Making a positive difference
for energy consumers

Balancing and Settlement Code Panel, electricity suppliers and distribution companies, consumer representatives and other interested parties

Tel: 020 7901 7000
Email: smartermarkets@ofgem.gov.uk

Date: 28 January 2015

Dear colleagues,

Update on electricity settlement project

Ofgem considers it is in consumers' interests to be settled using their half-hourly (HH) consumption data. In 2014, we approved a modification to the Balancing and Settlement Code (BSC) that requires larger non-domestic consumers to be settled using half-hourly consumption data from 1 April 2016.[1] We also launched a project to explore how this could be achieved for domestic and smaller non-domestic consumers. Since then, we have made good progress in developing reform with valuable input from stakeholders.

Today, we have published an update on our work to promote demand-side flexibility and will be publishing a strategy in the summer.[2] We are committed to ensuring that reforms are developed and implemented in a coordinated way. Our next steps for settlement reform will therefore be set out in the context of this strategy.

The remainder of this letter covers:

- background to the settlement project
- summary of 2014 work
- next steps.

The settlement project

In April 2014, we published a launch statement for the electricity settlement project.[3] This project is part of Ofgem's Smarter Markets Programme.[4] That Programme aims to capitalise on the opportunities created by the roll-out of smart meters to make markets more efficient, dynamic and competitive. The four projects within the Smarter Markets Programme (one of which is the electricity settlement project) were created to make the necessary changes to market arrangements to help realise this vision.[5]

[1] This modification applies to sites in Profile Classes 5-8. Further details of our decision can be found on our website: https://www.ofgem.gov.uk/ofgem-publications/90995/p272d.pdf
[2] The update on our work on demand-side flexibility can be found on our website: https://www.ofgem.gov.uk/publications-and-updates/open-letter-facilitating-efficient-use-flexibility-sources-gb-electricity-system
[3] Ofgem, 2014, 'Electricity Settlement Reform launch statement'. (https://www.ofgem.gov.uk/ofgem-publications/87053/electricitysettlementlaunchstatement.pdf)
[4] More information on the Smarter Markets Programme can be found on Ofgem's website: https://www.ofgem.gov.uk/electricity/retail-market/market-review-and-reform/smarter-markets-programme
[5] Market arrangements are the arrangements that underpin how market participants interact with each other and with consumers.

The electricity settlement process set out in the BSC gives suppliers incentives to match the amount of energy they buy with the amount their customers use because they are charged for any difference between the two.[6] The calculation of charges is made for each half-hour settlement period.

Settlement using HH data

At present, the majority of energy is settled "non-half hourly" (NHH), using estimates of HH consumption. This is because most sites do not have meters that can record consumption in each settlement period.

Smart meters will be able to record HH consumption data and can be read remotely. This presents an opportunity to make the settlement process more accurate and timely. In our launch statement we set out the full reasoning behind our view that it is in consumers' interests for them to be settled against their HH consumption data. In short, it would help make energy markets smarter by:

- helping to create the right environment for more demand-side response (DSR)[7]
- helping suppliers to forecast demand more accurately, strengthening competition and reducing costs
- making the settlement process more efficient.

The settlement project was launched to consider how to achieve settlement with HH data. It is focussed on the settlement of domestic and smaller non-domestic customers.[8] It includes the settlement of both import (energy use) and export (energy generation).

Summary of 2014 work

In 2014, our settlement project explored two aspects of reform:

- the options for optimising certain parts of the existing arrangements for settlement with HH data, so that they can accommodate millions of sites in a cost-effective way.
- the options for how to transition the market to any new arrangements for sites that are not currently settled using HH data.

