

PUBLIC

Half Hourly Settlement for Dynamically Switched Meters

Impact Assessment



ELEXON Market Design and Analysis
PSRG37/01
5 November 2014

HALF HOURLY SETTLEMENT FOR DYNAMICALLY SWITCHED METERS

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MANAGEMENT SUMMARY

ELEXON is seeking views on behalf of the Profiling and Settlement Review Group (PSRG) on the impact of:

- treating dynamically switched smart Meters as static clock switched (with an approximation in Settlement); and/or
- registering dynamically switched smart Meters as Half Hourly (HH) Metering Systems (more accurate allocation of energy in Settlement).

This consultation forms part of a PSRG project¹ to identify options to ensure accurate Settlement of any loads (and/or time of use registers) that are dynamically switched by means of smart or advanced Meters. ELEXON welcomes responses from Suppliers, Licensed Distribution System Operators (LDSOs), the Transmission Company, Supplier Agents, other industry code administrators, trade associations and any other interested parties.

The PSRG project will deliver a report to the Supplier Volume Allocation Group (SVG) with a recommendation of any changes required to support continued dynamic switching using smart Meters.

We have incorporated the consultation questions into the relevant sections of this document and provided a consolidated list of questions in a separate Word document for you to complete your response.

Please send your response to BSC.Admin@elexon.co.uk by **26 November 2014**.

Please address any questions to Jon Spence (jon.spence@elexon.co.uk or 020 7380 4313).

¹ The terms of reference for this project can be found in '[Project Initiation Document : Settlement of Dynamically Switched Registers](#)' (PSRG29/04 10 December 2013).

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INTRODUCTION

Background

The introduction of smart metering and the Data and Communications Company (DCC) will result in changes to how remote load control and dynamic switching instructions are issued.

Currently the Radio Teleswitch Service (RTS) is the only widely-used mechanism for the dynamic switching of Non Half Hourly (NHH) tariff registers. About 1.8 million customers have their electrical storage and immersion heating controlled remotely via the RTS. Messages are sent via the BBC's 198 kHz long wave network to a teleswitch device connected to a customer's Meter to turn the customer's heating on and off. The Teleswitch Agent (a role performed by the Energy Networks Association (ENA)) provides a single, daily report to the Supplier Volume Allocation Agent (SVAA) summarising the broadcast teleswitch times. The SVAA uses this file as part of the calculation of profile coefficients to ensure that Metered Volumes are allocated to the correct half hour periods (Settlement Periods).

Under the new smart arrangements, the DCC will process requests from Suppliers to remotely switch registers and control load and will send commands to be applied by the relevant smart Meter.

The requirement for dynamic switching is likely to continue into the future, whether to:

- provide continuity of service to those customers who currently have their electrical storage and immersion heating controlled remotely by the RTS;
- enable other electrical loads (such as electric vehicle (EV) charging points) to be controlled remotely for the purposes of Demand Side Response (DSR); or
- support dynamic Time of Use tariffs (where the Meter register, rather than electrical load, is switched remotely).

Any future use of dynamic switching with smart Meters will require either:

- a new mechanism for Suppliers to confirm the out-turn (or scheduled) switching times to the SVAA for the purposes of profiling; or
- the relevant Metering Systems to be registered as HH.

This will continue to ensure that switched volumes are settled accurately for Suppliers and avoid any misallocation of energy and resultant cross-subsidies between different consumers.

Solution options

We previously identified four solution options.

Option 1 – Manage within the existing framework

Suppliers would choose whether to:

- move dynamically switched Metering Systems to clock-switched Standard Settlement Configurations (SSC);
- settle customers on dynamic tariffs under the HH arrangements (i.e. on an elective basis);
- create SSCs that reflect the 'operating window' of the dynamic tariff (e.g. a 10 hour window, during which a customer would enjoy seven hours of switched load) and accept a time-bound misallocation of energy (although this would impact other Suppliers via GSP Group Correction).

