NHH SETTLEMENT BY METER TYPE

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Summary	This paper provides the findings from a proof of concept undertaken in relation to separating Non-Half Hourly Settlement performance by Meter type.

1. Background

1.1 As part of the Performance Assurance Framework (PAF) review we carried out an assessment of the Settlement Risks associated with the mass roll-out of smart Meters. The Issue 69 workgroup supported us in this assessment and helped us to develop an interim smart risk register, which is now incorporated into the Risk Evaluation Register[1] (RER).

1.2 The workgroup considered the highest risk area to be the Supplier-agent interfaces; in particular, the risk that Metered Data is inaccurate or missing as a result of problems with the Supplier interface with its Non-Half Hourly (NHH) Meter Operator Agent (MOA) and NHH Data Collector (DC). This resulted in the production of the Smart Meter Technical Detail report to monitor performance against this risk area.

1.3 There were two other risk areas related to the rollout (data processing and legacy) which were deemed less significant and were both assigned a medium risk rating. The PAB approved for ELEXON to undertake a proof of concept to demonstrate whether separating NHH Settlement performance by Meter type provides valuable insights into performance which should be formalised into routine assurance reporting. Such reporting could provide a similar view of performance as the Performance Assurance Reporting and Monitoring System (PARMS) Serial SP08a, which is used to monitor performance against the top Settlement Risk SR0074[2].

1.4 The SP08a Settlement performance levels are currently required to be met per Settlement Day, Supplier and Grid Supply Point (GSP) Group. Enhanced Settlement performance monitoring would provide insights into how the different segments of the NHH market are performing, supporting identification of Settlement Risk and targeting mitigations. Furthermore, the NHH Settlement performance levels outlined in BSC Section S Annex S-1 were set two decades ago when there was limited or no remotely capable Metering Systems in NHH. There is now approximately 30% of the NHH energy metered through such remote Metering Systems, and this proportion is going to significantly increase in the next few years as a result of the smart Meter rollout. Having access to performance by Meter type would support a review of the NHH Settlement performance levels to reflect the changing dynamic of the market.

[1] https://www.elexon.co.uk/reference/performance-assurance/performance-assurance-processes/
[2] The risk that NHHDCs do not collect and/or enter valid Meter readings resulting in old/default data entering Settlement.

2. Proof of concept approach

2.1 To provide a view of Settlement performance per Meter type, we required access to consumption data on a Metering System Identifier (MSID) level. To achieve this, we asked NHH Data Aggregators (DAs) to perform aggregation runs in audit mode, which outputs a file (L0038) providing the consumption values per MSID and whether an estimated (EAC) or actual (AA) consumption value was used during the run. We asked for the below aggregation runs to be performed in audit mode, providing us a snapshot of Settlement performance at the point when the aggregation runs were performed (approx. 18/04/2018).

Settlement Run	Settlement Day
Final Reconciliation (RF)	01/03/2017
Third Reconciliation (R3)	18/09/2017
Second Reconciliation (R2)	27/12/2017
First Reconciliation (R1)	01/03/2018

2.2 To determine the current Meter type installed per MSID, we obtained an ad hoc extract of the Electricity Central Online Enquiry Service (ECOES) for NHH sites. This is the same as the monthly extracts we receive for monitoring compliance with Modification P272[3], but also covering Profile Classes 1-4.

2.3 We grouped the Meter types into four main categories as per the below table. Please note, we grouped Smart Metering Equipment Technical Specification (SMETS) v1.0 and v2.0 Meters together as the number SMETS2 Meters at R1 is still too low to provide a meaningful distinction. However, these different variants of smart Meters could be separated in future as the volume of SMETS2 Meters increases.

Meter group	Meter Type(s)
ADM	NSS
AMR	RCAMY, RCAMR or NCAMR
Legacy	K, N, S or T
SMETS	S1, S2A, S2B, S2C, S2AD, S2BD, S2CD, S2ADE, S2BDE or S2CDE

2.4 Finally, we joined the Meter type and consumption datasets to provide an aggregated view of consumption per Meter type.

Limitations

2.5 We determined the Meter types through an ad hoc extract of ECOES. This provides a snapshot in time of the current Meter type installed when the extract was taken (mid-April 2018). This does not however provide a historical view of Meter types. Therefore, if the current Meter was installed after any of the Settlement Days used in the proof of concept (as referenced in the above table), we are unable to determine the previous Meter type. Therefore, we only used the current Meter type in the Settlement performance calculation if it was installed prior to the Settlement Day, i.e. if the Meter was installed after the Settlement Day it was excluded from the calculation.