We convened an expert group to inform our thinking. Parties interested in joining the expert group were invited to apply for membership. Selection was made to ensure representation of a wide range of viewpoints, knowledge and commercial interests. Members included: independent suppliers, large suppliers, Supplier Agents,[9] a Distribution Network Operator, IT specialists, a consumer organisation and central bodies.[10] There were seven meetings of the expert group between June and November 2014. Material from all of the meetings is available on our website.[11]

We are grateful to the expert group members whose ideas and input helped us to make progress in 2014. The expert group was positive about the project and supported the

[6] Generators are also subject to electricity settlement.
[7] Electricity demand-side response (DSR) is when consumers adjust the amount of electricity they use at particular times in response to a signal.
[8] For the purposes of settlement, customers are assigned to a Profile Class according to their consumption pattern and meter type. Domestic and smaller non-domestic customers are assigned to Profile Classes 1-4.
[9] Supplier Agents are appointed by suppliers to maintain meters, retrieve consumption information and prepare it for settlement. They may be independent companies or part of the supplier's own business.
[10] For membership details, see p.4 of 'Role and Operations of the Expert Group'. (https://www.ofgem.gov.uk/ofgem-publications/88227/11roleandoperationoftheexpertgroup.pdf) (This lists the membership at initiation – some representatives of organisations alternated between meetings. Attendance at each meeting can be seen in Annex 1 of the relevant minutes.)
[11] https://www.ofgem.gov.uk/electricity/retail-market/forums-seminars-and-working-groups/electricity-settlement-expert-group

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ambition of using HH data in settlement. The views of members helped us to shortlist options which would achieve the project's ambition, including for: the timing of settlement, how data is collected and prepared for settlement, the process for estimating data when it is unavailable, and the rules and timing of the transition to any new arrangements.

There is a summary of our key conclusions on each of the policy areas we covered in the annex to this letter.

Next steps for the settlement project

Today we have launched a new project to develop our strategy to enable and enhance the efficient provision and use of demand-side flexibility[12] sources across the supply chain in the GB electricity system. The aim of this is to ensure the energy system becomes sustainable while continuing to deliver resilience and value for money as its operation changes. We will publish our strategy this summer.

Our ambition remains for all consumers to be settled using HH consumption data. Enabling more demand-side response, a source of flexibility, is a major benefit of such reform. We are committed to ensuring that reforms are developed and implemented in a coordinated way, and have listened to industry's feedback about the extent of concurrent regulatory change. Moreover, our ambition is, by its nature, longer term. This is because it is dependent upon the successful roll-out of smart metering to domestic and smaller non-domestic consumers. We want industry to focus on ensuring this roll-out is a success.

These considerations mean that our next steps for settlement reform will be set out in the context of our wider strategy on demand-side flexibility.

Contact

If you have any comments or questions about this letter or on the electricity settlement project in general, please contact Jonathan Amos at smartermarkets@ofgem.gov.uk.

Yours sincerely

Rob Church
Partner, Retail Markets

[12] Flexibility takes several forms. It may include demand change, time-shifting demand, embedded generation, fuel substitution, and efficiency schemes. It may also be distinguished by its purpose, its means of operation, and the speed and duration of response.

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ANNEX: SUMMARY OF CONCLUSIONS FROM 2014 WORK

This paper presents Ofgem's initial conclusions from the work undertaken to date. These conclusions are based on our analysis and the discussions with the expert group. As explained in the body of the letter, and referred to below, further work is needed to come to a firmer view in several areas. Where the views of the expert group are being cited, this is made explicit.

Ambition: using half-hourly data for settlement

We think it is in consumers' interests for them to be settled on their actual HH data. The expert group was enthusiastic about Ofgem's focus on electricity settlement and agreed that using HH data for settlement (of both import and export) was an appropriate ambition. Their view was that a full business case was needed to support any reforms and this should include a quantification of the costs and benefits where appropriate. They also stressed the need for analysis of the distributional impacts of using HH data in settlement, given that not all consumers may be willing or able to shift load.

Optimising the settlement process for using HH data

There is already a process for settling consumers using HH data. Currently around 120,000 (predominantly larger) sites are settled through this process. However, that process is unlikely to be wholly appropriate for the millions of sites in scope for this project. The focus of our work in 2014 was to look at how to optimise existing processes to accommodate much larger numbers of customers.

Our approach to shortlisting options was predominantly qualitative: a key element to this approach was having a robust method of evaluation. To this end, and as part of our broader analytical framework for the project, we developed a set of evaluation criteria.[13]

We developed options for the following aspects of settlement, in the context of all customers being settled using their HH data: Data Collection (DC) and Data Aggregation (DA) functions, data estimation, settlement timetable (including correcting volumes after the final settlement run) and Data and Communications Company (DCC)[14] data retrieval.

