

GC0097 Proposal Updates

1st November 2017



Action Update: IT User Groups

Drivers

- Ofgem / participant feedback about more engagement around System Operator IT developments
- Significant change within the industry over the next few years that will impact IT systems:-
 - EU Codes
 - Multiple BSC modifications (inc P354 & P355)
 - Demand Side participation
 - EBS
 - Flexibility programme

Proposal

- New internal approach to governance will co-ordinate work across multiple projects to ensure joined-up approach to development and deployment
- Opportunity exists for a similar approach to engagement on IT systems to optimise industry time and resources
- This update was shared at the Operational Forum on 19th Oct
- Specific Terms of Reference to follow

Aggregation: Geographical limits

- Since first consultation on P344 National Grid has raised concerns about allowing aggregation across a GSP group.
 - Uncertainty around impact to operational security
 - Risk of no visibility of large volumes of energy, potential for exacerbation of constraints
- Recent work with control room has suggested the need for visibility at a GSP level
- Feedback has suggested that this is not acceptable for many of our stakeholders.
 - Inconsistent with current BSC wording, level playing field issues
- Therefore, further work needs to be done by NG to understand if how these operational security concerns can be mitigated

Project TERRE: Recent progress

- Mods processes were delayed to allow for further work on understanding the impacts of TERRE
 - Key concerns existed around operability of the process and interactions with BM and other timescales.
- The following measures were taken to increase our understanding:
 - Workshops with commercial and operational experts to validate key decisions
 - War games: playing through scenarios with varied system conditions to understand decisions faced by different parties and consequential impacts on behaviours.

Project TERRE: Recent progress

- Findings:
 - TERRE creates an additional opportunity for BSPs, but also additional complexity (particularly for second half hour of period)
 - Pay as bid vs pay as clear led to a change in behaviour from BSPs
 - There is a risk that the interactions between the two parallel markets with different payment structures can be exploited if the design of TERRE is not carefully considered from this perspective. Particularly in the case of using one for energy and the other for locational requirements.
- Next steps
 - Extension of war games internally and externally
 - Further analysis into potential liquidity and uses for TERRE
- Thank you for your patience!

Proposal updates

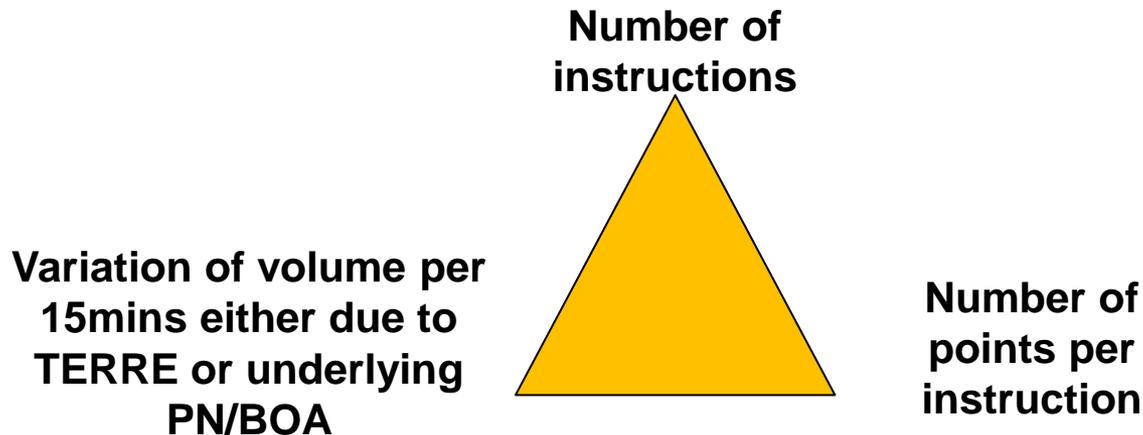
Replacement Reserves E2E Process



- Key areas to cover today:
 - **Dispatch of RRIs** → timings and type of instruction
 - **TERRE/ BM interactions** → Proposal for dealing with overlap between the two markets
 - **Shape of delivery** → Instruction of ramps and settlement implications
- To be covered at subsequent meeting
 - Pre-qualification arrangements