Option 2 - Mandate HH Settlement for dynamically switched Metering Systems with smart Meters

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HH Settlement would be mandated if Suppliers use dynamic switching for Metering Systems with smart Meters. Like Option 1 this avoids the need to make changes to the NHH profiling arrangements.

Option 3 – Co-ordinated dynamic switching

During the mass roll-out of smart Meters, customers on existing dynamically switched tariffs will progressively move from traditional teleswitched Meters to smart Meters. To provide continuity of service to these customers, Suppliers may wish to switch their load at the same times as those remaining on the RTS SSCs. This will also allow LDSOs to continue to use the RTS Groups for load management purposes during the roll-out. For this to be achievable, the Group Code Sponsor will need to publish switch times (day ahead or as far in advance as is feasible), such that Suppliers can switch load at the same times using co-ordinated instructions to the smart Meter through the DCC.

No changes would be needed to the SVAA system or the BSC. The obligation on Group Code Sponsors to publish switch times in advance would probably need to be added to the Radio Teleswitch Agreement (or an equivalent agreement under the Distribution and Connection Use of System Agreement (DCUSA)).

Option 4 – Amend the process for notifying switch times

This would involve changes to the SVAA system and Supplier systems, such that Suppliers (whether directly, through an RTS Access Provider equivalent or through a Teleswitch Agent) notify the SVAA of switch times. It would need a variant of the Teleswitch Contact Data Interface File (D0277). New dynamically switched SSCs would become Supplier-specific, existing RTS SSCs would be allocated to the Group Code Sponsor and all other SSCs would remain generic. The SVAA would need to perform completeness checks to ensure that switch times had been received from all Suppliers and apply appropriate SSC-specific defaults where data was missing. During the smart Meter roll-out, the SVAA would need to process multiple versions of the new dataflow alongside the existing D0277 flow.

June consultation

In June 2014 we issued a [consultation](#) on the four options outlined above. On 16 July the PSRG reviewed the [consultation responses](#) and agreed that further consideration should be given to Options 1 and 2.

The reasons for progressing Options 1 or 2 are as follows:

- seven out of 12 respondents to the June 2014 consultation, who expressed a preference, were in favour of progressing either Option 1 or 2;
- options 1 and 2 allow for learnings to inform a decision about central system and Supplier system changes at a more appropriate time (for example, if innovative Time of Use Tariffs take off or a decision is made not to progress universal HH Settlement);
- options 1 and 2 avoid the development costs associated with Options 3 and 4;
- options 1 and 2 avoid cross-subsidies.

The reasons for not progressing Options 3 and 4 at the current time are given below.

Option 3 – Co-ordinated dynamic switching

Of 14 respondents to the June consultation, three (two Suppliers and an LDSO) expressed a preference for Option 3. Disadvantages of Option 3 are:

- it continues to rely on the switch times notified by the Teleswitch Agent, so it will only work for as long as the RTS arrangements are in place (probably only until 2020);
- synchronisation between RTS switching times for non-smart Meters and for smart Meters operated by multiple Suppliers would be difficult to control;

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- the difficulty and costs of communicating required switch times between LDSOs and all relevant Suppliers in time to apply them;
- it will clearly not work for 'immediate' commands (although we understand that these are rarely used) or close to real-time network management needs;
- it would not readily support new dynamic SSCs; and
- some dynamic switching may be automatically triggered – i.e. driven by bespoke calculation tools feeding into the RTS scheduling.

Option 4 – Amend the process for notifying switch times

Two of the 14 respondents to the June consultation (an LDSO and a Supplier/LDSO) preferred Option 4.

Disadvantages of Option 4 are:

- it is the highest cost option, taking into account changes to central BSC Systems and Supplier systems;
- high development costs would be incurred for the benefit of a group of dynamically switched customers who are currently low in number;
- dynamic switching is confined to two or three Grid Supply Point (GSP) Groups (and with an uneven distribution of Supplier registrations) so there would be cross-subsidies in terms of development costs;
- the payback period for the system changes would be short, if universal HH Settlement is introduced in 2020 and the Smart Metering Equipment Technical Specifications (SMETS) Meter variants and Auxiliary Load Control Switches (ALCS) are not available until after the start of the smart metering mass-rollout in December 2015.

