

# INITIAL ANALYSIS OF ADOPTING A 15-MINUTE SETTLEMENT PERIOD

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## PURPOSE OF ANALYSIS AND APPROACH FOLLOWED

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Ofgem has approached ELEXON for our initial analysis of the impacts, costs and benefits to Settlement and related stakeholders if the European Network Code on Electricity Balancing (EBNC) requires GB to adopt a 15-minute Imbalance Settlement Period (ISP).

The limited time available has not enabled us to discuss our thoughts with the industry or to undertake any formal BSC impact assessment or cost-benefit analysis.

The information presented is therefore high-level and indicative only. ELEXON has focused on what may have to change, and why, to accommodate a 15-minute ISP. However, due to the time constraints, we have not considered in any detail how the changes would be delivered.

ELEXON has identified a number of areas that will be affected by an ISP change and these have been listed below with comments and a 'traffic light' rating of material impact for reference only. For completeness, we have included impacts outside the central BSC arrangements (e.g. impacts on participants and other industry arrangements) but cannot comment on their potential costs.

The impacts of moving to a 15-minute ISP depend on the approach taken to implement it. Processes such as calculation of Imbalance Settlement Prices have to be aligned with the ISP definition in order to comply with the EBNC. Other processes, such as metering and distribution billing for customers above 100kW, have historically been aligned with the ISP definition. However, in principle they do not have to remain so. We do not believe that implementing a 15-minute ISP would necessarily require all current half-hourly Meters and business processes to switch over to 15-minute data. For this reason we have considered the following two approaches:

- A '**minimum change approach**' requires only those processes that are directly relevant to Imbalance Settlement to be switched to 15-minute data. This includes contract notifications, metering for large Balancing Service Providers (BSPs), calculation of Balance Responsible Parties' (BRPs') imbalances, and calculation of imbalance prices. Processes not directly related to Imbalance Settlement, however, will continue to use 30-minute data.

This approach therefore delivers only the minimum change needed to comply with European legislation. It makes moving to 15-minute data as optional as possible for BSC Parties and thereby minimises the impacts and costs to GB participants. However, in doing so, it adds extra complexity to the central BSC Systems and processes which will need to handle a mix of 15-minute and 30-minute data.

- A '**maximum change approach**' requires all existing Half Hourly (HH) processes to use 15-minute interval data. Effectively the entire concept of HH ceases to exist and will be replaced with Quarter Hourly (QH) arrangements.

While simpler for the central BSC arrangements, this approach will have extremely high impacts on GB participants. Its costs will ultimately be borne by the end consumer. It will require a significant industry-wide implementation project, potentially putting other developments on hold.

Both approaches will require the BSC Systems to process more data, and we would need to investigate further any potential impacts on system performance. The BSC Systems are old and bespoke, raising the question of whether we should take the opportunity to replace them at the same time.

For both approaches, we have assumed that Gate Closure remains unchanged from its current timing of one hour before the start of the Settlement Period.

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## OUR INITIAL ANALYSIS BY AFFECTED AREA

### Balancing Mechanism (BM)

#### Effect on National Grid and BSC Parties

Minimum change approach	Maximum change approach
Red	Red

For both approaches, we assume that:

- There will be no impact on the Final Physical Notifications (FPNs) submitted by BSPs to the Transmission Company, as these are a profile over time and so largely independent of ISP duration
- Dispatching Balancing Mechanism actions is also independent of ISP as it is done in real time
- 15-minute Bids and Offers are required to get 15-minute Bid-Offer prices – this will impact the Transmission Company’s Electricity Balancing System (EBS) as well as the systems of BSPs (generators and those Suppliers providing Demand Side Response)
- The Transmission Company will also need to provide the BSC Systems with non-BM balancing services data in 15-minute form to match the new ISP duration (e.g. Balancing Services Adjustment Data and Applicable Balancing Services Volume Data)
- The impacts and costs will be high

#### Effect on BSC Central Services (BMRS)

Minimum change approach	Maximum change approach
Amber	Amber

For both approaches, we assume that:

- A change in ISP duration will have a moderate effect on the reporting of Settlement Data via the Balancing Mechanism Reporting Service (BMRS)
- It will affect the underlying BMRS database, which will need to process double the amount of BM data

The most recent significant change to the publication of BMRS data was P219 ‘Consistency between Forecast and Outturn Demand’ with an estimated central BSC implementation cost of £150,000. We initially suggest that the BMRS costs of a change in ISP would be of this order or greater.

