ELEXON WHITE PAPER:

Enabling customers to buy power from multiple providers

This white paper offers an ELEXON view of how BSC central services could be adapted to offer Settlement solutions in support of individual customers buying electricity from more than one supplier.

We are responsible for managing and delivering the end-to-end services set out in the Balancing and Settlement Code (BSC), delivering balancing and imbalance settlement and the provision of assurance services to the BSC Panel and BSC Parties. We manage the assessment, development, operation and implementation of changes to central systems and processes.

We believe that relatively straightforward amendments to BSC central services (building upon the changes we will be delivering in 2019 to open the Balancing Mechanism to independent aggregators) could form the basis of new industry arrangements that allow customers the flexibility to buy electricity from multiple providers.

For further information please contact jon.spence@elexon.co.uk / 020 7380 4313.

How could BSC central services support multiple Suppliers?

At present, an individual consumer may (in most circumstances: see SVA Shared Metering Arrangements below) only obtain their power from a single Supplier. The concept of the Supplier as the principle intermediary between a customer and the energy market, sometimes referred to as the 'Supplier Hub' principle, is embedded in industry rules and licences. However, the market is changing and there is a growing belief, voiced by Ofgem and others (see References 1 to 4), that customers should be provided with more choice in how they buy (and sell) their energy.

In future, customers should be able to buy energy from (and sell energy to) parties other than their retail Supplier. This would enable a wide range of innovations in the electricity supply market that would currently be difficult or impossible to bring to market. For example, it could allow:

- Community energy schemes where a generator, such as a battery or photovoltaic (PV) cells, is owned communally and export shared between members.
- Electric vehicle (EV) manufacturers to offer vehicles on a simple £/mile basis, including all the electricity needed to charge the vehicle (this could be at multiple charging points at different locations, subject to technology solutions to support appropriate measurement at the various locations). This could also apply to future 'device as a service' markets for household appliances in 'smarter homes' (for example, fridge rental with power included).
- Peer-to-peer trading, for example, a customer buying a neighbour's excess solar energy. This could be facilitated by the development of apps that allow consumers with micro-generation to sell (or give) their excess generation to other nearby consumers (rather than receiving the export feed-in tariff). For example, an app could be designed that allowed consumers to donate their 'spill' to local charities, or families in fuel poverty.
- 'Rapid switching' where energy is purchased from different Suppliers or wholesale energy sources for periods as short as a Settlement Period (Half Hour).

The BSC currently supports community energy arrangements, where the customers involved in the scheme have the same Supplier and both the Supplier and their appointed Data Collector are active participants in the scheme. However, a community energy scheme across multiple Suppliers would not be supported.

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This paper proposes that ELEXON's Supplier Volume Allocation (SVA) arrangements[1] should be changed to recognise the right of customers to buy electricity from (or sell electricity to) other parties (not necessarily licensed Suppliers). This is in addition to their 'main' or 'default' Supplier, who would continue to be responsible for metering and data collection/data aggregation activities under the BSC. Where a customer does this, the main Supplier's Energy Imbalance position would be amended (to remove the volume for which another party is responsible), and the main Supplier would be notified of the volume (in order that they can adjust their customer billing). It is expected that the main Supplier would want to share these adjustments with the customer, by way of a consolidated bill for information purposes. This would show the volume (but not the cost) of energy bought from other Suppliers.

The SVA Shared Metering arrangements

There is already a procedure under the BSC for multiple Suppliers to settle a single Meter. This is known as the SVA Shared Metering Arrangements (see Reference 5). The procedure is Supplier – rather than customer-led and may be used, for example, to share export volumes at a generator that is co-owned by different Suppliers. It is little used, only applies to Meters that are half hourly capable and requires a degree of manual intervention between the respective Suppliers and the appointed Half Hourly Data Collector (HHDC). The procedure requires Suppliers to submit information regarding how they will share supply in advance (usually as fixed proportions) and to appoint the same Meter Operator and HHDC.

The SVA Shared Metering arrangements were designed for use at large, non-domestic sites. They do not offer a viable solution in terms of facilitating multiple Suppliers (including peer-to-peer trading) or use in the domestic or smaller commercial sectors.