Next Steps

The PSRG will meet to discuss the responses to this impact assessment. The PSRG will then make a recommendation to the SVG about whether HH Settlement should be mandated where smart metering equipment is being used for dynamic load or register switching. The PSRG will also identify any additional changes that are needed to facilitate HH Settlement for domestic and small non-domestic Metering Systems.

Parties can then consider whether to propose any Modifications or raise any Change Proposals to implement any of the solutions identified.

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OPTION 1: MANAGE WITHIN THE EXISTING FRAMEWORK

Description

No changes will be made to the SVAA system to process switch times for dynamically switched Meters and no changes will be needed to Supplier systems to notify switch times.

On replacement of an RTS Meter by a smart one, Suppliers will have the option to switch the Meter on a static² or semi-static³ basis using the smart Meter's ALCS Calendar. The Supplier would then need to reassign the Metering System from an RTS SSC to a clocked-switched SSC.

If the Supplier wishes to switch the smart Meter on a dynamic basis, they would need to carry out a Change of Measurement Class from NHH to HH.

There would be nothing to prevent Suppliers from utilising the ALCS functionality of a smart Meter dynamically. So any Metering Systems that remained NHH settled would be subject to inaccurate Settlement if dynamically switched. The total volumes allocated to Time Pattern Regimes would be correct, but there would be a misallocation of energy between individual half hours/Settlement Periods (i.e. to a greater extent than the misallocation that occurs as a result of the estimation already inherent in Settlement profiling). This misallocation of energy could be time-bound by creating SSCs that reflect the 'operating window' of the dynamic tariff. So if a customer is offered seven hours of heating load within a 10-hour operating window, the SSC would be set up with a 10-hour switched period to which all switched load would be allocated.

This is effectively a 'do nothing' option, but one of the aims of this consultation is to identify any changes to the current HH settlement processes to accommodate domestic and small non-domestic Metering Systems.

Assumptions

Timescales

Although Initial Live Operation (ILO) of the DCC is planned for Quarter 4 2015, it is not anticipated that the SMETS meter variants (and associated ALCS) will be available for installation until 2016-17.

The BBC and ENA have reached an agreement to keep the RTS infrastructure working until 2020, which coincides with the planned completion of the mass roll-out of smart metering. So it is assumed that RTS metering will be replaced by smart metering between 2016/17 and 2020.

Ofgem considers⁴ that "it is in consumers' interests to be settled against their half-hourly consumption data", including the reason that it will "create the right environment for demand-side response (DSR)". As such its Smarter Markets programme is considering universal HH Settlement. If universal HH Settlement is adopted, it is unlikely to be implemented ahead of the completion of the mass smart metering roll-out in 2020. So there is likely to be a period between 2016/17 and 2020 (or thereabouts) when dynamically switched customers could be settled HH, but without the economies of scale that universal HH Settlement would bring.

In the event that a decision were taken not to proceed with universal HH Settlement, it might be advisable to revisit Option 4 (amend the process for notifying switch times). The cost-benefit argument for Option 4 may change if there is an increase in dynamic switching; for example dynamic Time of Use tariffs (where the Meter register, rather than electrical load, is switched remotely) or new switchable loads (such as electric vehicle charging points).

² Where the registers/load are switched at the same time every day of the year.

³ Where registers/load are switched at the same time every day within a defined season or change only to accommodate British Summer Time and/or Bank Holiday adjustments.

⁴ '[Electricity Settlement Reform – Moving to Half Hourly Settlement](#)' (4 April 2014)

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Access to data

It is assumed that customers benefit from dynamically switched tariffs, so will give consent to their Supplier to access HH data.

Volumetrics

Under the current arrangements about 1.8 million customers have their electrical storage and immersion heating controlled remotely via the RTS. Of these, we estimate that approximately 165,000 are dynamically switched, predominantly in the South Scotland and North Scotland GSP Groups. The remainder are switched on a static or semi-static basis.

