Second Interim Assessment Report

P344 'Project TERRE implementation into GB market arrangements'

P344 seeks to align the Balancing and Settlement Code (BSC) with the European Balancing Project TERRE (Trans-European Replacement Reserves Exchange) requirements.

This will implement the TERRE balancing product at national level and enable compliance with the obligations stemming from the European Electricity Balancing Guideline (EB GL).

This Modification is expected to impact:

- BSC Parties
- Non-Balancing Mechanism participants
- Transmission Company
- Central Registration Agent (CRA)
- Balancing Mechanism Reporting Agent (BMRA)
- Electricity Contract Volume Aggregation Agent (ECVAA)
- The Funds Administration Agent (FAA)
- Half Hourly Data Aggregators (HHDAs)
- Settlement Administration Agent (SAA)
- Supplier Volume Allocation Agent (SVAA)
- ELEXON

ELEXON

Phase

Initial Written Assessment

Definition Procedure

Assessment Procedure

Report Phase

Implementation

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About This Document

This document is the P344 Workgroup's second Interim Report to the BSC Panel. It sets out the Workgroup's solution that, alongside the Proposer, it has developed over the course of the Assessment Procedure to date.

ELEXON will present this report to the Panel at its meeting on 8 February 2018. The Panel will consider the Workgroup's solution and will determine whether to seek Ofgem's provisional thinking in respect of the solution. The Panel may then issue such direction as it sees fit to the Workgroup in respect of Ofgem's provisional thinking.

There are four parts to this document:

- This is the main document. It provides details of the defect, solution, impacts, costs, benefits and proposed implementation approach. It also contains details of the Workgroup's membership and its full Terms of Reference.
- Attachment A contains the draft legal text changes to the BSC for P344. Please note that the contents of Attachment A are spread across a number of BSC legal text documents.
    - BSC Section A 'Parties and Participation'
    - BSC Section D 'BSC Cost Recovery and Participation Charges'
    - BSC Section J 'Party Agents and Qualification Under the Code'
    - BSC Section K 'Classification of Registration of Metering Systems and BM Units'
    - BSC Section M 'Credit Cover and Credit Default'
    - BSC Section N 'Clearing, Invoicing and Payment'
    - BSC Section P 'Energy Contract Volumes and Metered Volume Reallocations'
    - BSC Section Q 'Balancing Mechanism Activities'

- BSC Section R 'Collection and Aggregation of Meter Data from CVA Metering Systems'
- BSC Section S 'Supplier Volume Allocation'
- BSC Section S Annex S-2 'Supplier Volume Allocation Rules'
- BSC Section T 'Settlement and Trading Charges'
- BSC Section V 'Reporting'
- BSC Section X Annex X-1 'General Glossary'
- BSC Section X Annex X-2 'Technical Glossary'

- Attachment B contains the full Business Requirements that will be used to develop the BSC Systems and has been used to develop the P344 legal text.

1 Summary

Why Change?

Project TERRE is a balancing product implementation project, developed by a group of European Transmission System Operators (TSOs), including National Grid. It will fulfil incoming legal requirements on TSOs included in the European Electricity Balancing Guideline (EB GL). The EB GL requires those TSOs that use Replacement Reserve (RR) to implement and make operational a new European platform for the exchange of energy.

The EB GL Entered into Force on 18 December 2017, and the legal deadline for National Grid to utilise the TERRE platform for GB balancing of RR products is expected to be December 2019.

What is Replacement Reserve?

Replacement Reserve (RR) products are Pan-European balancing energy products with a >15 minute lead time.

Solution

The TERRE product will enable all TERRE participating Balancing Service Providers (BSPs) to submit bids (upwards or downwards) to their national TSO (i.e. National Grid for BSPs in GB) on an hourly basis to fulfil 15 minute delivery periods. The TSO will forward these Bids to a central platform (termed LIBRA) which will process them in order to meet the RR requirements specified by TSOs. Acceptances and associated delivery instructions will be passed back to the BSP via the national TSO.

P344 will seek to implement the TSO-BSP Settlement solution of the TERRE balancing product within the GB electricity market arrangements. It will facilitate payments between National Grid and GB BSPs for acceptances issued to GB BSPs by the LIBRA platform via National Grid. Payments to BSPs will be subject to validation of delivered volumes against metered data (with any non-delivery subject to imbalance charges and potentially additional Non-Delivery Charges). Project TERRE will also introduce a TSO-TSO settlement process (which will, for example, pay National Grid for RR delivered by GB BSPs to meet a non-GB requirement); but this is outside the scope of P344 (and of the BSC).

TERRE implementation in the GB market has interlinked impacts with National Grid's Grid Code (GC) through Modification GC0097 'Grid Code Processes Supporting TERRE' which focusses on the physical balancing of the system, from bid formats to the dispatch of BSPs.

The P344 solution will allow customers and independent aggregators to participate in the TERRE balancing product (using embedded generation or demand side response to deliver RR, independently of their electricity supplier). The BSC changes for P344 will also remove all BSC barriers to customers and independent aggregators participating directly in the existing Balancing Mechanism (BM)[1], although there may be other restrictions outside the BSC (e.g. in the Grid Code).

What is a BSP?

A BSP is a market participant with reserve providing potential that is able to provide balancing services to the TSO.

Not to be confused with Balance Responsible Party (BRP), which is responsible for the imbalance position as a result of balancing activities.

Impacts & Costs

ELEXON requested a detailed Impact Assessment from its service provider on 10 January 2018, the same time that this second Industry Consultation period commenced.

[1] Whilst Modification P344 was not specifically intended to remove BSC barriers to independent aggregators participating in the BM, the P344 solution does so. This is because the P344 processes for settling RR are closely linked to existing BSC processes for settling Bid Offer Acceptances (BOAs) in the BM. Therefore it allows customers and independent aggregators to access both markets.

P344 is expected to impact Trading Parties, market participants that wish to participate in the TERRE product, the Transmission Company and a number of BSC Agents, with further details identified in section four of this paper.

Implementation

The TERRE product implementation in the GB market will comprise of two stages. The first will include a parallel running phase, intended by the European Central TERRE project to be a full end-to-end test of all systems and associated processes outside of the live system balancing and associated Settlement environments.

The second stage refers to the live environment implementation phase in advance of the legal backstop whereby National Grid is mandated by the EB GL to utilise the TERRE product for balancing of the GB Transmission System. This operational go live window is expected to be around October-November 2019, as determined and subject to further amendment/confirmation by the European TERRE Central Project team.

Recommendation

The P344 Workgroup and Modification Proposer (National Grid) initially recommend that the P344 Proposed Modification be approved, with the following views against the Applicable BSC Objectives. Further information can be found in section six of this paper.

P344 Proposer and Workgroup views against Applicable BSC Objectives		
Applicable BSC Objective	P344 Proposer	P344 Workgroup
(a) The efficient discharge by the Transmission Company of the obligations imposed upon it by the Transmission Licence	Neutral	Neutral (Unanimous)
(b) The efficient, economic and co-ordinated operation of the national electricity transmission system	Positive	Positive (Majority)
(c) Promoting effective competition in the generation and supply of electricity, and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity	Positive	Positive (Unanimous)
(d) Promoting efficiency in the implementation and administration of the balancing and settlement arrangements	Neutral	Split
(e) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency [for the Co-operation of Energy Regulators]	Positive	Positive (Unanimous)

P344 Proposer and Workgroup views against Applicable BSC Objectives		
Applicable BSC Objective	P344 Proposer	P344 Workgroup
(f) Implementing and administrating the arrangements for the operation of contracts for difference and arrangements that facilitate the operation of a capacity market pursuant to EMR legislation	Neutral	Neutral (Unanimous)
(g) Compliance with the Transmission Losses Principle	Neutral	Neutral (Unanimous)

2 Why Change?

Project TERRE is an implementation project, developed by a group of European TSOs, including National Grid. It will fulfil incoming legal requirements on TSOs included in the EB GL. Among other things, EB GL obligations require those TSOs that use RR to implement and make operational a European platform for the exchange of energy. The TERRE product will harmonise the despatch of RR across several TSO areas including Great Britain, France, Switzerland, Spain, Portugal, Italy, Czech Republic, Romania, Poland and Hungary (Greece, Norway, Sweden, Finland and Denmark are currently observers).

In relation to current GB market arrangements, the TERRE product will be utilised to balance the Transmission System in a similar manner to how current localised products such as BSC Bid-Offers or Short Term Operating Reserve (STOR) submissions are used.

National Grid raised BSC Modification P344 on 1 June 2016 with a view to implement the product at national Settlement level to ensure GB compliance with the EB GL as preceding work on Issue 60 'Interfaces between the European Balancing Project TERRE and the current GB market arrangements' was inconclusive.

What is STOR?

Short Term Operating Reserve (STOR) is a balancing product whereby generation or demand can be amended by at least 3MW (can be aggregated with a collection of smaller sites). The participants providing the service to National Grid may be Balancing Mechanism (BM) or non-BM and connected to either the distribution or Transmission System.

What is the issue?

The EB GL Entered into Force on 18 December 2017, meaning that it carries the backing of European law. Due to this, the legal deadline for National Grid to utilise the TERRE platform for GB balancing of RR products is expected to be December 2019. This legal deadline is subject to intermediary approval proceedings as outlined further in section five of this paper.

National Grid is expecting to utilise RR Products for energy balancing in GB from the TERRE product go-live date. As noted previously, this is currently scheduled for October/November 2019 in advance of the legal backstop date. National Grid is mandated by incoming EU regulation through the EB GL to utilise the TERRE product for GB balancing from the legal backstop date, expected to be in December 2019. Compliance to the EB GL is of importance to ensure that GB doesn't risk infraction proceedings and the potential for fines to be levied against GB market participants. It is important to note that, until otherwise directed, TERRE product implementation in the GB market is continuing with the assumption of no impact from ongoing Brexit negotiations.

National Grid wishes that the TERRE product should feed into the BSC calculations of imbalance prices and volumes, as soon as it is used as part of GB balancing. This will require changes to the GB market arrangements, including the Balancing and Settlement Code provisions.

3 Background

Defining GB implementation approach

In advance of Issue 60 and P344, National Grid worked in collaboration with the Department for Energy and Climate Change (DECC)[2], Ofgem and ELEXON on determining the most appropriate GB implementation approach to overarching obligations stemming from the EB GL.

As a result of discussions from this group, the GB implementation approach to the EB GL requirements seeks to maximise the exchange of cross border (XB) products in a manner that is proportionate to, and recognises the specific needs of GB balancing. This approach was discussed with stakeholders at an industry workshop in January 2015 in advance of the subsequent work to develop and implement the TERRE product into the GB market.

Common European Electricity Market and GB Specific Products

It was determined that the option of the GB market utilising common European Electricity market and GB specific balancing products simultaneously for balancing purposes would be most beneficial and efficient for the market as a whole. Under this option, European standard products are introduced into the GB market with expectation they will replace some of the volume currently provided by GB-specific products. This would mean that the number of GB specific products would be reduced (for instance, the removal of System Operator (SO) to SO trades upon the TERRE product being implemented). However, some GB balancing products will be retained in order to meet balancing requirements not met by standard products (e.g. Bid-Offer Acceptances (BOAs)) in the GB Balancing Mechanism (BM).

What are SO to SO trades?

Trading of electricity between the GB market and continental Europe is possible due to interconnectors and this trading determines the direction of electricity flow across these assets. The System Operator (SO) may in some cases need to adjust these interconnector flows closer to real time via System Operator to System Operator (SO to SO) trades.

What is an RR Product?

Replacement Reserves (RR) are formally defined within the legally-binding European 'Guideline on System Operation' (Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation). This defines RR as the active power reserves available to restore or support the required level of Frequency Restoration Reserve (FRR) to be prepared for additional system imbalances, including generation reserves. The European Network Codes (ENCs) from which the EB GL stems, define various types of reserves (to be standardised and shared where possible on an EU-wide basis) to manage energy balancing, i.e. to manage system frequency.