2.6 As the view of consumption across Reconciliation Settlement Runs is for a single Settlement Day, we are unable to identify trends in Settlement performance over time purely from this single activity.

[3] Mandatory Half Hourly Settlement for Profile Classes 5-8

2.7 We calculated percentage energy settled on actual Meter reads by using the annualised values provided in the L0038 file, i.e. total AA divided by EAC + AA. As SP08a is calculated from profiled consumption values, our calculation doesn't align exactly, but it's a reasonable enough proxy.

3. Findings

3.1 The following table provides the high level output from the proof of concept. The cells are coloured based on relative performance at each Settlement Run.

Meter type	MSID count (R1)	Energy share (R1)	R1	R2	R3	RF
ADM	1,256,313	3.21%	36.96%	77.83%	92.67%	97.94%
AMR	901,346	11.44%	67.45%	85.85%	91.95%	96.76%
Legacy	22,213,989	70.97%	33.63%	68.62%	86.87%	96.00%
SMETS	5,580,370	14.38%	59.79%	92.64%	97.16%	98.88%
Total	**29,952,018**					

3.2 Despite the Settlement performance levels (e.g. 97% at RF) being obligated per Settlement Day, Supplier and GSP Group across all Meter types, it is useful to compare each segment against these standards to demonstrate under performance that will impact aggregate performance. The noteworthy items from the above are as follows:

- Across all Reconciliation Settlement Runs, legacy Meters are settling less consumption on actual Meter reads when compared to the different types of remote NHH Meters (unsurprisingly);
- Automatic Meter Reading (AMR) Meter types are the top performing at R1 with 67.45% of consumption on actual Meter reads. This is over twice the performance standard for this run of 30%;
- Advanced Domestic Meter (ADM) Meter types are performing significantly below other remote Meter types at R1. This could be due to quarterly read cycles, i.e. R1 aggregation runs occur approximately 44 calendar days after the Settlement Day. However, performance has caught up by R3, and the energy share is the lowest of the four Meter type categories;
- SMETS Meter types are the top performing for R2, R3 and RF where they settled 92.64%, 97.16% and 98.88% of consumption on actual Meter reads respectively;
- Remote Meter types now account for nearly 30% of NHH consumption;
- With the exception of legacy and AMR Meter types at RF, all market segments are meeting the NHH Settlement performance levels at all runs; and
- Legacy and AMR Meters did not meet the NHH performance level of 97% at RF, settling 96.00% and 96.76% on actual Meter reads respectively. These segments will be the contributors to the performance standard not being met a market level, which was 96.53% for the RF Settlement Day used in the proof of concept.

3.3 We further investigated RF Settlement performance for AMR Meters, and identified that the underperformance can be attributed to the residual Profile Class 5-8 sites that have not yet migrated to Half Hourly (HH) Settlement. Appendix 1 provides the relative Meter type performance split by Profile Classes 1-4 and 5-8. This has highlighted that both legacy and AMR Meters are significantly underperforming across all Settlement Runs in Profile Classes 5-8, which equates to approximately 1.25% of total NHH energy share at R1. Interestingly, the AMR Meters in Profile Classes 5-8 are performing below the legacy Meters. Presumably this is why they haven't yet been migrated to HH Settlement.

3.4 As we did during our investigation into the performance of AMR Meters, with access to granular data, we can provide aggregated views based on different market dimensions, e.g. Profile Class, Supplier, Data Collector. Attachment A (confidential) provides a view of NHH Settlement performance by Meter type per Supplier.

4. Options to provide on-going reporting

4.1 The initial report presented to the PAB on the two associated risk areas (data processing and legacy) noted that an estimate at RF for a smart Meter is likely to be no worse than an estimate at the same run for a legacy Meter, and therefore there appeared to be limited benefit in separating performance by market sector. This proof of concept sought to help us consider the benefits of separating NHH Settlement performance by Meter type and further understand how this could be delivered.