### Benefits

We consider that a reduced ISP duration may enable BSPs to reflect their costs more accurately/granularly in their Bid-Offer submissions. However we anticipate that this would be a marginal benefit.

Given greater time, ELEXON could further investigate this by analysing the distribution of historic Bid Offer Acceptances (BOAs).

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## Settlement system

### Effect on BSC Central Services (SAA and SVAA)

Minimum change approach	Maximum change approach
Red	Red

Under a minimum change approach, we assume that the central BSC Settlement systems will need to:

- Process a mix of existing Non Half Hourly (NHH) data, HH data for non-BSPs who don't wish to move to 15-minute metering, and QH data for BSPs
- Receive QH Interconnector Metered Volumes
- Issue a corresponding mix of Settlement reports (effectively creating new additional QH reports to avoid impacting existing ones)
- Profile NHH and HH data into 15-minute ISPs
- Calculate 15-minute Imbalance Prices (including a change to the existing 15-minute Continuous Acceptance Duration Limit, below which balancing actions aren't included in the prices)
- Handle more complicated clock changes, as a 15-minute ISP will mean a four-period 'jump'

Under a maximum change approach, we assume that the central BSC Settlement systems will need to:

- Receive QH Interconnector Metered Volumes
- Change all existing HH data and reports to QH
- Profile NHH data into 15-minute ISPs
- Calculate 15-minute Imbalance Prices (including a change to the existing 15-minute Continuous Acceptance Duration Limit, below which balancing actions aren't included in the prices)
- Handle double the amount of data
- Handle more complicated clock changes, as a 15-minute ISP will mean a four-period 'jump'

We believe that the costs of amending the central Settlement systems under either approach would be in the £ millions. They are likely to significantly exceed the estimated implementation costs of past and present changes to these systems (e.g. P62 'Changes to Facilitate Competitive Supply On The Networks Of New Licensed Distributors' at £580,000 and P305 'Electricity Balancing Significant Code Review Developments' at £625,000). A more comparable scale of change may be the introduction of BETTA.

### Effect on BSC Parties

Minimum change approach	Maximum change approach
Amber	Red

Assuming the minimum change approach detailed above, there will be little effect on most BSC Parties. Non-BSPs will continue to send and receive data in HH format or move to QH if decided appropriate by the Party itself. However both a minimum and maximum change approach will impact Interconnector Administrators, who will need to provide 15-minute Deemed Interconnector Metered Volumes. We assume that this may in turn impact the auction process for Interconnector capacity, impacting Interconnector Users and any associated systems.

For a maximum change approach, we assume that every industry participant that sends and receives ISP data flows will be impacted.

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## Benefit

We consider that 15-minute Imbalance Prices may incentivise Trading Parties to balance their position more accurately within a half hour, due to sharpened price signals made possible by more granular data. Given more time, ELEXON could analyse past Bids and Offers to see if a 15-minute ISP would have altered the balancing actions taken by the Transmission Company.

However, under the minimum change approach, any non-BSPs who don't wish to move to QH data may not benefit from 15-minute price signals (e.g. if HH data is profiled into QH data simply by splitting it 50:50 between two ISPs).

## Contract notifications

### Effect on BSC Central Services (ECVAA)

Minimum change approach	Maximum change approach
Amber	Red

Under a minimum change approach we assume that:

- The Energy Contract Volume Aggregation Agent (ECVAA) system will be re-engineered to support 15-minute contract data (Energy Contract Volume Notifications and Metered Volume Reallocation Notifications)
- The ECVAA system will, however, continue to support legacy 30-minute contracts and will apportion these to 15-minute ISPs
- The ECVAA system will therefore need to support a mix of 15-minute and 30-minute data
- Parties will have the option to switch to 15-minute, or to keep their existing, 30-minute contracts
- Parties can choose to manage the risk of change as they wish, avoiding the risk of a 'big bang' change on a single day (given the high financial impact to Parties of any errors in contract notifications)

Under a maximum change approach:

- All contracts will be 15-minutes, with a 'big bang' change on a single day
- All Parties will need to manage the associated risk
- The ECVAA will need to process double the amount of contract notifications and issue double the amount of acknowledgements

Under either approach, the central BSC implementation cost will be significant. We believe that the cost will exceed the most expensive historic ECVAA change, P98 'Dual Notification of Contract Positions', which was in the region of £2m.

