

Date: 05/01/2017

James Earl, Senior Policy Manager  
Settlement Reform, OFGEM**Moixa Technology Ltd – Response to Consultation***Mandatory Half-Hourly Settlement: aims and timetable for reform*

Dear James,

Moixa Technology welcomes the invitation to comment on Ofgem's consultation on HHS reform, which we welcome as key part of enabling a more flexible, smart energy system – enabling greater choice and economic benefits to wholesale agents and end customers.

Moixa is the UK leader in behind the meter (BTM) residential energy storage and aggregation of such distributed assets for a range of utility, network and system benefits. We are in a unique position to comment on how BTM storage models can benefit through improved settlement mechanisms, from evidence gained across delivering a majority of UK pilots and projects on distributed energy storage, e.g. for LCNF/NIC, DECC – Energy Storage Demonstration, InnovateUK (Localized Energy Systems), Big 6 Utility deployments, Social housing, private and retail customers. We are also happy to participate in OFGEM interview/evidence committees. We have also accumulated considerable data across projects on real-time energy use, storage/solar, and test cases for a range of system benefits, providing insight and research on how storage and related demand side technologies can aid the overall system, should suitable time of day, half-hourly, and other settlement or credit mechanisms/incentives, be pervasive in the UK Energy System.

Moixa is supportive and positive about the opportunity to expedite 'mandatory' HHS as a function of the energy system. Interim strategies of elective are an important staging point – but also face potential exploitation or AEC (Adverse effect on competition) of trading and 'settlement' arbitrage opportunities between Profile Class and HHS elective choice between customer groups, that may both benefit (in educating/expediting services) but ultimately be an unequal system property (akin to net-metering/grid defection risks) impacting the fair distribution and contribution of customers to various network and system charges to maintain effective infrastructure.

Equally 'mandatory' HHS may be the only mechanism to effectively accelerate and confirm customer benefits of adopting smart meters, or smart storage, as

technologies that benefit the wider grid. For example – a home owner may face a natural choice of delaying or not allowing a ‘smart meter’ to be fitted – if they are say a classic day-time worker, using predominant energy profile in the peak evening phase, in the same was as a high water user might try and avoid/delay having a water meter fitted. Smart meters overall face a significant issue in what they deliver for customers if adopted unequally across a population – as arguable only fair pricing can occur if everyone is on a similar HHS or real-time basis, that accurately provides data enabling choices on how best to apportion costs.

Energy Storage has a significant opportunity within an energy system featuring smart meters and HHS – since it ‘solves’ the problem by providing a customer benefit, of working and responding to price signals or market/network needs to enable a shift in consumption of energy without impacting customer behaviour (or requiring occupancy of a property and energy use at a time – simply not possible by a normal energy user). Without co-installation of energy storage, we doubt (1.5) that HHS will always be in the customer interest – since many customers simply cannot move energy consumption to low times, particularly fuel-poor or workers (not at home), and so storage is essential to allow such customer benefit. In a related point – a Solar only household – would likely be worse off in the summer by HHS – since they likely currently ‘underpay’ on a profile settled basis, for evening consumption, due to overall daily metered energy benefiting from solar (and corresponding FiT payments), so might choose not to adopt HHS – but might significantly benefit from HHS in non-solar winter months. Whereas a Solar+Storage household would likely be clearly better off on a HHS basis – since could use storage for self-consumption and reduce peak summer HHS consumption and benefit from shifting night energy in winter to HHS peaks.

HHS for homes is particularly important for Europe and the UK which have an overall electricity system profile where the peak is driven demonstrably by Domestic Energy Use. This is in contrast to say US, where profiles vary by state – favouring C&I demand peaks or Air-conditioning peaks, and is not characterized by simply a winter peak domestic challenge. This is particularly important in respect of HHS as whilst P272 might mandate HHS for certain profile or industrial customers – strategically the UK grid can only effectively manage winter peak by addressing settlement in domestic properties.