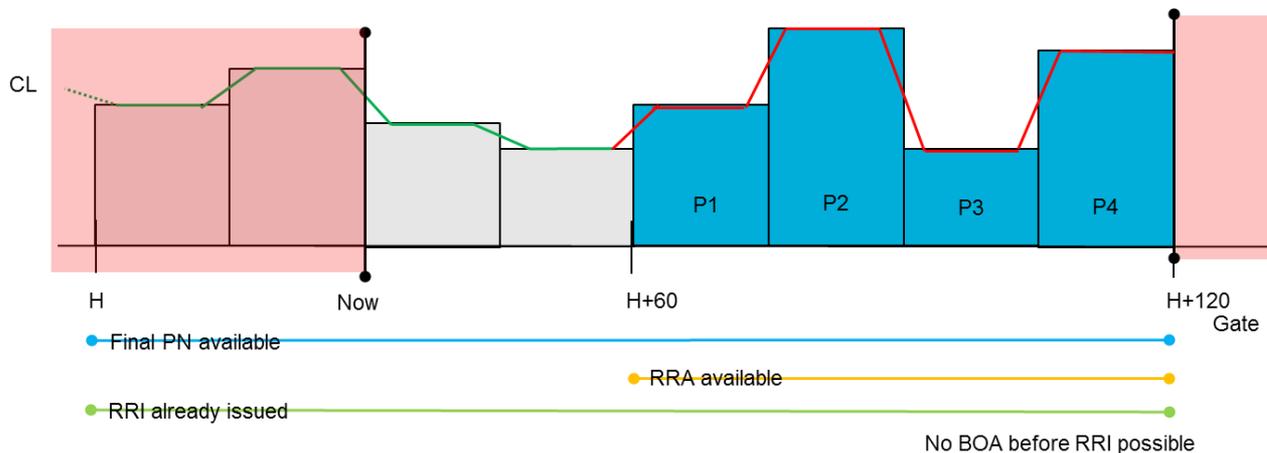
Dispatch of RRs: Options

- How National Grid will instruct BSPs to deliver the TERRE volumes is a key design choice
- There has been a lot of thinking about how to handle this and there are three options present for consideration:
 - BOA based RR Instructions
 - Delta MW RR Instruction
 - Power Profile RR Instruction
- When considering the above options we need to consider the relationship between the following elements
- Note we also assume that all instructions will be automated and issued at or after H-30 (hence we will have a PN from which to instruct – for more info see appendix)