Costs

The table below identifies the main factors that will drive the cost of servicing dynamically switched customers under the HH arrangements.

Cost-driver	Description
Metering	It is assumed that SMETS 2 Meters will comply with Code of Practice (CoP) 10, the minimum specification for HH Meters. So no additional metering costs will be incurred.
Data Retrieval	<p>It is too early to know how, if at all, DCC data retrieval costs would be impacted by requesting HH interval data, rather than NHH Billing Log data. We understand that the initial DCC charging regime has been based on expected reading frequencies provided by Suppliers and other DCC users. These in turn are likely to have assumed that Metering Systems will continue to be settled NHH. Whilst this charging regime would need to be revisited if all smart Meters were settled HH, it is assumed that, in the shorter term, data retrieval for HH dynamically switched Metering Systems would be on the basis of the initial charging regime.</p> <p>Data retrieval costs will be a factor of the DCC transactional charges and the frequency with which HH data is retrieved. The latter may be influenced by HH performance targets. For the two new Measurement Classes F (HH domestic) and G (HH non-domestic whole current), introduced by Modification Proposal P300 'Introduction of new Measurement Classes to support Half Hourly DCUSA Tariff Changes (DCP179)', performance targets are currently not differentiated from Measurement Class E (HH non-domestic current transformer metered).</p>
Data storage & transmission costs	There will clearly be an increase in the volume of data retrieved from the Meter and stored in Supplier and agent systems (although for Supplier systems, increases can also be expected for NHH Metering Systems). This will be accompanied by an increase in dataflow sizes.
Proving Tests	CP1411 'Remove exemption from Proving Tests for Code of Practice 10 Metering Systems' has been approved for implementation in June 2015. Proving Tests will then be mandatory for all HH Metering Systems.

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Cost-driver	Description
Other BSC processes	The processes defined in BSCP502 'Half Hourly Data Collection for SVA Metering Systems Registered in SMRS' were designed for 100kW Metering Systems and are arguably too onerous for Measurement Class 'F' and 'G'.
HH agent fixed costs	Currently HH agent fixed costs are recouped across a (collective) base of about 133,000 Metering Systems. This will increase by about 160-170,000 Metering Systems by 2016 as a result of Modification P272 'Mandatory Half Hourly Settlement for Profile Classes 5-8'. If all Metering Systems which are currently switched dynamically were settled HH, there would be a further increase of about 165,000 Metering Systems. Even with the increased number of HH Metering Systems, the HH agent fixed costs attributable to each Metering System will be well in excess of the equivalent NHH value. NHH agent fixed costs are recouped across a collective base of 29 million Metering Systems. It is assumed that economies of scale won't be achieved until universal HH Settlement is introduced.
DUoS charging	Modification Proposal P300 has been approved for implementation in the November 2015 release. DCUSA DCP179 'Amending the Common Distribution Charging Methodology (CDCM) tariff structure' has been approved for implementation in April 2015. These changes should ensure that customers with dynamically switched Meters will not be adversely impacted in terms of Distribution Use of System (DUoS) charges as a result of moving to the HH arrangements.
RTS Costs	It is assumed that Suppliers will still be subject (via DUoS charging) to RTS infrastructure costs, which will continue for as long as the RTS infrastructure is still required. These costs will not reduce as a result of RTS Metering Systems switching to smart.

No.	Consultation question
1	<p>Have we identified the main cost-drivers for servicing dynamically switched customers under the HH arrangements?</p> <p><i>Please provide rationale and any additional comments.</i></p>
2	<p>What proportion of the overall cost of servicing dynamically switched customers under the HH arrangements would you ascribe to each of the cost-drivers listed in this section?</p> <p><i>Please provide in percentage terms or as a ranking.</i></p>
3	<p>What is your estimate of the <u>incremental</u> annual cost per dynamically switched Metering System of servicing it HH rather than NHH?</p> <p><i>Please provide rationale and any additional comments. If your estimate is sensitive to the number of</i></p>

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Metering Systems remaining on dynamically switched tariffs, please provide details of any assumptions you have made and how you would expect costs to vary if numbers increase/decrease.

