

Respondent A

Please share your feedback on NGESO's overall strategy for frequency response and reserve, including the plan to move to a single, simultaneous, co-optimised auction, and the new market design and auction platform (please see sections A, B, and C above).	
Respondent A is strongly in support of a co-optimised auction. The co-optimised approach will reduce financial and reputational risk on providers which is inherent in the current manual EPEX process. We are strongly in favour of the use of API to interface with the EAC platform. We are disappointed to hear of delays to the Reserve services being added to the EAC platform.	Thank you for your support of co-optimisation and the use of API to interface with the EAC platform. We also note your disappointment with the delay to the launch of Quick and Slow Reserve services. These have been delayed in light of the significant changes that would have been required in our existing, legacy balancing systems and processes, given the complexity of the new service designs. At present, we are still re-examining our proposed service design options and evaluating our IT solutions. The Reserve Reform team plan to share and seek feedback on these developments in September.
Please share your feedback on the proposal to amend the existing frequency response procurement rules to enable a cutover to the new platform and auction clearing algorithm.	
This is a sensible approach to have one set of procurement rules covering both response and reserve services as these services will be procured from a single market platform.	Thank you for the feedback in support of this change.
Please share your feedback on the proposed design of co-optimisation in the new market clearing algorithm (please see section F above).	
Co-optimisation is a welcomed addition to the new market clearing algorithm as it reduces the "game theory" aspect of the current market structure and allows us to de-risk many of our optimisation processes.	Thank you for the feedback in support of this change.
Please share your feedback on the proposed design of service stacking for frequency response services (please see section G above). Do you expect any problems to comply with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services?	
We do not anticipate an issue with delivering stacked frequency services. We also do not foresee any issue with a faster speed of response from DR when stacked with DC or DM. Through injection testing of frequency services, the assets have already proven to be capable of delivering sub 1-second response.	Thank you for providing this confirmation.
Please share your feedback on the proposed changes to the specification of sell orders (please see section H above).	
While the proposed changes to sell orders increases complexity for order creation and submission, the fact that these are necessary to allow co-optimisation is worthwhile. Any tools within the auction platform to facilitate with the complexity of these orders would be appreciated, such as the	We plan a series of Market Trials, where providers will have the opportunity to submit offers into simulated auctions that are cleared against representative ESO buy orders. Providers will be supported during the Trials, and we will give all participants in the Trials the

<p>possibility to create sets of default or template orders which can be easily applied to auctions.</p>	<p>opportunity to ask questions about offer submission and market clearing.</p> <p>In production, the User Interface will have the capability to clone a basket, which may then be edited. Users can use this facility to create their own templates.</p>
<p>Please share your feedback on the proposed changes to the clearing algorithm to NGESO buy orders to be paradoxically accepted (“overholding”) to increase overall market welfare (see section I above).</p>	
<p>Overholding makes sense in a market structure where there is only one buyer (NGESO) whose requirements don’t need to be equal to a single value. Additional DCMR response volume at a lower cost for NGESO can only benefit system stability and reduce overall costs to end consumers.</p>	<p>Thank you for the feedback in support of this change.</p>
<p>Please share your feedback on the proposal to allow negative prices for buy orders, sell orders, and market clearing prices (see section J above). Will there be impacts to provider settlement systems? Do you have any recommendations to NGESO?</p>	
<p>Removed for confidentiality.</p>	<p>Removed for confidentiality.</p>
<p>Please share your feedback on the proposed changes to performance monitoring for frequency response to accommodate stacked services (see section K above).</p>	
<p>Respondent A supports the proposal to have a different k-factor calculation for each contracted product.</p> <p>A separate K value for combine High and combined low services makes sense. However, with the increased complexity we do need multiples of very clear examples with the supporting calculations provided.</p>	<p>Thank you for your feedback. ESO is working to produce updated excel calculators to support the understanding of the methodology. The provider will be able to analyse individual settlement period data and replicate the calculations from our performance monitoring system.</p>
<p>Please share your feedback on the proposal to amend the settlement formula to accommodate negative prices, and to ensure a meaningful settlement adjustment in case the market clearing price is close to £0/MW/h (see section L above). What are your thoughts on NGESO’s proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance?</p>	
<p>Other comments on negative pricing have been provided in response to Question 7. Respondent A understand that NGESO want to introduce negative pricing, especially in high frequency products, and that NGESO has to have a way to incentivise accurate delivery. However, the risk of providing a high</p>	<p>Thank you very much for this detailed response. The ESO acknowledges the concerns raised by respondents regarding the consequences of the settlement adjustment methodology when the market clearing price is negative, and the potential adverse outcomes</p>

service at a negative price under the current k-factor methodology may be too great to warrant Providers offering these prices. A less punitive penalty regime may lead to increase incentivisation to bid at negative prices; we believe this can still be done in a way that continues to ensure service delivery to the ESO. The below suggestion is a potential method that ESO could consider to re-evaluate the k-factor calculation for all services:

- Issue: current rules state lowest K value in a settlement period sets the K value for that settlement period, and the lowest K value SP sets the multiplier for revenue for that EFA block. This means that a provider could deliver a service perfectly for 03:59:59 (HH:MM:SS) but for less than 1s they did not deliver and lose the whole EFA block as revenue. This becomes even more of an issue in negative pricing as the Provider would then need to pay the ESO for this 1s of under-delivery.
- Solution: continue with the lowest K value in an SP sets the K value for that SP. However, it only acts as a multiplier for revenue in that SP and not for the entire EFA block. Furthermore, if there are more than 3 (as an example) SPs with K value fails in an EFA block, the average of those three K values fails sets the K value for the EFA block.

We would be happy to discuss this in more detail.

on market participation and market clearing. We will therefore modify the proposed settlement adjustment methodology in line with the suggestion of some respondents and propose instead a fixed settlement adjustment for poor performance when the market clearing price is negative, rather than an adjustment equal to the absolute value of the market clearing price.

Our revised proposal for the settlement adjustment methodology defines a “Minimum Adjustment Price”, which we propose to be £1/MW/h. If the market clearing price is greater than or equal to the minimum adjustment price, then the settlement adjustment price is equal to the market clearing price; while if the market clearing price is less than the minimum adjustment price, then the settlement adjustment price is equal to the minimum adjustment price.

For example, if a unit has a K-factor equal to zero for a particular frequency response service, the settlement will be £0/MW/h if the market clearing price is greater than or equal to £1/MW/h (i.e., consistent with the current methodology). If the market clearing price is less than £1/MW/h, then the settlement will be equal to the market clearing price less £1/MW/h, which will result in a payment from the provider to the ESO. For example, if the market clearing price is £0.25/MW/h, then settlement will be £ -0.75/MW/h (resulting in a payment to the ESO), while if the market clearing price is £ -6/MW/h, then the settlement will be £ -7/MW/h (rather than £ -12/MW/h under the methodology proposed by the ESO in the Consultation documents).

Thank you also for your proposal to calculate the K-factor for each Settlement Period rather than each EFA block. At this time, we are not proposing to change the period of time over which the K-factor applies. We will continue to evaluate the effectiveness of our market

	<p>monitoring methodology, and will propose changes as necessary to improve the effectiveness of the market and of service delivery.</p>
<p>NGESO plans to enable separate disarming codes for each frequency response service (DC, DM, DR). This is a prerequisite for enabling the stacking of frequency response services. What are the impacts of this change on providers (units providing frequency response, control technology, internal systems, etc.)? What recommendations and advice do you have for NGESO?</p>	
<p>More information needs to be providing on the disarming and rearming codes and how these will be communicated to BM and non-BM providers. At the moment, the service terms refer only to “electronic means”. It has not been possible to find other literature from the ESO on this topic, therefore more information is required to comment fully on this proposal.</p> <p>Questions to ESO:</p> <p>What mechanism will NGESO use to send the notifications (EDT/EDL Quorum similar to REAS instructions?)</p> <p>How do we respond to acknowledge/ accept the disarm instruction?</p> <p>How fast do we have to accept / reject the disarm instruction and disarm a unit?</p> <p>How are disarm notifications tracked / accounted for in delivery metrics?</p> <p>Will there be potential for re-arm codes?</p> <p>Depending on how the code instructions will be issued etc will determine how we develop and deploy our response to the instruction.</p>	<p>The proposal to introduce new disarming and rearming codes is currently under development. We expect to go-live with stacking at the same time as we launch the new EAC platform, and the new disarming and rearming codes will follow at a later date. We included this question in our Consultation to give early visibility of the issue to Frequency Response providers and to get initial feedback that could support the development of the proposal. We will update market participants with our detailed proposal when it has been developed further.</p> <p>Thank you for highlighting the particular issues of concern to you. We will address these in our detailed proposal.</p>
<p>Do you have any additional feedback on the proposed new Reserve/Response Procurement Rules?</p>	
<p>No additional comments.</p>	
<p>Do you have any additional feedback on the proposed amendments to the Frequency Response Service Terms?</p>	
<p><u>ABSVD</u></p> <p>The new service terms state that ABSVD will continue to only be applied to BM assets. NGESO needs to approach ABSVD in the same way for both BM and non-BM assets. Applying ABSVD to BM only will cause disparity in market participants pricing, which in a Pay as Clear market could result in a higher overall cost of service.</p>	<p>Thank you for highlighting this. The Response reform team are reviewing ways to align ABSVD for BMUs and non-BMUs as part of our Response reform work. Significant changes to IT systems and processes have already been identified and work has already been undertaken to deliver some of the new systems which would be required. They are working to confirm timelines for addressing the</p>

	remaining barriers and hope to be able to share these in the next couple of months as part of our Response reform future plans.
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Respondent B

<p>Please share your feedback on NGESO's overall strategy for frequency response and reserve, including the plan to move to a single, simultaneous, co-optimised auction, and the new market design and auction platform (please see sections A, B, and C above).</p>	
<p>Overall, we are supportive of the plan to move to a single, simultaneous, co-optimised auction as it should lead to efficiencies. We welcome the ability to stack different services and request that the 'Stacking Guidance' document (referenced in the New Response Service Terms) is also reviewed and updated. In addition, we have flagged that the MEL guidance is wrong in the existing document. We believe it is important to allow participants sufficient time for units to test their stacking capabilities such as their ability to deliver a faster ramp rate for DR when stacked with DC or DM. If there are any significant issues during testing, we recommend it is extended.</p>	<p>Thanks for your feedback. We understand the concern around the state of energy rules. ESO is currently reviewing the state of energy guidance within our Response Reform timelines. This includes the ramp rate review taking into consideration stacked services. More details will be shared with the industry when the studies are completed.</p> <p>We will take the proposal into consideration and inform the market of the decision in due course. We recognise that this is a significant change for market participants and will ensure that participants readiness is fully considered prior to the transition to EAC.</p>
<p>Please share your feedback on the proposal to amend the existing frequency response procurement rules to enable a cutover to the new platform and auction clearing algorithm.</p>	
<p>We don't see any issues with the planned cutover. We believe it will be more important to share the data and results of the auctions. This will also be important during the testing phase to enable participants time to monitor and assess their performance.</p>	<p>Thank you for this feedback we will ensure this is taken into consideration for the testing phase.</p>
<p>Please share your feedback on the proposed design of co-optimisation in the new market clearing algorithm (please see section F above).</p>	
<p>We are supportive of the new clearing algorithm and bidding structures. We ask that the ESO are clear about their volume targets and how they will evolve. We also understand that they may re-optimize the volume across products i.e., if there is insufficient volume in DC then they may buy more DM. It will be important for the market to have transparency of the volume options.</p>	<p>NGESO buy orders will be published in full ex-post after each auction. Buy orders that are substitutable (i.e., where offered volume of one service may substitute NGESO requirements for another service) will be indicated in the data publication. While the specific quantity of each service that is substitutable will vary from day to day depending on actual network conditions, NGESO's approach to the use of this feature of the market design will be transparent to all market participants.</p>

Please share your feedback on the proposed design of service stacking for frequency response services (pleases see section G above). Do you expect any problems to comply with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services?

We believe that the faster response time for DR will place additional stress on batteries, which may mean some batteries only enter DR and don't stack. Therefore, the testing phase will be important to encourage stacking with DR. During the testing phase and during early go-live, we recommend that there is a brief period of penalty relief while units settle into the EAC. We ask that the ESO provide clarity in advance as to whether this will be permitted to avoid any confusion for participants. This was an issue for the introduction of DC when there was uncertainty on the start date of the penalty calculation.

Thanks for your feedback. We expect that participants will have the opportunity to offer to stack services from Day 1 of the go-live of the new platform. However, participants are under no obligation to offer service stacking, and can instead restrict themselves to the submission of baskets each containing only a single service (i.e., either DC or DM or DR). In particular, providers have the opportunity to stack fast and slow services if they wish, but are not obliged to do so, and may therefore protect their battery units against a perceived risk of additional stress.

In the case where a provider does not offer any baskets containing more than a single service, on EAC Day 1 all rules relating to service delivery and performance monitoring will remain unchanged from current practice. Service stacking is an extension to the current terms for service delivery.

We are planning that performance monitoring will be applied from Day 1 of the market, but we will monitor outcomes and adjust the application if necessary.

Please share your feedback on the proposed changes to the specification of sell orders (please see section H above).

The proposal makes sense, and we are supportive of the logic.

Thank you for the feedback in support of this change.

Please share your feedback on the proposed changes to the clearing algorithm to NGENSO buy orders to be paradoxically accepted ("overholding") to increase overall market welfare (see section I above).

We are supportive of the proposal for the benefit of overall market welfare.

Thank you for the feedback in support of this change.

Please share your feedback on the proposal to allow negative prices for buy orders, sell orders, and market clearing prices (see section J above). Will there be impacts to provider settlement systems? Do you have any recommendations to NGENSO?