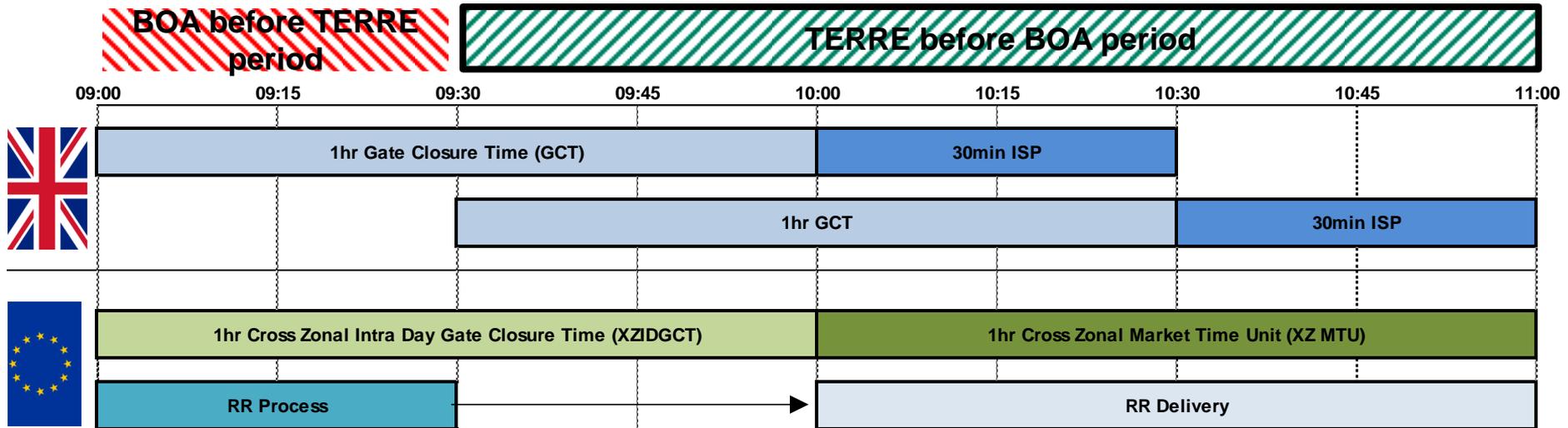


Dispatch of RRIs: Proposed solution

- National Grid will instruct units activated in TERRE using a BOA based Replacement Reserve Instruction (RRI)
- RRIs will be start being issued at H-30
- RRIs will be issued in sequence as close as possible to each other once the previous RRI has been accepted (see example below)
 - RRIs for P1-P4 are issued in sequence from H+30
 - Possible because PNs for periods P3 and P4 become final immediately at H+30
 - Because RRIs now extend to the BM gate, BOAs can only alter the post-RRI CL
 - The 'full delivery' for P1 is at H+65 so the P1 RRI has 35 minutes' notice
 - Because the ramp after P4 is outside the BM gate, the RRI between H+115 and H+120 will have to be modified by the starting ramp of the next RR cycle