There is also a strong interplay between settlement and storage and demand side technologies (DSR), since in broad terms, our data/pilot evidence, is that DSR cannot be relied on as a guaranteed infrastructure for domestic demand side reduction in peak hours (customers simply are not predictable, mandatable, or

price responsive over loads in growth use during peak hours, electronics, lighting, connectivity, IoT, eMobility) on a sustained term basis. In contrast energy storage is a 'perfect' asset in being both push and pull, invariant of occupancy (household can be away), season (temperature on heat independent) so can be more relied on as part of grid infrastructure for 'time' 'capacity' and 'demand' side (turn up or reduction) opportunities, should there be an effective fiscal mechanism to settle and reward time of use activities.

Moixa is supportive of plans for an aggressive and accelerated move to allow wider uptake of half-hourly settlement through various technical, market, incentive and regulatory (mandatory opt-in with exclusions) to full mandated approaches. Broadly

- Removal of barriers (economic, regulatory, awareness) that prevent easy adoption of 'elective HHS'.
- Lowering the transaction cost of Half-Hourly settlement – which otherwise faces increased meter / data / elexon / charges as well as IT complexity for BSC members. This is in part mitigated in scale economics if all settlement is this way, however, will be a staged cost where certain rebates or reliefs may be required to ensure a level playing field.
- Accelerating adoption of 'elective' through market or incentives, from government awareness/signals (as per the switch strategy), to reliefs or targets for suppliers to adopt or have a staged proportion of customers elected into a HHS basis (e.g. % target or P322 equivalent timeline after change) or a CMA action alternate to say pre-paid meters to have targets for HHS where they deliver a lower customer bill.
- Enabling certain eligible opt-outs
- Encouraging HHS benefits in respect of energy storage deployments, since such deployments could clearly aid system savings (e.g. demand turn up, or reducing peak capacity)

We have outlined comments tagged to the consultation questions in the attachment

Yours Sincerely

Simon Daniel  
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## **2. Approach: Moixa - Comments in relation to Questions in consultation:**

2.1 – *Proposed approach* – Rapid deployment of ‘elective’ HHS together with incentives or reliefs on Elexon charges, is a critical first step – both to start initial market, and gain real and rapid feedback from BSC members on the practicality (IT, customer offer, customer adoption and comprehension) which will likely feed into and de-risk approach for mandatory HHS.

2.2 – *Impact – Costs & Benefits*. 2.8 in respect of IT costs is likely to be a major barrier for various (larger) BSC as well as small (extra systems) suppliers, and so a staged approach for mandatory HHS should be considered where it is ‘benefits led’ such that customers and suppliers are rewarded by adopting and enabling (rather than penalized for being slower to update), such that natural competition means customers migrate to suppliers offering HHS rather than force utilities to adopt HHS by certain date – as there will likely be a strong argument and reality that many large Utilities can simply not adapt systems to accommodate, unless already advanced and included in DCC preparation – and may be unreasonable to insist on full mandatory adoption within a realistic timeline. Market forces may be a better mechanism where they save face a falling/digression in BSC/Elexon charges for HHS settlement vs rising cost base for Profile settlement as a mechanism to encourage a business case led update to IT – which could run into tens of large millions of system update complexities. This is a key point for Ofgem to achieve HHS objectives – as does need to accommodate the challenge this faces to legacy/Big 6 IT systems and costs.

2.17 – Moixa can provide on request data points on value of load-shifting, and how this can be securely/persistently achieved through BTM storage.

2.18 – We agree – and see evidence across multiple Utilities we work with on storage related propositions – however there is perhaps a distinction between ‘wholesale/imbalance’ costs the supplier faces – independently of how they settle/bill customers, where DSR/contracts/storage and other mechanisms could part-mitigate, and how they chose to ‘bill’ the customer. A Utility could settle/manage and is exposed to time of day, whereas a bill could be presented more simply to customers on a flat or alternate basis. In general time is complex for an end customer, already at risk of confusion from tariff choices, and how bills are presented when no time variable is present.

2.19 – A critical factor here is that storage enables this, without customer intervention, so is not so much ‘enabling customers to more easily manage’ but ‘enabling utilities to manage on behalf of customers’. In general energy is not front of mind, particularly in peak hours, to average customers, and sustained

change of behaviour or spending any daily attention on energy is hard, unless it is fully automated by such storage/smart technologies – or managed on their behalf by a Utility. This also has impact on bill strategies – where it may be better simply for the Utility to provide a rebate based on how well household technology, or reduced use of peak energy/time change was, rather than show quantitatively how many KWh was used in specific time intervals (that will have different daily charge rates dependent on wholesale markets).