The Supplier Hub principle

In November 2017, Ofgem published 'Future supply market arrangements – call for evidence' (Reference 1). This described the Supplier Hub principle as a barrier to innovation, such as new ways for consumers to access and manage their supplies. Ofgem wrote that 'a challenge with peer-to-peer models is the inability to have multiple suppliers servicing a single consumer, and knock-on challenges with balancing and settlement'. Ofgem is due to publish its response to the call for evidence in spring 2018.

Any reforms that move away from the Supplier Hub principle are likely to have far-reaching impacts across the complete spectrum of industry governance, as described in more detail below. The reform proposed in this paper is more modest and so is deliverable in shorter timeframes, potentially as early as 2020. Changes will be required to the BSC and, potentially to the Distribution Connection Use of System Agreement (DCUSA) and Data Transfer Catalogue (DTC). However, the proposal retains the default Supplier principle, so would not have far-reaching impacts across codes and licences.

Longer term reforms

The current market rules and structures were designed on the basis of consumers buying energy from (or selling energy to) a single retail Supplier. This applies, not only to the BSC, but to the registration services defined under the Master Registration Agreement (MRA), to the processes for billing Distribution Use of System (DUoS) and Transmission Use of System (TNUoS) charges and beyond. The Retail Energy Code (REC), which has not yet been introduced, continues the principle of a single Supplier registering responsibility for each Metering Point at consumer premises. Any reform of the Supplier Hub principle is likely to impact multiple industry codes. In particular, updating industry registration systems to allow for multiple retailers at a single connection point is a significant change. Any

[1] Supplier Volume Allocation is the process for determining how much energy the customers of each Supplier in each distribution network area consumed in a given half hour period for the purposes of imbalance settlement. This is operated by ELEXON.

new arrangements will need to take account of the impacts on all customers, protecting the interests of all consumers and not just the more engaged consumers participating in peer-to-peer trading and other innovative schemes. They will also need to recognise the social and consumer protection roles performed by retail Suppliers.

Any reforms that are reliant on market-wide Half Hourly Settlement (HHS)[2] will not be practical before the HHS arrangements go live; not expected before 2022/23.

In view of the likely lead times for major reform across multiple codes and/or licences, ELEXON believes that tactical changes to BSC central services to support multiple supplier arrangements (without the need for licence changes, registration system changes or (at the extreme) primary legislation), can be delivered in much shorter timeframes and will be of real benefit to consumers, Suppliers and innovative trading platforms.

An example scenario

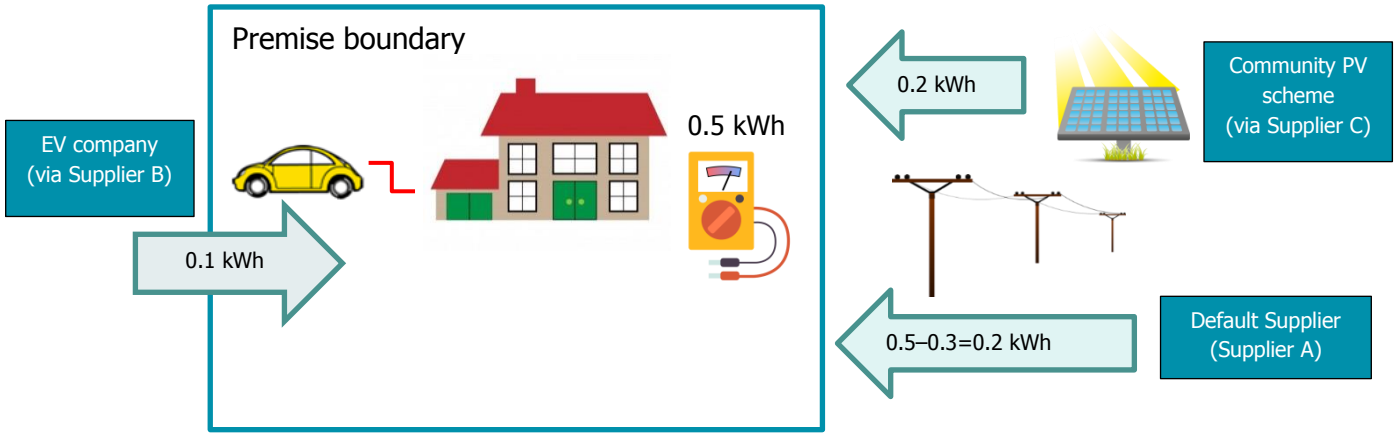
To illustrate our proposed solution, consider the following example of a customer who wishes to purchase electricity from multiple sources:

