the DTC supports it.

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- The D0012 'Confirmation of Inclusion of the Metering point in Reading Schedules' to let HHDCs know when they will receive the data (a DTC change would be required to allow the Supplier to send this flow).

It was suggested that new flows could be developed for the above options which 'piggy back' on existing data flows with minimal change. For example, if the D0003 is only being used for proving tests, a Supplier-HHDC flow would be 'new', and so could be modelled on either the D0003 or D0036/D0275 with a DTC change. The SRAG were invited to discuss the proposed strawman and agree recommendations for the Work Area 1 report.

The SRAG recommendations on HH data flows and changes to BSCP502

The SRAG agreed that to allow for flexibility, the Supplier should be allowed to send the HHDC:

- i) the raw data file obtained from the smart Meter, together with any supporting data items required (e.g. MSID, Measurement Quantity (MQ)) to allow the HHDC to validate the data and convert into the D0036 'Validated Half Hourly Advances for Inclusion in Aggregated Supplier Matrix'; or**
- ii) the D0003¹⁴ 'Half-Hourly Advances' – updated to include a validated/non-validated flag; or**
- iii) the D00275 'Validated HH Advances' – updated to allow it to be sent from Supplier to the HHDC include a validated/non-validated flag;**
- iv) the D0010 'Meter Readings' - DTC change required Supplier to LDSO; and**
- v) the D0012 'Confirmation of Inclusion of the Metering point in Reading Schedules' - DTC required to allow the Supplier to send this flow.**

The SRAG recommends that a Change Proposal (CP) should be raised to amend the BSCP502 processes to allow the Supplier to reflect these process options for DCC enrolled smart Meters.

¹⁴ *The DTC changes could amend these data flows or be new data flows based on the existing flow structures.*

APPENDIX D – SRAG DETAILED CONSIDERATION OF HH DATA VALIDATION AND ESTIMATION

ELEXON presented the SRAG with a spreadsheet comparing the current HH data validation processes to potential options for validating smart data. The SRAG believed that the current checks and balances were designed to cater for the Meter technology at the time in the early 90's (e.g. separate outstations). The SRAG was asked to consider how Meter technology has changed and what risks that presents to the Settlement process and therefore what validation is now needed.

ELEXON noted that in some circumstances 'alerts' would be generated and it is likely the Supplier would have to take the appropriate action in each case.

The SRAG commented on the frequency for obtaining data from Meters, noting that there would be little to no value in performing daily reconciliations if data was only obtained from a Meter on a weekly basis. The SRAG also noted the two types of service request: for obtaining Settlement register or billing data, and obtaining the HH profile data.

The SRAG questioned whether erroneously large values should be checked against the cumulative read. Currently if data is erroneously large then, this would be picked up by the DC, who can take action to investigate. This would not be possible for smart Meter reads.

The SRAG decided that a Meter Advance Reconciliation (MAR) was not relevant given the above assumptions. However, it noted that in a hypothetical complex ToU tariff, the total consumption may total the HH periods, but noted that there is no guarantee that each period is mapped to the correct billing period. It commented that it may be worth implementing some sort of check that data is mapped to the correct period.

The SRAG identified that the behaviour of domestic customers is less predictable than commercial customers, and commented that is the standard for data validation is set too high, then issues may arise as a result.

The SRAG highlighted the checks that can be done to a smart Meter. These are:

- i) DCC checking communications hub is working;
- ii) Suppliers knowing when to expect Meter readings; and
- iii) Suppliers comparing billing data against Settlement Data.

The SRAG identified that corrupted Meter readings are more difficult to identify than missing Meter reads. It questioned which stage of data processing presented the greatest risk of data corruption, and commented that any prescribed validation processes should be designed to try to mitigate this risk.

The SRAG noted that many of the validation steps will be performed by the Supplier rather than the HHDC. The SRAG commented that the HHDC is best placed to make decisions on validation alerts. The SRAG considered that these alerts could therefore be passed to the HHDC for investigation.

The SRAG discussed proving tests and how they would work with smart Metering, and whether these tests should be done at installation. The SRAG agreed that the assumption is that since the Meter is built to an agreed specification; there should be no need for a site visit and proving test for a move to HH. This would apply to both SMETS 1 and SMETS 2 metering (whether they are serviced by the DCC or by the Supplier's HHDC agent). However, customers with advanced Meters (currently in Profile Classes 1 to 4) would still require proving, protocol testing and follow the existing validation processes if they move to elective HH settlement. This is because of the different specifications and types of advanced meters and their communication methods. The SRAG recognised the potential implications these may have for Suppliers and their customers with advanced Meters.

The SRAG discussed protocol testing and the requirements under BSCP601 'Metering Protocol Approval and Compliance Testing'. The SRAG agreed that these were not appropriate for DCC enrolled smart Meters since the

method of data collection from the Meter by the DCC is an approved approach. Hence, the SRAG agreed that a CP be raised to remove the requirements for protocol testing from BSCP601.