One of these defined reserve types is Frequency Containment Reserve (FCR), which is intended to be the fastest European response reserve, used for halting any further divergence of system frequency from the nominal GB standard of 50Hz. Frequency Restoration Reserve (FRR) is slower and is used to return the system frequency to the nominal standard. The slowest is Replacement Reserve and this is used to replace FRR that has been utilised. Not all EU TSOs use or will use RR, but National Grid is one that plans to do so.

The TERRE product is a standardised bid and offer platform for RR across Europe. It will be formally defined as part of the implementation of the European Electricity Balancing Guideline (EB GL).

[2] Now the Department for Business, Energy and Industrial Strategy (BEIS).

RR products must be compliant with TSOs requirements and meet 12 criteria, which are set out below:

1. Full activation time (FAT) of 30 minutes (inclusive of preparation and ramping time).
2. Preparation period from 0 to 30 minutes.
3. Ramping period from 0 to 30 minutes.
4. Minimum quantity of 1 MW.
5. Minimum delivery period of 15 minutes or multiples of 15 minutes (i.e. "blocks").
6. Maximum delivery period of 60 minutes.
7. Location (bidding zone) – this will be Great Britain for parties bidding into TERRE in respect of GB-based generation or demand.
8. The validity period as defined by the BSP but equal or less than 60 minutes.
9. The recovery period as defined by the BSP (time before another activation is possible).
10. The maximum bid size will be:
    - in the case of a divisible offer (part-acceptance possible), no maximum bid size will be applied.
    - in the case of an indivisible offer (all or nothing acceptance), the local rules will be implemented.
11. Bid divisibility will be under the responsibility of BSP. The bid volume:
    - Min volume (resolution): 1MWh.
    - Resolution after Common Merit Order (CMO): 0.1MWh[3].
    - For indivisible bids (not applicable for divisible bids).
12. Price of submitted bids/offers: the cap and floor prices will be compliant with the local market rules[4].

What are Balancing Services?

Balancing services are used by the Transmission Company in its role as System Operator (SO) to balance supply and demand in real time. These are also used in the calculation of imbalance prices (also known as cash-out prices).

TERRE Standard Product Shape

The TERRE product will be required to meet the 12 criteria of an RR product. However, the way in which it meets these requirements is not clearly specified. The definition of how the TERRE product will meet the RR criteria within the GB market has been discussed by the P344 Workgroup, guided by the central TERRE project team.

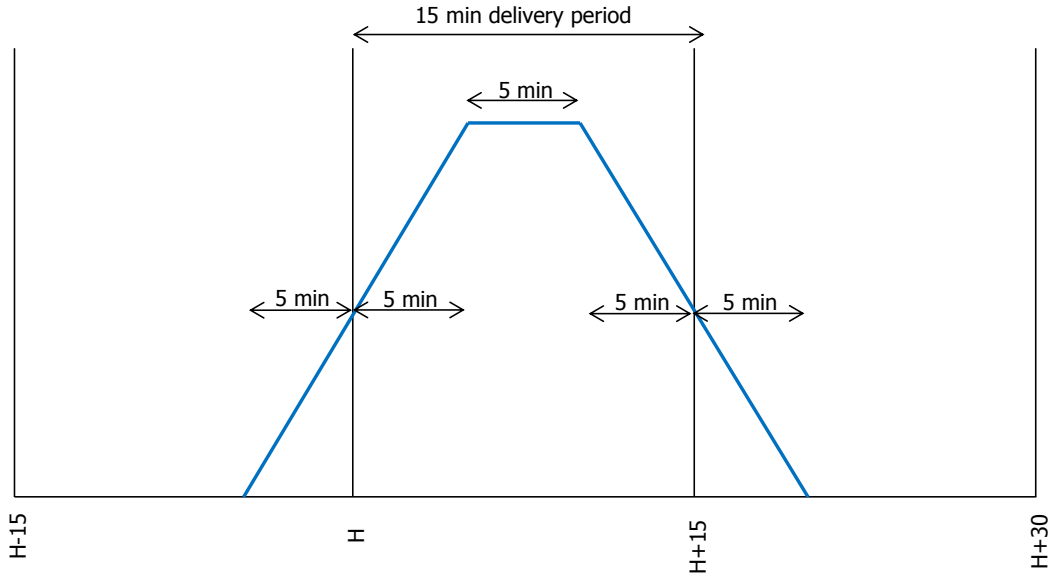
The central TERRE team previously presented the ideal shape that the delivery of TERRE volumes should follow within each TSO area. National Grid has confirmed that it wishes for this standard product shape to be used in the GB market as the basis for delivery of TERRE volumes. The standard product shape provides the desired delivery based on the

[3] Having a resolution of 0.1MW means that in case an offer is partially accepted (e.g. pro rata), the value will be rounded at the value with one decimal number.
[4] TSOs are seeking harmonisation of caps and floors.

XB exchange schedule and minimises excess volumes being produced where multiple TERRE acceptances are stacked together.

The standard product shape to deliver the TERRE product in the GB market will consist of symmetrical ramps around the start (H) and end (H+15) of the 15-minute TERRE block. At the start of the delivery block, the TERRE standard product shape suggests that ramping should ideally commence at (H-5) and finish at (H+5). There will then be a fixed period at full delivery for 5 minutes before the ideal down ramp commences at (H+10) and concludes at (H+20). The ideal duration for the TERRE product delivery is therefore 25 minutes (from H-5 to H+20) and that the duration of the maximum delivered volume is 5 minutes (from H+5 to H+10).

TERRE Standard Product Shape



The TERRE Procurement Process (Auction)

A TERRE procurement process will run hourly through an auction and results will be associated with a one hour delivery period, which comprises four 15-minute TERRE blocks. Through the bid process, TERRE blocks can be linked together by BSPs and can be conditional on delivery of another block in the same auction. Participation in the hourly auction by BSPs is voluntary. The TERRE auction will conclude with a Cleared Price (not pay-as bid) for the required volumes determined by the requirements submitted by the TSOs

Under TERRE there a certain rules that enable the relevant TSO (e.g. GB SO) to "exclude" bids from certain BSPs units from a TERRE auction (for example as a result of constraints on the transmission system which could impact on system security).

BSPs will submit bids to National Grid, who will pass bids into the TERRE auction through the central TERRE "LIBRA" platform which is operated by the central TERRE service provider. An algorithm designed to ensure the highest social welfare for all TSOs will determine the least cost provision of the TSO requirements through the TERRE auction. Results from the hourly auction will be published centrally through the TERRE platform and on the BMRS. GB BSPs will be instructed by the GB TSO to deliver the TERRE products (see Modification GC0097 'Grid Code Processes Supporting TERRE').

TERRE Product Settlement

For each 15 minute period associated with an hourly auction, the TERRE central algorithm will determine a clearing price for accepted bids, based upon the requirements submitted by the TSOs.

BSP bids accepted by the optimisation algorithm will be instructed to deliver by the relevant TSO. Settlement between TSOs will be based on the marginal prices resulting from the algorithm without considering any constraints.

For the majority of cases, accepted bids from BSPs in TERRE TSO participation areas will be settled using a single clearing price that is calculated centrally by the TERRE platform.

The central TERRE project team has identified a scenario where the BSP should be settled using a pay as bid price. In this scenario a TSO may identify a need to manage the cross border exchange flow and will introduce a constraint on an interconnector in the central algorithm. Any constrained bids accepted through the TERRE process on this basis with a higher price than the marginal price will be paid on pay-as-bid basis. In this case, the TERRE central platform will flag the relevant acceptances to TSOs for Settlement.

Interaction with current BSC arrangements

The P344 Proposer and Workgroup believe that the P344 solution should be closely integrated with existing BSC processes for BM Settlement, in order to facilitate participation in both markets (for those GB BSPs who choose to participate in both). In particular they propose that:

- GB BSPs wishing to participate in TERRE should be required to register a BM Unit containing the assets (generation or demand side response) that will be used to deliver the replacement reserve. This contrasts with existing ancillary services such as STOR, which allow a BSP to participate without registering a BM Unit (a 'non-BM' participant);
- The Settlement process should allow a BM Unit to participate in both TERRE and the BM simultaneously (rather than having to choose which market to participate in). Note that participation in both markets remains optional, so BSPs will not be required to participate in both (or either); and
- Payments to (or from) GB BSPs for RR should be treated as Trading Charges under the BSC (with similar payment terms to existing Trading Charges).

As a result, the implementation of Project TERRE is expected to impact a number of BSC areas including (but not limited to):

- BSC Party and Participation Capacity registration
- BM Unit registration and requirements
- The rules regarding Interconnectors under the BSC
- SVAA data procurement requirements
- Default rules for missing or late TERRE data
- Settlement of Balancing Mechanism Actions

- The calculation of Trading Parties' Imbalance Volumes
- The calculation of Trading Charges
- The timing of BMRS data publication
- Non-delivery charges
- Credit calculations
- The publication of information on the BMRS relating to Imbalance Price calculations and GB-related RR Product Acceptances

It will also bring current non-BM providers into the BSC arrangements in order that they can participate in the TERRE product.

Who can participate in TERRE?

It is envisaged that all current BM participations will be able to participate in TERRE, should they opt to do so.

The EB GL also requires that TSOs facilitate demand response participation in the TERRE product, including independent aggregation facilities and energy storage. Ofgem defines Independent Aggregators[5] as market participants who bundle changes in consumer's loads or distributed generation output for sale in organised markets, and who do not simultaneously supply the customer with energy. In order to facilitate this, the P344 Workgroup has introduced the concept of a "**Secondary BM Unit**" (as described in section 3 below).

The Workgroup recognised that requiring all TERRE participants to accede to the BSC – including customers and independent aggregators, who currently provide Balancing Services through a 'non-BM route' – could act as a disincentive to participation. To mitigate this risk, the P344 solution includes proposals that allow such participants to be recognised as a distinct new category of BSC Party **("Virtual Lead Parties")**. The Workgroup suggests that this new category of BSC Party should not be subject to the same level of charges and obligations as existing BSC Parties. This is on the basis that they participate in the BSC only for the purpose of registering Secondary BM Units to participate in TERRE and/or the BM. If they wished to participate in other aspects of the BSC (such as registering Primary BM Units or trading in wholesale markets) the full BSC charges should apply.

Settlement timescales, reporting and TERRE

It is envisaged that the TERRE settlement timescales and reporting process will be aligned with the current Settlement timescales and reporting processes.

Under the BSC, Settlement data is reported to BSC Parties (including BM participants) in various Settlement reports produced by BSC Central Systems e.g. the SAA. These reports are produced in a pipe-separated 'NETA' (New Electricity Trading Arrangements) file format and distributed via File Transfer Protocol (or high grade dedicated communication lines (optional) for paying Parties).

Settlement data is published in accordance with the BSC Settlement timetable:

[5] See 'Ofgem's views on the design of arrangements to accommodate independent aggregators in energy markets' open letter dated 24 July 2017

BSC Settlement timetable		
Settlement Run	ID	Average timing (Working Days after Settlement Date)
Interim Information Run	II	5
Initial Settlement Run	SF	18
1st Reconciliation Run	R1	37
2nd Reconciliation Run	R2	82
3rd Reconciliation Run	R3	152
Final Reconciliation Run	RF	290

NETA reporting

The implementation of Modification P114 'Entitlement of Licence Exemptible Generators (LEGs) and other Non-trading Parties to BSC Membership Without Evidence of Trading' meant that non-BSC Parties can apply to receive the SAA-I014 (sub-flow 2) for each Settlement Run under licence, granted on a case-by-case basis by ELEXON in accordance with the BSC (further information).

In addition to NETA Settlement reports, disaggregated data is published to the market via the Balancing Mechanism Reporting System website. Under the current arrangement in the BM, National Grid sends Bid-Offer data to BMRS shortly after Gate Closure for a given Settlement Period, with publication soon afterwards. National Grid also sends Acceptance data to BMRS shortly after being instructed. BMRS publishes both types of data shortly after receipt from National Grid.

What is the SAA-IO14 (sub-flow 2)?