4.2 If we wish to report NHH Settlement performance by Meter type on an on-going basis, there are two main options each providing different benefits:

Option 1: Amendments to SP08a

4.3 The first option would be to include this level of granularity in the PARMS Serial SP08a. This would provide a reliable and trusted daily view of Settlement performance per Meter type across all runs. This would allow us to monitor trends in Settlement performance as we transition to smart Meters and the number of legacy Meters diminish. Such a framework would also support a review of NHH Settlement performance levels, Supplier Charges and Peer Comparison, if it was desired to monitor the segments of the NHH market differently. For example, we'd expect remote NHH Meters to settle a high percentage on actual Meter reads by R2 (to account for quarterly read cycles as the BSC allows for NHH) – perhaps something comparable to the HH performance standard of 99%. Conversely, as legacy Meters continue to diminish and become sparsely populated, physical Meter read activities could become more challenging than when the performance levels were set two decades ago.

4.4 However, the changes required to provide the additional level of granularity to SP08a would be significant. To implement this solution, we would need to draw the Meter type through to BSC central systems. In addition to a Modification to the BSC, we would need:

- Data Transfer Catalogue (DTC) changes to make revisions to D0209[4] and D0041[5] data flows to capture the Meter type; and
- Consequential changes to the Supplier Meter Registration Service (SMRS), NHH DA, Supplier and BSC central (Supplier Volume Allocation Agent (SVAA) and PARMS) systems to send or receive the amended data flows.

4.5 A BSC Modification impacting the above systems would feasibly take between 18 months to two years to implement. The cost to make the required system changes would also be high, both centrally and at participants. This solution would also result in an increased volume of data flow transactions which would have performance implications.

4.6 Whilst this would provide a reliable and trusted daily view of performance, it would be at an aggregated level, i.e. we could not drill down to an MSID level to identify root causes.

[4] Instruction(s) to Non Half Hourly or Half Hourly Data Aggregator
[5] Supplier Purchase Matrix Data File

Option 2: Ad hoc NHH DA and ECOES extracts

4.7 The second option is to undertake an activity similar to the proof of concept on a routine or ad hoc basis. This would provide a view of Settlement performance across the Meter types at the point in time when the extracts are taken. However, the limitations with such an approach, as outlined in section 2 of this paper, would apply to any future activities.

4.8 As this was the first time we'd requested such information from NHH DAs, it was a learning exercise for those involved (including ELEXON). We experienced some issues with the format of the submissions and transferring the data. We'd expect to experience less of these issues in future if an on-going activity was established, and we would provide additional education and guidance to support the activity.

4.9 Due to the activity requiring a reasonable amount of coordination and data transfer involving 15 distinct organisations, it may prove challenging to undertake on a monthly basis. A quarterly exercise would be more feasible. We discussed performing a set of aggregation runs in audit mode once a quarter with the Software Technical Advisory Group (STAG), and no fundamental concerns were raised regarding the feasibility of such an activity. At the STAG meeting, it was agreed that we would need to mutually determine the quarterly timetable to ensure no impacts on business as usual activities, and ideally it would align with the similar data they provide to the Department for Business, Energy and Industrial Strategy (BEIS) on an annual basis. We would also need to agree a universally preferred solution for transferring these files in a way that satisfies both security concerns and convenience. However, it should be noted that this would put an additional reporting burden on industry participants.

4.10 As future extracts would provide a snapshot in time of Settlement performance across runs, it would not support changes to NHH Settlement performance levels, Supplier Charges or Peer Comparison as could be considered through amendments to SP08a. Therefore, the main purpose of future extracts would be to support the routine operation of the PAF. One element would be to provide the PAB additional detail on performance against the top Settlement Risk SR0074. Another element would be to support delivery of other assurance techniques. For example, as discussed earlier, the small numbers of residual MSIDs in Profile Classes 5-8 are contributing disproportionate volumes of estimated energy in NHH Settlement. We could further investigate the root cause of these estimation issues through a Technical Assurance (TA) audit, selecting a targeted sample from the datasets.

4.11 Having access to granular MSID level data such as these extracts provide, enables a more targeted approach to Settlement Risk identification and technique deployment.

5. Conclusions

5.1 The dynamic of the NHH market has changed over the past 20 years and its transformation will accelerate in the next three years as smart Meters are rolled out in large numbers. Having the ability to further analyse NHH Settlement performance by Meter type would provide additional insights into performance during the transition. In addition, there will always be a proportion of the market with non-remote (legacy) Meters as consumers opt out of the rollout and instances where Suppliers are unable to install smart Meters after taking all reasonable steps. It could be argued that applying the same Settlement performance standards to remote and legacy Meters, especially at earlier Settlement Runs, does not take into consideration the fundamental differences in how the Meters are read.