DC and DA functions

DC and DA functions are at the heart of the settlement process as they prepare the necessary data for settlement. This is the case for both current NHH settlement and future settlement using HH data. Data collection (DC) includes retrieving consumption data from the meter (data retrieval – DR) and processing it (data processing – DP). The latter includes validating consumption data and estimating in instances where it is not available. Data aggregation (DA) is the packaging up of consumption data to meet the requirements set out in the BSC.

At present, suppliers appoint Supplier Agents of their choice to carry out these functions (these may be either 'internal' agents, ie part of the supplier's business, or external companies contracted by the supplier).

We focussed on where the responsibility for these functions should lie in the future. Several high-level options were discussed:

- the current competitive Supplier Agent model

[13] Ofgem, 'Analytical framework for electricity settlement project'. (https://www.ofgem.gov.uk/ofgem-publications/88229/13analyticalframework.pdf).

[14] The DCC is the commonly used name for the holder of the Smart Meter Communication Licences granted by the Secretary of State to Smart DCC Limited pursuant to sections 7AB(2) and (4) of the Gas Act 1986 and sections 6(1A) and (1C) of the Electricity Act 19879. Its role has been created by the government to organise the communications and data transfer, and management required to support smart metering.

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- a new central agent model
- a hybrid model with a central provider competing with independent agents.

The indication from the expert group was that the most viable high-level options are the existing Supplier Agent model and the central agent model.

The potential benefits of the Supplier Agent model identified by the group stemmed from maintaining the dynamics of competition. Specifically, the view was expressed that this would lead to: competition on price and quality; innovation; and customer choice.

There were mixed views on the merits of pursuing the central agent model. The potential advantages of a central agent were deemed by some members of the expert group to be efficiency savings from increased scale and a consistent standard of data quality to all suppliers. The group cited disadvantages of this model, namely the need for a price control (thus incurring costs) and the difficulties of suppliers obtaining services tailored to their requirements.

Considering the hybrid model, the expert group deemed it as likely to create practical difficulties. It could distort competition by creating a dominant player and create uncertainty for the provider of the central agent since the size of its market would not be clear.

We discussed several sub-options. These primarily relate to option design and function responsibility, particularly for the central agent option.

- There are sub-options relating to the functions that a central agent would undertake. This is because it may not be appropriate for a central agent to carry out all of the functions of Supplier Agents at present, either because they may not all be relevant in the future or because some functions could be better left open to market competition. There were mixed views from the expert group on the feasibility of centralising some but not all functions.
- There are sub-options relating to where the responsibility for the central agent functions should lie. The DCC and Elexon were discussed in this context. There are further sub-options around splitting the responsibility for the central functions across multiple bodies.

More work is required to define the DC and DA functions that will be required in the future and to identify viable options for how these functions could be delivered (in terms of where responsibility should lie) and assess the relative merits of these options. In particular it is necessary to assess how DC and DA functions could change with the roll-out of smart metering. For example, these functions will be affected by the establishment of the DCC, which will undertake the DR function for domestic and enrolled smaller non-domestic customers. Moreover, the existing HH DC and DA rules were designed for sites with large consumption. Some of these rules may not be appropriate for domestic and smaller non-domestic customers and so could unnecessarily increase the costs of using HH data in settlement.

Data estimation

Under the proposed settlement reform, customers would be settled on their actual HH data whenever it is available. There are certain situations where it may be unavailable. For example, a delay in receiving the data from a smart meter owing to a communications interruption would mean that actual HH data was not available in time for one or more settlement runs.[15]

[15] A settlement 'run' is the calculation of volume allocations (and the payment of imbalance charges) at a point after the settlement day in question.

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Two solutions would need to be found for estimating missing HH data: one for sites with smart meters and one for the remaining sites with traditional meters (both during and after the transition).

For sites with smart meters, the HH estimation process is unlikely to be wholly appropriate in its current form.[16] However, the principle which underpins it – generating site-specific estimates based on historical data – can be applied to sites with smart meters. There is more work needed to develop the detail of how the process could best be adapted for these sites.

Sites with traditional meters will still need a form of profiling even after the proposed reforms, since there will be no HH data on which to base site-specific estimates. We have identified two possible options for this, all of which may be less costly than the current process.