We recommend that NGENSO has a cap on negative prices to avoid accidental errors.

A minimum market price is defined for the market. Bid prices, offer prices, and market clearing prices must be above this floor. This price will initially be set to -£999.99/MW/h. We recognise that this might not be a practical filter for accidental errors. However, given that the market is pay-as-clear, a provider accidentally submitting a sell order

	with a very low, negative offer price would be protected in case the offer were accepted. A very off-market order is very unlikely to set the clearing price. More information can be found in the Market Design Report published by N-SIDE.
Please share your feedback on the proposed changes to performance monitoring for frequency response to accommodate stacked services (see section K above).	
We support the proposed changes to performance monitoring.	Thank you for the feedback in support of this change.
Please share your feedback on the proposal to amend the settlement formula to accommodate negative prices, and to ensure a meaningful settlement adjustment in case the market clearing price is close to £0/MW/h (see section L above). What are your thoughts on NGESO's proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance?	
<p>We understand the intention of the changes is to better incentivise good performance. However, we are not supportive of a structure where the penalty level can be higher than what can be earned by participating in the product. We understand that this scenario could arise where prices are less than £1/MWh. We understand that NGESO will provide worked examples so the market can better understand the impact in different market conditions. We see this as essential to ensure a common understanding.</p>	<p>The ESO acknowledges the concerns raised by respondents regarding the consequences of the settlement adjustment methodology when the market clearing price is negative, and the potential adverse outcomes on market participation and market clearing. We will therefore modify the proposed settlement adjustment methodology in line with the suggestion of some respondents, and propose instead a fixed settlement adjustment for poor performance when the market clearing price is negative, rather than an adjustment equal to the absolute value of the market clearing price.</p> <p>Our revised proposal for the settlement adjustment methodology defines a "Minimum Adjustment Price", which we propose to be £1/MW/h. If the market clearing price is greater than or equal to the minimum adjustment price, then the settlement adjustment price is equal to the market clearing price; while if the market clearing price is less than the minimum adjustment price, then the settlement adjustment price is equal to the minimum adjustment price.</p> <p>For example, if a unit has a K-factor equal to zero for a particular frequency response service, the settlement will be £0/MW/h if the market clearing price is greater than or equal to £1/MW/h (i.e., consistent with the current methodology). If the market clearing price is less than £1/MW/h, then the settlement will be equal to the market clearing price less £1/MW/h, which will result in a payment from the</p>

	<p>provider to the ESO. For example, if the market clearing price is £0.25/MW/h, then settlement will be £ -0.75/MW/h (resulting in a payment to the ESO), while if the market clearing price is £ -6/MW/h, then the settlement will be £ -7/MW/h (rather than £ -12/MW/h under the methodology proposed by the ESO in the Consultation documents).</p>
<p>NGESO plans to enable separate disarming codes for each frequency response service (DC, DM, DR). This is a prerequisite for enabling the stacking of frequency response services. What are the impacts of this change on providers (units providing frequency response, control technology, internal systems, etc.)? What recommendations and advice do you have for NGESO?</p>	
<p>We don't have any specific recommendations for disarming the different frequency services but are happy to provide comments on proposed solutions.</p>	<p>We will update market participants with our detailed proposal on disarming codes when it has been developed further.</p> <p>Thank you for indicating your willingness to comment on our proposed position in the future.</p>
<p>Do you have any additional feedback on the proposed new Reserve/Response Procurement Rules?</p>	
<p>We have no additional comments.</p>	
<p>Do you have any additional feedback on the proposed amendments to the Frequency Response Service Terms?</p>	
<p>We have no additional comments.</p>	

Respondent C

<p>Please share your feedback on NGESO's overall strategy for frequency response and reserve, including the plan to move to a single, simultaneous, co-optimised auction, and the new market design and auction platform (please see sections A, B, and C above).</p>	
<p>We are extremely disappointed at the announced delay to Quick and Slow Reserve, especially since ancillary service reform is a key action within government's Smart Systems and Flexibility Plan 2021. It is also somewhat shocking that despite these services being in a design phase for the best part of 2 years, only now have 'a series of challenges and risks associated with delivering the changes on [ESO's] legacy systems' been identified. With the OBP not set for completion until 2027 there is a risk that Reserve reform will spectacularly miss its RIIO-2 timelines. However, an even more worrying issue arises as IT issues we generally associate with the BM creep into ancillary</p>	<p>Thank you for supporting the transition to co-optimisation. The co-optimisation functionality of the EAC project delivers valuable benefits, even during the period of time when it is limited to the procurement of the three frequency response services only. A majority of the units that currently provide frequency response have the capability to provide all three of the services. The current market design requires providers to select in advance a single service to offer, with a risk that their unit is not cleared for the service despite the possibility of the unit delivering an alternative service at a competitive</p>

services. Our belief is that ESO's IT investment plans are far from convincing in relation to adaptability and the risk of locking-in products unnecessarily in conflict with Government's own standards for CNI. Therefore, we must ask whether the OBP will be any more adaptable than legacy systems and whether we will encounter the same unjustifiable timelines for reform in five or ten years time. Although we are supportive of the EAC, given the lack of opportunity to consult on these delays elsewhere we thought it best to raise here.

We applaud the transition to co-optimisation, again noting delays from the original launch of DC three years ago. As with other ESO reforms, more transparent engagement at an earlier stage will better allow industry to adapt and plan their own IT systems in preparation for changes and flag anything that needs second thought. Finally, we are saddened that the investment and effort put into the EAC will not be fully realised given the now indefinite delay to Reserve Reform. It is not clear whether such a project would have been as embraced if it was only ever going to be the procurement method for three related services.

price. This also creates risk for NGESO. During extreme market conditions (such as sustained negative day-ahead prices), providers may "herd" toward a particular service, leaving requirements for other services unfilled. The co-optimised market design will mitigate these risks. In addition, the new market design also ensures a more efficient market clearing. The co-optimised market clearing has a market welfare that is greater than or equal to a market without co-optimisation.

Thank you also for sharing your thoughts on the delay to Quick and Slow Reserve. The decision to delay Quick and Slow Reserve was taken in light of the significant changes that would have been required in our existing, legacy balancing systems and processes, given the complexity of the new service designs. In the midst of a complex and rapidly evolving systems change environment, NGESO believed it was more prudent to re-evaluate these changes to consider if implementation into our legacy systems was still appropriate, as opposed to direct implementation into our Open Balancing Platform (OBP).

Regarding OBP, first delivery is in December 2023 and then there are planned deliveries every three months. We are looking at priorities within the current delivery schedule to see where we can support the new reserve services and will give a firm commitment to industry once we have completed our impact assessment in September.

Postponing the rollout of our new Reserve services grants us the opportunity to re-examine the proposed service designs, evaluate IT options, and collaborate with industry more effectively. This will ensure that the best solutions are delivered and that the necessary updates to our balancing systems are apt for enhancing our operational toolkit and are better aligned with the implementation of our future systems.

	At present, we are still re-examining our proposed service design options for Quick and Slow Reserve and evaluating our IT solutions. NGENSO are committed to working with you and hope to be able to seek further feedback on this development work in September.
Please share your feedback on the proposal to amend the existing frequency response procurement rules to enable a cutover to the new platform and auction clearing algorithm.	
We support the approach to consolidation and note that it better reflects trends in industry towards standardisation.	Thank you for the feedback in support of this change.
Please share your feedback on the proposed design of co-optimisation in the new market clearing algorithm (please see section F above).	
We support the approach to co-optimisation and hope this will enhance market efficiency.	Thank you for the feedback in support of this change.
Please share your feedback on the proposed design of service stacking for frequency response services (please see section G above). Do you expect any problems to comply with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services?	
We have long supported service stacking and are pleased to see it finally addressed via the EAC. We also appreciate that stacking may necessarily lead to requirements for one service being altered when stacked with another.	Thank you for the feedback in support of this change.
Please share your feedback on the proposed changes to the specification of sell orders (please see section H above).	
We understand that the introduction of co-optimisation will be accompanied by somewhat increased complexity. Equally, as providers become accustomed to the platform and its functioning, any systems to aid this adjustment such as default sets or template orders would be extremely helpful.	<p>We plan a series of Market Trials, where providers will have the opportunity to submit offers into simulated auctions that are cleared against representative ESO buy orders. Providers will be supported during the Trials, and we will give all participants in the Trials the opportunity to ask questions about offer submission and market clearing.</p> <p>In production, the User Interface will have the capability to clone a basket, which may then be edited. Users can use this facility to create their own templates.</p>
Please share your feedback on the proposed changes to the clearing algorithm to NGENSO buy orders to be paradoxically accepted (“overholding”) to increase overall market welfare (see section I above).	
We support this approach.	Thank you for the feedback in support of this change.
Please share your feedback on the proposal to allow negative prices for buy orders, sell orders, and market clearing prices (see section J above). Will there be impacts to provider settlement systems? Do you have any recommendations to NGENSO?	

<p>We support the introduction of negative pricing, subject to the below concerns being kept under consideration.</p> <p>Negative pricing will potentially increase financial risk for providers in cases of under performance since it will become a payment as opposed to lost revenue. This may impact providers willingness to submit negative bids.</p> <p>The amendments made to clauses 7.1 and 7.2 are somewhat unclear and may not have been appropriately amended to address instances where customers may need to pay NGESO more for unavailability as a result of negatively priced under-delivery. It is not clear from clause 7 or clause 8 whether offsetting payments due from the provider to the ESO against future payments from the ESO to the provider would be permissible if the proposed payment process is to be introduced.</p>	<p>NGESO acknowledges the concerns raised by respondents regarding the consequences of the settlement adjustment methodology when the market clearing price is negative, and the potential adverse outcomes on market participation and market clearing. We will therefore modify the proposed settlement adjustment methodology in line with the suggestion of some respondents, and propose instead a fixed settlement adjustment for poor performance when the market clearing price is negative, rather than an adjustment equal to the absolute value of the market clearing price.</p> <p>We have amended the drafting of 7.2 to clarify that for settlement periods where a unit is unavailable, no amount is payable by either party. Schedule 4 paragraph 1d facilitates the netting of amounts payable by the ESO against amounts payable by the provider. This net amount is payable monthly.</p>
<p>Please share your feedback on the proposed changes to performance monitoring for frequency response to accommodate stacked services (see section K above).</p>	
<p>We support this proposal</p>	<p>Thank you for the feedback in support of this change.</p>
<p>Please share your feedback on the proposal to amend the settlement formula to accommodate negative prices, and to ensure a meaningful settlement adjustment in case the market clearing price is close to £0/MW/h (see section L above). What are your thoughts on NGESO's proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance?</p>	
<p>We appreciate NGESO's desire to balance the introduction of negative pricing and ensuring accurate delivery. However, as above, under the current proposal, providers may be disincentivised from submitting negative bids owing to the penalty risk. We are aware that other respondents to this consultation are offering proposals for an alternative approach and encourage ESO to engage in transparent industry engagement on these suggestions.</p>	<p>The ESO acknowledges the concerns raised by respondents regarding the consequences of the settlement adjustment methodology when the market clearing price is negative, and the potential adverse outcomes on market participation and market clearing. We will therefore modify the proposed settlement adjustment methodology in line with the suggestion of some respondents and propose instead a fixed settlement adjustment for poor performance when the market clearing price is negative, rather than an adjustment equal to the absolute value of the market clearing price.</p> <p>Our revised proposal for the settlement adjustment methodology defines a "Minimum Adjustment Price", which we propose to be</p>

	<p>£1/MW/h. If the market clearing price is greater than or equal to the minimum adjustment price, then the settlement adjustment price is equal to the market clearing price; while if the market clearing price is less than the minimum adjustment price, then the settlement adjustment price is equal to the minimum adjustment price.</p> <p>For example, if a unit has a K-factor equal to zero for a particular frequency response service, the settlement will be £0/MW/h if the market clearing price is greater than or equal to £1/MW/h (i.e., consistent with the current methodology). If the market clearing price is less than £1/MW/h, then the settlement will be equal to the market clearing price less £1/MW/h, which will result in a payment from the provider to the ESO. For example, if the market clearing price is £0.25/MW/h, then settlement will be £ -0.75/MW/h (resulting in a payment to the ESO), while if the market clearing price is £ -6/MW/h, then the settlement will be £ -7/MW/h (rather than £ -12/MW/h under the methodology proposed by the ESO in the Consultation documents).</p>
<p>NGESO plans to enable separate disarming codes for each frequency response service (DC, DM, DR). This is a prerequisite for enabling the stacking of frequency response services. What are the impacts of this change on providers (units providing frequency response, control technology, internal systems, etc.)? What recommendations and advice do you have for NGESO?</p>	
<p>What mechanism will NGESO use to send the notifications? How do we respond to acknowledge/ accept the disarm instruction? How fast do we have to accept / reject the disarm instruction and disarm a unit? How are disarm notifications tracked / accounted for in delivery metrics? Will there be potential for re-arm codes?</p>	<p>The proposal to introduce new disarming and rearming codes is currently under development. We expect to go-live with stacking at the same time as we launch the new EAC platform, and the new disarming and rearming codes will follow at a later date. We included this question in our Consultation to give early visibility of the issue to Frequency Response providers and to get initial feedback that could support the development of the proposal. We will update market participants with our detailed proposal when it has been developed further.</p> <p>Thank you for highlighting these particular questions to be considered. We will address these in our detailed proposal.</p>

Do you have any additional feedback on the proposed new Reserve/Response Procurement Rules?	
No	
Do you have any additional feedback on the proposed amendments to the Frequency Response Service Terms?	
The new service terms state that ABSVD will continue to only be applied to BM assets. NGENSO should approach ABSVD in the same way for both BM and non-BM assets. Applying ABSVD to BM only will cause disparity in market participants pricing, which in a Pay as Clear market could result in a higher overall service cost.	Thank you for highlighting this. We are reviewing ways to align ABSVD for BMUs and non-BMUs as part of our Response reform work. Significant changes to IT systems and processes have already been identified and work has already been undertaken to deliver some of the new systems which would be required. We are working to confirm timelines for addressing the remaining barriers and hope to be able to share these in the next couple of months as part of our Response reform future plans.