The SRAG recommendations on data validation and proving and protocol testing

The SRAG recommends that:

- iv) the Supplier should be responsible for the existing HHDC validation check relating to detected errors in Metering Equipment functionality . Specifically, the Supplier is responsible for addressing 'Alerts' from the smart Meter;**
- v) the Supplier or HHDC will be responsible for validating the smart Meter profile data against the 'Maximum Permissible Energy by Metering System Code of Practice', i.e. the validation will be carried out the same way as for standard HH Metering, using the relevant COP (CoP10) threshold;**
- vi) the requirements around site checks for SVA Metering Systems and Site Visit Report should be also applied to the smart Meter sites;**
- vii) proving tests are not needed for SMETS 1 and 2 Meters (both DCC enrolled smart Meters and Supplier Data Collector serviced Meters);**
- viii) proving tests should also be backed out from Measurement Class G;**
- ix) a CP for BSCP502 should be raised to address the above changes; and**
- x) a CP be raised for BSCP601 'Metering Protocol Approval and Compliance Testing' to remove the requirements for DCC enrolled smart Meters.**

Data estimation processes

ELEXON presented a spreadsheet detailing the current HH estimation processes in BSCP502 and considered potential changes that could be made to aid smart data estimation. It was identified that most existing processes still work bar those that required to use Check Meter data that is not available for smart Meters.

The SRAG considered that where only one Period is missing, data could be calculated and entered manually. However, it questioned whether this could be automated to suit the potential large numbers moving to elective HH Settlement.

The SRAG noted that where multiple Periods are missing, data trends from neighbouring weeks could be used to estimate the data. It commented however, that for intermittent use properties, such as holiday-homes, the data used in estimation might be significantly different from the actual consumption for the Period.

The SRAG concluded that an Estimated Annual Consumption (EAC) would always be available for customers provided the Supplier sends a D0289 'Notification of MC/EAC/PC'. The SRAG agreed that current HH data estimation processes can be kept, but noted that not all were applicable to smart Meters.

The SRAG identified that for data to be estimated where other data is not available new Default Period Profile Class Coefficients (DPPCCs) would be required for Profile Classes 2 and 4. The SRAG also questioned whether there would be any distinction made between flat rate and Economy 7 customers. Initially, the Profile Class will be known from when the site was settled NHH. This issue may need to be revisited at a later date for sites that have never been settled NHH e.g. by setting an identifier in the Centralised registration system.

The SRAG recommendations on the data estimation processes

The SRAG recommends that:

- i) the existing estimation processes are suitable with the exception of methods that mentioned check Meters, the use of PC6 as backstop default for smart Meters, references to Reactive Energy, or the use MOP data and
- ii) that new Default Period Profile Class Coefficients (DPPCCs) be calculated for Profile Classes 2 and 4 and are added to the Market Domain data for use in the back-stop data estimation processes; and
- iii) a CP for BSCP502 should be raised to address the above changes.

APPENDIX E– SRAG DETAILED CONSIDERATION OF HH DATA PRECISION

HH data flow precision

The SRAG identified that the current level of precision (one decimal place, 0.1 kWh) is insufficient to accurately store Half Hourly (HH) period data for the lower annual consumption values typical of domestic customers, typically 3,000 kWh per annum and below.

To support this analysis, ELEXON consulted HHDCs on how their Data Retrieval rounding systems work for smaller domestic consumption values (1,000 – 3000 kWh), and what the costs and lead times would be for them to implement the new, higher precision value.

ELEXON's analysis identified that the following data flows/items only would be affected by an increase in the precision level of HH period values from one to three decimal places:

Table 1 Affected Data items and flows on improved data precision

Data Item	Used in Data Flow(s)
J0177 'Period Meter Consumption'	D0036 'Validated Half Hourly Advances for Inclusion in Aggregated Supplier Matrix' D0275 'Validated Half Hourly Advances'
J0021 'Meter Period Value'	D0003 'Half Hourly Advances'
J0281 'Total kWh (and kVArh) of Estimated Periods'	D0022 'Estimated Half Hourly Data Report'

Points to address following HHDC responses to questionnaire:

- **HHDCs require lead times of from six to 12 months to implement system and process changes.** This would ideally be implemented during a release that does not involve other major system changes.
- **Suppliers would need to make equivalent adjustments to their own systems receiving the flows.** A respondent referred to the example of when the D0010 flow was changed in c.2001 to add a decimal place, but many Suppliers did not update their systems, which then truncated D0010s to integer readings. While the D0010 change had little material impact, precision issues in the D0036 could lead to over or under billing of customers. The SRAG believed that the impact on billing will present enough incentive for Suppliers to amend their systems to account for and utilise the increased precision.
- **Making similar changes to NHHDA flows (D0040 'Aggregated Half Hour Data File' and D0298 'BMU Aggregated Half Hour Data File') would add further complexity.** The SRAG believed that as the flows used by NHHDAs contain totals across multiple Metering systems, the existing period precision of one decimal place will remain sufficient, and so no changes to these flows will be required.