This report contains everything that happened in the Settlement systems on a particular day, broken down into half hour Settlement Periods.

This includes System Buy/Sell Prices, information on trading activity and charges for each Balancing Mechanism Unit (Party), Metered Volumes and Settlement cash flow information. It also has all the information needed to re-calculate the System Buy/Sell Prices.

EU reporting requirements

Aggregated balancing data is reported via BMRS (and ENTSO-E's EMFIP) in accordance with Article 17 of the Transparency Regulation. See Modification P295 'Submission and publication of Transparency regulation data via the BMRS' for further information.

Article 12(2) of the EB GL requires each TSO to publish various information on balancing energy bids. ELEXON proposes that these requirements are satisfied by publication of such information on BMRS.

Existing BM Settlement arrangements and TERRE

It is envisaged that the existing BM Settlement arrangements will remain unchanged. Under the BM, National Grid can issue MW profile instructions to a BM Unit to deviate from a MW baseline.

BSPs that want to participate in the BM must indicate the MW level at which they expect their BM Unit to be at for any given Settlement Period. This is known in the Grid Code as a Physical Notification (PN). At Gate Closure, this MW level is finalised and sent to Settlement where it is termed the BM Unit's Final Physical Notification (FPN) and acts as a baseline for any future deviation instructions from National Grid.

For a given Settlement Period, National Grid can issue these instructions (deviations from the FPN) between Gate Closure and the end of that Settlement Period in order to balance

the system. These instructions should respect physical and dynamic data (intended output level, maximum/minimum limits, ramp rates etc.) that the BM Unit submits to National Grid.

For each instruction received, Settlement calculates Offer or Bid Acceptance Volumes based on the difference between the instruction and the baseline. BM participants are settled (i.e. paid or must pay) on the basis of these volumes. As the baseline is the Final Physical Notification (FPN), if there is no instruction post Gate Closure to the BM Unit from National Grid, the baseline will equal the FPN.

Instructions have a sequential BOA Number set by National Grid. This is important as National Grid can make a series of 'revisions' to what it wants the BM Unit to do, through a series of instructions (some of which may 'undo' a previous instruction). Settlement processes instructions in order of BOA Number, with an intention that they are processed in the time order that instructions were issued.

What is Settlement?

Settlement is the process by which payments are made or taken by the Settlements company (ELEXON) in respects of energy trades and the operation of the BM.

What is Gate Closure?

Gate Closure is the point of time one hour prior to a Settlement Period by which all notifications relating to that Settlement Period must be submitted. This deadline is the point by which Trading Parties, mainly generators, must notify their Final Physical Notifications (FPNs) and Bids and Offers for that Settlement Period to National Grid, acting as the System Operator.

Imbalance pricing and TERRE

Under the current arrangements, individual Actions taken to balance the GB system (e.g. Accepted Bids and Offers under the BM) are ordered and subject to various calculation steps such as Flagging, Tagging and repricing.

The TERRE procurement process will impact on GB imbalance pricing where the volume accepted meets GB requirements for energy balancing. However, because the central TERRE system cannot identify whether a given RR Acceptance is required to meet a GB or foreign need, GB Settlement cannot simply isolate individual actions associated with BSP BMUs. This will necessitate aggregation of the TERRE actions in the GB imbalance pricing calculation associated with TERRE volumes.

Credit, invoicing, payment default and TERRE

Under the current arrangements in the BSC, if a BSC Party fails to pay their Balancing and Settlement Code Company (BSCCo) or Trading Charges invoices, all other BSC Parties are required to pay for these amounts under a Default Funding Share mechanism (i.e. mutualisation payments), based on their market share of Credited Energy Volume.

Under the P344 solution the Default Funding Share arrangements are unchanged. However, it should be noted that Virtual Lead Parties that are not a Trading Party (i.e. without Energy Accounts) are not be subject to the Default Funding Share mechanism as they do not have any Credited Energy Volume associated to them (similar to Non-Physical Traders under the current arrangements).

BSC Contingencies, Black Start and TERRE

A Black Start event is an event whereby the Transmission Network has shut down and requires a series of localised start-up activities (without relying on the Transmission Network), leading to restoration of normal operation. Section G 'Contingencies' of the BSC states that a Market Suspension Period will exist during:

- a Total Shutdown (as defined in the Grid Code) or;

- a Partial Shutdown (as defined in the Grid Code) that also meets the Market Suspension Threshold, essentially meaning that national demand is 95% less than previously forecasted.

During a Market Suspension Period, the BM is suspended in addition to the following:

- No compensation to BM participants for BM outages
- Energy Contract Volume Notifications (ECVNs) are suspended
- A single imbalance cash-out price applies (calculated by BSCCo and approved by Panel, based on the cash-out prices in the previous 30 days)
- Credit Assessment Energy Indebtedness (CEI) and Metered Energy Indebtedness (MEI) are set to zero
- Actual energy Indebtedness (AEI) (for Settlement Days within the Market Suspension period) is set to zero

The P344 solution proposed that the BSC contingency arrangements include the TERRE process.

Interaction with other BSC Modification Proposals

P344 has similarities to two other Modification Proposals that are progressing through the Formal BSC Change Assessment Procedure: Modification Proposal P354 ('Use of ABSVD for non-BM Balancing Services at the metered (MPAN) level'), and Modification Proposal P355 ('Introduction of a BM Lite Balancing Mechanism').

Modification Proposal P354 is intended to ensure that Suppliers' Energy Imbalance Volumes are adjusted for 'non-BM' balancing services provided by their customers to National Grid. Similarly, some elements of the P344 solution are intended to ensure that Suppliers' Energy Imbalance Volumes are adjusted for replacement reserve provided by their customers to National Grid through participation in Project TERRE. Therefore some elements of the P344 and P354 solutions are similar. Each Workgroup has attempted to align the solutions of the Modification Proposals, where appropriate, in order to facilitate efficient implementation of both Modifications (should they both be approved by Ofgem).

Modification Proposal P355 is intended to allow smaller generators to participate in the Balancing Mechanism. The P355 Workgroup has discussed a number of possible approaches to achieving this, following which the P355 Proposer has concluded that the Secondary BM Unit element of the P344 solution covers much of what was intended by P355. The Proposer has therefore requested that any further work for P355 is put on hold until June 2018, when the Draft Modification Report for P344 is presented to the BSC Panel.

4 Solution

The P344 Workgroup has developed the solution to Modification P344 over a total of 24 Workgroup meetings since the Modification was first raised on 1 June 2016. Due to the interdependencies with National Grid's Grid Code Modification GC0097 'Grid Code Processes Supporting TERRE', there have been a number of workgroup meetings held as cross-Code between P344 and GC0097 to ensure the solutions align operationally.

Proposed solution

As the Proposer of BSC Modification P344, National Grid has owned the solution throughout the Assessment process and has on a number of occasions amended the Proposed solution in light of internal considerations and guidance from the P344 Workgroup. At its meeting on 12 December 2017, the P344 Workgroup, including National Grid, finalised the Proposed solution to be put forward as part of this second Interim Assessment Report to the BSC Panel, and as consulted upon during the second Assessment Procedure Consultation.

Facilitating aggregators/customers

In order to facilitate participation by customers and independent aggregators (as required by the EB GL), the P344 Workgroup proposes to amend the BSC to allow participation in TERRE (and the BM) by two different types of BM Unit:

- BM Units as currently defined, where the Supplier or Generator registering the BM Unit is responsible for power Imported from the system and/or Exported to the system by the BM Unit. The P344 solution refers to these as "**Primary BM Units**" (as all Plant and Apparatus connected to the licensed electricity network must be included in one); and
- A new type of BM Unit (a "**Secondary BM Unit**"), allocated by a customer or aggregator for purposes of participating in TERRE and/or the BM. The Party registering the Secondary BM Unit is financially responsible for delivery of any acceptances issued to the BM Unit from TERRE or the BM; but not for other flows of power to or from the Secondary BM Unit.

For example, an aggregator might register a Secondary BM Unit containing three customers with the capability to provide demand side response to National Grid. The P344 solution will allocate any Energy Imbalance associated with failure to deliver an acceptance to the aggregator; but all other energy used by the customers will be allocated to the Primary BM Units of their chosen electricity Suppliers. The customers' electricity Suppliers will retain responsibility for network charges and final consumption levies.

Because P344 incorporates the arrangements for settling RR into the BSC, customers and aggregators who wish to register Secondary BM Units will need to become Parties to the BSC. However, they will be doing so in a new role (or 'participation capacity'), different to existing participation capacities (such as Supplier, Generator and Non-Physical Trader). The P344 Workgroup uses the term "**Virtual Lead Party**" for this new role of registering Secondary BM Units in order to participate solely in TERRE and/or the BM.

Note that a single BSC Party may register in more than one participation capacity. Some parties (e.g. customers and independent aggregators) may wish to sign up to the BSC only

What are Energy Accounts?

Energy Accounts are the accounts whereby Energy Contract Volume(s) from the trading of electricity are debited, credited or nullified.

Energy accounts are held by all BSC Parties that trade electricity (Trading Parties).

as a Virtual Lead Party, while others will sign up in multiple participation capacities (e.g. a Supplier aggregator acting as both Supplier and Virtual Lead Party).

Independent Aggregators/customers registering as a BSC Party only in the capacity of Virtual Lead Party would not be classified as a Trading Party (unless they voluntarily apply to hold Energy Accounts). This new participation capacity does not preclude existing Suppliers from participating in the TERRE product, as there are existing BSC provisions to allow Supplier Aggregation. In this instance, the Supplier has in essence already deemed itself to have Energy Accounts by virtue of being a Supplier.

In order that an Independent Aggregator/customer can participate in the TERRE product through the Virtual Lead Party arrangements, the participant will be required to complete the BSC Market Entry process and hence meet the Qualification requirements and associated testing. The cost for acceding to the BSC arrangements is a one off administration fee of £500.

Once Qualified, participants will be subject to BSC obligations. However, if they do not hold Energy Accounts, they will not be subject to pay the BSC Base Monthly charge which is currently set at £250 per calendar month. Instead, the Virtual Lead Party will be required to pay a Base Virtual Lead Party Monthly Charge, set at a level by the BSC Panel as being proportionate to the role that the Virtual Lead Party participation capacity has within the overall BSC arrangements.

Similarly, a Party that has registered solely as a Virtual Lead Party will not have Funding Shares (Main, SVA General or Default) and hence will not be liable for any BSC cost recovery through the Funding Share allocation method. Consequentially, this will preclude such participation capacity from voting in the BSC Panel election process.

Further information on the technical requirements for existing Qualification can be found on the BSC Website, and further detail on TERRE related Qualification obligations can be found in Business Requirement (BR) one of Attachment B

What is a BM Unit?

BM Units are an individual or collection of plant and/or apparatus, considered to be the smallest grouping that can be independently controlled.

BM Units are used as units of trade within the BM, with any energy produced or consumed by the plant/apparatus within the BM Unit being accredited to that BM Unit for the purposes of Settlement.

What is the BSC Panel?

The BSC Panel is a group of individuals acting impartially to ensure the BSC provisions are given effect promptly, fairly, economically, efficiently, transparently and in a manner that will promote competition in the generation, supply, sale and purchase of electricity.

Registration of Secondary BM Units and BSC charges

As detailed above, BSC Parties registered with the Virtual Lead Party participation capacity will be able to register Secondary BM Units in order for the units to participate in the TERRE product. This new classification of BM Unit will allow the association of SVA Metering System Numbers that a customer or aggregator is bringing together in a Secondary BM Unit for the purposes of participating in the TERRE product. Secondary BM Unit arrangements under the Proposed P344 solution will be akin to existing arrangements relating to the registration of BM Units.

The P344 Workgroup discussed the possibility of limiting each Secondary BM Unit to SVA Metering Systems supplied by a single Supplier, in order to simplify the process of adjusting Suppliers' imbalance positions. However, the Workgroup concluded that such a constraint that could pose a barrier to customers changing their electricity Supplier, and was therefore undesirable.