Respondent D

Please share your feedback on NGENSO's overall strategy for frequency response and reserve, including the plan to move to a single, simultaneous, co-optimised auction, and the new market design and auction platform (please see sections A, B, and C above).	
<p>This is broadly a positive change to the market. It makes sense to have a single platform for all auctions, and co-optimised auctions should in theory be a good way to take profit of the assets as much as possible by submitting several strategies in parallel. As a general note, Respondent D would like to state that those EAC changes represent a lot of simultaneous development needs for the industry which can be challenging to follow.</p> <p>We will need to see in practise how the clearing algorithm works to make sure all assets are considered fairly and that everything works as planned.</p> <p>Respondent D would like also to note that this new process leads to increased costs for the industry due to the significant complexity in the new rules – particularly around strategy design and ongoing analysis.</p> <p>Overhead costs will be increasing for optimisers and, whilst the changes are designed to make the market more efficient, they do tend to shift the overall benefit in favour of the buy side (National Grid). In this context, Respondent D wonder whether the K-factor penalty costs being too harsh under the proposed methodology, this will also be discussed in questions below.</p>	<p>Thank you for this feedback. We recognise that the scope of this proposal is large, and we appreciate industry's effort to review this consultation, as well as to implement and operate these changes. The ESO prefers to deliver this package of work as a single market change, rather than as multiple, phased projects, because we believe this approach will ultimately require less effort and cost overall for both industry and the ESO, and also because we want to realise the benefits of these initiatives as soon as possible.</p> <p>Together with our partner, N-SIDE, we have planned a full suite of tests for the clearing algorithm. In addition, there will be a series of Market Trials including market participants.</p> <p>All assets are considered fairly by the clearing algorithm. Sell orders are evaluated strictly based on their contribution to market welfare (considering the clearing rules, such as looping, curtailability, mutual exclusivity, parent/child links, etc.) and not on any other criteria (such as asset size or ability to stack services).</p>

	<p>The new market design facilitates more complex asset optimisation strategies, but these are not required to participate. The co-optimisation features of the market mean that providers can offer their capabilities into multiple services simultaneously, and thus eliminate up-front analysis to predict which of the three services will have the highest clearing price or the most scarcity.</p> <p>The introduction of an API to facilitate order submission and retrieval of auction results is expected to reduce operational effort (although obviously up-front implementation effort is required). Overall, in addition to more efficient market clearing and lower clearing prices, we expect that the new overholding and co-optimisation features of the market will reduce risk for participants by creating the possibility to clear offers that would otherwise have been rejected in the previous market design.</p> <p>We will propose an amended methodology for settlement adjustment for poor performance, based on industry responses to this consultation.</p>
<p>Please share your feedback on the proposal to amend the existing frequency response procurement rules to enable a cutover to the new platform and auction clearing algorithm.</p>	
<p>It is not perfectly clear to Respondent D how the transitioning between the “old” Service Terms and the “new” Service Terms will occur. We are a bit confused by the number of files there are, which ones are the most recent ones or not. For example there are some files being looked at for this consultation (some of which do not include all latest changes in the “compare” version), and they seem to be some even more recent files to be reviewed for the consultation of the 31st July. It starts to be really hard for Respondent D to track the different changes, their exact purposes, which document to review at each stage, and which documents will be the final ones.</p>	<p>The main documents are (1) substantially new procurement rules for the EAC platform (“Response Reserve Services Procurement Rules”), (2) an updated version of the existing frequency response procurement rules (“New Response Services Procurement Rules”), and (3) an updated version of the existing frequency response service terms (“New Response Services Service Terms V2”). “Compare” versions have been provided for the existing procurement rules and service terms, but we did not provide a compare version for the EAC procurement rules (i.e., the first document in the list above) because much of the drafting is substantially new, and not a simple edit to previous drafting.</p>

	<p>The documentation has been drafted on the basis that the new auction platform will only commence operations from the date notified by NGESO as the “effective date”, which will be the date when the platform will open for submission of sell orders for service days from and including what is termed the “EAC Go-Live Date”. Procurement of frequency response services for service days prior to the EAC Go-Live Date will continue under the existing frequency response procurement documentation (i.e., “New Response Services Procurement Rules”), but with effect from the service day prior to the EAC Go-Live Date, auctions under the existing frequency response procurement rules will cease and that document will terminate. The existing frequency response service terms will continue in operation throughout this period, both before and after the EAC Go-Live Date, but with certain changes taking effect from the EAC Go-Live Date to reflect the creation of frequency response contracts under the new auction platform.</p>
<p>Please share your feedback on the proposed design of co-optimisation in the new market clearing algorithm (please see section F above).</p>	
<p>Respondent D believes the changes are broadly positive. Whilst it increases Respondent D analytical costs due to the complexity of the new market design, it should minimise the chances of Respondent D assets being uncontracted so long as markets clear above our price floors.</p> <p>NG needs to assure all assets (big or small) are treated fairly, Respondent D think these changes will be more meaningful if there is more demand, relative to where it is against DC now, in DM and DR – otherwise market-reflective pricing will remain somewhat inappropriate in those markets since optimisers have to price their assets with respect more to game theory than their cost of delivery and/or opportunity cost.</p> <p>At the moment Respondent D would also like to note that the clearing algorithm is only a theory and proper feedback can only be provided once some trials have been led successfully. These trials will also help improve our understanding about how the clearing algorithm works in practice.</p>	<p>The clearing algorithm does not systematically favour large units or small units in market clearing.</p> <p>NGESO expects that the Market Trials will support market participants in better understanding the clearing algorithm.</p>

Please share your feedback on the proposed design of service stacking for frequency response services (pleases see section G above). Do you expect any problems to comply with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services?

There doesn't seem to be any specific concern from our control partner about the stacking requirements but please refer to Q11 for more details.
Respondent D would like clarification from NG if an asset is not able to stack from Day 1 if it would be disadvantaged/deprioritised vs assets that can stack? Responding faster to DR due to stacking with DC will result in more frequent breach of SoE due to DR's higher throughput. Currently, we understand SoE requirements need to be pooled for all the stacked services. The faster response times for DR might render the asset unavailable more frequently due to stacking.

If an asset is not able to stack (or if the provider prefers to offer baskets defined on only one single service), its sell orders have the same priority in clearing as assets that are able to stack. Sell orders are evaluated based on their contribution to market welfare, subject to the clearing rules.

A unit that has stacked services will pool its energy for the purposes of SoE requirements. The probability that the asset will become unavailable will depend on system conditions. For example, a unit that has stacked DC and DR will be able to deliver DR for longer if DC has not been activated, and will be able to deliver DC for longer if DR utilisation is lower than expected. If DR is provided with a faster response time (due to stacking with DC or DM) then the unit must start delivering DR more quickly, but it can also cease delivering DR more quickly. We do not necessarily expect a higher throughput of energy, and we do not expect units to become unavailable more frequently when they are stacking services.

Please share your feedback on the proposed changes to the specification of sell orders (please see section H above).

The changes make sense and are consistent with our expectations. However, the added complexity will make tendering more complex for Respondent D and will increase analytical costs.
Respondent D would like clarification on rejections of Sell orders if they are incorrect and/or invalid: If a sell order is submitted for, as an example, 10 Eligible Assets and the Sell Order for one of them is invalid, will the Sell Orders for all 10 Eligible Assets be rejected or only the one invalid Sell Order?
Respondent D would prefer for only the invalid order to be rejected, and all valid orders accepted, as this reduces the chance of an auction being missed for the entire portfolio. In its simplest form – if we submit an invalid Sell Order through the API, does only that Sell Order get rejected or does the whole API upload get rejected?

Our proposed design of the sell order seeks to balance two conflicting objectives: maximising the opportunity for participants to optimise their assets commercially, while keeping a reasonable limit on complexity. It is not required that participants use all possible features of the sell orders. Examples of simple sell order submissions are given in the EAC Market Design Explainer document.

If multiple baskets are submitted via a single API call and one of them is invalid, then all baskets submitted via that API call are rejected. This design choice ensures that the user can make necessary corrections to the invalid basket and resubmit the same API call. The alternative design (where correct baskets are accepted and only incorrect baskets are rejected) would require the user to edit the payload to remove all

Respondent D would also like NG to provide more information about the validation tests that are being done by the platform ahead of submission. If submission is accepted, can participants assume that orders are valid and follow correctly the procurement rules and service terms? Strong validation process should be done by NG to ensure service can be actually delivered by the assets.

The mock auction should demonstrate how efficient is the clearing algorithm with multiple baskets and several child/substitutable child strategies.

the accepted baskets before resubmitting only the ones that have failed. A user who prefers to avoid that valid baskets are rejected in case of an error in the submission can mitigate this behaviour by submitting one basket per API call.

The scope of sell order validation on the new market platform is not materially changed from the existing validation on the EPEX CTS++ platform. The total offered quantity of each product in each service window must be less than or equal to the pre-qualified capacity for that product. Additionally, the total offered quantity of all low-frequency products must be less than or equal to the capacity (in MW) of the unit to deliver power, and the total offered quantity of all high-frequency products must be less than or equal to the capacity of the unit to take power. This validation is enforced primarily to protect against “fat finger mistakes” which could undermine the overall integrity of auction clearing. For example, if a 50 MW unit were to offer (and clear) 500 MW of capacity, then there would be 450 MW of unfilled ESO requirements and simultaneously 450 MW of provider offers with no commercial route to market. However, consistent with the existing functionality of the CTS++ platform, the new market platform will not validate the offered energy (in MWh) of sell orders submitted by energy-limited units. The available MWh of a unit is not known in advance to the market platform as this depends on the unit’s state-of-charge, and even where the nameplate energy storage capacity of an energy-limited asset is known, this can degrade over time. The consequence of an error in respect of the available energy indicated by a submitted sell order (which has otherwise passed its power capacity validation) is adverse, but it is nonetheless smaller than the potential consequence of an error in offered power capacity.

We expect market participants as prudent providers of the frequency response services to conform to the Procurement Rules and to ensure the deliverability of their offers prior to submission of the sell orders

	<p>to the platform. Non-compliance with the Procurement Rules will be detected by the performance monitoring process.</p> <p>Performance testing of the new market clearing algorithm has been successful and has demonstrated that the algorithm can calculate the market clearing efficiently, under both normal (expected order submissions) and stress (triple expected order submissions). The algorithm is currently undergoing functional testing to verify the economic efficiency of clearing in the new market design.</p>
<p>Please share your feedback on the proposed changes to the clearing algorithm to NGESO buy orders to be paradoxically accepted (“overholding”) to increase overall market welfare (see section I above).</p>	
<p>Can National Grid provide clarity on:</p> <ul style="list-style-type: none"> • what happens to the clearing price if National Grid activate their overholding allowance and, • whether there is a limit to the overholding volume. <p>Ideally, these will include some worked examples.</p> <p>Respondent D is concerned that NG could use this rule to buy more low-priced volume and reject the single MW child bids we’re used to seeing set the market price. This would lower the clearing price and raise the volume (more welfare for NG at the expense of less welfare for industry).</p> <p>Respondent D would like evidence this doesn’t benefit unfairly large assets vs smaller assets?</p>	<p>An explanation of the implementation of overholding is provided in Section 5.3 (“How are buy orders treated by the EAC algorithm?”) of the EAC Market Design Report published by N-SIDE. An example is provided in the EAC Market Design Explainer document published by ESO. Please see Example 2b in Section “Market Clearing Rules – More Definition” (slide 56 in the June 2023 version). The amount of overholding is limited by the bid quantity in the “overholding buy-order” (as defined in Section 5.3 of the EAC Market Design Report). To illustrate the impacts on the clearing price of overholding, consider the following example:</p> <p>Case 1: Suppose the ESO has a buy order for 100 MW, priced at £16/MW/h, and an additional “overholding buy order”, for 30 MW, priced at £0/MW/h. Suppose further that there are three sell orders: Unit A has an offer of 90 MW priced at £2/MW/h; Unit B has a non-curtailable offer of 14 MW priced at £8/MW/h; and Unit C has an offer of 10 MW priced at £12/MW/h. We first accept the offer of Unit A. The ESO then has an outstanding requirement of 10 MW bid at £16/MW/h. Clearly, we will not accept both remaining offers. If we accept Unit B then this will have a cost of 14 MW x £8/MW/h, for a total cost of £112/h. Accepting this unit will fulfil the remaining 10</p>

MW of the ESO's requirement at a bid price of £16/MW/h (for a benefit of £160/h), while the remaining 4 MW will be partially matched against the second buy order (priced at £0/MW/h), with no benefit (because the bid price is £0/MW/h). The total benefit therefore will be £160/h while the total cost will be £112/h, for an overall contribution to market welfare of £48/h. In contrast, if we accept Unit C, then the cost is 10 MW x £12/MW/h or £120/h in total, while the benefit is also £160/h, for an overall contribution to market welfare of £40/h. We therefore accept Unit B and reject Unit C because this clearing solution maximises market welfare. The clearing price is £8/MW/h, paid over a total of 104 MW procurement, for a total procurement cost of £832/h. The overholding solution therefore has higher market welfare, lower clearing prices, and lower overall total procurement costs than the solution without overholding.