5.2 However, the future of NHH Settlement is currently uncertain. The Significant Code Review on market wide HH Settlement is underway. A decision is planned to be made in the second half of 2019 as to whether to proceed with market wide HH Settlement or not. If market wide HH Settlement proceeds, the final decision on the operating model is planned to be made in the winter of 2020 with the implementation following. Therefore, any changes to NHH Settlement monitoring and/or performance standards could only be for an interim period until market wide HH Settlement is implemented. However, it should be noted that any delays

to the rollout of smart Meters could delay a move to HH Settlement. At the time of writing this paper (May-18), approximately 22% (6.6 million) of NHH Metering Systems have a smart or advanced electricity Meter installed. There is also some uncertainty around the implementation timescales of market wide HH Settlement, as it will depend on a number of factors such as the operating model adopted. Therefore, the interim period could be longer than anticipated.

5.3 Taking all the above into consideration, it is hard to justify making amendments to the PARMS Serial SP08a due to the lead times, system impacts, costs, and uncertainty around the future of the NHH market. Therefore, we are not proposing to progress these changes at this time. However, we propose that we revisit this option as part of the performance assurance technique work stream of the PAF review in the second half of 2019 when a decision is made on market wide HH Settlement.

5.4 In regards to undertaking future extracts of ECOES and NHH DA systems to provide snapshots of NHH Settlement performance by Meter type, there should be clear benefits to obtaining this data due to the data provision burden on participants. The output from the proof of concept has provided useful insights into NHH Settlement performance, which continues to be a focus of the PAF. Having access to this data has a number of other potential benefits for central assurance activities such as:

- Validating the Meter exchange figures in the smart MTD report, i.e. identifying the number of exchanges not reported due to the Data Transfer Network (DTN) extracts not providing full coverage of the market;
- Facilitating targeted audits to identify root causes of estimation at RF and/or use of default estimation values and providing information for the annual BSC Audit; and
- Assessing consumption values that are statistical outliers, which could support a review of the erroneously large EAC/AA thresholds used for monitoring SR0072[6].

5.5 Despite providing useful insights into NHH Settlement performance, we are not proposing to provide such reporting on a routine basis, as the main use would be for supplementary information. However, we propose that future snapshots can be provided as required on demand. For example, if we see degradation to NHH Settlement performance as we progress through the rollout which we want to investigate further. We plan to use the data obtained during this exercise to support other assurance related activities, and the findings will be considered as part of the data provision work stream of the PAF review as we investigate future approaches to data and reporting.

6. Recommendations

6.1 We invite you to:

a) **NOTE** the findings from the proof of concept; and

b) **NOTE** that we will revisit the option to amend PARMS Serial SP08a as part of the performance assurance technique work stream of the PAF review in summer 2019.

Appendices

Appendix 1 – NHH Settlement by Meter type and profile class

Attachments

Attachment A – Supplier performance by Meter type (confidential)

[6] The risk that NHHDCs process incorrect Meter readings, resulting in erroneous data being entered into Settlement

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NHH SETTLEMENT BY METER TYPE

APPENDIX 1 – NHH SETTLEMENT BY METER TYPE AND PROFILE CLASS

The following table provides NHH Settlement performance to actual Meter reads across the Reconciliation Runs. As with the table in section 3 of this paper, the cells are coloured based on relative performance at each Settlement Run.

Meter type	PC	MSID count (R1)	Energy share (R1)	R1	R2	R3	RF
ADM	1 to 4	1,256,278	3.21%	36.98%	77.83%	92.67%	97.94%
AMR	1 to 4	892,991	10.90%	69.24%	87.32%	93.06%	97.42%
Legacy	1 to 4	22,202,267	70.26%	33.59%	68.69%	87.00%	96.11%
SMETS	1 to 4	5,580,357	14.38%	59.79%	92.64%	97.16%	98.88%
AMR	5 to 8	8,355	0.54%	31.20%	56.41%	67.38%	82.46%
Legacy	5 to 8	11,722	0.71%	37.19%	61.89%	73.54%	85.52%
Total		**29,951,970**					