2.20 This is a critical point, and moixa can provide data on request. An important macro heuristic from hundreds of storage/real-time ‘settled’ systems deployed in the field, is that in large aggregates – the ‘Elexon’ profile settlement approach works, if all households are treated as an aggregate, whereas clearly on each individual property energy usage will be chaotic – as no house actually uses a profile class on a daily basis. This has important impact as HHS both enables accurate billing to a household – but more so – enables energy flows to be monetized across properties – enabling the whole system to be managed on a profile basis, but houses compensated if that involves a flow of energy through or back through the meter.

2.21 The impact assessment should consider the twinned benefit of Storage co-installed with HHS/Smart meters, as helps remove any dependency on behavioural or sociodemographic.

### **3. Plan: Moixa - Comments in relation to Questions in consultation:**

3.2 - Moixa considers that the Smart Meter and HHS strategy is likely incomplete without an equivalent strategy running in parallel for Smart storage, e.g.

- Storage should or could be treated as accessory under a Meter Asset Provider, which we term BAP – Battery Asset Provider, as has an interplay between how say a SMETS meter is both funded, communication, and interplay with HHS benefit.

- We can (on request) make suitable proposals for how Ofgem could create suitable BAP (Battery Asset Provider) and BOP (Battery Operator) roles to work alongside the reform timetable

- Consumer issues – significant factor here is tariff and bill complexity, and both how much a customer should or could be made aware of time related consumption, cost, usage. How much customers care about such granularity or have the ability to understand wholesale, time, peak, charge variances. So principles of policy mechanisms that suppliers use best endeavours or work in customer interest, is likely more important than showing granularity on a complex of bill of precise decimals of usage in

intervals (energy is likely both boring and annoying to customers, and bills themselves are often already complex on static time basis).

- Transition to HHS also needs to rapidly benefit from expedient 'elective HHS' in addition to P272

3.8 – benefit of being incentive or access to lower BSC charges , so that industry can play up (or delay) high IT charges over rising cost of not doing as a business choice rather than an arguable unreasonable or hard date target.

3.11 We agree elective is a critical enabler and de-risker for mandatory – though is subject to elective HHS being cost-effective at Elexon (or required to be by Ofgem target), we would expect a number of market drivers to surface from

- new suppliers offering time tariffs that either simulate or deliver for real HHS settlement or Economy 7/10 variants

- medium suppliers and big 6 suppliers with large populations of SMET1/2 meters deployed – opting or encouraging selective customers to elect into HHS to obtain a lower tariff ('Settlement Arbitrage') – which is a mixed blessing – as accelerates the switch/or adoption of tariffs but at expense of those left on regular settlement (since in theoretical scale this is unfair to Profile Class customers who likely would pay more)

- Storage to be actively encouraged or prompt a switch to a HHS compliant tariff provider.

#### **4. Policy: Moixa - Comments in relation to Questions in consultation:**

4.4-4.5 – There may be some synergies with 'Battery Operators 'BOPs' and MOPs, in so much that BOPs may naturally gain high frequency meter or equivalent consumption readings (for other purposes) that might provide transition, test, or alternative roles here to supplier agent functions.

Without a 'demand action agent' such as a BOP (Battery Operator) or a DSR, simply having 'data functions' (MOA, HHDC, DA) do not deliver infrastructure, so a joined up approach would correctly integrate a policy for a demand/storage asset alongside DCC, Smart Meter/MOA, HHS to deliver an assured peak or on request demand reduction or turn-up. Aspects of settlement code changes and policy could be used to encourage markets or delivery of this.

4.9 Smart Energy storage together with HHS providers wholesale agents and suppliers the opportunity to 'correct' or compensate their imbalance position through real-time or scheduled control of their BTM storage assets. So settlement and audit times could be much faster than outlined here.