Case 2:

In this case, Unit B offers at a price of £9/MW/h (instead of £8/MW/h), while all other parameters are the same as case 1. Unit B therefore has a total cost of 14 MW x £9/MW/h or £126/h in total, while the benefit of £160/h is unchanged, and so the contribution to market welfare is £34/h. The contribution of Unit C remains £40/h. In case 2, we accept Unit C and reject Unit B. The clearing price is £12/MW/h, paid over a total of 100 MW procurement, for a total procurement cost of £1200/h. Note that this solution without overholding has higher total procurement costs than the solution with overholding. This solution is the optimal solution because it has the maximum total market welfare (although, in this, case, much more of that welfare is going to providers of the ancillary service compared to case 1).

The main application of the overholding feature is to buy lower-priced volume and reject the single MW child bids which set the market price. Allowing paradoxical acceptance of a buy order is a new

	<p>feature that replaces the current methodology for overholding, where the ESO uses an “elastic buy order curve” (i.e., a linear buy order with steeply declining bid prices for quantities in excess of the quantities required to secure the system). Compared to the current practice, we expect the new algorithm to both decrease procured volume and decrease the clearing price, which will reduce the overall costs of balancing and benefit consumers.</p> <p>We do not expect the new clearing algorithm to benefit larger assets over smaller assets. The change will facilitate the algorithm to more often clear cheaper offers over more expensive offers, regardless of unit size.</p>
<p>Please share your feedback on the proposal to allow negative prices for buy orders, sell orders, and market clearing prices (see section J above). Will there be impacts to provider settlement systems? Do you have any recommendations to NGESO?</p>	
<p>Proposal is aligned with Respondent D expectations. It is however difficult to anticipate what will be the actual impact on the market of negative clearing prices. The main concern for Respondent D is about k-factor penalty for negative clearing prices. What used to be “only” a missed opportunity for positive clearing prices is becoming actual payment penalties for negative clearing prices (see question 9). This could lead to some contractual issues as liability for these penalties is not always clear between the asset owner, the optimiser and the RtM provider.</p> <p>Respondent D needs to ensure there is a process to pay NG in case of negative clearing price.</p> <p>Negative k-factors could have an impact on reporting and settlement processes within Respondent D which will mean potential significant operational changes. On this basis, Respondent D cannot guarantee that it would be in a position to submit negative prices into the EAC auctions from day one and would suggest that the implementation of this feature is staged and introduced at a later date, once co-optimisation has been fully tested and implemented.</p>	<p>The ESO acknowledges the concerns raised by respondents regarding the consequences of the settlement adjustment methodology when the market clearing price is negative, and the potential adverse outcomes on market participation and market clearing. We will therefore modify the proposed settlement adjustment methodology in line with the suggestion of some respondents, and propose instead a fixed settlement adjustment for poor performance when the market clearing price is negative, rather than an adjustment equal to the absolute value of the market clearing price.</p> <p>Sufficient providers have indicated their readiness to settle at negative market clearing prices, and we expect to enable providers to submit sell orders with negative offer prices on Day 1.</p>
<p>Please share your feedback on the proposed changes to performance monitoring for frequency response to accommodate stacked services (see section K above).</p>	

Response from our control partner + see question 9 below: *“The ramp rates of the k-factor for negative prices could cause too high penalties, and therefore could the rate of increase of the k-factor for negative pricing be scaled down”*
Respondent D would like to see some detailed examples (potentially Excel based) on the calculation of k-factors and performance bounds for several scenarios.

Thanks for your feedback. We have amended our methodology to calculate penalties when clearing prices are negative. As a consequence, the ramp rates have been scaled down. Our revised proposal for the settlement adjustment methodology defines a “Minimum Adjustment Price”, which we propose to be £1/MW/h. If the market clearing price is greater than or equal to the minimum adjustment price, then the settlement adjustment price is equal to the market clearing price; while if the market clearing price is less than the minimum adjustment price, then the settlement adjustment price is equal to the minimum adjustment price.

Examples of how different K-factors affect the settlement values have been published (add link to spreadsheet)

<https://www.nationalgrideso.com/document/283281/download>

An example showing performance bounds for a unit delivering response services and calculation of the K-factor for a specific contracted period can be found here

<https://www.nationalgrideso.com/document/277526/download> and we aim to keep this document continuously updated.

Please share your feedback on the proposal to amend the settlement formula to accommodate negative prices, and to ensure a meaningful settlement adjustment in case the market clearing price is close to £0/MW/h (see section L above). What are your thoughts on NGESO’s proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance?

This is obviously not as favourable to participants as the current rules, however the change does make sense from a NG point of view, and the methodology adopted seems to be pertinent.

Respondent D understands the linear adjustment between -£1/MW/h and £1/MW/h is favourable to NG as enable a penalty payment even at £0/MW/h bids. Can NG confirm why the value of £1/MW/h was chosen, and not £0.5/MW/h as an example?

For positive bids, Respondent D agrees about the settlement adjustment: if service is provided with a k-factor of 0, then NG doesn’t pay the participant for the service.

The ESO acknowledges the concerns raised by respondents regarding the consequences of the settlement adjustment methodology when the market clearing price is negative, and the potential adverse outcomes on market participation and market clearing. We will therefore modify the proposed settlement adjustment methodology in line with the suggestion of some respondents, and propose instead a fixed settlement adjustment for poor performance when the market clearing price is negative, rather than an adjustment equal to the absolute value of the market clearing price.

However, for negative bids, Respondent D believes the penalty is too hard for participants and the risk increases a lot: when delivering a -£10/MW/h service with a k-factor of 0, then participants would need to pay NG a total of -£20/MW/h which Respondent D believes is unreasonably high. Respondent D would suggest a much lower slope for the settlement adjustment of negative price bids as for negative price bids, the settlement adjustment is not anymore an opportunity cost but a realised risk/actual penalty. A fixed penalty not linked to clearing price could also be a potential alternative or a cap on penalty for negative bids.

Our revised proposal for the settlement adjustment methodology defines a “Minimum Adjustment Price”, which we propose to be £1/MW/h. If the market clearing price is greater than or equal to the minimum adjustment price, then the settlement adjustment price is equal to the market clearing price; while if the market clearing price is less than the minimum adjustment price, then the settlement adjustment price is equal to the minimum adjustment price.

For example, if a unit has a K-factor equal to zero for a particular frequency response service, the settlement will be £0/MW/h if the market clearing price is greater than or equal to £1/MW/h (i.e., consistent with the current methodology). If the market clearing price is less than £1/MW/h, then the settlement will be equal to the market clearing price less £1/MW/h, which will result in a payment from the provider to the ESO. For example, if the market clearing price is £0.25/MW/h, then settlement will be £ -0.75/MW/h (resulting in a payment to the ESO), while if the market clearing price is £ -6/MW/h, then the settlement will be £ -7/MW/h (rather than £ -12/MW/h under the methodology proposed by the ESO in the Consultation documents).

Regarding the derivation of the “Minimum Adjustment Price” (i.e., - x1 = x2 = X in our previous formulation), we had the objective that this price should be set to a level that is not unduly punitive but nonetheless creates a financial incentive for good performance, even in cases where the market clearing price is just a few pence. We wished to avoid a complex indexation formula to derive this price, and we favoured the simplicity a fixed, round number. We examined the distribution of clearing price outcomes for LF frequency response services over the period January to May 2023, and noted that the 10th percentile of clearing prices was £0.934/MW/h over this period. We finally concluded that £1/MW/h was a reasonable choice of this

	<p>parameter to separate “low” market clearing prices from “normal” market clearing prices.</p> <p>As stated above, we propose that the minimum adjustment price should be £1/MW/h, unchanged from our previous proposal (i.e., -x1 = x2 = X = 1). We commit to monitoring the impact of this settlement methodology, to reviewing the level of the minimum adjustment price, and to revising it if necessary. We remain open to further feedback from market participants on the derivation of this parameter.</p>
<p>NGESO plans to enable separate disarming codes for each frequency response service (DC, DM, DR). This is a prerequisite for enabling the stacking of frequency response services. What are the impacts of this change on providers (units providing frequency response, control technology, internal systems, etc.)? What recommendations and advice do you have for NGESO?</p>	
<p>At the moment, very few information is provided regarding disarming codes. Here is the response from Respondent D control partner: <i>“Grid will need to make it clear if it plans to launch EAC with stackable services without the disarming codes initially. It will then need efficient communication of when these disarming codes will be provided to allow participants to incorporate in a timely fashion”</i></p> <p>Can NG justify why they need those disarming codes as those codes have not been used yet so far. This is a significant work for Respondent D/control partner to implement those changes if never going to be used. This should not be a Day 1 delivery as this would be too much development in a too short period of time.</p>	<p>The proposal to introduce new disarming and rearming codes is currently under development. We expect to go-live with stacking at the same time as we launch the new EAC platform, and the new disarming and rearming codes will follow at a later date. We included this question in our Consultation to give early visibility of the issue to Frequency Response providers and to get initial feedback that could support the development of the proposal. We will update market participants with our detailed proposal when it has been developed further.</p> <p>Thank you for highlighting the particular issues of concern to you. We will address these in our detailed proposal.</p>
<p>Do you have any additional feedback on the proposed new Reserve/Response Procurement Rules?</p>	
<ul style="list-style-type: none"> • For assets under Active Network Management, it is mentioned in Schedule 2 that assets need approval from NG to see if eligible. Are they some transparent rules? Are there any SLAs for max response time from NG to confirm if asset is eligible? • We note that the version names of the documents are unclear and (potentially) incorrect. This has left us unable to fully comment on the documentation as we are not totally confident we are commenting on 	<p>The paragraph relating to “assets under Active Network Management” in Schedule 2 is unchanged from the existing Procurement Rules. Similarly, paragraph 6.5 in the “Response Reserve Services Procurement Rules” is numbered 6.2 in the existing Procurement Rules, but is otherwise unchanged. We are not consulting on any proposed amendments to these paragraphs as part</p>

the final proposals (for example the “compare” version doesn’t show the comparison vs the latest version of the procurement rules it seems, with baskets etc.).

- We would like to see some worked examples of tender files, which items do we fill out and which do NG fill (i.e. the various ID columns). We suspect this will be provided in the API documentation but worked examples will be really helpful in the meantime
- Paragraph 6.5: Can NG provide additional information on ineligibility based on location? This could be a big risk for asset owners if a posteriori they realise an asset cannot participate in D*.
- Paragraph 6.6: Do you confirm this is to be interpreted as of today: ABSVD refund for BMUs but not for non-BMUs? Can you please provide an excel file containing examples of how ABSVD work?

Additionally, please find below the comments from our control partner:

- *We recommend that a single duration test can be used for all Response Services (i.e., DC, DM and DR) provided the duration test is for the longest duration required by any service, e.g., the duration test of 60 minutes for DR can be used for DM and DC.*
 - *This is a sensible approach and will surely shorten the test times. However, there’s a discrepancy between tolerances of DR and the other two. While the duration tests for DC and DM have a +/- 3% tolerance (our understanding), DR looks at the minimum response achieved within the 10 seconds to 60 minute timescale.*
 - *This means there’s no minus tolerance and the plant should never fall below its rated/contracted power even slightly. If the same tolerance gets introduced for DR, then a duration test for DR sampled at 20 Hz could be used for the other two.*
 - *Frequency signals are also different between the services. E.g. 49.8Hz is used for full contracted power while testing for DM whereas it’s 49.5 for DC. Would this present a problem with the above amendment?*
- *General comments relating to DM and DR:*

of this EBR Article 18 Consultation. Please contact your account manager with any questions relating to these paragraphs.

We have provided further guidance on the use of the documents in our answer to your response to question 2, above.

Tender files will not be uploaded to the EAC platform. Sell orders may be submitted wither via the API or the user interface. The API documentation has been published and a sandbox environment is available for providers to test their connection and the validity of their sell orders.

We are not proposing a change to the application of ABSVD as part of this EBR Article 18 Consultation. However, we are reviewing ways to align ABSVD for BMUs and non-BMUs as part of our Response reform work. Significant changes to IT systems and processes have already been identified and work has already been undertaken to deliver some of the new systems which would be required. We are working to confirm timelines for addressing the remaining barriers and hope to be able to share these in the next couple of months as part of our Response reform future plans.

Thank you very much for your detailed response in regard to testing. We have raised this with the relevant teams within the ESO and believe that many of these points have been addressed with in our release 1 frequency response reform consultation. This sits out with the scope of the EAC consultation, but we would like to engage with you further on these points to ensure that further clarification can be provided where needed.