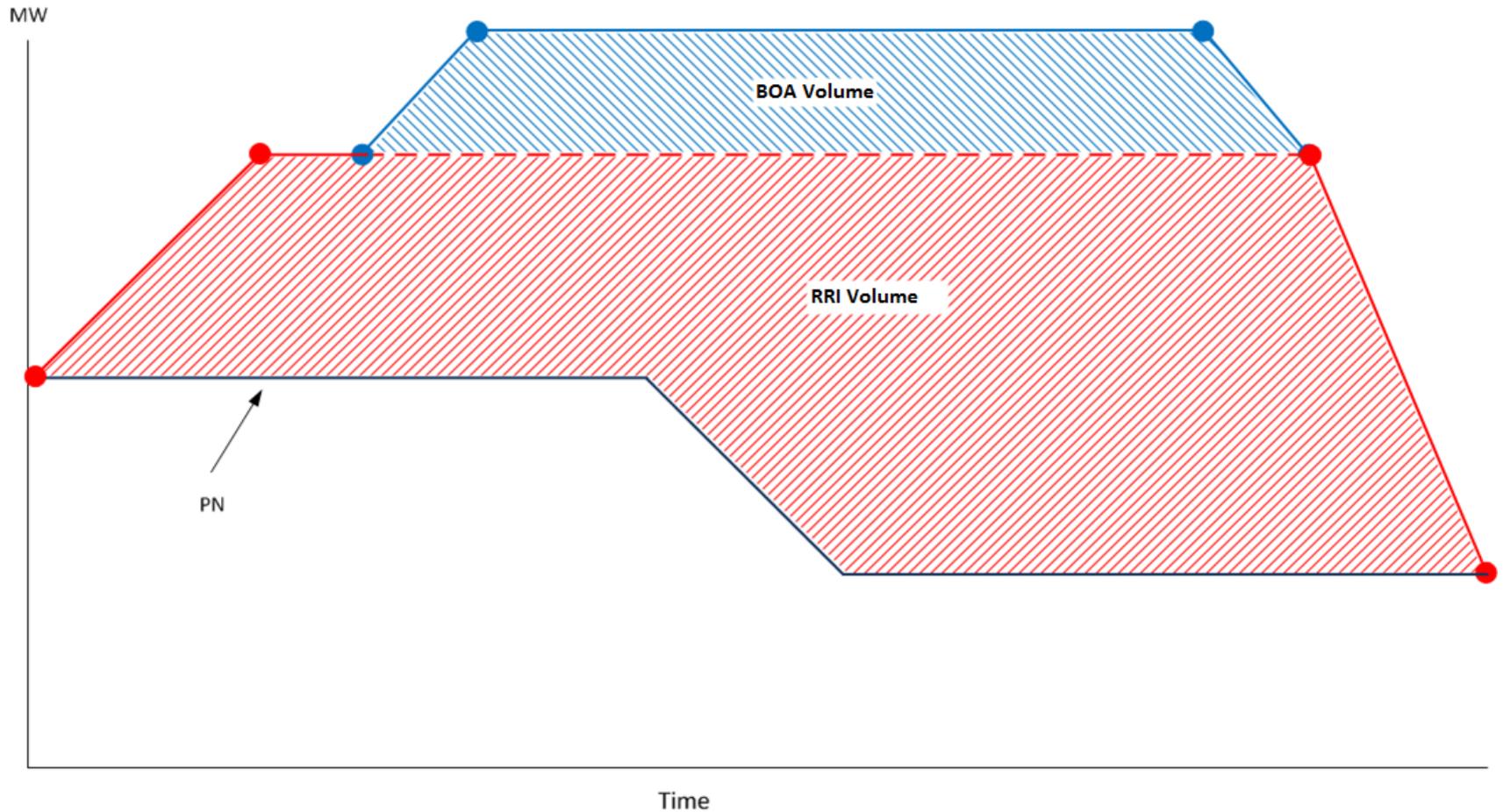


TERRE/ BM interactions: RRI before BOA

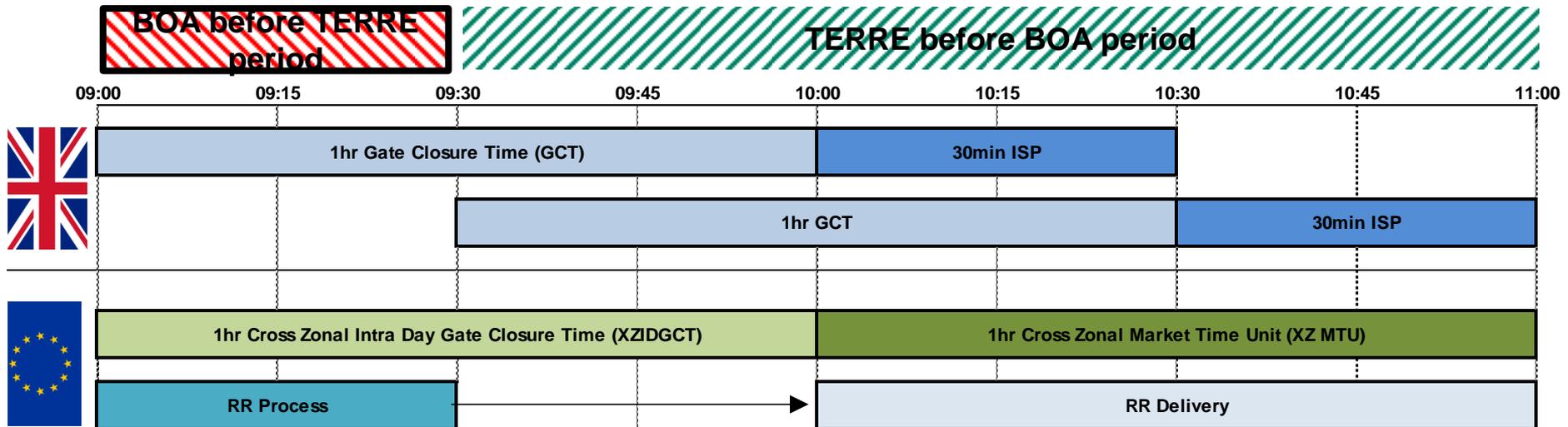


- Following the issuing of the RR Instructions NG will continue to use the BM hence there is an 1.5hr window where BOAs can be issued to units that are in both TERRE and the BM and may have already been issued an RRI
- We propose this is treated exactly the same as when further BOAs are issues on top of previously issued BOAs – i.e. the new baseline for the unit effectively becomes CCL+/- RRI