- A domestic consumer has a single boundary point Meter.
- They lease an electric vehicle (EV) with a contract that requires the EV company to provide the electricity for the EV. There is a measuring device in the cable feeding the car to record how much energy is supplied to the EV.
- They are also part of a neighbourhood scheme, which allows them to buy a share of the exports from photovoltaic (PV) cells on the roof of a shared, community building. There is a separate Meter at the community building recording the export from the PV cells.
- The customer buys the rest of their power from their Supplier (Supplier A).
- Assuming that the total volume of electricity provided to its customers by the EV company is too large to fall within a supply licence exemption, the EV company would need to acquire a supply licence, or enter into a 'white label' arrangement with a licensed Supplier. For the purposes of this example we refer to the licensed entity supplying the electricity as 'Supplier B'.
- The operator of the community PV scheme intends to supply the electricity it generates to local consumers directly, without going through a licensed Supplier (making use of the 'Class A' exemption for small Suppliers, which permits them to supply to domestic consumers 2.5 MW of electricity they have generated themselves). However, they would still need a licensed Supplier ('Supplier C') to register the export Metering System(s) and record the electricity exported onto the distribution system.

This is illustrated overleaf.

In a sample half hour (Settlement Period), the consumer uses 0.5 kWh of energy. This is recorded on their Meter. However, 0.1 kWh of this energy is recorded by the EV metering device as being used to charge the EV, and so this energy should be allocated to the EV leasing company. Further, the Community PV scheme has surplus power, which is exported onto the distribution network, and 0.2 kWh of which is sold to the consumer under the community energy scheme. The total export for the community PV is metered.

[2] We are currently leading on the design of market-wide Half Hourly Settlement for Ofgem, which is a significant enabler for storage, aggregators, electric vehicles and time-of-use tariffs as well as being essential for the realisation of the full benefits of the smart Meter roll out.



In order to reflect the purchases of energy from the EV company and the Community PV scheme, the proposal is to adjust the metered volumes of the three Suppliers for the Settlement Period in question.

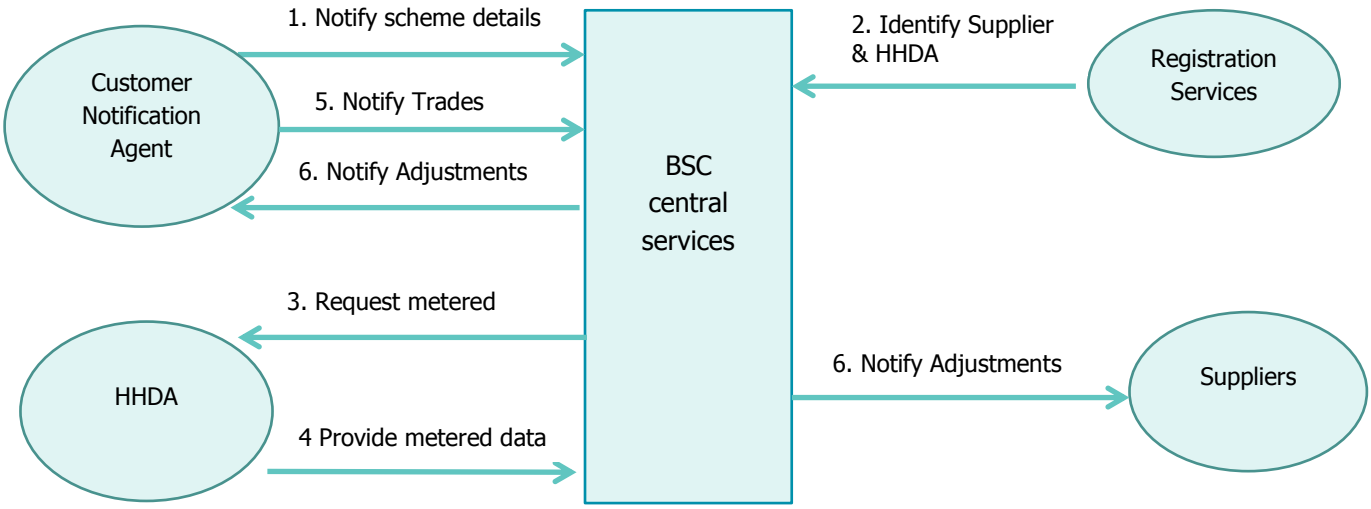
- The import volume for Supplier A (the domestic customer's Supplier) will be adjusted down by 0.3 kWh (leaving a Settlement liability of 0.2 kWh in respect of the customer).
- The import volume for Supplier B (the EV leasing company's Supplier) will be increased by 0.1 kWh (in respect of our example customer, with additional increases for other customers in the leasing scheme).
- The export volume for Supplier C, for the Community PV scheme, is reduced by 0.2 kWh (in respect of our example customer, with additional reductions for other customers in the community scheme). The 0.2 kWh is not individually metered, but is a share of the total export metered at the PV generator. If the total customer shares notified exceed the total volume exported, they will be reduced pro rata.