- *DM and DR operate in a much narrower frequency band (+/- 0.2Hz) than DC. It's further tighter for DM, as the plant needs to deliver 95% of its contracted power within a 0.1Hz frequency band (this is from 50.1 to 50.2 or 49.8 to 49.9). What we noticed is that this may bring more noise than stability on the grid in places. The risk is:
 - *As the power change is expected to be fast and in big amounts due to the narrow frequency band, this causes measurement instability on the frequency monitors. This can result in spikes in the measurements, therefore causing more spikes in the power response. We have witnessed during DM testing at a few sites, the plant wasn't able to recover until the frequency moved back to within 49.9 to 50.1Hz.**
- *We were able to minimise the noise by slowing the change of response but even that wasn't enough on some sites. Therefore, we recommend a review of the response curves for DM and DR services.*
- *Page 28, Table 9 - the frequency injection profile in Table 9 belongs to frequency injection of DM, but it is in DC section*
- *Page 43 (Graphs for Test 1) - the pink in the Graph looks at 0.68 sec which contradicts the test Full delivery time which is 1 sec. Either there should be one more line at 1 sec which shows the test is good if the asset is able to deliver full power before it or that pink line should be shifted to that.*
- *Page 43 (DC/DM/DR test calculator example graphs) - now all the three services are combined in one document it is important to see the consistency in the colour of the example graph like in DC the reference line for fast and slow assets is Pink, while in DM and DR it is green.*
- *Page 61 (Graphs for Test 1) - the Green reference line in the graph of test 1.7 should be at 1 sec it is going to be 1.05 sec. If that is something different which is allowed a tolerance of 0.05 sec it should be mentioned in the table above.*

<ul style="list-style-type: none"> • Page 66 (Pass criteria point 1) - the explanation “the sum of minimum response achieved within the 10 second to 60 minute timescale constitutes the total volume of the Response Unit. (i.e. the minimum total response achieved within each timescale).” is not including the -5% tolerance which is given in Table 4 on page 68. <ul style="list-style-type: none"> ○ The statement for pass criteria for DR looks confusing as it is easily covering the +5% tolerance, however it will be difficult to cover -5% tolerance in the exact statement. • Page 71 (Appendix-A) - why is the minimum sample rate for Test 1 different from 2 and 3? 10 Hz is harder to achieve and once established, it could be used for 2 and 3 as well. It would be preferred if the test is done and passed at 10Hz. • Comment on full document - it will be very helpful if the table no. and Figure number would not be the same for all the services in the documents like Table 2 occurs twice in the document which makes the referencing difficult. Assume this is because the document has been combined for all services. <p><i>It would be very helpful if there is a list of tables and figures in the content page.</i></p>	
<p>Do you have any additional feedback on the proposed amendments to the Frequency Response Service Terms?</p>	
<p>Please find below a few questions/comments from Respondent D.</p> <ul style="list-style-type: none"> - Do participants still need to comply with ramp rates rules? - Contracted Response Energy Volume: how do participants need to calculate it when services are stacked? It is the sum of all Contracted Response Energy Volumes across the services (as seem to suggest the definition) or the maximum of the values? Do participants need to interpret this definition differently than in previous Service Terms? Section 5.2 seems to change slightly the view on how State of Charge is considered and some clear explanation of the changes would be helpful. - Definition of availability Fajj: when services are stacked is this value the same for all services? Otherwise might not be possible for NG to really work out which service was not available or is this something NG would be able to do by comparing to different response curves? 	<p>We are addressing the rules with respect to “ramp rates” in our Response reform work.</p> <p>We understand the concern around the state of energy rules. We will be publishing an updated State of Energy Management document to reflect the requirements when services are stacked.</p> <p>In the settlement formula in Schedule 3, the term Fajj is the same for all services. The unit is either available or unavailable, this state applies to all contracted services.</p> <p>We will provide additional detailed examples of the performance monitoring calculation for units providing stacked services.</p>

<ul style="list-style-type: none"> - Schedule 3 of Service Terms is not an easy read, can participants get an excel based example for the calculation of each term in different scenarios? Example: how k-factors are calculated with an example of expected vs actual response. - Could we have an excel based example of ABSVD calculation in different scenarios: BMU, non BMU, Virtual Lead Party, with BM actions or not etc.? This is to understand the expected ABSVD refund participants can expect from NG in different scenarios. <p>Additionally, please find below the comments from our control partner:</p> <ul style="list-style-type: none"> • <i>We're unclear on a couple of points on page 13:</i> <ul style="list-style-type: none"> ○ <i>"Whether or not the Response Unit is available for the applicable Auction Product(s) pursuant to paragraph 5" - we are not clear what is meant by availability here. We do not currently send any such value in our Operational Metering</i> ○ <i>"Whether or not the Response Unit is the subject of a Disarming Instruction" - This requires clarification. Disarming via the Control Point API disarms the entire unit, but ASDP now supports disarming of individual services as well.</i> • <i>So our questions on these points explicitly are:</i> <ul style="list-style-type: none"> ○ <i>What is meant by availability in this context (we have read paragraph 5 but still not clear)</i> ○ <i>Does Grid require a single armed/disarmed value for the entire unit, and/or some kind of complex value/bitmap which conveys the armed/disarmed status of all services?</i> • <i>We are happy with the response parameters when stacking</i> 	<p>A unit is currently either armed or disarmed for all frequency response services (and not per service). This is being reviewed as part of the work on Response reform.</p> <p>The calculation of ABSVD and the format of operational data is not being amended as part of this EBR Article 18 Consultation. We have, however, raised this request with the relevant team and they will aim to provide a an excel based example of the ABSVD calculation in different scenarios. Please contact your account manager with any further questions relating to these paragraphs.</p>
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Respondent E

<p>Please share your feedback on NGENSO's overall strategy for frequency response and reserve, including the plan to move to a single, simultaneous, co-optimised auction, and the new market design and auction platform (please see sections A, B, and C above).</p>	
<p>We are supportive of NGENSO's ambitions to move to a single, simultaneous, co-optimised auction. We understand the rationale for moving the auction</p>	<p>Regarding EAC vs SMP, they are both parts of the same IT solution that aim at providing a coherent experience for market participants.</p>

capability to the Single Market Platform (SMP) and agree with the need to offer market participants a single system interface for frequency and reserve services. Whilst NGENSO have described the ultimate design ambition for the auction and platform, the details provided in the consultation documents do not clearly outline how this is to be achieved. Detailed process design is either split across multiple documents for market participants to decipher themselves, or there are placeholders for further detail which will be provided soon. It has been challenging to provide feedback on elements of the design when we've been provided with partially completed documentation.

The co-optimisation of auctions is a good development for the market overall and should allow volume to be offered into multiple services. Unfortunately, the current documentation is very high level, providing an overarching concept but not giving a sufficient level of detail and clarity of how certain elements will be delivered.

This is reflected in the Procurement Rules which are too generalised to a point they don't define the processes sufficiently. As an example, the "Clearing Algorithm" is a term is used yet no details of the calculations are shared. There is more information in the Market Explainer Slides from April which are not part of this consultation; this paired with the API specification being incomplete and not showing required data means we are building our understanding on certain assumptions and having to cross reference documents outside of the consultation pack.

Within section B you outline that the API can be used to retrieve results from the SMP, yet other documentation specifies that this is the EAC platform. The terms SMP and EAC seem to be used cross purposes throughout the consultation adding to some of the confusion regarding the systems being used.

The API specifications are not currently clear regarding what data is required and what output data to expect. Our understanding was this was to allow parties the freedom to build orders how they see fit; however, the lack of

Both are deeply integrated but are managed by different teams which can unfortunately cause some confusions in our communication.

There are multiple ways to retrieve auction result data:

1. Data Portal – this will have 4 data files in a similar manner to the current auction for all participants.
2. EAC will provide results pertaining to the authenticated participant via the API.
3. SMP – to be confirmed, attend the SMP show and listen where this will be a point of discussion

Regarding the auction results, they will be available in EAC (for the last 10 days) as well as in Data Portal (forever at the moment), but not in SMP.

Regarding the EAC API specification, we are doing our best to improve its documentation based on the feedback received. If you have specific information missing, please send us the list of clarification you would like to have and we will include them in the documentation so it can benefit to all. For example, we have recently added some examples on how to retrieve auction results.

information provided means building an API protocol to communicate with the EAC platform may result in missing “Mandatory” information and require further development. A later acknowledgement by NGESO is that this data will follow after the consultation has closed, meaning we cannot truly be confident in the current transition plan.

It is worth outlining that we, as market participants, invest considerable time in reading and understanding any service change and consultation documents which NGESO issue. We also make time to attend accompanying webinars and drop-in sessions to seek clarity and provide NGESO with feedback to support product development. Once product changes are approved, there is also considerable system and process development work on our side to implement what is required to comply within the specified deadlines. Delays from NGESO in providing the full suite of specification documents and details mean significant time is spent on understanding documents and asking follow up questions, only for this to be repeated when NGESO issue updates later on. We would urge NGESO to give consideration to how clear their communications are with market participants and to streamline and improve the fragmented approach to detailing process and product changes.

Please share your feedback on the proposal to amend the existing frequency response procurement rules to enable a cutover to the new platform and auction clearing algorithm.

The switch to the new platform needs to only happen once industry parties are ready. The current lack of detailed documentation available to participants to build and develop the required APIs means parties may not be ready in time. NGESO have outlined their concepts and proposals, but the underlying supporting documentation is incomplete.

NGESO need to appreciate that this is a large industry change and appropriate development time should be provided to all parties. We would need at least 3 months to develop the APIs and connections, any delays in the provision of technical specifications means we may not be able to deliver a solution in time and delay any testing / onboarding for us. We would also encourage NGESO to

Thank you for this feedback we are committed to working with market participants to ensure that they are ready at the launch of the Enduring Auction platform.

<p>account for any testing bottlenecks which might cause delays with their IT tests if multiple market participants are ready to test within a short space of time.</p>	
<p>Please share your feedback on the proposed design of co-optimisation in the new market clearing algorithm (please see section F above).</p>	
<p>We agree co-optimisation is ideal for NGENSO and parties to offer all available volume to the market however the decision making for the algorithm seems to rely on the undefined term of “Market Welfare”. Parties should be able to specifically identify a priority on which auction product they would like to offer capacity for. For example Market X and if I don’t get that I can offer Market Y or Z.</p> <p>The current co-optimisation structure would mean a basket is created for each Market and then the algorithm would put the asset in the best position for “Market Welfare” without any direction from the parties.</p>	<p>The current clearing algorithm for frequency response (i.e., the HELENA algorithm on the EPEX CTS++ platform) relies on maximisation of market welfare to clear the market. The objective function of the new clearing algorithm is therefore unchanged from current practice in this regard. For a definition and explanation of the objective function and market welfare, please see pages 7, 14, and the glossary of the <i>FRA Algorithm – Public Description</i> document published by EPEX: FRA algorithm - Public description (nationalgrideso.com). An explanation of market welfare is also provided in Chapter 3 (“Objective Function”) of the EAC Market Design Report published by N-SIDE. Examples of market welfare can be found in the section “Market Fundamentals” (page 6 to 8) of the Market Design Explainer document published by the ESO PowerPoint Presentation (nationalgrideso.com). A provider can indicate the relative priority of different baskets by pricing them differently: each order in each basket must have an offer price in £/MW/h.</p>
<p>Please share your feedback on the proposed design of service stacking for frequency response services (please see section G above). Do you expect any problems to comply with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services?</p>	
<p>As we are already a Dynamic Containment service provider, we will not have an issue delivering at the fast frequency requirements.</p> <p>Have NGENSO considered that there is a risk with stacking that parties participating in multiple services may indirectly affect the pricing in the DC market.</p> <p>NGESO procuring volume in stacked services while knowing the delivery response will be quicker than required may cause less volume to be directly acquired in the DC auction with the expectation the actual requirement is picked up by another service.</p>	<p>The speed of DR response does not impact the quantity of the DC service requirement. The ESO must procure sufficient frequency response to secure the system against the largest loss. If the largest generation connection were lost when the system frequency was already close to 49.8 Hz, then all DRL units would already be delivering close to 100% of their contracted capacity. The full quantity of DCL would then be needed to cover the loss, and this would be true regardless of whether the DRL been activated fast or slow prior to the loss.</p> <p>In practice, different combinations of the three services may secure the system sufficiently, and the ESO may use substitutable buy orders</p>

Whilst service stacking can provide benefits to the market and participants, it does also impact auction transparency. It will be more difficult to ascertain the marginal offer in an auction when there are multiple offer structures spanning across auction products. We wouldn't want to see the DC requirement diminish and the DR service inadvertently increase due to stacked offerings that incorrectly show a reduced DC requirement because it has been provided indirectly by another service.

to procure less of one service and more of another. This action would not be inadvertent, but rather it would be informed by modelling of the requirements, estimation of the cost of alternative actions to correctly price the buy orders, and the operation of the clearing algorithm to maximise the market welfare of the auction.

Please share your feedback on the proposed changes to the specification of sell orders (please see section H above).

The additional options for sell order structures provide useful flexibility for market participants. The baskets in particular would be a useful tool, although the limit of 25 baskets per unit per EFA day may be restrictive when offering a unit into multiple auction products across a day.

The ability to use child bids to include curtailable capacity is also a useful structure. Some of the additional options for substitutable child bids may be unnecessarily complex for the market, so it will be interesting to see if and how these are utilised by market participants.

We do have concerns about how robust the auction submission process is to IT failures. Whilst an API is a sensible route for providing sell offers, there does need to be a backup route if there is any failure of the API (at either the NGESO or the market participant end). We are aware that there is an option to manually input offers into an interface, but this feels overly cumbersome and highly prone to human error. A backup file upload route would have been preferred, and we would request NGESO give further consideration to developing this.

The limit of 25 baskets per unit per auction is imposed to ensure the clearing algorithm can run within the time available. The complexity of the auction increases non-linearly with the number of baskets, so doubling the number of baskets in the auction will significantly more than double the calculation time required by the algorithm. We plan to review this limit after a period of market operation.

Our proposed design of the sell order seeks to balance two conflicting objectives: maximising the opportunity for participants to optimise their assets commercially, while keeping a reasonable limit on complexity. The substitutable child orders enable participants to indicate a wide range of possible stacking combinations for a unit without being constrained by the limit of 25 baskets per unit per auction. During and after the Market Trials, the ESO will support market participants who wish to avail themselves of this feature of the market design.