TERRE/ BM interactions: RRI before BOA



TERRE/ BM interactions: BOA before RRI

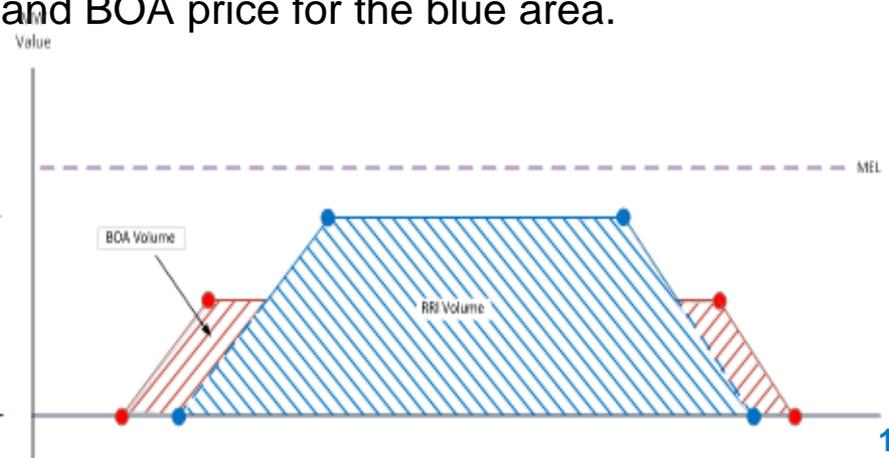
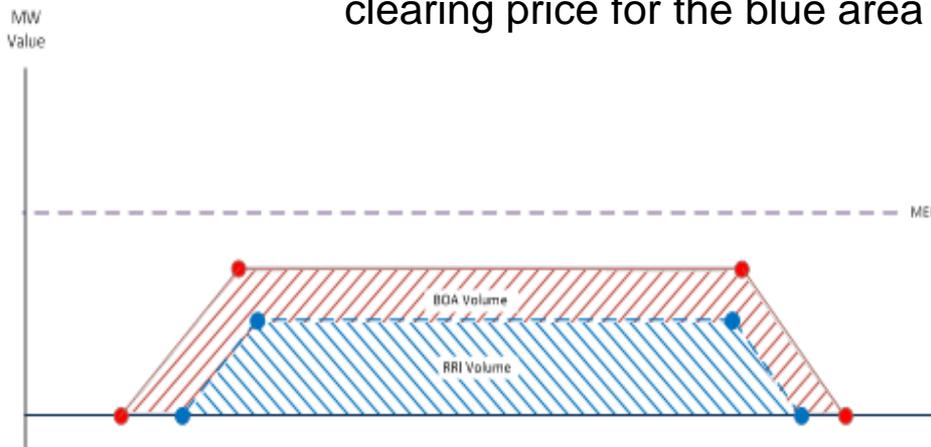


- As shown above due to the delay in RR offer submissions and activations in each 2hr window there is a 30min window where it is possible to issue BOAs to a unit that is then subsequently activated in TERRE.
- RR offers and needs are submitted at H-45 (09:15) therefore there is the possibility to restrict RR offers if a BOA is issued in the first 15min (09:00-09:15)
- Only an issue for BOAs issued in this time window which overlap with RR delivery window
- We have identified the following possible scenarios
 - BOA before RRI same direction
 - BOA before RRI in opposite directions

TERRE/ BM interactions: BOA before RRI proposed solution

■ Actions in the same direction:

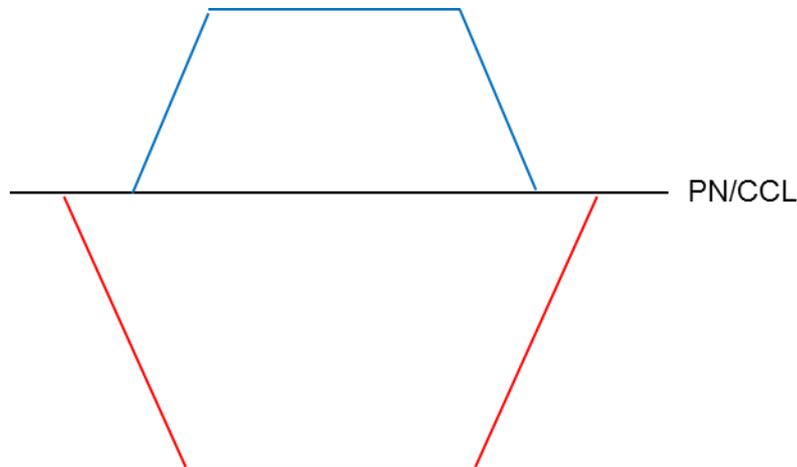
- The restriction of RRIs will occur when a BOA has been issued between H-60 and H-45 if deemed necessary
- When a BOA has been issued before an RRI and they are in the **same direction** and the **BOA volume is larger** than the RRI, no RRI will be issued
 - unit to be settled for the RRI volume using the RR Activation with the remaining volume settled at the BOA price (i.e. the red area in the bottom left diagram)
- When a BOA has been issued before an RRI and they are in the **same direction** and the **RRI volume is larger** than the BOA, a RRI will be issued for the difference (blue area above red area in bottom right diagram).
 - The RR schedule will be used to ensure that the unit is paid the TERRE clearing price for the blue area and BOA price for the blue area.



TERRE/ BM interactions: BOA before RRI proposed solution

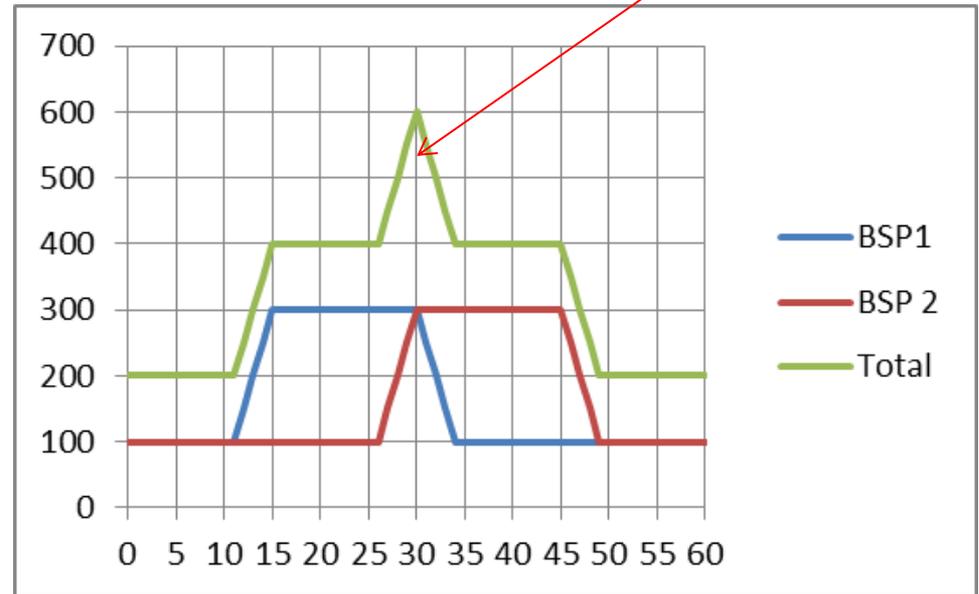
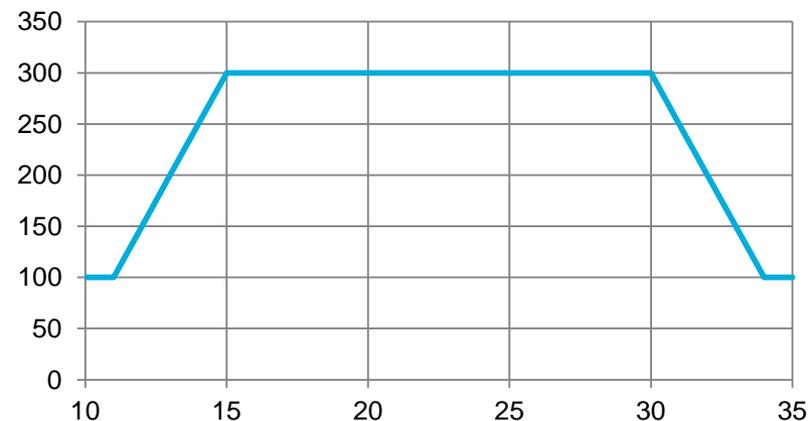
■ Actions in opposite directions:

- Where a BOA has been issued before an RRI and they are in **opposite directions** the RRI will not be issued and the unit will continue to follow the instructed BOA output.
- *There is a concern around gaming between TERRE and BM that could result in the unwinding of RRIs being exploited. The following options are being considered to mitigate this:*
 - **Option 1:** By automatically unwinding the RRI at the bid/offer price in the BM
 - **Option 2:** By automatically unwinding the RRI at the bid/offer price in the BM but capping the unwinding cost at £0
 - **Option 3:** By removing any unwinding cost for the RRI



Shape of delivery: full delivery by product boundary

- Previous discussions have centred on whether the standard TERRE product is a block (ramping energy outside 15min delivery window) or a trapezoid (standardised ramps)
- The diagram below shows the situation where the standard TERRE product is a block and the ramping energy is outside of the 15min delivery period and is unpriced
- This results in a consistent over delivery of net energy due to ramps

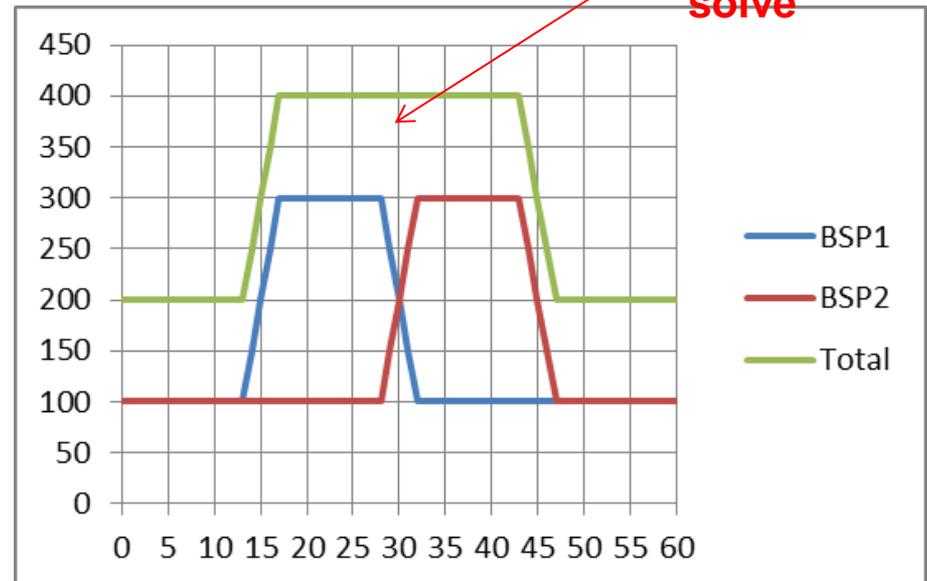
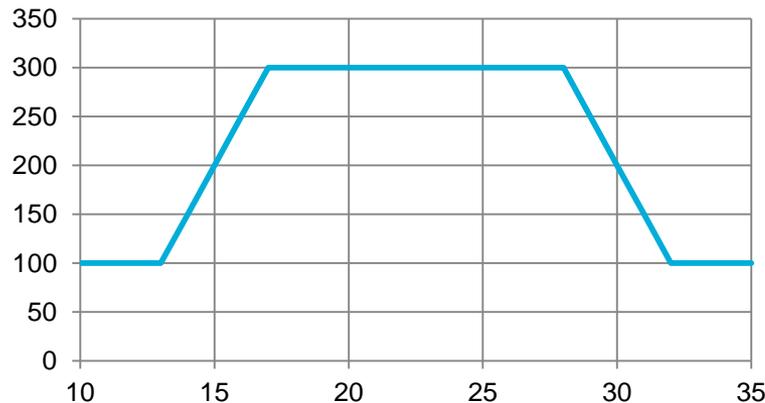