The P344 solution allows a Virtual Lead Party to register SVA Metering Systems with different electricity Suppliers (Lead Parties) in the same Secondary BM Unit (including customers they supply themselves, in the case of a Virtual Lead Party who is also an electricity Supplier).

The P344 Workgroup also discussed whether SVA Metering Systems in a Secondary BM Unit should be limited to a single Grid Supply Point (GSP), or to a single GSP Group. Restricting each Secondary BM Unit to a single GSP would give National Grid more certainty about where on the system a response will be delivered, but would limit the ability of aggregators to aggregate, and would not be consistent with the existing rules for Suppliers (who are permitted to aggregate SVA Metering Systems at different GSPs into a single Additional BM Unit, provided that the GSPs fall within the same GSP Group). The Workgroup has therefore concluded that the solution should permit aggregation within each of the fourteen GSP Groups. In practise, if a Virtual Lead Party was handling SVA Metering System Numbers across multiple Grid Supply Point (GSP) Group Ids, it would have to register a Secondary BM Unit for each GSP Group Id (similar to Supplier Additional BM Units currently).

A Virtual Lead Party in respect of its Secondary BM Units shall not be subject to the BM Unit Monthly Charge or the CVA BM Unit Monthly Charge. However, the Virtual Lead Party will be subject to the Secondary BM Unit Monthly Charge which will be set by the BSC Panel and published on the BSC Website.

Further, the P344 Proposed solution notes that it shall not be possible to submit Metered Volume Reallocation Notifications (MVRNs) in relation to Secondary BM Units since there is no metered volume allocated to the Secondary BM Units for the purpose of imbalance Settlement.

Further information on the Proposed Secondary BM Unit arrangements can be found in BR two of Attachment B.

Secondary BM Unit MSID Pairs

Virtual Lead Parties who register Secondary BM Units will also be required to communicate to the Supplier Volume Allocation Agent (SVAA)[6] the SVA Metering System Numbers to be associated to a given Secondary BM Unit on a given Settlement Date. This information serves two purposes:

- It allows SVAA to calculate the reference total metered volume for the Secondary BM Unit (using metered data provided by Half Hourly Data Aggregators), in order that the P344 solution can verify that any acceptances issued to the BM Unit were successfully delivered relative to this reference volume; and
- It allows the P344 solution to adjust Suppliers' Energy Imbalance volumes for acceptances associated with the relevant SVA Metering System Numbers and delivered by the customers and generators in the Secondary BM Unit, in order to ensure compliance with the EB GL (and a level playing field between Secondary and Primary BM Units).

In order to support the allocation of delivered volumes to Metering Systems, the Virtual Lead Party must also identify which Export MSID (if any) is associated with a given Import

[6] The Workgroup has proposed that SVAA holds the register of which SVA Metering System Numbers are allocated to each Secondary BM Unit, and to aggregate metered data received for those SVA Metering System Numbers from HHDAs. The reason for choosing SVAA (rather than SAA or a new agent role) is that SVAA already receives data from HHDAs (and a similar role has been proposed for SVAA in one of the P348/P349 options). This does not necessarily imply that we need the functionality to be incorporated into the existing SVAA system (and we would welcome opinions on whether SVAA in in fact the correct agent role).

MSID. This is done by specifying 'MSID Pairs', where an 'MSID Pair' means one Import Metering System and, where applicable, one Export Metering System situated at a single Boundary Point for the purposes of the providing Balancing Services. To clarify a MSID Pair must contain a SVA Import Metering System but does not always have to have to contain a SVA Export Metering System. An SVA Metering system can only be registered in one MSID Pair at any given time.

The P344 Workgroup discussed at some length whether Suppliers should be entitled to receive details (from the BSC Settlement System) of acceptance volumes delivered by each of their customers. Providing such information to Suppliers would potentially increase the efficiency of billing arrangements, and avoid a need for customers and Suppliers to devise their own mechanisms for providing such data to Suppliers (where required for billing purposes). For this reason, the Workgroup's first consultation on the P344 solution proposed that there would be mandatory reporting of this data to Suppliers. However, responses to the consultation revealed some concern from independent aggregators that automatic disclosure of this information would provide a competitive advantage to Suppliers (who are in some cases the independent aggregators' direct competitors). Potential approaches to this problem would appear to include the following:

- Disclosure of delivered volume data to Suppliers from BSC Central Systems, for all customers participating in TERRE (or the BM) through a Secondary BM Unit;
- No disclosure of delivered volume data to Suppliers from BSC Central Systems. If Suppliers require this data for billing purposes, they would need to agree a mechanism for providing it with customers; or
- Disclosure of delivered volume to Suppliers from BSC Central Systems, only for those customers where the Virtual Lead Party registering the Secondary BM Unit has indicated that the customer has provided consent to the disclosure. If Suppliers require the data for billing purposes they would potentially need to agree with the customer that data can be disclosed, but the solution for providing the data would be provided centrally (by BSC Systems).

The Workgroup's proposal, subject to the results of this consultation, is to progress the third of these options. In order to support this, Virtual Lead Parties providing the MSID Pair information to the SVAA would be required to include a Supplier Disclosure Flag. This flag will indicate whether the customer consents to their Supplier being provided Half Hourly (HH) delivered volumes by BSC Systems on Balancing Services delivered through the applicable SVA Metering System Number. The P344 Workgroup deemed that this should be an opt-in arrangement with the customer rather than opt-out.

In order to maintain confidentiality, the P344 solution requires Half Hourly Data Aggregators (who may know which SVA Metering Systems are participating in TERRE, as a result of being asked to provide metered data to SVAA) not to disclose the identity of the SVA Metering Systems to Suppliers. During implementation of P344 (assuming that it is approved) ELEXON will consider how best to monitor compliance with this obligation.

Virtual Lead Parties will be able to submit amendments to data submissions retrospectively related to SVA Metering Systems so that erroneous associations can be later remedied, and this will feed into the next applicable Settlement Run. There will be a formal process governing SVA Metering Systems data submissions and amendments that will be defined within a new BSC Procedure (BSCP). The Workgroup determined that retrospective amendments of SVA Metering Systems data submissions should either not be allowed to incentivise accuracy, or be allowed with an appropriate deadline, for example the Settlement Final (SF) or the First Reconciliation Settlement Run (R1).

SVA Metering System Balancing Services Register

The SVAA shall maintain a register, to be known as the "**SVA Metering System Balancing Services Register**". This register shall include details of SVA Metering System Numbers belonging to each BM Unit that offers Balancing Services; the associated Supplier for each of the SVA Metering System Numbers identified in a MSID Pair; and the associated effective dates.

For the avoidance of doubt, an SVA Metering System can only be associated with one BM Unit that offers Balancing Services at any given time. For example, if a customer was participating in the BM through their Supplier's Additional BM Unit, but then signed up with an independent aggregator to participate in TERRE through a Secondary BM Unit, the Supplier would no longer be able to use that customer's SVA Metering System number in the BM.

The process will include controls to ensure that the same SVA Metering System is not able to provide Balancing Services through two BM Units at the same time. In order to support this, Suppliers as the Lead Party of Primary BM Units will be required to notify Settlement of any SVA Metering System Numbers they are using to provide Balancing Services.

For further information on the SVA Metering System Balancing Services Register, please refer to BR four in Attachment B.

What is an RR Acceptance?

An RR Acceptance is a confirmation from the central TERRE platform, to the TSO of a successful bid by a BSP into an RR auction period.

Half Hourly Data Aggregators

Half Hourly Data Aggregators[7] (HHDAs) will be required to submit HH metered volume data for SVA Metering System Numbers associated with Secondary BM Units to Settlement. There will be an obligation on Suppliers to ensure that HHDAs undertake this requirement.

Settlement will use this data and the registration data to calculate an aggregated RR volume for each Secondary BM Unit, in order to facilitate Settlement of RR Acceptances. This is a similar process to the one by which HHDAs submit metered data for Metering Systems in Capacity Market Units (CM Units) to the Electricity Market Reform (EMR) Settlement process.

For clarity, HHDAs shall not disclose to Suppliers the MSIDs for which they have provided disaggregated metered data. However, the raw quantity of MSIDs for which they have done so may be disclosed, so long as such MSIDs are not identifiable.

Overall, this process assumes that HHDAs are not able to opt-out of providing HHDA services for use within the GB TERRE arrangements. Allowing such an opt-out would create a risk that customers are unable to participate in TERRE, or can only do so if they persuade their Supplier to appoint a different HHDA, which would not be desirable.

MSID Pair delivered volumes

Virtual Lead Parties (VLPs) will be required to submit HH delivered volume data for SVA MSID Pairs associated with Secondary BM Units to Settlement within Working Day plus one. The HH delivered volume data is the volume of the TERRE bid acceptance established relative to the reference metered data for the relevant SVA Metering System in the

[7] Non Half Hourly Data Aggregators are not able to submit data, as participation in TERRE requires half hourly settlement metering to verify deliver.

Secondary BM Unit. This data will be used to adjust each Supplier's imbalance position for volumes delivered by their customers.

The Workgroup recognises that the integrity of the P344 solution depends upon VLPs allocating delivered volumes to MSID Pairs using a fair and accurate process. During the implementation of P344, consideration will be given to what performance assurance techniques could be used to achieve this (e.g. the allocation of delivered volumes to MSID Pairs could be subject to technical assurance or BSC Audit). ELEXON is also investigating the possible use of distributed ledger technology ('blockchain') to provide transparent and non-reputable logging of instructions issued to customers (and hence increase the auditability and transparency of the process), although we do not envisage such a solution being required (or available) on 'day 1' of TERRE (i.e. any such solution would be implemented as a separate Modification or Change Proposal).

Settlement will use the delivered volume data and the metered volume data received from the HHDA to allocate the delivered volumes to individual MSIDs within the Secondary BM Units, in order to facilitate the Settlement payments of RR Acceptances. The process for the SVAA to allocate MSID Pair Delivered Volumes between SVA Metering Systems is contained within BR seven.

Where data is missing, the SVAA will chase data and if not received, deem data for the affected Settlement Periods.

Further technical detail of the requirements for the Virtual Lead Party submitting data to Settlement and the SVAA resolution of missing data can be found in BR six.

Currency Conversion

The central TERRE arrangements require the inter TSO arrangements to settle in Euros.

For GB settlement, the P344 Workgroup proposes that the GBP-EUR currency conversion will be undertaken centrally by National Grid. The Settlement arrangements will calculate and publish a day-ahead exchange rate for use by National Grid. The currency conversion rate to be utilised will be published on the BMRA on the day preceding the Settlement Date.

Currency conversion centrally was determined to be more efficient for GB TERRE participants as there will be no requirement upon GB BSPs to trade or be involved with foreign exchange, as supported by responses to the first P344 Industry Consultation during quarter one 2017.

A BSC Panel approved financial service provider will be used to determine the exchange rate to be used at the day-ahead stage under a transparent process. This process will form part of a new Code Subsidiary Document, which will be developed during the implementation phase of the Modification.

TSO interface

The TERRE product will require various new data items to be exchanged between Balancing Service Providers (BSPs), National Grid, the central TERRE platform (LIBRA) and BSC Settlement Systems.

What is an RR Instruction?

An RR Instruction an instruction sent to the control point of an RR accepted BM Unit to deviate from their current committed level

BSC Settlement Systems will need to be able to receive new data items from National Grid (some of which originated with the central TERRE system) in relation to supporting the Settlement of the TERRE auctions. These new data items will consist of the following:

- Details of all RR Bids submitted by GB parties for an RR Auction Period
- Details of the RR Auction Result Data;
  - Quarter Hour Volume of GB Need met (MW level)
  - Quarter hour RR Acceptance Data (MW level)
  - Quarter Hour RR Interconnector Scheduled Volume (MW level)

ELEXON's current understanding of the expected data items required is covered in BR nine. However, this may be subject to amendment, should National Grid's solution or the central TERRE platform development require or change the data items or format types required. This will be confirmed between ELEXON and National Grid in due course but is not expected to impact on BSPs in any instance.