The current EPEX CTS++ market platform offers only a single submission option, namely .csv file upload. The new market platform will have two options (API and user interface), which will add resilience to the process. When surveyed, the majority of industry responses favoured an API interface over .csv upload. Offering .csv upload as a third option has a small perceived incremental benefit but

	<p>would be very complex in development and usage to conform to the market design of multiple baskets each containing multiple orders. While we do not foresee the API to have resilience issues, in the scenario where the API is not available a user can make an alternative submission by cloning the previous day's (or another day's) baskets and then editing the baskets for price and volume.</p>
<p>Please share your feedback on the proposed changes to the clearing algorithm to NGESO buy orders to be paradoxically accepted (“overholding”) to increase overall market welfare (see section I above).</p>	
<p>Overholding is an ideal requirement but to ensure fairness to the end consumer this should be limited to a maximum of x% of the original requirement.</p> <p>The clearing algorithm itself doesn't seem to be explained in detail and is just referenced as the Auction algorithm. A supplementary document should be provided outlining the rules and constraints of the algorithm should be shared with participants.</p> <p>Having raised and discussed some of the points in section 9.2 of the Procurement Rules in the EAC drop in session it seems that there is no specific definition of Market Welfare and this seems to be a term being used. What isn't clear is whom Market Welfare is referring to.</p> <p>In one of the examples that was discussed it was suggested the orders being selected have no preference over Parent /Children of equal volumes and pricing but the system will randomly select one of the offers.</p> <p>It has also been outlined in the same discussion that if the algorithm is taking too long and times out it will just take the latest “Best Offer” so far which may not be the best for the Market Welfare.</p> <p>The Market Welfare needs to be defined and any rejection codes need to clearly identify why something has been rejected especially if it is due to the algorithm timing out and not because the offer has been paradoxically rejected.</p>	<p>The clearing algorithm is explained in detail in Appendix 2 of the EAC Market Design Report published by N-SIDE.</p> <p>Market Welfare is a defined term in the Glossary of the Procurement Rules. An explanation of market welfare is provided in Chapter 3 (“Objective Function”) of the EAC Market Design Report published by N-SIDE. Definitions and examples of market welfare can be found in Section Market Fundamentals (slide 6-8 in June 2023 version) of the Market Design Explainer document published by ESO. The objective function for the new clearing algorithm is unchanged from the current clearing algorithm: the HELENA algorithm on the EPEX CTS++ platform also relies on maximisation of market welfare to clear the market. The calculation of market welfare in the proposed new market is identical to the calculation of market welfare in the existing market for DC/DM/DR.</p> <p>An explanation of the implementation of overholding is provided in Section 5.3 (“How are buy orders treated by the EAC algorithm?”) of the EAC Market Design Report published by N-SIDE. The amount of overholding is limited by the bid quantity in the “overholding buy-order” (as defined in Section 5.3 of the EAC Market Design Report). An example is provided in the EAC Market Design Explainer document published by ESO. Please see Example 2b in Section “Market Clearing Rules – More Definition” (slide 56 in the June 2023 version).</p>

We would also challenge that the algorithm timing out is not the best outcome for Market Welfare.

The clearing algorithm does not systematically favour parent orders nor child orders. However, in the case of a parent order and a child order with equal offered quantities and equal prices, the clearing of one order or the other is not random, but depends on the application of the clearing rules. The clearing rules require that constraints with respect to links between orders, welfare sharing etc. be respected, and these rules are different for parent orders and child orders. Acceptance or rejection of a parent or child order therefore influences the acceptance or rejection of other orders in different ways. Consequently, the overall market welfare of the clearing solution will likely be different in the different scenarios.

It is possible that for a given auction, there exist two clearing solutions with the same market welfare. Typically, this occurs when a single auction participant has more than one market unit with exactly the same capabilities, and the participant submits identical baskets for all these market units. In the case that one of these baskets is the marginal offer (i.e., one or more of the identical baskets is cleared but not all can be cleared), then the prevailing solution will be the first solution that is found. This is explained on the bottom of page 11 of the EAC Market Design Report. For a complex auction such as we expect for the EAC, it is very rare that two different clearing solutions have equal welfare but different marginal offers. In this unlikely event, the prevailing solution is still the first solution that is found (and there is no other hierarchy of solutions based on the order type or other characteristic of the offers).

The clearing algorithm has a time limit to find a solution, which is constrained by the auction gate close (when the calculation can begin), the target publication time for auction results, and the required time to complete other necessary, associated business processes (such as integrity checks on the auction results).

	<p>Performance testing of the new clearing algorithm has been successful. For data sets based on historical levels of participation, the algorithm clears the auction within the allocated time. For our stress tests (based on datasets three times larger than we expect, given participation trends), the algorithm normally finds an optimal solution within the time limit, and it always finds a solution whose welfare is within 0.03% of the theoretical optimal welfare. We note that the practice of having a time-bound optimisation is consistent with the current frequency response auction (although, to date, no frequency response auctions have “timed out”). A time-bound auction is also standard industry practice. For example, the EUPHEMIA clearing algorithm for day-ahead market coupling in European power markets does not find the optimal solution within the allocated time, but rather the prevailing solution is the solution with highest market welfare found within the allocated time.</p>
<p>Please share your feedback on the proposal to allow negative prices for buy orders, sell orders, and market clearing prices (see section J above). Will there be impacts to provider settlement systems? Do you have any recommendations to NGESO?</p>	
<p>Buy orders should not be eligible for Negative prices. When NGESO are procuring this service they should not be able to request negative prices for a service and should be limited to a £0.00 price. We agree negative offerings from service providers is acceptable as this is a strategic decision from parties and if NGESO are not wanting to procure volumes it should be controlled in the volume requirements and not the pricing.</p> <p>Our settlement system can accept credit or debit notes so processing will not be an issue from our perspective and verbal confirmation from NGESO is that invoicing to parties will be a net figure for the month and not separate credit / debit notes makes this easier.</p>	<p>The ESO may submit some buy orders with negative bid prices, as this will be necessary to limit the quantity of overholding for products and service windows where the market clearing price is likely to be negative. In contrast, if the ESO were to submit an “overholding buy order” at a price of £0/MW/h for a product for which there is an abundance of offers priced below £0/MW/h, then the welfare-maximising solution would seek to fill the entire overholding quantity. The EAC overholding methodology will work most effectively if the “overholding buy order” is priced below the expected market clearing price. In general, the quantity of service that the ESO requires for system security will be bid at or above £0/MW/h. If ESO does not want to procure volumes for certain products, ESO will set the volume requirement to 0MW and this will not be reflected through pricing.</p>

	<p>Whilst it is feasible that a self-bill Invoice and a Self-Bill Credit are created for Ancillary Services, our systems will net the self-bill Ancillary Services invoices and where the net amount is positive, the net payment will be made to the service provider. In the case where the net amount is negative the service provider would be expected to pay NGESO.</p> <p>Within a given month the totals for DC/DM/DR will be netted and the resulting amount would appear on either a self-bill invoice to self-bill credit. However adjustments are separately categorised which means that it would be possible to have a self-bill invoice for £10k for Dynamic services supplied this month, and self-bill credit of –5k in respect of an adjustment to a previous payment.</p>
<p>Please share your feedback on the proposed changes to performance monitoring for frequency response to accommodate stacked services (see section K above).</p>	
<p>Monitoring assets at the unit level and only at the fastest service measurement seems acceptable however this should also be reflected in the onboarding tests. An asset which is qualified to deliver at the Dynamic Containment response rates is clearly able to deliver at the slower rates required for Dynamic Moderation / Regulation.</p> <p>This should be reflected in the testing and onboarding requirements as it reduces the costs and impacts on providers when qualifying assets for all services.</p>	<p>Further testing is not required (evidence of correct delivery of DC and correct delivery of DR from a unit is enough for us to allow stacking of DC and DR from that unit)</p>
<p>Please share your feedback on the proposal to amend the settlement formula to accommodate negative prices, and to ensure a meaningful settlement adjustment in case the market clearing price is close to £0/MW/h (see section L above). What are your thoughts on NGESO’s proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance?</p>	
<p>We agree that the settlement adjustment should be meaningful in the case where the clearing price is low or negative. Market participants should be incentivised to provide good performance, or declare their assets unavailable. This proposal goes some way to ensure providers are driven to do this.</p>	<p>We commit to monitoring the impact of the settlement, to reviewing the proposed £1/MW/h minimum settlement adjustment, and to revising it if necessary. We remain open to further feedback from market participants on the derivation of this parameter. We have simplified the drafting of Schedule 3 of the Service Terms.</p>

<p>-£1/MW/h to £1/MW/h as a band seems reasonable, but we would suggest this is regularly reviewed to check it is still a meaningful limit.</p> <p>In the interests of clarity in the documentation, the use of x1, x2 and X as variables is not overly helpful. Using more standard mathematical representation of variables such as x,y,z or a,b,c would've been more straightforward.</p>	
<p>NGESO plans to enable separate disarming codes for each frequency response service (DC, DM, DR). This is a prerequisite for enabling the stacking of frequency response services. What are the impacts of this change on providers (units providing frequency response, control technology, internal systems, etc.)? What recommendations and advice do you have for NGESO?</p>	
<p>We see the requirement for needing to disarm a unit from a longer running service and support the change but as noted, previously any system change requires time and we need the associated “codes” and process for receiving these notifications.</p> <p>We also need to understand how these instructions flow through to Settlement and how this information is presented in the backing data to ensure parties can validate the Settlement invoicing from NGESO. Currently there is no mechanism in the backing data to identify where NGESO have provided instructions to a party.</p>	<p>The proposal to introduce new disarming and rearming codes is currently under development. We expect to go-live with stacking at the same time as we launch the new EAC platform, and the new disarming and rearming codes will follow at a later date. We included this question in our Consultation to give early visibility of the issue to Frequency Response providers and to get initial feedback that could support the development of the proposal. We will update market participants with our detailed proposal when it has been developed further.</p> <p>Thank you for highlighting the particular issues of concern to you. We will address these in our detailed proposal.</p>
<p>Do you have any additional feedback on the proposed new Reserve/Response Procurement Rules?</p>	
<p>The naming convention of all the documentation and the incomplete specifications has resulted in more effort being required to assess this change than really should be needed and we are still in a position where we cannot confidently agree that we will be able to deliver the new specification in the current timescales.</p> <p>It has also been suggested that the revised / Final Reserve Rules are to be circulated for consultation at a later date once they are fully designed, on this basis we can only comment on the Response services.</p>	<p>Thank you for this feedback. The specification document was made available at the earliest opportunity to give participants maximum time to commence their implementation work. We appreciate all the information has not been readily available at the beginning however we are aiming to update this living document as it evolves based on feedback.</p>

Do you have any additional feedback on the proposed amendments to the Frequency Response Service Terms?

No

Respondent F

Please share your feedback on NGESO's overall strategy for frequency response and reserve, including the plan to move to a single, simultaneous, co-optimised auction, and the new market design and auction platform (please see sections A, B, and C above).

We agree the overall strategy is sensible. The ESO should explain as soon as possible whether the changes proposed also facilitate the addition of Balancing Reserve to the platform.

Balancing Reserve will eventually be procured via the EAC platform, and will share common business processes relating to the management of assets and units, sell order submission, etc. The Balancing Reserve service is still under design and development, and our current assumptions may change during the design process. We intend to align the market design and clearing algorithm for Balancing Reserve with the market design for frequency response, although there will likely be differences in the Balancing Reserve service design (for example, relating to service window, stacking rules, etc.) that will require modifications to the market design. In particular, we currently expect that the auction for Balancing Reserve will be held in the morning, while frequency response will be procured in the afternoon. If this is the final design, then Balancing Reserve will not be co-optimised with frequency response. We will continue to communicate with industry as the design for Balancing Reserve progresses.

Please share your feedback on the proposal to amend the existing frequency response procurement rules to enable a cutover to the new platform and auction clearing algorithm.

We believe the proposal is sensible. The ESO should provide as much notice as possible for when the cutover will occur.

Thank you for this feedback we will ensure that adequate notice is provided.

Please share your feedback on the proposed design of co-optimisation in the new market clearing algorithm (please see section F above).

We believe the proposal is sensible. It is important that market participants are provided with the opportunity to test the new offering capability in a test environment as soon as possible.

Thank you for the feedback in support of this change.

We plan a series of Market Trials, where providers will have the opportunity to submit offers into simulated auctions that are cleared

	against representative ESO buy orders. Providers will be supported during the Trials, and we will give all participants in the Trials the opportunity to ask questions about offer submission and market clearing.
Please share your feedback on the proposed design of service stacking for frequency response services (please see section G above). Do you expect any problems to comply with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services?	
We agree with the intent to facilitate service stacking although we do not have any detailed comments on this subject.	Thank you for the feedback in support of this change.
Please share your feedback on the proposed changes to the specification of sell orders (please see section H above).	
See our answer to question 3.	We plan a series of Market Trials, where providers will have the opportunity to submit offers into simulated auctions that are cleared against representative ESO buy orders. Providers will be supported during the Trials, and we will give all participants in the Trials the opportunity to ask questions about offer submission and market clearing.
Please share your feedback on the proposed changes to the clearing algorithm to NGESO buy orders to be paradoxically accepted (“overholding”) to increase overall market welfare (see section I above).	
The concept appears sensible although we cannot comment specifically on the detailed formulae.	Thank you for the feedback in support of this change.
Please share your feedback on the proposal to allow negative prices for buy orders, sell orders, and market clearing prices (see section J above). Will there be impacts to provider settlement systems? Do you have any recommendations to NGESO?	
We believe the overall approach is sensible. We wouldn’t expect there to be an adverse impact on our settlement processes.	Thank you for the feedback in support of this change.
Please share your feedback on the proposed changes to performance monitoring for frequency response to accommodate stacked services (see section K above).	
The rationale for the change appears sound although we cannot comment on the detailed formulae.	Thank you for the feedback in support of this change.
Please share your feedback on the proposal to amend the settlement formula to accommodate negative prices, and to ensure a meaningful settlement adjustment in case the market clearing price is close to £0/MW/h (see section L above). What are your thoughts on NGESO’s proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance?	
The rationale for the change appears sound although we cannot comment on the detailed formulae	Thank you for the feedback in support of this change.

NGESO plans to enable separate disarming codes for each frequency response service (DC, DM, DR). This is a prerequisite for enabling the stacking of frequency response services. What are the impacts of this change on providers (units providing frequency response, control technology, internal systems, etc.)? What recommendations and advice do you have for NGENSO?