First, there could be 'smart profiling'. This describes a new method for creating profiles which would be based on data collected from sites with smart meters. This could enhance accuracy compared with the current profiling process, provided that appropriate proxies for traditional meters can be identified in the population of sites with smart meters.

Second, existing profiles could be 'frozen' (ie no longer updated) in one of two ways.

- the regression equations[17] could be frozen but the daily profile coefficients[18] would still be calculated based on the actual outturn temperatures
- both the regression equations and the profile coefficients could be frozen. The latter would be calculated in advance based on 10-year average temperatures.

These options may be less costly than smart profiling, but are also likely to be less accurate.

Settlement timetable

Settlement timetable describes both the duration of the settlement process, from the first to the last settlement run, and the timing of intermediate runs.

The remote capability of smart meters creates an opportunity to shorten the existing settlement timetable. This could bring significant benefits. There are potential benefits to all suppliers of bringing forward the first settlement run: it would reduce the collateral they put up with Elexon, which covers their risk of default.

There are also potential dynamic benefits (ie benefits from enhanced competition) that could accrue to the market from reducing the overall duration of the timetable. Fluctuations in allocated volumes after the first settlement run create financial risk for suppliers, which comes at a cost (eg through the need to set aside more capital). This is particularly relevant to smaller parties.

From discussions with the expert group on this topic, we consider that:

- the information run[19] (II) could be carried out at three working days compared with one week at present.

[16] This is set out in the BSC Procedure, BSCP502, section 4.2. (http://www.elexon.co.uk/csd/bscp502-half-hourly-data-collection-for-sva-metering-systems-registered-in-smrs/)
[17] These equations define the statistical relationship between certain variables (eg temperature) and the profiled energy consumption. They are currently updated annually.
[18] An estimate of the fraction of yearly consumption within each settlement period, calculated each day using the observed temperature for that day.
[19] Prior to the first settlement run, there is an indicative 'interim information run' to enable parties to identify and correct errors before they enter settlement. No charges are made at this point.

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- the first settlement run (SF) could be carried out at 10 working days compared with one month at present.

We shortlisted options for the final settlement run (RF) at one, three and six months. Currently the final run stands at 14 months. We concluded that one month is a challenging but feasible ambition. One way of making the transition as smooth as possible would be to initially have an interim run at one month, which could become the final run in due course.

Although the DCC will provide Smart Meter Communications Services in future[20], we explored with the expert group what we can learn from meters that are remotely-read at present. We concluded that a significant reduction in timescales (in particular of the final run) is possible but may need to be implemented incrementally.

The Profiling and Settlement Review Group (PSRG) are currently undertaking a project to reduce settlement timescales. They are looking at reducing the final settlement run from 14 months to seven months in the short to medium term.[21] This change could help realise some of the benefits outlined above and support incremental implementation of the options identified by the expert group.

Correcting volumes after the final settlement run

Following the discussion on the settlement timetable, we held a separate session to discuss options for correcting errors that come to light after the final settlement run. The options identified are:

- the status quo: 28-month time limit (or "backstop") for extra settlement runs; no backstop for extra settlement determinations (ESD)[22]
- a reduced backstop (eg 14 months) on the use of both further runs and ESDs
- a new mutual insurance scheme whereby suppliers pay premiums and the scheme pays for corrections (above an excess) that occur after the final settlement run.[23]

We do not consider that this area is likely to be critical to the business case for the settlement project. However, future work on the options could help make settlement as efficient as possible. Just as with the benefits of reducing the settlement timetable, a less open-ended disputes process could give suppliers greater financial certainty, which is likely to particularly benefit smaller suppliers and new entrants. The downside would be a potentially increased risk of being unable (without recourse to litigation) to resolve errors that come to light at a later date.