Making these adjustments ensures that:

- Supplier A (the consumer's 'main' Supplier) is not responsible in imbalance settlement for electricity that the consumer has bought from elsewhere.
- Supplier B is responsible in imbalance settlement for electricity supplied to the EV.
- Supplier C does not gain the benefit in imbalance settlement of electricity that the Community PV scheme generates in order to supply to local customers.

Proposed solution

To enable customers to buy electricity from more than one supplier, we are proposing the following solution.



Our proposal is to introduce a new role within the BSC, that of a Customer Notification Agent (CNA). This role would be carried out by the commercial facilitators of local energy, EV or appliance with power, peer-to-peer or rapid switching schemes. Alternatively, it could be carried out by the technology platform providers for these schemes. The CNA would be a facilitator rather than an active energy trader, so would not need to be licensed, but platform users would need to be Suppliers or licence exempt. The CNA role would be a narrow one. It would notify BSC central services of the Metering Systems for the customers, generators and Suppliers involved in energy trades under the relevant scheme. It would then notify the associated energy volumes, along the same lines as an Energy Contract Volume Notification Agent (ECVNA)[3]. Unlike an ECVNA they would need to be authorised by the licensed (or exempt) Supplier whose trades that are notifying, rather than by the default Supplier.

Suppliers will need to be confident that adjustments submitted into Settlement by CNAs have been calculated accurately. We believe this can be achieved by requiring CNAs to accede to the BSC. This would be a 'lighter touch' BSC Party role, along the lines of a Virtual Lead Party (as proposed for Independent Aggregators as part of Modification Proposal P344 (Reference 6)). Accession to the BSC would allow appropriate Performance Assurance Techniques[4] to be applied to their activities. Similar issues arise with independent aggregators submitting to Settlement, details of the volumes delivered by customers under P344, and we therefore expect that the learning from P344 will inform implementation of innovative trading schemes. ELEXON is already working on a proof of concept to explore how blockchain technology can assist in the assurance of data submitted to settlement, by providing a transparent and immutable record of data used to calculate inputs to settlement.

We propose that our solution would need (in many cases) to verify the notified volumes against half hourly metered data. For example:

[3] The Agent who notifies the energy volumes associated with trades between BSC Parties.
[4] Part of ELEXON's role as administrator of the BSC is to monitor the compliance of all BSC parties and to design and operate a risk-based performance assurance framework.

- The total energy purchased by a consumer (from parties other than their main Supplier) in any given half hour should not exceed their metered Import.
- The total energy sold by a class A exempt Supplier in any given half hour should not exceed their metered Export.

To allow these checks to be made, we would identify and record the Suppliers and Half Hourly Data Aggregators (HHDA) for each Metering System by accessing the Electricity Central Online Enquiry System (ECOES). Requests would be issued to the relevant HHDAs to provide Half Hourly metered data for the Metering Systems in question. As explained below, this is essentially the same process as that proposed for Modifications P344 and P354.