An important consideration for us is in a situation where we are providing DRL and DRH and the unit is disarmed for only DRL. Do we then continue to provide only DRH or cease DR provision entirely? The separate disarming of Low and High response could be quite complex for market participant systems.

We believe there would be merit in creating separate global disarm instructions for the 3 'services' (DR, DM, DC) that will disarm all service variants together so that where necessary the number of instructions is kept to a minimum to avoid additional complexity.

Most importantly we believe any complexity can be best mitigated by the ESO producing business process documentation which is as clear and detailed as possible. This documentation should also be provided as soon as possible.

The proposal to introduce new disarming and rearming codes is currently under development. We expect to go-live with stacking at the same time as we launch the new EAC platform, and the new disarming and rearming codes will follow at a later date. This means that on Day 1, arming and disarming individual services will not be implemented. The arming and disarming signals will be at a unit level. Once the new systems are in place, we will communicate this to the market in advance of the implementation.

Do you have any additional feedback on the proposed new Reserve/Response Procurement Rules?

As we understand it, paragraph 6.6 is written such that non-BM energy volumes are not passed through ABSVD although BM energy volumes are. What is the rationale for this difference in treatment? It does not feel correct to treat BM and non-BM participants differently on this issue.

Finally, we note that there appears to be a cross-referencing error in paragraph 8.8 as this refers to "without prejudice to paragraph 0".

We are reviewing ways to align ABSVD for BMUs and non-BMUs as part of our Response reform work. Significant changes to IT systems and processes have already been identified and work has already been undertaken to deliver some of the new systems which would be required. We are working to confirm timelines for addressing the remaining barriers and hope to be able to share these in the next couple of months as part of our Response reform future plans.

Thank you for highlighting the cross-referencing error. Occasionally cross references are lost on conversion of the Word document to PDF, this cross reference should be to 8.14 and will be corrected in the final version.

Do you have any additional feedback on the proposed amendments to the Frequency Response Service Terms?

Following discussions with the ESO, it has become apparent that the Frequency Response Service Terms as currently drafted exclude synchronous plant from participation in the Dynamic Regulation Service. Specifically, paragraphs 6.7 iv, 6.11 vi, Schedule 2 (Capability Data Tables) and Schedule 5 (Testing) Part 3

Thank you for the feedback however this sits outside the scope of changes we are consulting on for the delivery of the EAC platform. This change is being progressed and reviewed as part of our Response

<p>(Dynamic Regulation Test Requirements), refer to units providing equivalent Mode A Frequency Response capability in the Deadband. This is not possible for synchronous plant. We do not believe it was the intent of the ESO to prevent synchronous plant from participation where the technical capability exists. This issue was previously acknowledged by the ESO in the earlier DR consultation document entitled “You Said, We Did” (dated 13 January 2022) but, unfortunately, the current drafting has not resolved this. Therefore, we propose that the Deadband provisions are amended to state a Response Unit which is not Energy Limited may operate with a zero Deadband such that the response requirement becomes a straight line starting at -0.2Hz, 100% and ending at +0.2Hz, -100%. However, we are open to alternative drafting changes which will remove this restriction on participation for synchronous plant.</p> <p>The drafting change must be made as soon as possible to facilitate the entry of synchronous plant into the DR market. We note that the Balancing Reserve proposal was recently rejected by Ofgem in part because it excluded a significant quantity of otherwise technically capable assets. We believe the precedent and Ofgem’s expectations have therefore been clearly set that all technically capable plant should be enabled to compete for Balancing Services.</p>	<p>reform work. We will share this feedback with the Response reform team.</p>
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Respondent G

<p>Please share your feedback on NGESO’s overall strategy for frequency response and reserve, including the plan to move to a single, simultaneous, co-optimised auction, and the new market design and auction platform (please see sections A, B, and C above).</p>	
<ul style="list-style-type: none"> • Overall agreed that a co-optimised approach could lead to consumer and system cost savings, and will likely improve the success of assets entering the different services • Clear communication needs to be made of how to utilise the API function of EAC <p>Clear communication also needed on how/when Balancing Reserve will be included within EAC, please can you inform us with this?</p>	<p>Thank you for your comments. We will endeavour to ensure all communication related to the API function and how it is utilised is clear on our website and during our drop-in sessions. If there is a particular concern, please feel free to request a 121 session with the team.</p> <p>In regard to Balancing Reserve, this will eventually be procured via the EAC platform, and will share common business processes relating to the management of assets and units, sell order submission, etc. The</p>

	<p>Balancing Reserve service is still under design and development, and our current assumptions may change during the design process. We intend to align the market design and clearing algorithm for Balancing Reserve with the market design for frequency response, although there will likely be differences in the Balancing Reserve service design (for example, relating to service window, stacking rules, etc.) that will require modifications to the market design. In particular, we currently expect that the auction for Balancing Reserve will be held in the morning, while frequency response will be procured in the afternoon. If this is the final design, then Balancing Reserve will not be co-optimised with frequency response. We will continue to communicate with industry as the design for Balancing Reserve progresses.</p>
<p>Please share your feedback on the proposal to amend the existing frequency response procurement rules to enable a cutover to the new platform and auction clearing algorithm.</p>	
<p>No comments</p>	
<p>Please share your feedback on the proposed design of co-optimisation in the new market clearing algorithm (please see section F above).</p>	
<ul style="list-style-type: none"> Concerns over the time needed for deriving a clearing price with more complex bidding strategies through the new basket approach/stacking of services. Can Grid ensure that the algorithm will be able to efficiently calculate clearing prices within allotted time periods and that it doesn't inherently favour larger assets? 	<p>Performance testing of the algorithm has been successful. For data sets based on historical levels of participation, the algorithm clears the auction within allotted timescales. For our stress tests (based on datasets three times larger than we expect given participation trends), the algorithm always finds a solution whose welfare is within 0.03% of the theoretical optimal welfare. The cap on the maximum number of baskets per unit and auction (i.e., 25 baskets total) is enforced to ensure that the algorithm will always find an acceptable solution within the allotted timescales. We plan to review this limit after a period of market operation.</p> <p>We can also confirm that the algorithm does not have an inherent bias towards larger assets. The algorithm solves for the solution with maximum market welfare, regardless of asset size.</p>
<p>Please share your feedback on the proposed design of service stacking for frequency response services (please see section G above). Do you expect any problems to comply with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services?</p>	

<ul style="list-style-type: none"> • Agreed on the design being the best fit and no concerns over requirements with stacking • Could Grid clarify if a non-BMU loses some availability while delivering stacked services (and therefore required to redeclare availability via ASDP, with a combination of MW and product), how do we decide which product to redeclare? <ul style="list-style-type: none"> ○ Example: a 12MW site doing DCL (2MW), DCH (2MW), DRH (4MW), DML (4MW), partial outage of 8MW occurs, what do we redeclare? ○ Respondent G has concerns over providers just choosing the product with the least economical impact instead of based on what Grid requires – and could be open to gaming by providers <p>Please, however, refer to Q11 for more detailed comments on stacking and the new procurement rules</p>	<p>Currently partial availability is not allowed. A unit should declare themselves either available or unavailable for the contracted services. The performance factor K is calculated on a unit basis so the risk of a participant underperforming on the least valuable service and overperforming on the most valuable is mitigated. Therefore, we do not expect stacking/splitting to present any opportunities for gaming. Prior to Market Trials, the new market clearing algorithm will undergo functional testing to verify the efficiency of clearing the new market design.</p>
<p>Please share your feedback on the proposed changes to the specification of sell orders (please see section H above).</p>	
<ul style="list-style-type: none"> • Concerns over the looping of baskets with child and substitutable child orders, could this lead to inefficient clearing (and open up to gaming) if having to fully accept an offer with multiple back-to-back EFA blocks • Further concerns over assets being over-procured because of this looping functionality, as the platform is not performing any validation and just assumes the company tendering the services to guarantee it can provide them 	<p>We do not expect looping of baskets to present any opportunities for gaming. Prior to Market Trials, the new market clearing algorithm will undergo functional testing to verify the efficiency of clearing the new market design. Note that when baskets are looped, only the parent orders in each basket must be accepted together. Acceptance of the child and substitutable child orders in the basket is subject to each of the orders having non-negative order surplus.</p> <p>The scope of sell order validation on the new market platform is not materially changed from the existing validation on the EPEX CTS++ platform. The total offered quantity of each product in each service window must be less than or equal to the pre-qualified capacity for that product. Additionally, the total offered quantity of all low-frequency products must be less than or equal to the capacity (in MW) of the unit to deliver power, and the total offered quantity of all high-frequency products must be less than or equal to the capacity of the unit to take power. This validation is enforced primarily to protect against “fat finger mistakes” which could undermine the overall integrity of auction clearing. For example, if a 50 MW unit were to</p>

	<p>offer (and clear) 500 MW of capacity, then there would be 450 MW of unfilled ESO requirements and simultaneously 450 MW of provider offers with no commercial route to market. However, consistent with the existing functionality of the CTS++ platform, the new market platform will not validate the offered energy (in MWh) of sell orders submitted by energy-limited units. The available MWh of a unit is not known in advance to the market platform as this depends on the unit's state-of-charge, and even where the nameplate energy storage capacity of an energy-limited asset is known, this can degrade over time. The consequence of an error in respect of the available energy indicated by a submitted sell order (which has otherwise passed its power capacity validation) is adverse, but it is nonetheless smaller than the potential consequence of an error in offered power capacity. We expect market participants as prudent providers of the frequency response services to conform to the Procurement Rules and to ensure the deliverability of their offers prior to submission of the sell orders to the platform. Non-compliance with the Procurement Rules will be detected by the performance monitoring process.</p>
<p>Please share your feedback on the proposed changes to the clearing algorithm to NGESO buy orders to be paradoxically accepted ("overholding") to increase overall market welfare (see section I above).</p>	
<ul style="list-style-type: none"> Agreed that it is a beneficial change in terms of increasing welfare. Despite it producing higher welfare, Respondent G notes however that this will seemingly benefit larger assets as the new algorithm and overholding allowance will select a larger/cheaper asset over a smaller/expensive one 	<p>We do not expect that "overholding" will benefit larger assets at the expense of smaller ones. The algorithm will, in general, favour cheaper offers over expensive offers, regardless of the asset size. However, the algorithm may choose a smaller but more expensive asset over a larger but cheaper asset, in the case that this solution has higher market welfare.</p>
<p>Please share your feedback on the proposal to allow negative prices for buy orders, sell orders, and market clearing prices (see section J above). Will there be impacts to provider settlement systems? Do you have any recommendations to NGESO?</p>	
<ul style="list-style-type: none"> Believe that allowing negative prices can bring further cost savings, but do have concerns over if the inclusion of negative prices could drive down appetite for entering the services 	<p>The new co-optimisation features in the market design (baskets and substitutable children) will enable the provider to simultaneously make offers for different services. Providers will be able to submit sell orders for a particular service (at an offer price at which the provider</p>

<ul style="list-style-type: none"> No comment on impacts on settlement systems as do not provide this, but can imagine changes will need to be made for providers who do. Potentially a staged approach of negative price inclusion after go-live would be better received 	<p>finds acceptable, either negative or non-negative), and also make offers for other services. If the quantity of a particular service offered at negative offer prices is insufficient to meet the ESO's requirements, then the remaining part of the ESO's requirements will be matched against offers with a non-negative offer price. We therefore do not expect that the introduction of negative prices will adversely impact liquidity for any particular service.</p> <p>Sufficient providers have indicated their readiness to settle at negative market clearing prices, and we expect to enable providers to submit sell orders with negative offer prices on Day 1.</p>
<p>Please share your feedback on the proposed changes to performance monitoring for frequency response to accommodate stacked services (see section K above).</p>	
<ul style="list-style-type: none"> The ramp rates of the k-factor for negative prices could cause too high penalties, and therefore could the rate of increase of the k-factor for negative pricing be scaled down Could Grid provide some detailed examples of the calculation of k-factors and performance bounds for several scenarios No concerns on the technical requirements of implementing the proposed changes to performance monitoring 	<p>Thanks for your feedback. We have amended our methodology to calculate penalties when clearing prices are negative. Our revised proposal for the settlement adjustment methodology defines a "Minimum Adjustment Price", which we propose to be £1/MW/h. If the market clearing price is greater than or equal to the minimum adjustment price, then the settlement adjustment price is equal to the market clearing price; while if the market clearing price is less than the minimum adjustment price, then the settlement adjustment price is equal to the minimum adjustment price.</p> <p>Examples of how different K-factors affect the settlement values have been published: https://www.nationalgrideso.com/document/283281/download</p> <p>An example showing performance bounds for a unit delivering response services and calculation of the K-factor for a specific contracted period can be found here: https://www.nationalgrideso.com/document/277526/download , and we aim to keep this document continuously updated.</p>

Please share your feedback on the proposal to amend the settlement formula to accommodate negative prices, and to ensure a meaningful settlement adjustment in case the market clearing price is close to £0/MW/h (see section L above). What are your thoughts on NGENSO's proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance?

- Agreed that this new methodology means that with negative prices, providers with poor performance will now be penalised more than those with better performance
- Concerns that the penalties associated with negative pricing could lead to an increase of bids from participants to offset risk of non-delivery
- Not sure on arbitrary £1/MW/h adjustment as providers will likely just bid at £1.01/MW/h
- Could a fixed penalty (£/MW) be a better approach? Does the penalty need to be tied to the clearing price if it is £1 or below?
- Respondent G would like Grid to clarify what occurs to an asset if it is declared "unavailable", for example, would the settlement payment be £0/MWh for the relevant settlement period without any impact from where the auction cleared?