The PSRG project, already referred to, is looking at reducing the current 28-month backstop on extra settlement runs to 14 months and has recognised the need for a holistic review of the disputes process, should a modification be raised to reduce timescales.[24]

DCC data retrieval

We discussed options for how the DCC could retrieve HH data from smart meters. We concluded that suppliers would send a service request to the DCC in advance of needing the data. The DCC would then schedule the request in such a way as to avoid overloading the

[20] Smart Meter Communication Service as described in the Smart Meter Communication Licences Part I Section A paragraph 4.
[21] Elexon, Draft Final Report on Reducing Settlement Timescales, p.29. (http://www.elexon.co.uk/wp-content/uploads/2014/11/03_PSRG37_01a_Attachment_A_PSRG_Reducing_Settlement_Timescalesv0.3.pdf)
[22] This process provides a way of resolving Trading Disputes after the final settlement run without undertaking an extra settlement run.
[23] This suggestion was made by a member of the expert group. We did not explore it in detail: further work would be required to assess its feasibility.
[24] Elexon, Draft Final Report on Reducing Settlement Timescales, p.29. (http://www.elexon.co.uk/wp-content/uploads/2014/11/03_PSRG37_01a_Attachment_A_PSRG_Reducing_Settlement_Timescalesv0.3.pdf)

network. This would entail two-way communication (supplier requests data, meter returns data).

The smart meter specification has not been designed to allow meters to push HH data to suppliers at scheduled times (which would be one-way communication). Changing the specification would be costly and time-consuming.

There are a range of options for how scheduling retrieval may work in practice; the DCC enables a range of possible read frequencies. There may be advantages to suppliers of receiving HH data more frequently, eg daily. The point was made that suppliers would not necessarily be obliged to process the data as soon as they received it. More work is needed to understand the most cost-effective way of scheduling reads.

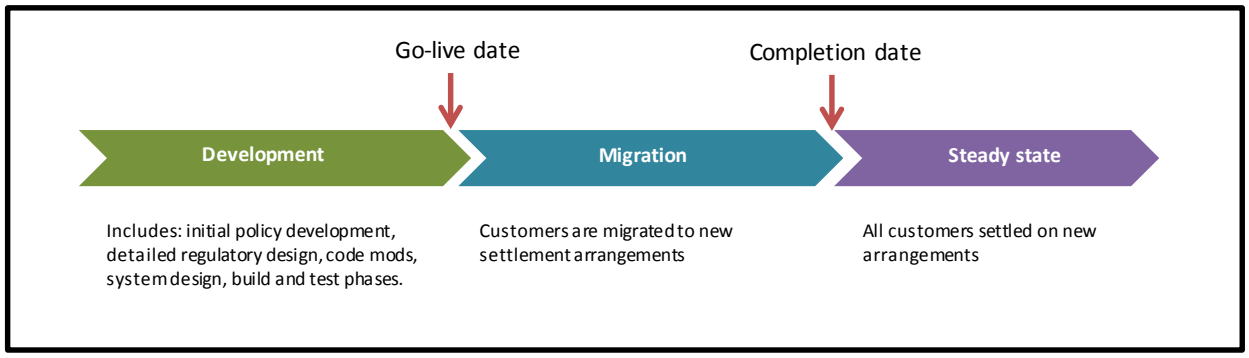
The transition to using HH data

We looked at how to transition customers onto new HH settlement arrangements. Options for transition could have significant implications for the costs of the reforms, the speed with which the benefits are realised and the risks that may be involved.

Timing

We framed our analysis of timing around milestone dates: the go-live date, which is when customers can begin to be settled on the new arrangements; and the completion date, the date by which all customers would be settled on them (see Figure 1). The migration stage is the gap in between migrating customers from the current arrangements onto the new ones.

Figure 1 – milestone dates



Settlement reform could affect several types of organisation, including suppliers, Supplier Agents, distribution network operators and central bodies. In particular, it would require changes to a number of suppliers' activities (eg demand forecasting, billing, customer service) and is likely to interact with other regulatory changes that also affect these activities.

There are other reforms of the energy market scheduled over the coming years that will affect suppliers' systems. These include: the smart meter roll-out; Electricity Market Reform;[25] switching reforms;[26] and centralised registration.[27] The transition scheduling will need to be sensitive to possible added costs and practical difficulties that any overlaps between these reforms may entail. Equally, there may be synergies to be gained from aligning with certain other reforms.

[25] Electricity Market Reform (EMR) is a government policy to incentivise investment in secure, low-carbon electricity, improve the security of Great Britain's electricity supply, and improve affordability for consumers.
[26] In June 2014 Ofgem consulted on its proposals to move to reliable, next-day switching by replacing existing network-run switching services with a centralised switching service, run by the DCC.
[27] A number of other potentially relevant projects were identified. The focus was to identify those which are known to be likely to overlap with settlement reform in the industry implementation phase. Other projects, such as Ofgem's work on demand-side response are recognised to be particularly relevant in the policy stage.