### Effect on BSC Parties

Minimum change approach	Maximum change approach
Green	Red

For the minimum change approach there is little impact on Parties, as they may choose whether to move to 15-minute contract notifications or not. Parties wishing to change will need to find Energy Contract Volume Notification Agents and Metered Volume Reallocation Notification Agents who are able to support 15-minute contracts.

For the maximum change approach, all Parties and Notification Agents will clearly be impacted entailing significant changes to IT systems across the industry. We would anticipate any associated participant costs to be high.

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## Benefit

A 15-minute ISP enables Parties to trade up to 1.25 hours ahead rather than up to 1.5 hours as currently. However, we suggest that this will have a minimal impact on liquidity.

## BSC Metering, Data Collection and Aggregation

### Effect on BSC Parties

Minimum change approach	Maximum change approach
Green	Red

For a minimum change approach, we assume that:

- 15-minute metering will be mandatory only for BSPs and will be optional for all other Parties
- Only a relatively small number of Meters will be affected
- Metering Equipment for circuits above 10 MVA are capable of recording data at 15-minute intervals (as required by BSC Codes of Practice (CoPs) 1 & 2 since 1993)
- However, the affected Meters will still need to be reconfigured (some remotely, some physically) and a small number may need to be replaced altogether
- We will need to ensure that affected Meters have sufficient memory to store (and not overwrite) twice the volume of data, in accordance with the relevant CoPs
- Dialling costs (and potentially also download times) will increase for the affected Meters, as data amounts are doubled
- Most Suppliers, Data Collectors and Data Aggregators won't have the capability to support 15-minute metering, meaning that BSPs will need to use specialised 'QH' Suppliers and Supplier Agents
- We will continue to collect HH metered data from sample NHH customers for use in NHH profiling (avoiding the need for these sample customers to have their Meters replaced); however we will apply a mathematical adjustment to turn this into 15-minute ISP data
- NHH Data Collectors and Data Aggregators will continue to create Estimated Annual Consumption and Annualised Advance values as currently (but will simply sum QH Profile Coefficients into the necessary Daily Profile Coefficients)

For a maximum change approach, we assume that:

- All existing HH Meters will have to be reconfigured or changed to QH – including those in the NHH profiling sample, and entailing the increased data dialling costs/download times and storage issues above
- The concept of HH will be defunct for BSC purposes
- All HH Suppliers, Data Collectors and Data Aggregators will have to support QH metering and process double the amount of data
- NHH Data Collectors and Data Aggregators will continue to create Estimated Annual Consumption and Annualised Advance values as currently (but will simply sum QH Profile Coefficients into the necessary Daily Profile Coefficients)

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In the absence of an impact assessment, we will initially assume a Meter reconfiguration (done via site-visit) cost of £250 per customer, payable by the Registrant. The costs vary depending on the CoP the Meters belong to. If the requirement is introduced to the 125,000 or so customers (predominantly 100kW and above) who are currently settled HH, the total costs would amount to around £30m. If the requirement extends to Profile Class 5-8 customers (who will be HH Metered under P272), there will be another 150,000 Meters that need to be reconfigured.

## Effect on BSC Central Services (CDCA) and Data Transfer Network

Minimum change approach	Maximum change approach
Amber	Red

For a minimum change approach, we assume that:

- There will need to be new QH Data Transfer Network (DTN) flows, but only the specialised QH Suppliers and Supplier Agents will need to amend their systems to receive these
- HH and NHH DTN flows will remain unchanged
- The Central Data Collection Agent (CDCA) will need to be able to dial and process Metered Volumes from a mix of HH and QH CVA Meters

For a maximum change approach, we assume that:

- All HH DTN flows will be amended to QH (there may also be a need to define new DTN file types)
- This will require management of the cutover and flow version numbering
- NHH DTN flows will remain unchanged
- The CDCA will need to handle the cutover from HH to QH CVA Metered Volumes

We consider that the CDCA cost from both approaches is likely to be equivalent, while the DTN and associated participant costs will be higher under the maximum change approach.