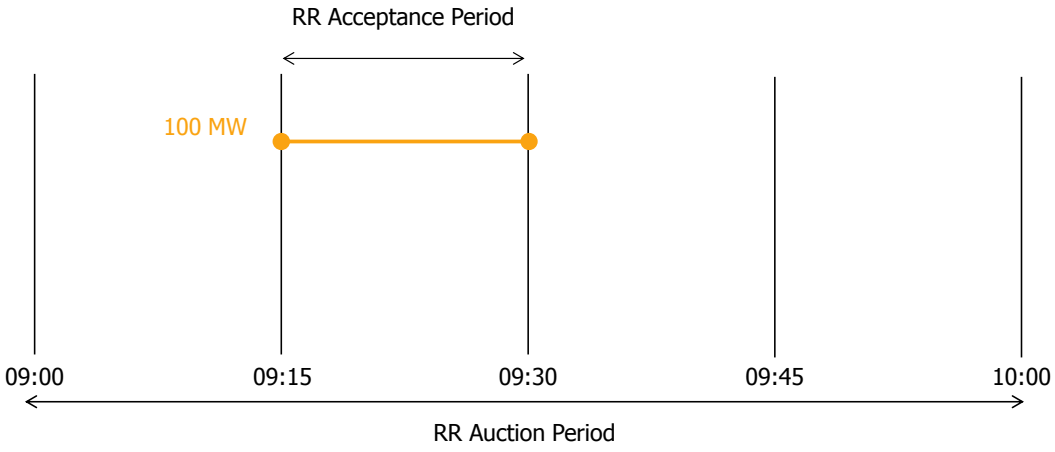
National Grid's Bid Offer Acceptance (BOA) interface will be amended so that it can be used to provide details of RR instructions as well as details of BOAs. For clarity an RR Instruction is a MW profile instruction sent to the control point of an RR accepted BM Unit to deviate from their current committed level. Therefore, it will consist of one or more Acceptance Volume Pairs, each with:

- a 'From' MW level and an associated 'From' time;
- a 'To' MW level and an associated 'To' time;
- a flag stating whether that Acceptance is relating to an RR Acceptance, and
- all other relevant BOA acceptance data.

Further information on the Settlement and National Grid data interfaces is detailed in BR nine in attachment B.

Quarter Hour RR Acceptance Settlement

The central TERRE platform will inform National Grid of BSP bids that have been accepted (i.e. Quarter Hour RR Acceptances) for each 15 min 'block' within the TERRE Auction Period (hour) and National Grid will forward this information to Settlement.



RRA

The Settlement of these Quarter Hour RR Acceptance 'blocks' will be completed under a new process whereby Settlement systems multiply the Quarter Hour RR Acceptance MW Level in the relevant Settlement Period by 0.25 to calculate the RR Accepted Volumes in MWhs for that quarter-hour. Settlement will then multiply the RR Accepted Volumes by the Quarter Hour RR Acceptance Price (£/MWh). Settlement systems will then sum the RR Cashflow for each quarter-hour within a Settlement Period to get the Period RR BM Unit Cashflow and then sum across all Settlement Periods for all Party BM Units per day to get the Daily Party RR Cashflow.

Subsequently, the Daily Party RR Cashflow (CRR_p) will be a new Trading Charge. It will be included on Trading Charge Advice Notes that are sent to BSC Parties participating in TERRE on a daily basis.

Further technical information and calculations can be found in BRs 10 to 12, detailed in Attachment B.

RR Schedule

Upon receiving the RR Acceptance 'blocks' from the central TERRE system, National Grid will interpret the data and issue an appropriate RR Instruction to the BSP, directing them to deliver the RR Acceptance.

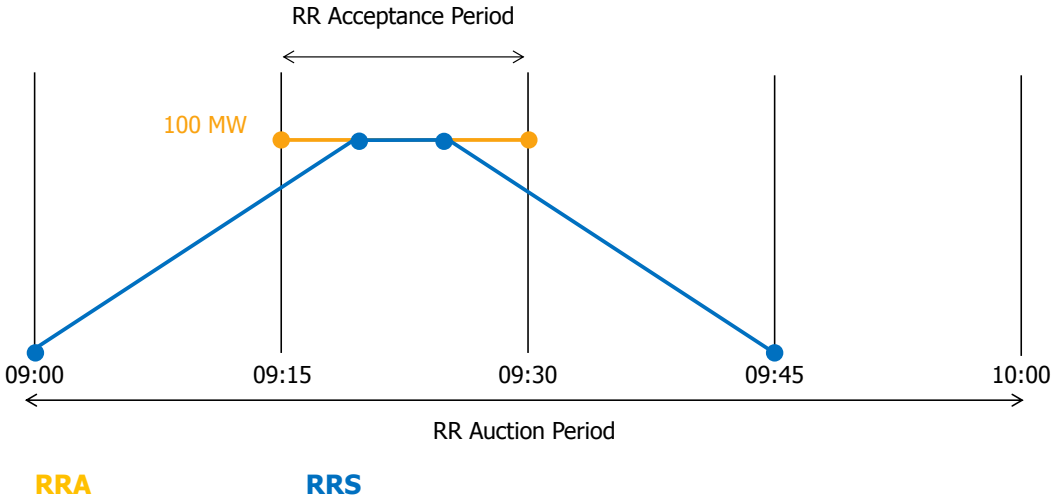
However a number of scenarios have been identified where issuing the RR Instruction won't be in the best interest of the overall GB Transmission System. In those instances National Grid has indicated it will not issue a RR Instruction.

Therefore, to facilitate accurate Settlement (due to RR Acceptances being financially firm as accepted by the central TERRE platform), the SAA, upon receipt of an RR Acceptance, will construct an RR Schedule to account for the instances where a RR Instruction is not received by the BSP. These RR Schedules are treated by Settlement systems just like any other instruction (i.e. setting a new baseline), except that they do not create Accepted Volumes that are payable.

The RR Schedule will respect the TERRE Standard Product shape and align with TSO RR Dispatch Principles, as outlined by National Grid, which includes:

- Where a RR Acceptance is deemed to be feasible;
    - RR Schedule will respect submitted relevant Dynamic Data Set parameters
    - The full MW delivery will be achieved between 0-5 mins into the 15min RR Auction Period
    - There will be a minimum duration of full MW delivery of the RR Acceptance of 5 mins
    - Run-Up Rates and Run-Down Rates < 10 min TERRE Standard Product Ramp rates will be dispatched symmetrical to the 15 min TERRE Auction Period boundary
- Where the RR Acceptance is **not** deemed to be feasible;
    - RR Schedule will not respect submitted Dynamic Data Set parameters
    - The full MW delivery will be achieved between 5 mins into the 15min RR Auction Period
    - There will be a duration of full MW delivery of the RR Acceptance of 5 mins

- Run-Up Rates and Run-Down Rates will be determined as the maximum feasible rate



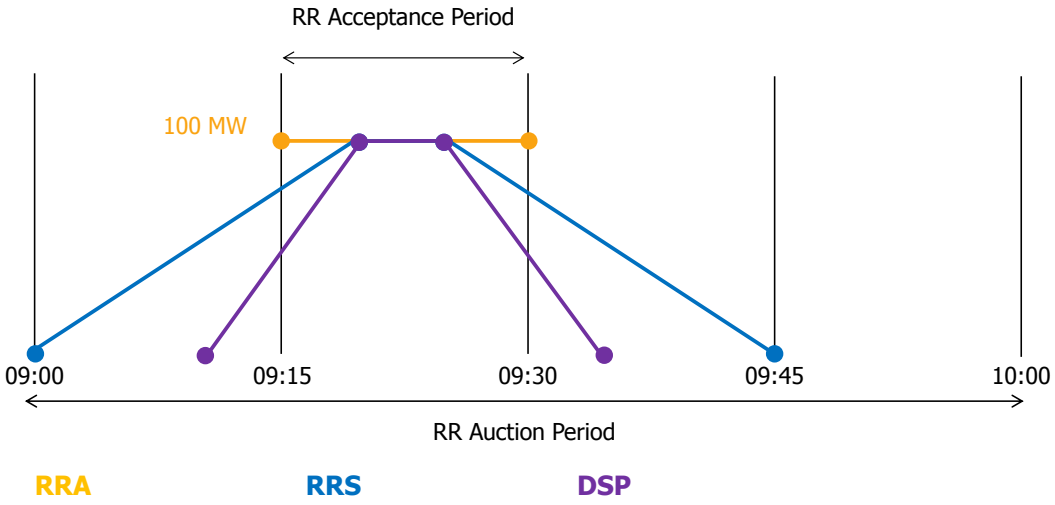
The RR schedule methodology will be documented in an open and transparent manner, appropriate to the information contained within on the BSC Website. It will be subject to amendment at any time, should National Grid's dispatch methodology change, in order that Settlement accurately reflects the financial firmness of TERRE acceptances.

Because RR Acceptances are paid under a separate mechanism (see BR ten), the volumes relating to RR Schedules are not paid at Bid Prices or Offer Prices per Bid-Offer Pair. Settlement systems will need to calculate RR Schedule Volumes (i.e. have equivalent calculations to those for Period Accepted Offer Volume and Period Accepted Bid Volume). This will ensure that the volumes for RR Acceptances and BOAs do not mix, as this could result in a BSP being paid twice (once via RR Cashflow and again via BM Cashflow).

For further information on the technical detail of RR Schedule Settlement, please refer to BRs 13 and 14.

Under the Proposed P344 solution, an RR Acceptance will represent the theoretical volume of the 15 minute accepted 'block'. However, the physical delivery (i.e. the RR Schedule) of the RR Acceptance will have volumes delivered outside of the 15 minute 'block' period due to the TERRE Standard Product shape taking account of BSP ramping.

RR Schedules are to be treated exactly as BOAs for non-delivery purposes and to calculate non-delivery Charges Settlement needs to be able to associate a price to all volumes delivered through TERRE. As the physical delivery volumes will not match the theoretical 'block' RR Acceptance Volumes the Non-Delivery calculation becomes compromised. Settlement will therefore use the RR Acceptances to derive the **Deemed Standard Product Shape** (for that Quarter Hour RR Acceptance) and then subsequently calculate **Deemed Standard Product Offer / Bid Volumes** for use in the non-delivery calculation.



Further technical information and calculations can be found in BRs 10 to 12, detailed in Attachment B.

TERRE Standard Product Shape Settlement

It is assumed that the RR dispatch will be consistent with the Deemed Standard Product Shape. In many cases, it is likely that the MWh volume associated with an RR Schedule will differ from the volumes associated with the Deemed Standard Product Shape. This is because the RR Schedule will take in account BM Unit ramping capabilities, whilst the Deemed Standard Product Shape does not.

The Settlement system will calculate the MWh difference between the RR Schedule shape and the Standard Product Shape. This is to align the P344 solution with the EB GL, which introduced the concept of Balancing Energy Deviation Volumes (the deviation from the standard shape as a result of the BM Unit's pre-declared ramping rates).

Balancing Energy Deviation Price (BEDP)

The ENTSO-E Public consultation document for the design of the TERRE RR Harmonized Balancing Area released in June 2017 introduced a new concept of Balancing Energy Deviation Price (BEDP). This BEDP concept is intended to incentivise delivery of the TERRE Standard Product Shape over other potential delivery shapes that provide TERRE balancing volumes to the Transmission System.

At the time of developing the P344 solution, the European project's intention of what should be achieved from the BEDP price was unknown, but the Workgroup thought that the P344 solution should enable the calculation of such a cashflow to align with future European incentive harmonisation.

Therefore, the functionality to calculate a cashflow based on the deviation of the RR Schedule from the TERRE Standard Shape (i.e. the Balancing Energy Deviation Volume) has been included, but with the BEDP currently set to zero. This cashflow is to be aggregated to a daily level and is to be known as the Daily Party RR Instruction Deviation Cashflow.

Should the BEDP need to be changed in the future, either as an EU requirement, on the basis of harmonisation with other European TSO areas or on the wish of BSC participants, a BSC Modification can be raised to address this.