4.11 Shortening the settlement timescale is critical – and to ensure ‘financial stability’ of small suppliers – who may not properly manage exposure to wholesale, currency, oil, imbalance, trading conditions – and not realize a traded past position is already significantly out of the money. This is likely to become increasingly visible in the market for new/smaller suppliers now that recent market wholesale conditions have changed. Expediting HHS therefore has a critical value in the market – to ensure better stability across all types of suppliers by preventing such delayed settlement shocks causing bankruptcy or risks to supplier trading.

4.13-4.14 – Yes this was highlighted on HHS calls – and does need a simple mitigation or reverting to Profile Class for periods of incomplete data/faults – though with some care that this itself doesn’t create a false arbitrage play (IT systems conveniently down again at a time of NSIM event , interconnect sudden fault).

4.15 – there is a potential risk that the GCF falls disproportionately on small suppliers who lack generation assets which could be reviewed alongside an update to this policy. But logic would imply that the ratio of settlement error is allocated in proportion to the NHH vs HHS population, with some weighting to encourage HHS adoption to avoid – e.g. there may be an argument that NHH Solar only customers significantly under-meter on a profile basis, since benefit in summer months from Profile settlement.

- there may be a case of mandating earlier Solar or distributed energy resource customers to be on HHS to both gather accurate data, and to both compensate or charge customers accordingly for use of system

- arguable failure to do this in Germany has driven peak costs to be high for all users, ineffective use/recovery of system cost and the reason for an expected 80% increase in T&D costs in Germany in 2017.

4.18 Mandating FIT, CHP, other distributed energy users early to be under HHS – would also have benefits of

- Providing accurate data to OFGEM of the role/timing of generation and appropriate means to compensate or incentivize time
- Helping expedite the eco-system where energy storage could be deployed, as helps monetize the time shift value of storage – and avoidance of potentially higher peak HHS costs

4.19 Other Smart household devices may themselves act as a form or fiscal or non-fiscal meter, connected to communication devices, aggregation platforms and services – so would be useful if aggregate/VPP platforms could integrate and report into DCC – independent of enrolment or status of end user meter – particularly during transition periods – and before effectiveness of DCC services.

4.20-4.22 A Challenge here is where solar install is financed, on assumed FIT return profiles – including ‘deemed export’ suddenly being impacted by – e.g. simple adoption of a smart meter – that starts to measure. It is both critical to measure actual import for settlement, as well not to impact (historic PV finance) but equally – this can impact storage (e.g. would storage self-consumption as metered under HHS) impact a deemed export payment stream. There can be a separation here from the set rate ‘of deemed export’ at time of install, for life of asset – for FIT processing simplicity and for financing, from metering for purpose of settlement and imbalance (to enable supplier to measure/procure).

Given the scale of distributed energy resources as proportion of day time supply – and the extreme of doing this in Germany (where grid switches off) it is essential that HHS and metering strategies at least measure domestic generation accurately. E.g. a view of a leading DNO is that ‘use of system/grid’ is down 10%+ in KWh per year – as mix of ‘energy efficiency’ and PV/Wind/Generation at grid edge and self or local consumption – but without measurement this could be viewed as ‘recession’, ‘energy efficiency’ or renewable usage, and has substantive impact on overall BEIS (DECC) demand forecasts if in fact energy efficiency has been overtaken by IoT/or demand increases, but hidden by effective self-consumption.

4.23-4.27 – As with the case of rising (~80%) T&D in Germany, there is an emergent case that such charges may be better geared as standing charge, alongside actual opportunity of using HHS to correctly attribute the ‘sub-portion’ of TSO - T&D costs that have a time period sensitivity. Some of this overlaps with the overall imbalance price so may not need additional special treatment.

4.29 There is a potential risk from data protection framework outlined here – that this prevents a supplier ‘working in the interest of the customer’ to study the data to recommend (market) an intervention that could save money (e.g. switch to HHS elective or a time related tariff, or energy asset installation), unless prior consent were obtained. A workaround might be to allow batch/automated assessment to make a recommendation that then requires consent of customer for a validation. E.g., a supplier should not be constrained from offering ‘based on an automated study of your HHS consumption profile, you could potentially benefit by £X on an alternate tariff/or on adoption of an energy asset’, do you give consent for us to make a study an recommended benefits / key features proposal etc. Currently Smart Energy Code may limit some offers that will over time be possible with HHS.

5.3 We are happy to provide further stakeholder input on request