## Smart Metering

Minimum change approach	Maximum change approach
Green	Red

The Department of Energy and Climate Change (DECC) is currently rolling out HH 'Smart' Metering. Its Smart Metering Equipment Technical Specifications (SMETS) versions 1.0 and 2.0 specify that Smart Meters must be capable of recording and collecting data at 30-minute intervals. There is no clear indication that the Meters will be capable of performing the same functions at 15-minute intervals.

For a minimum change approach, we therefore assume that:

- Smart Meters don't support QH data
- BSPs will have to retain conventional HH Meters, Suppliers and Supplier Agents
- Given the small number of Meters involved, this will have minimal impact on DECC's Smart Programme

For a maximum change approach, we assume that:

- All HH Meters will have to be QH capable
- The SMETS will need to change to require Smart Meters to have QH capability
- All existing HH Smart Meters will have to be reconfigured or changed to QH

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- This will increase the data transfer requirements for the communication networks operated by the Data and Communications Company (DCC)
- There will be a significant impact on the scope, costs and timescales of DECC's Smart rollout

## Network charging

Minimum change approach	Maximum change approach
Green	Amber

For a minimum change approach, we assume that:

- No change is required to Distribution Use of System (DUoS) charging
- QH Data Collectors have to be able to still send HH data to Distribution Network Operators (DNOs) for use in DUoS charging, but they can do this by adding the two 15-minute readings together
- No change is required to Balancing Services Use of System (BSUoS) charging, as this uses total Metered Volumes

For a maximum change approach, we assume that:

- DUoS tariffs don't necessarily have to change (hence no 'red' rating)
- However, since there will be no more HH Meters, DNOs have to be capable of handling QH data for DUoS purposes
- This will involve significant system impacts for DNOs
- No change is required to BSUoS charging for the reason above

## Customer billing

Minimum change approach	Maximum change approach
Green	Red

For a minimum change approach, we assume that:

- Moving to QH billing is optional (even for QH-settled customers), and the Supplier and customer will need to agree to this
- There will be an impact on the billing systems of any Suppliers that choose to move to QH, but this will be the Supplier's choice

For a maximum change approach, we assume that:

- All HH Suppliers will have to move to QH billing
- This will impact all HH customers and Supplier's billing systems, with significant IT costs across the industry and potentially costs for customers and their advisors as well

## Electricity Market Reform (EMR)

Minimum change approach	Maximum change approach
Green	Amber

For a minimum change approach, we assume that:

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- The Contracts for Difference (CFD) and Capacity Market (CM) arrangements will be able to continue operating on a HH basis
- As CfDs are private contracts intended to give certainty, participants will not wish to change these where they are currently HH
- The CM will continue to use HH Settlement processes (and HH Metered Volumes)
- QH Data Collectors will have to be able to still send HH data (e.g. by summing the two 15-minute Metered Volumes) to BSCCo who will pass it to the EMR Settlement Services Provider

For a maximum change approach, we assume that:

- There are no more HH Meters, so EMR will receive QH data
- However, this can be easily turned into HH data at a relatively modest cost so is not a significant issue
- The CM will have the option to change to QH Settlement, but will not be required to
- There is an outstanding question of whether new CfDs would move to QH

## Other

### Registration

Under a minimum change approach, the BSC Systems (CDCA) will need to distinguish between HH and QH Meters. This will require new QH registration processes.

Under a maximum change approach, all HH Meters will be reregistered in CDCA systems as QH.

### Qualification

Under both approaches, new Qualification requirements may be needed for QH Suppliers and Supplier Agents.

### Performance Assurance

New QH performance targets will be required under both approaches (potentially these can be the same as the existing HH ones).

There are also potential impacts on the checks undertaken by the Technical Assurance Agent (TAA), as these use HH data. Under either approach, the TAA may need to update its systems to be compatible with QH data.

### Advanced Meters

There are potential impacts on advanced Meters, which have already been rolled out to all PC 5-8 premises. This accounts to around 170,000 Meters. It is not clear if these Meters are reprogrammable.

## CONTACTS

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