Large deviation
on boundaries

Shape of delivery: full delivery 5mins after product boundary

- Previous discussions have centred on whether the standard TERRE product is a block (ramping energy outside 15min delivery window) or a trapezoid (standardised ramps)
- The diagram below shows the situation where the standard TERRE product is a trapezoid with standardised ramps of 10mins (5mins either side of the boundary) and the ramping energy is partly outside/inside the 15min delivery period and the standard ramp is priced
- This should lower the net over delivery of energy due to ramps

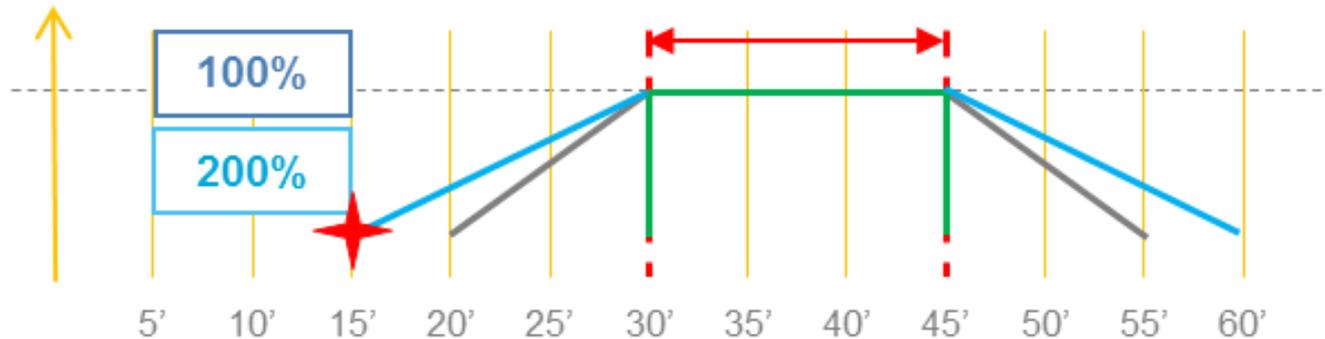
**Less deviation
lower cost to
solve**



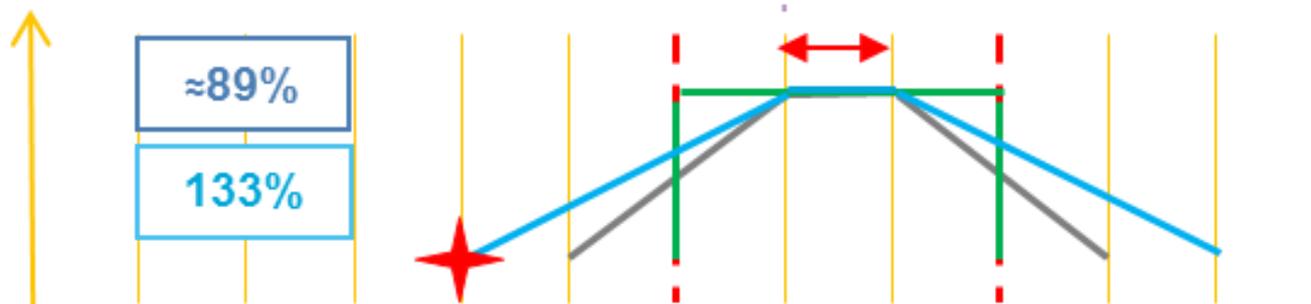
Shape of delivery: total energy delivered

- Dark blue box shows the % of the volume delivered in the period requested
- Light blue box shows the total % of energy delivered compared to what was requested
- A trapezoid standard product means that less ramping energy is unpriced but that less energy is delivered within the requested period however the overall volume delivered is less versus requested is less

Original proposal:



Latest proposal:



Shape of delivery: Proposal

- The TERRE product will assume a standardised ramp of 10mins starting 5mins before the delivery period
- The Full Activation Time will be between 0-5mins into the 15mins scheduling period
- Energy delivered under the standardised product shape will be priced
- Energy delivered outside the standardised product shape will be unpriced
- There will be a minimum duration of full delivery of 5mins
- Elexon's previously suggested approach of a Deemed Standard Product Shape and Balancing Energy Deviation to be followed