In those cases where it is important for central BSC Systems to validate that customers have not bought more electricity than they used in a given half hour, the customer would need to be settled Half Hourly. This would be true of 'rapid switching schemes', but not necessarily so for 'device as service' schemes. Under a community energy scheme, the export would need to be Half Hourly settled, but import could be Non Half Hourly settled. It may be necessary for the BSC Panel to make determinations on the appropriateness of Non Half Hourly Settlement for particular schemes or types of scheme. It is assumed that where a scheme requires Half Hourly Settlement, it will be targeted at engaged consumers who are willing to register with Suppliers actively adopting elective Half Hourly processes.

Local energy or peer-to-peer trades in respect of small-scale generation would require export Metering Systems to be registered for Settlement purposes in the Meter Point Administration Service (MPAS). This is not mandatory for licence-exempt generation, but engaged consumers should be amenable to this.

The Customer Notification Agent will notify BSC central services of energy trades as soon as they have been made, including the Half Hourly volume traded and the Metering System(s) involved in each trade.

BSC central services will then adjust the total aggregate energy volumes assigned to the two parties subject to the trade. As part of the adjustment process, and where appropriate, the traded volumes will be verified against the HHDA volumes for the relevant Metering Systems and may be capped as a result. The relevant Suppliers and the Customer Notification Agent will be notified of the adjustments.

Impact on Suppliers

The purpose of notifying Suppliers of adjustments made to their Energy Imbalance positions is to allow them to adjust their bills to the consumer accordingly. For example, Supplier A in the example above would bill the consumer for the 0.2 kWh they had supplied, but not the 0.3 kWh supplied by other parties, although the 0.1 kWh and 0.2 kWh bought from other Suppliers would be itemised (but uncosted) on the statement. Of course, a BSC Modification cannot mandate Suppliers to do this (as customer billing falls outside the remit of the BSC and other industry codes). It is therefore conceivable that some Suppliers might opt out of allowing their customers to buy electricity from third parties (at least initially). Some Suppliers might not support the arrangements at all, while others might be amenable to some types of scheme, but not others. A Supplier would likely be happier where the customer was buying additional power for an unpredictable load like an electric vehicle, than where the Supplier was providing metering services for a customer who was buying the bulk of their power elsewhere. To the extent that the supply market is competitive (and the ability to buy from third parties valued by consumers), one might expect that Suppliers would welcome an opportunity to provide their customers with additional value; but Ofgem (as regulator) could if necessary consider intervening to ensure that customers have choice in whom to buy their electricity from.

The changes to Supplier billing systems required to take account of adjustments from BSC central services are similar in many ways to those that Suppliers will be required to make in support of BSC Modifications P344 (Reference 6) and P354 (Reference 7). Both of these Modifications adjust Supplier imbalance positions for energy volumes their customers have sold to National Grid (either directly or through an Independent Aggregator).

In addition to the direct impact on billing systems, we recognise that allowing customers to buy electricity from other providers will impact other Supplier processes (such as demand forecasting). In some cases this may simplify forecasting for Suppliers e.g. if customers are charging their EV using electricity from a third party, it insulates their 'main' Supplier from the impact of them switching to an EV. In other cases it may have an effect that Suppliers need to take into account e.g. if customers were buying significant volumes of electricity from local exempt Suppliers it would reduce the demand they purchase from their 'main' Supplier, who would need to take this into account in their demand forecast (as they do other changes in consumer behaviour).

Impact on Network Charges and Final Consumption Levies

The adjustments will be made to Supplier volumes by BSC central services prior to ELEXON issuing the reports used in aggregate Half Hourly Distribution Use of System (DUoS) billing[5], Transmission Use of System (TNUoS) charging and Electricity Market Reform (EMR) charging. In our example, Supplier A would have their DUoS bill reduced by 0.3 kWh and Supplier B would have their bill increased by 0.1 kWh. The DUoS implications for Supplier C as default export Supplier and the licence exempt generator will need further consideration. In the event that industry parties consider that the Settlement adjustments create undesirable consequences in relation to DUoS charging, they could propose appropriate changes to the DCUSA charging methodology.

Customers who are subject to individual DUoS[6] are billed on data from Half Hourly Data Collectors (HHDC). The relevant volumes would not be subject to adjustments being made by BSC central services. We would need to produce a separate report of adjustments to Licensed Distribution System Operators (LDSO) to allow them to reallocate their charges.