Daily Party RR Instruction Deviation Cashflow

The Daily Party RR Instruction Deviation Cashflow will be a new Trading Charge. It will be included on Trading Charge Advice Notes that are sent to BSC Parties participating in TERRE on a daily basis.

Settlement-National Grid Cashflow

Because TERRE relies on BSP-TSO settlement, RR Cashflows will need to feed into the calculation of payments between Settlement and National Grid (i.e. System Operator BM Cashflow). This flow will be renamed System Operator Cashflow, to reflect the fact that it does not only relate to the BM.

Settlement systems will calculate a total of RR Cashflows across all quarter-hour TERRE delivery block periods and BM Units and this will feed into the System Operator Cashflow. This also facilitates the principle that Settlement calculations should net to zero on a daily basis.

RR Instruction Settlement

National Grid will forward to Settlement, data on any instructions that it issues to BM Units (e.g. BOAs under the existing BM arrangements, or instructions relating to RR Acceptances). The P344 solution will not calculate Accepted Bid-Offer Volumes for RR Instructions as these volumes are already accounted for within the RR Schedule. The RR Instruction is intended to act as a baseline for subsequent acceptances and so will re-use the existing accepted volume calculations in BSC Section T 'Settlement and Trading charges' used for the BM. This is in order to minimise cost and complexity, and align calculations for both TERRE and the BM.

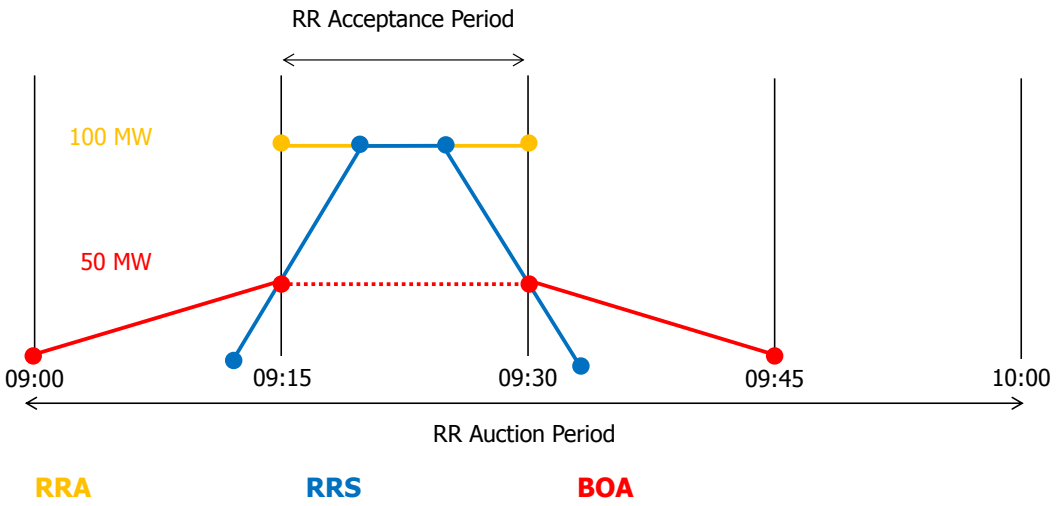
The solution assumes that in almost all cases National Grid will also forward instructions that it has issued to the BM Unit pursuant to satisfying the RR Acceptance. It also assumes that in almost all cases this instruction will match the RR Schedule and as such there will be no difference in volume.

Cases where there is a difference in volume between the RR Schedule and RR Instruction will be captured by the existing BM processes i.e. under delivery against the RR Schedule will be subject to existing Non-Delivery rules and over delivery against the RR Schedule will be taken into account in a Trading Party's Imbalance position (a Virtual Lead Party with a Virtual Balancing Account will not be adjusted).

BOA Settlement

Due to the delay between the submission of a RR offer (H-60) and receiving the RR Acceptances (H-30), where H refers to the start of the TERRE hour period, there exists a possibility for the TSO to issue BOAs to a BM Unit that is then subsequently accepted for TERRE. Analysis of the scenarios that result from this circumstance has identified a particular instance where the BOA acceptance is not compatible with the RR Schedule i.e. Settlement integrity is compromised. Therefore additional logic is required to identify and amend the acceptance data so the appropriate volumes are entered into Settlement.

Settlement systems shall compare Bid-Offer acceptance data received against previous acceptance data. If the previously accepted data relates to an RR Schedule and is of the same direction (i.e. offer/offer or bid/bid) and the Bid-Offer acceptance MW value is less than RR acceptance MW value then Settlement shall **not** calculate Acceptance Volumes for that period.



Non-Delivery

The P344 solution requires that Period RR Total Accepted Offer / Bid Volumes are included in the calculation of Non-Delivered Volumes. This will ensure that any BSP that do not provide the necessary accepted volumes can be settled appropriately.

Deemed Standard Product Volumes and RR Instructed Offer/Bid Deviation Volumes will be included in the existing Non-Delivery Charge calculation to ensure all RR Schedule volumes can be associated with a price £/MWh. The **Deemed Standard Product Volumes** and **RR Instructed Offer/Bid Deviation** will be priced at the GB TERRE clearing / bid price and Balancing Energy Deviation Price accordingly during the allocation of Non-Delivery Order Numbers (alongside any BOAs) to Non-Delivered Volumes. This process is needed to ensure that there is no benefit in a BSP Non-Delivering on an RR Acceptance.

The technical detail of how the SAA will calculate non-delivery alongside the current arrangements is detailed in BR 21 of attachment B.

Imbalance Settlement

P344 proposes that the calculation of imbalance prices and Net Imbalance Volume (NIV) should include all the physical actions taken on the GB system (by Interconnectors or GB BSPs), but only those taken to meet a GB need should be treated as priced.

The physical actions to be taken into account and considered are:

- The Volume of GB need met as declared by TERRE;
- the sum of RR Schedule volume (i.e. GB BSP despatch); and
- the sum of Interconnector volumes for each Interconnector scheduled by TERRE.

The central TERRE platform will not state whether a given RR Acceptance is to meet a GB or other European need, meaning that Settlement cannot isolate those actions taken for a European need and ensure they are unpriced. Therefore, P344 proposes that actions (volumes/prices) are calculated at an aggregate level for each quarter hour. However,

individual actions should still be visible on the BMRS and have traceability to a given imbalance price.

The Workgroup agreed that unpriced actions relating to a given quarter-hour should be netted to minimise the introduction of unpriced actions that would be subject to repricing and could affect the final imbalance price.

Therefore Settlement will determine the following actions to be included in the imbalance price calculation:

- Volume of GB need met (as declared by TERRE) will enter the imbalance price calculation as an action with a price matching the TERRE GB clearing price;
- Settlement shall calculate an aggregated unpriced System Buy Action for any other physical action taken with volumes > 0 (i.e. to meet a foreign need); and
- Settlement shall calculate an aggregated unpriced System Sell Action for any other physical action taken with volumes < 0 (i.e. to meet a foreign need).

RR Acceptance Volumes and Energy Imbalance Volumes

RR Acceptance Volumes will need to feed into Period BM Unit Balancing Services Volume, which in turn feeds into the calculation of Non-Delivered Bid and Offer Volumes and also of Energy Imbalance Volumes.

In order to ensure that the registered Supplier of a given SVA Metering System Number in a Secondary BM Unit is not affected by that Secondary BM Unit's participation in TERRE, the Energy Imbalance Volume calculation will need to include balancing services volumes relating to that Secondary BM Unit's despatch.

In essence, Suppliers will have their imbalance position adjusted for actions taken by a Virtual Lead Party in regards to the Metering Systems they have registered.

Reporting

The P344 Workgroup agreed that new data under TERRE would be reported to BSC Parties via the existing SAA-I014 Settlement Report. Therefore, the SAA-IO14 flow shall include a number of new data groups and data items, as documented within BR 24 of attachment C.

It was also agreed that a new sub-flow of the SAA-I014 Settlement Report should be created that contains only data that would be relevant to BSC Parties who have registered solely under the Virtual Lead Party Capacity. This would not include Energy Account-level data as these Parties will not hold Energy Accounts (unless explicitly requested and therefore the relevant data can be found in the main SAA-IO14 data flow). Technical detail of the SAA-IO14 sub-flow is detailed in BR 25 of attachment B.

Due to Virtual Lead Parties potentially wishing to receive Settlement data in a different format to the NETA files, the SAA-IO14 new Settlement Report sub-flow will be made available to Virtual Lead Parties in .csv format. Virtual Lead Parties will be able to access this data through File Transfer Protocol (FTP) or via a webpage.

Data publishing on BMRS

Disaggregated Secondary BM Unit and TERRE data will be published on BMRS upon receipt from National Grid. For Secondary BM Units this will include a number of new TERRE-specific data items as detailed within BR 27.

BMRS will publish BSP TERRE bid data. The P344 solution assumes that data from National Grid will be flagged to identify whether a bid is for an upwards adjustment (increasing output) or downwards adjustment (decreasing output).

BMRS will also publish the following data:

- Secondary BM Unit Physical Dynamic Data;
- RR Bid Data;
- TERRE Auction Result Data;
    - Quarter Hour Volume of GB Need met
    - Quarter hour RR Acceptance Data
    - Quarter Hour RR Interconnector Scheduled Volume
- RR Instruction (with similar content to BOA data); and
- RR Schedule (with similar content to BOA data).

Indicative data on BMRS

The BMRA shall determine and publish a number of TERRE-specific indicative data items to be published on the BMRS in advance of actual calculated TERRE data is available for publishing. Information on the indicative data to be calculated is detailed in BR 28 of Attachment B.

Credit

The BSC credit calculations will need to include Daily Party RR Cashflow and RR Instruction Deviation Cashflow, as these are new Trading Charges and all Trading Charges are included in the calculation of Actual Energy Indebtedness. For Secondary BM Units, the proposed Settlement calculations mean that Daily Party RR Cashflow and Daily Party RR Instruction Deviation Cashflow arising from TERRE participation will be attributed to the Virtual Lead Party and not the registered Supplier(s).

Because Virtual Lead Parties are only responsible for providing Balancing Services volumes, it is inappropriate to calculate Credit Assessment Energy Indebtedness and Metered Energy Indebtedness for their Secondary BM Units. Further, other Parties such as Suppliers who happen to be the Lead Party for Secondary BM Units should also not have Credit Assessment Credited Energy Volume or Metered Credit Assessment Credited Energy Volume calculated for those Secondary BM Units. This is because this would be double-accounting in the estimation of volume.

Contingencies

Black Start

The P344 solution proposes that the existing contingency arrangements including a Black Start event are extended to cover TERRE. Notably that GB participation in TERRE is suspended alongside the BM. Any impacts on other TSOs (and compensation) due to a GB Black Start event will need to be covered under TSO-TSO agreements. We anticipate that any Non-Delivery by other TSOs due to foreign Black Start events will also be covered under these agreements.

Alternative solution

There have been a number of challenging timescales that the P344 Workgroup has been faced with during the development of the P344 solution. For instance, the central TERRE team's desire to conduct a parallel running phase commencing in quarter two of the 2019 calendar year meant that the anticipated point at which GB systems should be completed was bought forward by around three to four months. Further, there were challenges of a technical nature in relation to unknown dependencies between the GB TERRE implementation, European TERRE product design and the central TERRE platform (LIBRA). Similarly, there have been a number of technical considerations for National Grid as the P344 solution has progressed and the P344 solution has been dependent on a number of technical clarifications from the GB TSO.

In combination with these challenges, the BSC impacts from the Proposed Solution to P344 are vast. The optionality that could sit within specifics of each part of the solution could pose challenges for implementation in advance of the legal deadline, should these options be explored further by the Workgroup.

In consideration of these factors, the P344 Workgroup and Modification Proposer agreed that in order to deliver the product to market at the earliest opportunity, the solution shall be workable, with the acceptance that it may not be optimal. The P344 Workgroup and Modification Proposer alike accept that there may be further Modifications to improve the GB solution once the product is operational within the market. Due to this, the Workgroup has not suggested any Alternative solutions be raised for consideration.