The new precision is needed only for domestic and small commercial smart metered customers. A respondent noted that the new precision might not be available in some older Meter types, such as those with pulse multipliers. These Meters are typically already sited at large HH Metered customers where the impacts of using the lower 0.1 kWh precision will have relatively lower materiality. For these customers, we expect that HHDCs will add two trailing zeros to the 1DP period values in sending the D0036.

The SRAG noted that changes to HH Agent systems could take up to 12 months to implement. We will work with other Code Administrators and Panels to ensure these changes are raised and implemented in a timely manner.

The SRAG recommends that the data items in Table 1 above are amended to provide meter data to Watt hour resolution (three decimal places).

APPENDIX F – SRAG DETAILED CONSIDERATION OF CHANGE OF SUPPLIER, CHANGE OF TENANCY AND DATA PRIVACY

ELEXON highlighted the issues relating to the timing of the interactions between CoMC, CoT and data collection timescales, noting that on CoT or CoS the Supplier may have collected data prior to the customer providing appropriate permission.

The SRAG noted that the collection of a customer's HH smart Meter data required explicit written permission from the customer. It commented that therefore a CoT could result in the site going from being settled HH to NHH until permission has been granted. The SRAG commented that this may result in large numbers of CoMCs and questioned whether the current process would be able to handle this increased volume.

The SRAG suggested that an online 'tick-box' could mitigate the above requirement, noting that many customers would prefer the CoS process to be entirely online.

The DECC representative commented that these consent arrangements may be reviewed post DCC go-live¹⁵.

The SRAG identified that some customers may not wish to have their HH profile data collected as they may believe it will be collected in real time. The SRAG commented that it should be made clear to customers that their profile data will be collected retrospectively.

The SRAG recommendations on Change of Supplier and Change of Tenancy

- **The SRAG has not made any specific recommendations in this area and have noted the comments of the DECC representative.**

¹⁵ *The Government response to consultation on the timing of the review of the smart Meter Data Access and Privacy Framework (December 2015) notes that it may be necessary to propose amendments to the current Framework to ensure that the benefits of Settlement reform are delivered, whilst maintaining appropriate privacy safeguards. See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/486352/DAPF_Consultation_Response.pdf*

APPENDIX G - WORK AREA 3 - IMPACT ON SETTLEMENT OF UNMETERED EXPORT FROM DISTRIBUTED GENERATION

Work Area 3 of the Terms of Reference states that 'the SRAG shall estimate volumes of unmetered Export affecting Settlement calculations'. The unmetered Export from micro-generation is having a significant impact on Suppliers' ability to forecast and purchase energy accurately. The 'unmetered' exports re-allocated to Suppliers operating within a Grid Supply Point Group (GSPG) via the GSPG Correction process, potentially causing cross-subsidies. However, it is not clear to whom the spill actually belongs. It could be deemed that it belongs to the provider of the FiTs Payments, which is usually the Import supplier (although on Change of Supplier the original Supplier can be retained as the FiTs payee), or an Export Supplier contracted by the customer.

ELEXON built a simple model ([See SRAG03_01A](#)) to estimate the level of Photo-Voltaic (PV) Export spill onto the Distribution Networks:

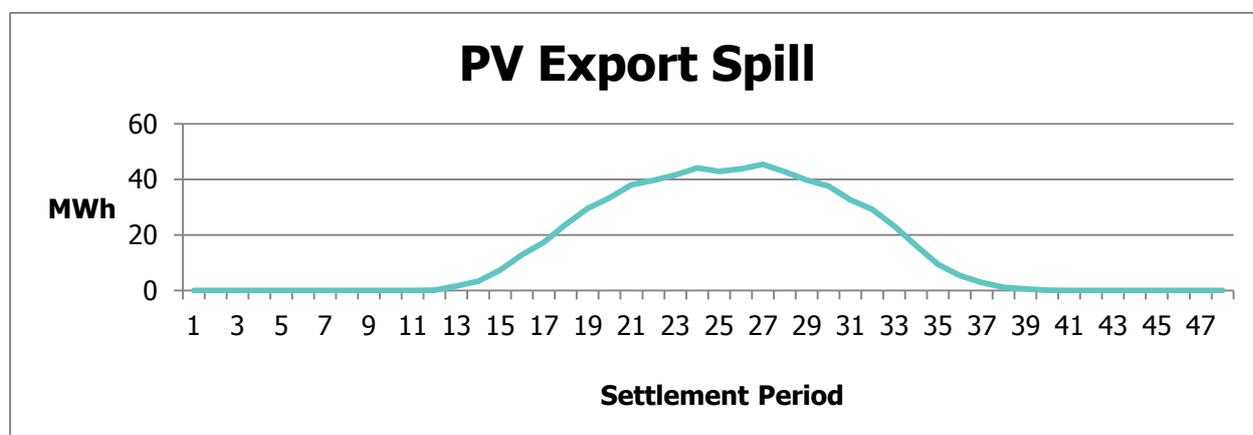
- i) It uses the Ofgem FiT register data from June 2015;
- ii) It models spill where PV Export is expressed as deemed in the FiT register; and
- iii) The PV export profile shape is derived from British Electro-technical and Allied Manufacturers' Association (BEAMA) trial data from 2007/08.