Required changes

Unless the Smart Energy Code (SEC) is amended to allow Half Hourly Data Collectors (HHDC) to access HH interval data directly from smart Meters via the DCC, a mechanism will be needed for Suppliers to provide this data to HHDCs. The least-change option is probably to use the 'Validated Half Hourly Advances for Inclusion in Aggregated Supplier Matrix' (D0036) flow. This would require changes to Supplier and HHDC systems. A change would also need to be made to the Data Transfer Catalogue (DTC) under Master Registration Agreement (MRA) governance to allow the D0036 to be sent by Suppliers to HHDCs. An alternative option would be to allow Suppliers to pass HH interval data to HHDCs using the method of their choice (for example, transferring DCC outputs in their raw form). Consideration would also need to be given to modifying the BSC to take into account the changed Supplier and HHDC responsibilities in relation to HH data retrieval.

This question will also need to be addressed if universal HH Settlement is introduced, but may not be resolved until after a solution for dynamic switching is needed.

Optional changes

The following changes could be made to HH processes to better accommodate domestic and smaller non-domestic Metering Systems.

Process	Description
Proving Tests	Once implemented in June 2015, CP1411 will mean that Proving Tests have to be carried out for all HH Metering Systems. A further change could be considered to exempt Measurement Classes F (HH domestic) and G (HH non-domestic whole current) from this requirement.
Estimation	BSCP502 includes an eight-tier method of estimating missing data for HH Metering Systems. This could be simplified for Measurement Classes 'F' and 'G'. On the other hand, HHDC may incur additional costs by running different estimation methods side-by-side.
HHDA Default	If the HHDC fails to send HH data to the HH Data Aggregator (HHDA), the HHDA will apply a default value per Settlement Period of 'HH Default EAC'/17520 (= the number of Settlement Periods in a non-leap year). The current value of 'HH Default EAC' is 1,500 MWh, an average across HH Metering Systems in Measurement Class 'C' (HH metered in 100kW Premises) and low numbers of Metering Systems in Measurement Class 'E'. Following P272, and in preparation for Measurement Classes 'F' and 'G', it would be more appropriate to use default values that are specific to individual Measurement Classes.

No.	Consultation question
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No.	Consultation question
4	<p>How should HH data from smart Meters be provided for Settlement purposes?</p> <p><i>Please provide rationale and any additional comments.</i></p>
5	<p>Which of the changes listed as 'optional' would need to be made to accommodate HH Settlement for dynamically switched domestic and small non-domestic Metering Systems?</p> <p><i>Please provide rationale and any additional comments.</i></p>
6	<p>Are there any additional changes that would be needed?</p> <p><i>Please provide details.</i></p>
7	<p>To what extent would the cost of servicing dynamically switched customers incurred by your organisation under the HH arrangements be reduced if these additional changes were made?</p> <p><i>Please provide rationale and any additional comments.</i></p>

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OPTION 2: - MANDATE HH SETTLEMENT FOR DYNAMICALLY SWITCHED METERING SYSTEMS WITH SMART METERS

Description

This is effectively the same as Option 1 except that if Suppliers elect to use dynamic switching for Metering Systems with smart Meters, they will be required to register these Metering Systems as HH. Like Option 1 this avoids the need to make changes to the NHH profiling arrangements. A Modification Proposal will be required to implement this mandate.

Under Option 1 there is a risk that Suppliers will carry out dynamic switching for NHH Metering Systems and, with no mechanism for notifying switch times to the SVAA and for these switch times to be taken into account for profiling, this will create a profiling error. This error will impact other Suppliers through the GSP Group Correction process and may lead to less Settlement accuracy and cost reflectivity in imbalance volumes and charges. Option 2 would provide additional assurance through the adoption of a mandate. In all other respects the options are identical.

No.	Consultation question
8	<p>Do you believe that a mandate is necessary?</p> <p><i>Please provide rationale and any additional comments.</i></p>