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Consideration will also need to be given to how long to allow for migrating customers to the new arrangements (once they are in place). A faster migration period could bring cost savings as it would reduce the time the industry has to run legacy NHH processes alongside any new arrangements. The potential downside of faster migration is more implementation risks.

Process

We discussed with the expert group the need for rules to manage the transition. The group believed that interim targets could be useful to incentivise and monitor the migration of customers onto the new arrangements.

During the transition, the costs incurred per NHH customer may increase as a function of their declining total number. This would be driven by both the costs of administering the remaining NHH process and the current error allocation mechanism, which allocates all error in settlement to NHH sites.[28]

The settlement process costs may need to be socialised across all relevant consumers during the transition. The BSC error allocation rules may need to be adjusted in advance of the transition so that the remaining NHH consumers are not allocated a disproportionate amount of error.

Furthermore, as energy costs will become more cost-reflective for suppliers, these costs may be passed onto customers in a way that is more reflective of their individual consumption patterns. The expert group said that the risks associated with such distributional impacts could be mitigated with robust consumer messaging and targeted interventions to protect vulnerable consumers.

The above points regarding the allocation of costs to consumers would also depend on the pricing decisions taken by suppliers. Suppliers could decide to spread costs over their portfolio of customers even in the absence of any obligations to do so.

Dependencies

We identified several dependencies for transitioning to using HH data, each requiring solutions to be found.

The expert group identified the current Change of Measurement Class process as not wholly suitable for the migration of millions of sites onto new settlement arrangements. Work could be progressed to design a new process, optimised for the mass migration of sites, but this may require greater certainty over the future of DC and DA functions.

One expert group member raised an issue about the accuracy of smart meters. The technical specifications for smart metering equipment do not specify a level of accuracy for smart meters. So it is possible that some smart meters would not meet the accuracy requirements of current HH settlement. One option for resolving this could be the creation of a new metering code of practice for smart meters.[29] The solution should be both cost-effective and not have an unacceptable impact on the accuracy of settlement.

The current data privacy and access rules affect the availability of HH data for settlement. Under the current rules, suppliers must receive explicit consent to obtain their customers' HH data. We explored the possible workaround of a central agent anonymising customers' data before passing it to the supplier. This solution was not deemed by the expert group to enable suppliers to perform essential functions, such as identifying and resolving errors, because these tasks often require site-specific data.

[28] In this context, error refers to a mismatch between the amount of energy allocated to suppliers and the amount that was used. A mechanism is used to spread this error across suppliers such that all volumes of energy are settled and paid for.
[29] The accuracy requirements for metering equipment are specified in the Codes of Practice for Metering Systems that sit under the BSC.

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A related question is which parts of the supplier's business would require access to the HH data (not necessarily at a site-specific level of detail). The expert group indicated that this data would be needed for a range of functions, such as demand forecasting and pricing. More work is required to explore the interactions between settlement reform and data privacy and access rules.

Approach to cost assessment

Initial discussions on how to assess the costs of using HH data were held with the expert group. The expert group agreed with the proposal to develop reform packages (ie coherent combinations of options), once there is a better understanding of the costs and benefits of the different options. From a feasibility perspective, no potential packages were identified as unworkable.

The expert group agreed with the suggestion that costs could be categorised according to business activities (such as forecasting, billing, customer service). We began initial discussions with the group about what those categories might be for different types of organisation. The group said that any cost assessment must be clear on the assumptions underpinning it, so that the responses from different industry parties are consistent. They also thought that the industry should provide a rationale for their cost estimates.

Among the options we explored, responsibility for DC and DA functions and the timing and process of the transition are likely to have the greatest bearing on costs.

Export

The settlement of both import and export using HH data is within the scope of the project. Generally, the discussions applied to both export and import. We held an expert group session focussed on export alone, to identify any issues specific to it.

We concluded that there are specific benefits of export being settled on HH data, such as reducing the amount of unsettled export 'spilling' onto the grid and creating errors in settlement. We did not identify specific barriers to settling export using HH data where this data is available, ie a smart meter is installed and the customer has provided consent for this data to be accessed.

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