Model Assumptions

- i) The short code in the Fit Register is accurate;
- i) That PV systems will generate 858 kWh per unit of capacity ; That export spill will be a factor of between 0.4 and 0.6 of generation;
- ii) That the PV export profile will approximate to maximum monthly spill shape regardless of monthly day-type (it has not been calendar matched).
- iii) The model (with instructions) can be found in Attachment A to this paper. It should be noted the model does not look at the impact on Group Correction Factors (GCFs) caused by on-site consumption of generation and profiling, which may be of a similar order.

Modelled monthly maximum export spill

The model also allows you to look at the maximum potential monthly Export spill at different Export Factors (0.4, 0.5 or 0.6 i.e. 40-60% of deemed generation). This allows a view of the impacts within Settlement Period. So for the South West (GSP_L) in June the model gives peak spill estimates of over 40 MWh:



DECC Consultation Response on review of the Feed-in Tariff Scheme

ELEXON used the model data to respond to the DECC consultation on FITs saying that it believes that not only all micro-generation export should be metered, but that it should also be required to be registered for electricity balancing and Settlement purposes. Currently export energy from micro-generation does not have to be metered or settled. Our current estimates (based on the Meters that are defined as 'deemed' export on the FITs register) are that between 0.8-1.0 TWh of energy is being spilt onto the distribution networks annually. The Settlement processes allocate this spill across all electricity Suppliers, according to the proportion of energy consumed by each Supplier within a distribution region. This allocation is undertaken through a process known as Grid Supply Point (GSP) Group Correction. This is not an accurate allocation of energy and could be considered a cross-subsidy. This is because it does not allocate energy to the FITs Supplier in proportion to the energy paid for under the subsidy.

The GSP group correction issue also causes impacts on Suppliers in forecasting their energy purchasing. Suppliers have to estimate the degree of change, to their allocation, driven by the export spill. In order to accurately account for the energy, we believe that Settlement (both import and export) should be based on smart Meter profile data (half-hourly or more granular if required under European legislation). This approach would allow for accurate accounting of both the export and import energy in Low Voltage (LV) networks. The import profile would be accurate using the profile data from the smart Meter. Currently the NHH profiles are not adjusted for generation used on-site which causes further misallocation of micro-generation.

We also stated that we believed that this approach will facilitate innovation, dynamic time of use tariff development and help with demand side response initiatives.

Changes required supporting the Settlement of aggregated HH Export using Measurement Classes F and G

The SRAG identified an issue with settling the HH export energy if it were to be metered and be required to be settled on a HH basis. Modification P272 identified issues with DUoS billing which led to the raising of the Distribution and Connection Use of System Change Proposal (DCP179). DCP179 provided new aggregated HH Tariffs for Domestic and non-domestic customers and changed the name of the existing Generation (Export) Tariff to include HH Aggregated generation. However, the changes introduced by BSC Modification P300 'Introduction of new Measurement Classes to support Half Hourly DCUSA Tariff Changes (DCP179)' were focussed on Active Import to resolve the P272 issues and did not include changes to facilitate the aggregation of HH Export data.

New Consumption Component Classes (CCCs) for Active Export are required, together with, new Licensed Distribution System Operator (LDSO) Line Loss Factor Class ids (LLFC ids) mapped to export Standard Settlement Configurations (SSCs). There would also be some central system changes to facilitate the aggregation of the HH export data for output on the D0030 'DUoS Report'. This would require a BSC Modification, specifically to Section X2, which sets out the CCCs and the Measurement Classes with which they can be used.

The SRAG recommendation on Work Area 3 and aggregated HH Export using Measurement Classes F and G:

The SRAG agreed that Work Area 3 was complete and that it was within DECC's remit to address the issue relating to the Metering and Settlement of Export spill. The SRAG noted that the ability to settle the aggregated HH Export data would need to be addressed.

The SRAG recommends that a BSC Party raise a BSC Modification to address this issue as soon as possible.