Delivering the proposed solution

The delivery route for the proposed solution is a BSC Modification (with potential DCUSA and DTC changes). It might also be possible to use the 'sandbox' process, under Modification Proposal P362 (reference 8) to test the proposal. Clearly more detailed analysis of the proposed solution is needed and we need to consult with Ofgem, BSC Parties and peer-to-peer trading scheme developers, before we can begin to turn it into reality. However, we are confident that conditions are favourable for doing so. This is due in part to two factors:

- Functionality needed for the delivery of Modification Proposals P344 and P354.
- ELEXON's proposed re-platforming of the BSC central services.

P344 (Reference 6) seeks to align the Balancing and Settlement Code (BSC) with the European Balancing Project TERRE (Trans European Replacement Reserves Exchange) requirements. This is in order to allow the implementation of the project at national level and be compliant with the first tranche of obligations in the European Electricity Balancing Guideline (EB GL).

P354 (Reference 7) P354 proposes to allow the Transmission Company to provide Applicable Balancing Services Volume Data (ABSVD) for non-BM Balancing Services providers to BSC central services for allocation to the appropriate Supplier BM Unit to correct their Energy Imbalance position.

[5] Domestic and small non-domestic Metering Systems with whole current metering are billed DUoS in aggregate.
[6] Non-domestic Metering Systems that at least 100kW maximum demand or have transformer metering are billed DUoS on an individual Metering System basis.

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Both P344 and P354 are nearing the end of their Assessment Procedures. Until now BSC central services have only processed data for retail customers at aggregate level (with volumes summed by Supplier and GSP Group). Both P344 and P354 will introduce new functionality to record the individual Metering Systems used by Independent Aggregators to the TERRE product (or non-BM Balancing Services respectively) through demand side response (or the aggregation of small generators). BSC central services are to be modified to receive data for individual 'retail market' Metering Systems for the first time. This paves the way for the processing and interfaces needed to support customers buying power from multiple Suppliers.

Both P344 and P354 will require adjustments to be made to Supplier imbalance positions to take into account the actions being taken by independent aggregators for the TERRE market or to provide ancillary services to the Transmission Company outside the Balancing Mechanism. Again, these adjustment processes can be further developed to provide a multiple Supplier solution.

These BSC Modification Proposals are scheduled for implementation in 2019/2020 (subject to approval), enabling changes to support multiple Suppliers to be considered for implementation as early as 2020.

Re-platforming BSC central services

In order to prepare ourselves for unprecedented levels of change in the energy market, we are currently running technical proofs of concepts, with a view to a phased re-platforming of the BSC central services. We aim to develop the P344 and P354 solutions, subject to approval, on new systems. These will be based on micro services on a cloud platform. This will give us the ability to adapt flexibly and quickly to innovative business models that were not envisaged when designing the original agent services. The new service architecture will facilitate the development of the changes outlined in this paper to support peer-to-peer trading.

Conclusion

The BSC central services should be modified to allow the volumes allocated to Suppliers to be adjusted in support of customers buying energy from (or selling to) parties other than their main retail market Supplier.

ELEXON is working with Ofgem, innovators and industry participants to explore these changes further.

The re-platforming of BSC central services provides the opportunity to deliver flexible peer-to-peer and multiple Supplier solutions in shorter timeframes than would otherwise be possible.

References:

1. 'Future supply market arrangements – call for evidence' (Ofgem, 14 November 2017)
2. Transcript of Dermot Nolan's speech at the Future Consumer event (5 July 2017)
3. Transcript of Dermot Nolan's speech at the Energy UK Annual Conference (19 October 2017)
4. 'Do 'supplier hub' market rules need reform?' (Ofgem blog, 14 November 2017)
5. SVA Shared Metering Arrangements – BSC Section K Section 2.5 and BSCP550 'Shared SVA Meter Arrangement of Half Hourly Import and Export Active Energy'
6. 'Project TERRE implementation into GB market arrangements' (P344)
7. 'Use of ABSVD for non-BM Balancing Services at the metered (MPAN) level' (P354)
8. 'Introducing BSC arrangements to facilitate an electricity market sandbox' (P362)