Grid Code Modification GC0097

Under National Grid's Grid Code governance structure, there is the option for industry and/or the Workgroup to raise Workgroup Alternative Code Modifications (WACMs). The WACM process is similar to that of Alternative Modifications under the BSC. However, unlike the BSC, there is no limit to the number of WACMs that can be raised to be treated as alternatives to the Proposed Grid Code Modification Proposal. Should there be WACMs raised that are taken forward by the Grid Code Workgroup, the P344 Workgroup will need to assess whether the BSC solution is impacted. Should it determine that the BSC solution is impacted, the Workgroup may need to raise an Alternative solution to mirror the Grid Code solution on a technical level.

Legal text

The legal text for the P344 solution has been developed to deliver the P344 Business Requirements that have been developed by the P344 Workgroup, Proposer and ELEXON. This legal text can be viewed as Attachment A.

5 Impacts & Costs

Estimated central implementation costs of P344

Due to the challenging timescales to deliver the TERRE product within the GB market arrangements, ELEXON has been unable to conclude an Impact Assessment on the BSC Central Systems in advance of this second Interim Assessment Report.

Since the first Industry Consultation period, the solution has been further developed by the P344 Workgroup and as such, it has been determined that the previous indicative costs on BSC Central Systems would no longer be accurate. It would not be appropriate to publish these costs to industry, as they will not reflect the actual costs to deliver the Settlements solution.

ELEXON submitted the detailed Impact Assessment request to its service provider on 10 January 2018, the time at which the second Industry Consultation period commenced. The Impact Assessment response will be discussed with the P344 Workgroup alongside Consultation responses at the forthcoming Workgroup meetings during February – March 2018.

Indicative industry costs of P344

It is expected that there will be costs amongst all market participants that wish to participate in the TERRE product within the GB market in terms of system/process development, compliance and operational costs.

Those that are not currently BSC Parties but that who to participate in the TERRE product will incur further costs to accede to the BSC alongside the standing monthly charges applicable to their participation capacity.

P344 impacts

Impact on BSC Parties and Party Agents	
Party/Party Agent	Potential Impact
BSC Parties	BSC Parties and non-BSC Parties will be required to make the corresponding adjustments to their systems and process should they wish to participate in the TERRE product.
Non-BSC Parties	

Impact on Transmission Company
The Transmission Company will be required to make the corresponding adjustments to its systems and process to interact with Settlements as part of the TERRE product.

Impact on BSCCo
ELEXON will be required to make the necessary systems and process changes in order to implement this Modification.

Impact on BSC Systems and processes	
BSC System/Process	Potential Impact
BMRS	Changes will be required to implement this Modification.
CRA	
FAA	
SAA	

Impact on BSC Agent/service provider contractual arrangements	
BSC Agent/service provider contract	Potential Impact
BMRA	BSC Agents will be required to implement this Modification.
CRA	
FAA	
SAA	
SVAA	

Impact on Code	
Code Section	Potential Impact
Section A	Changes will be required to implement this Modification.
Section D	
Section J	
Section K	
Section M	
Section N	
Section P	
Section Q	
Section R	
Section S	
Section S Annex S-2	
Section T	
Section V	
Section X Annex X-1	
Section X Annex X-2	

Impact on Code Subsidiary Documents	
CSD	Potential Impact
BSCP15	Changes will be required to implement this Modification.

Impact on Code Subsidiary Documents	
CSD	Potential Impact
BSCP38	
BSCP65	
BSCP70	
BSCP71	
BSCP503	
BSCP507	
BSCP508	
BSCP537 Appendix 1	
BSCP537 Appendix 2	
BSCP537 Appendix 3	
New BSCP 1	
New BSCP 2	
Communication Requirements Document	Changes may be required to implement this Modification.
CVA Data Catalogue and Annex's A-C	
SVA Data Catalogue documents	
Reporting Catalogue	
NETA Programme, Interface Definition and Design (IDD) documents and spreadsheets	
Funds Administration Agent IDD documents	
BMRA Service Description (SD)	
CRA SD	
ECVAA SD	
FAA SD	
SAA SD	
SVAA SD	
SVAA (ISRA) Settlement Software and associated Settlement Software Documents	
BMRA User Requirements Specification (URS)	

Impact on Code Subsidiary Documents	
CSD	Potential Impact
CRA URS	
ECVAA URS	
FAA URS	
SAA URS	
SVAA URS	

Impact on Core Industry Documents and other documents	
Document	Potential Impact
Grid Code	The Grid Code is impacted by having to make changes in order to accommodate TERRE as a whole and fit in with the P344 solution that has been devised by the Workgroup.
Transmission Licence	Changes to the C16 statements will be required as a result of Project TERRE. There may be specific impacts as a result of this Modification.

Impact on a Significant Code Review (SCR) or other significant industry change projects
This Modification does not impact on any ongoing SCR.

Impact on Consumers
The implementation of this Modification will give some consumers the ability to participate in another balancing product within the market. There are no negative impacts on consumers that have been identified from the implementation of the solution to this Modification Proposal.

Impact on the Environment
This Modification does not have any direct impact on the environment.

6 Implementation

The implementation timescales surrounding Modification P344 are closely linked with the EB GL given that this document outlines the European legal obligations to implement the TERRE product across the participating markets. Further dependencies include the central TERRE parallel run and go-live window timescales.

The EB GL became law on 18 December 2017. As explained previously, Article 19 of the EB GL mandates those TSOs using the RR products to develop a European platform for the exchange of balancing energy from RR.

Article 19(1) of the EB GL requires that within six months, (i.e. by 18 June 2018) those TSOs must make a formal proposal for the platform to their National Regulatory Authorities (NRAs). Article 10 requires that the draft proposal must be subject to a public consultation lasting for at least one month before being submitted to the NRAs. Article 19(3) sets out what this proposal must cover.

Article 5 sets out that normally such a proposal must be approved by the relevant NRAs within six months of receipt. However, Article 7 allows the NRAs to agree to require an amendment to the original proposal, which would add up to four months to the process. If the relevant NRAs fail to agree, the decision will then fall to, or they may refer the decision to the Agency for the Cooperation of Energy Regulators (ACER), who has six months following referral to make a decision.

Once approved, Article 19(5) requires that the RR platform is implemented within one year and that the relevant TSOs shall strive to fulfil all their balancing energy needs from RR.

If this overall process takes the maximum permitted time, and the NRAs determine to approve the proposal at the end of the initial six month period, TERRE should go live within two years (by 18 December 2019). However, the exact legal deadline for implementation will not be known until the NRAs (or ACER) approves the RR/TERRE proposal.

Ofgem, as the GB regulator and as supported by the P344 Proposer National Grid, wishes for BSC Modification P344 to be implemented during the central TERRE parallel running phase in order that the GB market can participate in the end-to-end testing of the product. Therefore, official implementation of the BSC arrangements to facilitate TERRE should be suitable to enable this to take place.

Given development timescales and interface testing with National Grid that will be required in advance of the parallel running phase, the P344 Workgroup and Modification Proposer expects the GB market to be ready for parallel running during June – July 2019.

The format of the parallel running phase is yet to be confirmed by the central TERRE project. However, it is expected that parallel running will be a full-end to-end test, notably without actual energy volumes being delivered or payment flows being sent/received.

Subsequent to the parallel running phase, there will be a go-live window, at which point TSOs will begin to utilise the TERRE product for operational balancing of their respective TSO areas.

Should there be any material technical amendments or alterations to delivery timescales from a central TERRE project perspective during the P344 development phase, there will likely be impacts upon implementation timescales for P344 and the TERRE product.

Recommended Implementation Date

The Workgroup recommends a likely Implementation window for P344 that will enable the GB market to participate within the parallel running phase of TERRE implementation:

- June – July 2019 if the Authority's decision is received on or before 31 July 2018.

The exact implementation date will be confirmed at a later stage once the development timescales are better understood and a delivery plan is agreed between ELEXON and National Grid.

Workgroup and Proposer views against Applicable BSC Objectives

(a) The efficient discharge by the Transmission Company of the obligations imposed upon it by the Transmission Licence

Neutral (unanimous)

(b) The efficient, economic and co-ordinated operation of the national electricity transmission system

Positive (Proposer and Workgroup majority)

The Proposer believes that the P344 solution would better facilitate BSC Objective (b) as there will be both GB and EU level benefits from the TERRE product. The TSO noted that it will be able to procure balancing services at a lower balancing cost once the TERRE arrangements have been implemented within the market. Further, there will be increased competition in the market due to wider access to balancing products for market participants, greater liquidity and the netting of TSO imbalance needs. National Grid also noted that the TERRE product will act as a replacement for SO-SO trades.

The P344 Workgroup by majority supported National Grid's views as the Proposer and noted that increasing liquidity will also increase efficiency. The minority Workgroup view was neutral as there is a risk of currency conversion rates reducing the competitiveness of GB based TERRE product participants.

(c) Promoting effective competition in the generation and supply of electricity, and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity

Positive (unanimous)

The Proposer notes that broadening the provision of balancing services from a national to pan-European level is likely to promote increased competition between BSPs from different countries. The cross border sharing of reserve capacity will increase access to reserves along with access to cheaper energy on the continent. Further, it will allow GB BSPs wider access to provide balancing services to National Grid.

The P344 Workgroup membership emphasised the benefits of a wider range of market participants having the provision of providing balancing services to National Grid through the TERRE product. The P344 Workgroup also noted the efficiencies for the market of having a single Settlement provider within the market that the BSCCo will provide for the TERRE product once implemented and through Modification P344.

(d) Promoting efficiency in the implementation and administration of the balancing and settlement arrangements

Neutral (Proposer) and split (Workgroup)

A number of views were put forward by the P344 Workgroup which led to a split vote between neutral, positive and negative impacts against Applicable BSC Objective (d). Some Workgroup members noted that implementing the TERRE arrangements is making

the BSC more complicated. Further, there will likely be extensive costs involved to implement the P344 solution, however, in theory the long term BSC operating costs could be reduced as there will be a greater number of BSC Parties funding the BSCCo. One Workgroup member noted positives that ELEXON will be using its expertise to provide Settlement for the TERRE product.

(e) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency [for the Co-operation of Energy Regulators]

Positive (unanimous)

The P344 Proposer and Workgroup unanimously determined that the P344 solution better facilitates Applicable BSC Objective (e). The P344 solution will enable National Grid and BSPs to be compliant with incoming EU legislation through the EB GL. It is discharging its Settlement processes for the TERRE product through the BSCCo. Failure to comply to the ENCs would mean that the GB market risks infraction proceedings and the potential for fines to be levied against market participants.

The platforms and processes being developed will also form the basis for subsequent phases to meet other legal obligations for other balancing processes closer to real time into 2020 and beyond.

(f) Implementing and administrating the arrangements for the operation of contracts for difference and arrangements that facilitate the operation of a capacity market pursuant to EMR legislation

Neutral (unanimous)

(g) Compliance with the Transmission Losses Principle

Neutral (unanimous)

Appendix 1: Workgroup Details

Workgroup's Terms of Reference

As part of its considerations during the development of the solution to Modification P344, and as answered above as part of the P344 solution, the Workgroup covered the following areas set out in the table below:

Specific areas set by the BSC Panel in the P344 Terms of Reference for stage 2 of the Assessment Procedure
• The extent to which TERRE-related BSC processes should operate in euros.
• What assumptions need to be made to progress P344?
• What will the impact be on Gate Closure?
• What are the specific Settlement impacts? How will non-BM parties be treated under these rules?
• What accession, registration and BSC charges are needed for non-BM parties?
• What financial processes are needed (e.g. invoicing, credit and payment rules)? How will non-BM parties be treated under these rules?
• What non-delivery rules are needed (e.g. covering volumes and payments)? How will non-BM parties be treated under these rules?
• What are the failure scenarios?
• What are the reporting requirements?
• The consumer impacts from P344.

Assessment Procedure timetable

The table below depicts the full timetable for the P344 Assessment Procedure, both historic and into the future until the Panel considers the Assessment report at its meeting on 12 April 2018.

P344 Assessment Timetable	
Event	Date
Panel submits P344 to Assessment Procedure	9 June 2016
Workgroup Meetings 1 - 4	5 July 2016 – 22 September 2016
P344 Assessment Procedure Interim Report	13 October 2016
Workgroup Meetings 5 - 12	19 October 2016 – 8 February 2017
First Assessment Procedure Consultation	23 February 2017 - 14 March 2017
Workgroup Meetings 13 – 24	22 March 2017 - 12 December 2017
Second Assessment Procedure Consultation	10 January 2018 – 30 January 2018
Workgroup Meetings 25 - 28	7 February 2018 – 22 March 2018
Panel considers Workgroup's Assessment Report	12 April 2018

Workgroup membership and attendance

Please note that attendance portrayed within the table below includes attendance via teleconference.

P344 Workgroup Attendance			
Name	Organisation	Number of Workgroups attended (out of 24)	Attendance %
Members (current)			
Douglas Alexander	ELEXON *(Chair)*	22	91.7
Elliott Harper	ELEXON *(Lead Analyst)*	20	83.3
Sophie Tilley	National Grid (Proposer)	17	70.8
Greg Heavens	National Grid (Alternate)	3	12.5
Andy Colley	SSE	22	91.7
Phil Hewitt	EnAppSys Ltd	15	62.5
Liz Johnstone	NRB Interconnectors	0	0.0
Paul Jones	Uniper	18	75.0
Martin Mate	EDF	24	100.0
Bill Reed	RWE	23	95.8
Simon Reid	Scottish Power	20	83.3
Helen Stack	Centrica	10	41.7
Attendees (current and past)			
John Lucas	ELEXON	23	95.8
Matthew Roper	ELEXON	7	29.2
Elliott Hall	ELEXON	11	45.8
David Kemp	ELEXON	1	4.2
Royston Black	ELEXON	1	4.2
Simon Fox-Mella	ELEXON	4	16.7
Heather Milne	ELEXON	4	16.7
Steve Wilkin	ELEXON	9	37.5
Tina Wirth	ELEXON	8	33.3
Victoria Riley	ELEXON	1	4.2
Ed Morris	ELEXON	2	8.3
Sarah Ross	ELEXON	1	4.2
Iain Nicoll	ELEXON	1	4.2
Harry Parsons	ELEXON	1	4.2
Caroline Wright	National Grid	5	20.8
Heena Chauhan	National Grid	1	4.2
Adelle Wainwright	National Grid	3	12.5
Richard Woodward	National Grid	13	54.2
Alex Haffner	National Grid	1	4.2
Andy Paton	National Grid	1	4.2

Andrew Craig	National Grid	1	4.2
Chris Fox	National Grid	3	12.5
Haarith Dhorat	National Grid	1	4.2
John Mansi	National Grid	4	16.7
Nazar Ivasyuk	National Grid	4	16.7
Pradeep Ninan	National Grid	1	4.2
Ryan Place	National Grid	2	8.3
Adam Sims	National Grid	1	4.2
Vicci Walsh	National Grid	1	4.2
Tim Truscott	National Grid	1	4.2
Michael Coldwell	National Grid	2	8.3
Harvinder Virdi	National Grid	2	8.3
Pete Underhill	National Grid	1	4.2
John Kelly	National Grid	1	4.2
Julian Dyer	National Grid	1	4.2
Pavinder Babra	National Grid	1	4.2
Bernie Dolan	National Grid	4	16.7
Francesca Scucces	National Grid	6	25.0
Grendon Thompson	Ofgem	8	33.3
Leonardo Costa	Ofgem	9	37.5
Dominic Scott	Ofgem	1	4.2
Shai Hassid	Ofgem	3	12.5
Marcelo Torres	Ofgem	2	8.3
Alan McFadden	SSE	1	4.2
Steve Atkins	SSE	1	4.2
Tim Ellingham	RWE	1	4.2
Craig Taylor	Engie	3	12.5
Chris Fisher	Centrica	6	25.0
Samantha Pinder	Centrica	1	4.2
Mari Toda	EDF	1	4.2
Steve Taylor	Quorum Development	20	83.3
Anthony Waite	Upside Energy	2	8.3
Richard Hardy	KiWi Power	2	8.3
Yoav Zingher	KiWi Power	1	4.2
Andrew Heygate-Browne	Welsh Water	1	4.2
Andrew Dodson	City Holdings	1	4.2
Mark Symes	Green Frog Power	2	8.3
Graz Macdonald	Green Frog Power	2	8.3
Jonathan Graham	The ADE	2	8.3
William Caldwell	The ADE	4	16.7
Rick Parfett	The ADE	4	16.7
Saskia Barker	Flexitricity	12	50.0
Philip Pearson	Energy Pool EU	1	4.2
Matthew Tucker	Welsh Power	2	8.3
Ryan Goddard	Welsh Power	4	16.7

Paul Sanders	New Stream Renewables	2	8.3
Colin Prestwich	Smartest Energy	10	41.7
Simon White	Smartest Energy	2	8.3
Dago Cedillos	Open Eneri	2	8.3
Sebastian Blake	Open Eneri	1	4.2
Hannah Robertson	Origami Energy	2	8.3
Matthew Berry	Origami Energy	1	4.2
Arthur Probert	Ameresco	1	4.2
Vandad Hamidi	Dong Energy	1	4.2
Ian Tanner	UK Power Reserve	2	8.3
Aditi Tulpule	Nabarro	2	8.3
Sam Botterill	Independent	6	25.0
Tom Edwards	Cornwall Energy	2	8.3
Romain Benquey	Restore	1	4.2
Sam Do	UKPN	1	4.2
Nick Sillito	Peakgen	1	4.2
Mark Meyrick	Ecotricity	1	4.2
Carolina Escudero	UK Power Networks	2	8.3

Appendix 2: Glossary & References

Acronyms

Acronyms used in this document are listed in the table below.

Acronyms	
Acronym	Definition
ACER	Agency for the Cooperation of Energy Regulators
ADE	Association for Decentralised Energy
AEI	Actual Energy Indebtedness
BEDP	Balancing Energy Deviation Price
BM	Balancing Mechanism
BMRA	Balancing Mechanism Reporting Agent (BSC Agent)
BMRS	Balancing Mechanism Reporting Service
BM Unit	Balancing Mechanism Units
BOA	Bid-Offer Acceptance
BR	Business Requirement
BSC	Balancing and Settlement Code
BSCCo	Balancing and Settlement Code Company
BSCP	Balancing and Settlement Code Procedure
BSP	Balancing Service Providers
CEI	Credit Assessment Energy Indebtedness
CMO	common merit order
CRA	Central Registration Agent
CSD	Code Subsidiary Document
CVA	Central Volume Allocation
DECC	Department for Energy and Climate Change
DTC	Data Transfer Catalogue
EB GL	European Electricity Balancing Guideline
ECVN	Energy Contract Volume Notification
EMFIP	Electricity Market Fundamental Information Platform
EMR	Electricity Market Reform
ENC	European Network Codes
ENTSO	European Network of Transmission System Operators for Electricity
EU	European Union
EUR	Euro
FAA	The Funds Administration Agent
FPN	Final Physical Notification

Acronyms	
Acronym	Definition
FTP	File Transfer Protocol
GB	Great Britain
GBP	Pound Sterling
GC	Grid Code
GSP	Grid Supply Point
HH	Half Hourly
HHDA	Half Hourly Data Aggregators
II	Interim Information Run
LIBRA	The central TERRE platform
MEI	Metered Energy Indebtedness
MSID	Metering System Identifiers
MW	Megawatt
NETA	New Electricity Trading Arrangements
NETS	National Electricity Transmission System
NIV	Net Imbalance Volume
R1	First Reconciliation Settlement Run
R2	2nd Reconciliation Run
RF	Final Reconciliation Run
RR	Replacement Reserve
SAA	Settlement Administration Agent (BSC Agent)
SCR	Significant Code Review
SF	Initial Settlement (Settlement Run)
SO	System Operator
STOR	Short Term Operating Reserve
SVA	Supplier Volume Allocation
SVAA	Supplier Volume Allocation Agent (BSC Agent)
TERRE	Trans-European Replacement Reserves Exchange
TSO	Transmission System Operators
UK	United Kingdom
URS	User Requirements Specification
WACM	Workgroup Alternative Code Modifications
XB	cross border
ACER	Agency for the Cooperation of Energy Regulators
ADE	Association for Decentralised Energy
AEI	Actual Energy Indebtedness

Acronyms	
Acronym	Definition
BEDP	Balancing Energy Deviation Price
BM	Balancing Mechanism
BMRA	Balancing Mechanism Reporting Agent (BSC Agent)
BMRS	Balancing Mechanism Reporting Service
BM Unit	Balancing Mechanism Units
BOA	Bid-Offer Acceptance
BR	Business Requirement
BSC	Balancing and Settlement Code
BSCCo	Balancing and Settlement Code Company
BSCP	Balancing and Settlement Code Procedure
BSP	Balancing Service Providers
CEI	Credit Assessment Energy Indebtedness
CMO	common merit order
CRA	Central Registration Agent
CSD	Code Subsidiary Document
CVA	Central Volume Allocation
DECC	Department for Energy and Climate Change
DTC	Data Transfer Catalogue
EB GL	European Electricity Balancing Guideline
ECVN	Energy Contract Volume Notification
EMFIP	Electricity Market Fundamental Information Platform
EMR	Electricity Market Reform
ENC	European Network Codes
ENTSO	European Network of Transmission System Operators for Electricity
EU	European Union
EUR	Euro
FAA	The Funds Administration Agent
FPN	Final Physical Notification
FRR	Frequency Restoration Reserve
FTP	File Transfer Protocol
GB	Great Britain
GBP	Pound Sterling
GC	Grid Code
GSP	Grid Supply Point
HH	Half Hourly

Acronyms	
Acronym	Definition
HHDA	Half Hourly Data Aggregators
LIBRA	The central TERRE platform
MEI	Metered Energy Indebtedness
MSID	Metering System Identifiers
MW	Megawatt
NETA	New Electricity Trading Arrangements
NETS	National Electricity Transmission System
NIV	Net Imbalance Volume
RR	Replacement Reserve
SAA	Settlement Administration Agent (BSC Agent)
SCR	Significant Code Review
SF	Initial Settlement (Settlement Run)
SO	System Operator
STOR	Short Term Operating Reserve
SVA	Supplier Volume Allocation
SVAA	Supplier Volume Allocation Agent (BSC Agent)
TERRE	Trans-European Replacement Reserves Exchange
TSO	Transmission System Operators
UK	United Kingdom
URS	User Requirements Specification
WACM	Workgroup Alternative Code Modifications
XB	cross border

External links

A summary of all hyperlinks used in this document are listed in the table below.

All external documents and URL links listed are correct as of the date of this document.

External Links		
Page(s)	Description	URL
3,10,12	GC0097 'Grid Code Processes Supporting TERRE'	https://www.nationalgrid.com/uk/electricity/codes/grid-code/modifications/gc0097-grid-code-processes-supporting-terre
5	Issue 60 'Interfaces between the European Balancing Project TERRE and the current GB market arrangements'	https://www.elexon.co.uk/smg-issue/issue-60/

External Links		
Page(s)	Description	URL
5, 18	P344 Project TERRE implementation into GB market arrangements'	https://www.elexon.co.uk/mod-proposal/p344
8	P114 'Entitlement of Licence Exemptible Generators (LEGs) and other Non-trading Parties to BSC Membership Without Evidence of Trading'	https://www.elexon.co.uk/mod-proposal/p114-entitlement-of-licence-exemptable-generators-legs-and-other-non-trading-parties-to-bsc-membership-without-evidence-of-trading/
8	Further information on data flows	https://www.elexon.co.uk/about/other-services/data-flows/
8	Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation	http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R1485&from=EN
9	Balancing Mechanism Reporting System website	https://www.bmreports.com/bmrs/
9	P295 'Submission and publication of Transparency regulation data via the BMRS'	https://www.elexon.co.uk/mod-proposal/p295/