The ESO acknowledges the concerns raised by respondents regarding the consequences of the settlement adjustment methodology when the market clearing price is negative, and the potential adverse outcomes on market participation and market clearing. We will therefore modify the proposed settlement adjustment methodology in line with the suggestion of some respondents and propose instead a fixed settlement adjustment for poor performance when the market clearing price is negative, rather than an adjustment equal to the absolute value of the market clearing price.

Our revised proposal for the settlement adjustment methodology defines a "Minimum Adjustment Price", which we propose to be £1/MW/h. If the market clearing price is greater than or equal to the minimum adjustment price, then the settlement adjustment price is equal to the market clearing price; while if the market clearing price is less than the minimum adjustment price, then the settlement adjustment price is equal to the minimum adjustment price.

For example, if a unit has a K-factor equal to zero for a particular frequency response service, the settlement will be £0/MW/h if the market clearing price is greater than or equal to £1/MW/h (i.e., consistent with the current methodology). If the market clearing price is less than £1/MW/h, then the settlement will be equal to the market clearing price less £1/MW/h, which will result in a payment from the provider to the ESO. For example, if the market clearing price is £0.25/MW/h, then settlement will be £ -0.75/MW/h (resulting in a payment to the ESO), while if the market clearing price is £ -6/MW/h, then the settlement will be £ -7/MW/h (rather than £ -12/MW/h under the methodology proposed by the ESO in the Consultation documents).

	<p>If a unit is unavailable for any part of a Settlement Period, the settlement will be £0/MW/h for that period.</p>
<p>NGESO plans to enable separate disarming codes for each frequency response service (DC, DM, DR). This is a prerequisite for enabling the stacking of frequency response services. What are the impacts of this change on providers (units providing frequency response, control technology, internal systems, etc.)? What recommendations and advice do you have for NGESO?</p>	
<ul style="list-style-type: none"> • Respondent G notes there is very little detail on the disarming codes currently • Grid will need to make it clear if it plans to launch EAC with stackable services without the disarming codes initially. It will then need efficient communication of when these disarming codes will be provided to allow participants to incorporate in a timely fashion 	<p>The proposal to introduce new disarming and rearming codes is currently under development. We expect to go-live with stacking at the same time as we launch the new EAC platform, and the new disarming and rearming codes will follow at a later date. We included this question in our Consultation to give early visibility of the issue to Frequency Response providers and to get initial feedback that could support the development of the proposal. We will update market participants with our detailed proposal when it has been developed further.</p>
<p>Do you have any additional feedback on the proposed new Reserve/Response Procurement Rules?</p>	
<ul style="list-style-type: none"> • We recommend that a single duration test can be used for all Response Services (i.e., DC, DM and DR) provided the duration test is for the longest duration required by any service, e.g., the duration test of 60 minutes for DR can be used for DM and DC. <ul style="list-style-type: none"> ○ This is a sensible approach and will surely shorten the test times. However, there's a discrepancy between tolerances of DR and the other two. While the duration tests for DC and DM have a +/- 3% tolerance (our understanding), DR looks at the minimum response achieved within the 10 seconds to 60 minute timescale. ○ This means there's no minus tolerance and the plant should never fall below its rated/contracted power even slightly. If the same tolerance gets introduced for DR, then a duration test for DR sampled at 20 Hz could be used for the other two. ○ Frequency signals are also different between the services. E.g. 49.8Hz is used for full contracted power while testing for DM 	<p>Thank you very much for your detailed response. We have raised this with the relevant teams within the ESO and believe that many of these points have been addressed with in our release 1 frequency response reform consultation. This sits outside the scope of the EAC consultation, but we would like to engage with you further on these points to ensure that further clarification can be provided where possible.</p>

whereas it's 49.5 for DC. Would this present a problem with the above amendment?

- General comments relating to DM and DR:
 - DM and DR operate in a much narrower frequency band (+/- 0.2Hz) than DC. It's further tighter for DM, as the plant needs to deliver 95% of its contracted power within a 0.1Hz frequency band (this is from 50.1 to 50.2 or 49.8 to 49.9). What we noticed is that this may bring more noise than stability on the grid in places. The risk is:
 - As the power change is expected to be fast and in big amounts due to the narrow frequency band, this causes measurement instability on the frequency monitors. This can result in spikes in the measurements, therefore causing more spikes in the power response. **Removed for confidentiality.**
 - **Removed for confidentiality.** Therefore, we recommend a review of the response curves for DM and DR services.
- Page 28, Table 9 - the frequency injection profile in Table 9 belongs to frequency injection of DM, but it is in DC section
- Page 43 (Graphs for Test 1) - the pink in the Graph looks at 0.68 sec which contradicts the test Full delivery time which is 1 sec. Either there should be one more line at 1 sec which shows the test is good if the asset is able to deliver full power before it or that pink line should be shifted to that.
- Page 43 (DC/DM/DR test calculator example graphs) - now all the three services are combined in one document it is important to see the consistency in the colour of the example graph like in DC the reference line for fast and slow assets is Pink, while in DM and DR it is green.
- Page 61 (Graphs for Test 1) - the Green reference line in the graph of test 1.7 should be at 1 sec it is going to be 1.05 sec. If that is something different which is allowed a tolerance of 0.05 sec it should be mentioned in the table above.

<ul style="list-style-type: none"> • Page 66 (Pass criteria point 1) - the explanation “the sum of minimum response achieved within the 10 second to 60 minute timescale constitutes the total volume of the Response Unit. (i.e. the minimum total response achieved within each timescale).” is not including the -5% tolerance which is given in Table 4 on page 68. <ul style="list-style-type: none"> ○ The statement for pass criteria for DR looks confusing as it is easily covering the +5% tolerance, however it will be difficult to cover -5% tolerance in the exact statement. • Page 71 (Appendix-A) - why is the minimum sample rate for Test 1 different from 2 and 3? 10 Hz is harder to achieve and once established, it could be used for 2 and 3 as well. It would be preferred if the test is done and passed at 10Hz. • Comment on full document - it will be very helpful if the table no. and Figure number would not be the same for all the services in the documents like Table 2 occurs twice in the document which makes the referencing difficult. Assume this is because the document has been combined for all services. • It would be very helpful if there is a list of tables and figures in the content page. 	
<p>Do you have any additional feedback on the proposed amendments to the Frequency Response Service Terms?</p>	
<ul style="list-style-type: none"> • We’re unclear on a couple of points on page 13: <ul style="list-style-type: none"> ○ “Whether or not the Response Unit is available for the applicable Auction Product(s) pursuant to paragraph 5” - we are not clear what is meant by availability here. We do not currently send any such value in our Operational Metering ○ “Whether or not the Response Unit is the subject of a Disarming Instruction” - This requires clarification. Disarming via the Control Point API disarms the entire unit, but ASDP now supports disarming of individual services as well. • So our questions on these points explicitly are: <ul style="list-style-type: none"> ○ What is meant by availability in this context (we have read paragraph 5 but still not clear) 	<p>Thank you very much for raising these concerns. A unit is currently either armed or disarmed for all frequency response services (and not per service). The arming and disarming of frequency response is being reviewed as part of the work on Response reform.</p> <p>The format of operational data is not being amended as part of this EBR Article 18 Consultation. We would recommend you contact your account manager with any questions relating to the notification of unavailability. We will also be happy to engage further on these concerns should further clarification be needed.</p>

<ul style="list-style-type: none"> ○ Does Grid require a single armed/disarmed value for the entire unit, and/or some kind of complex value/bitmap which conveys the armed/disarmed status of all services? ● We are happy with the response parameters when stacking 	
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Respondent H

<p>Please share your feedback on NGENSO's overall strategy for frequency response and reserve, including the plan to move to a single, simultaneous, co-optimised auction, and the new market design and auction platform (please see sections A, B, and C above).</p>	
<p>Overarching Feedback:</p> <p>We would like to thank National Grid ESO for the opportunity to respond to this consultation. Respondent H are eager to support ESO by delivering the highest quality service in the markets that we participate in. We are also always striving to pioneer new ways of delivering those services, such as providing different frequency response services back-to-back, to improve grid management, contribute towards our Net Zero ambitions and create a more affordable energy system for customers.</p> <p>We welcome the introduction of the Enduring Auction Capability (EAC) Platform and support the move away from manual CSV uploads towards a more automated approach. However, we would like to express disappointment around the delays to the consultation release despite a minimal shift to the go-live date. We are concerned that a shorter period to prepare places a resource burden on market participants, particularly given the complexity of internal changes required. This is exacerbated for smaller organisations with limited resources. We urge ESO to take this into account in the future.</p> <p>We would also like to emphasise that robust market monitoring is critical to ensure all market participants are adhering to the market rules and are delivering a high-quality service to the grid. If ESO allow market participants breach the service terms, for example by bidding in more than the capacity of</p>	<p>Thank you for your feedback.</p> <p>We recognise that this is a significant change for market participants and will ensure that participants readiness is fully considered prior to the transition to EAC.</p> <p>We understand the concern around the state of energy rules. ESO is currently reviewing the state of energy guidance within our Response Reform timelines. This includes the ramp rate review taking into consideration stacked services. More details will be shared with the industry when the studies are completed.</p> <p>At this current point there isn't a notification system in place for nationalgrideso.com however as we bring the data portal into the main website in the coming months this feature along with other enhancements will also be brought in, so it will be available soon.</p>

the unit, it could present a very serious risk to system security with extreme consequences. We are in conversations with ESO regarding this issue at present, however with the introduction of service staking and co-optimisation through the EAC platform, this will be even more important to monitor.

We have set out below our high-level thoughts on the following changes proposed as part of this consultation:

Service stacking and negative pricing

Respondent H is supportive of the ability to stack different dynamic service products with each other as well as the introduction of negative pricing, we believe it will deliver significant system benefit and allow batteries to utilise their full technical capabilities.

However, as mentioned above, we do have concerns around the timelines ESO have set for industry to prepare for what will be a substantial step up in complexity. Participants will need to make significant changes to software systems to implement automated bidding in this new way. With less than 4 months to prepare between the consultation launch and go-live, this could prove challenging for smaller organisations. We urge ESO to continuously assess market readiness and the impact that a lack of market readiness would have on the capacity procured in each of the services.

API Market Interface

Respondent H welcomes the introduction of an API Market Interface and support the move away from the current manual processes to upload bids.

We would also like to use this opportunity to raise the following issues that are not directly addressed within this consultation:

State of Energy Management Guidance

We are disappointed not to see ESO producing any further guidance around the rules for the State of Energy (headroom and foot-room). This is something that we highlighted in last year’s Frequency Response consultation, and we remain concerned that existing guidance is not currently in line with the Service Terms.

To be clear, Respondent H are not advocating for relaxing the State of Energy rules, as we believe that maintaining robust rules ensures a high-quality service, however, further clarity and guidance is urgently needed.

Ramp Rate Rules

Whilst we recognise that a Ramp Rate review is currently underway alongside the annual Frequency Response consultation, we would like to request that ESO provides an update on the investigation into the review along with a proposed way forward as soon as possible.

Notification Updates

We would also like to suggest the introduction of automatic notifications via email when updates to the ESO website are made. This would be extremely useful, and it currently works well with the data portal.

Please share your feedback on the proposal to amend the existing frequency response procurement rules to enable a cutover to the new platform and auction clearing algorithm.

Respondent H supports the proposal to enable a cut over to the new platform and auction clearing algorithm.

Thank you for the feedback in support of this change.

Please share your feedback on the proposed design of co-optimisation in the new market clearing algorithm (please see section F above).

We support the proposed design, which allows the market to decide which products are procured, at what volumes and what prices. We believe that these changes will allow BESS assets to participate in the markets to a fuller

Thank you for the feedback in support of this change.

<p>extent of their technical abilities, which can only be a benefit to the markets and participants.</p>	
<p>Please share your feedback on the proposed design of service stacking for frequency response services (pleases see section G above). Do you expect any problems to comply with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services?</p>	
<p>Respondent H strongly believes that robust market monitoring is critical, particularly in the context of increased service staking through the new EAC platform. ESO must start taking instances of breaking the market rules, for example by over-bidding, very seriously. Our understanding is the validation checks will be undertaken that account for an asset's power capacity, however request that the checks be extended to cover their energy requirements (i.e., do they have enough energy reserved to meet the minimum energy requirement for that service).</p> <p>Respondent H is deeply concerned that current ambiguity around this presents a real risk to system security and ultimately drives up costs for consumers. In this respect, ESO must ensure that ambiguity within the Service Terms is stamped out with clear wording within the Service Terms Document and the accompanying Guidance Document.</p> <p>We do not expect any technical problems with regards to complying with the requirement that DR must be delivered more quickly when stacked with faster-acting services. We would like to raise however, that pre-qualification will not be in line with this new requirement and ask ESO to set out how they intend to address this?</p>	<p>Thank you for raising this. ESO is currently working on monitoring the non-compliance in the dynamic service market. ESO will implement extra checks to identify providers behaviour including providers offering capacity exceeding the asset capabilities. Non-compliance will be addressed in line with the Service Terms enforcement actions. No additional testing is required if market participants choose to participate in stacking / splitting. Each asset in a unit must be fully compliant with the service that the unit is procured to deliver. In other words, for a unit to deliver auction products under stacking / splitting, all its constituent assets must be tested and qualified for each individual auction product. For example, evidence of correct delivery of Dynamic Containment and correct delivery of Dynamic Regulation from a unit is enough for us to allow stacking of those services from that unit.</p>
<p>Please share your feedback on the proposed changes to the specification of sell orders (please see section H above).</p>	
<p>Respondent H are supportive of this change.</p>	<p>Thank you for the feedback in support of this change.</p>
<p>Please share your feedback on the proposed changes to the clearing algorithm to NGENSO buy orders to be paradoxically accepted (“overholding”) to increase overall market welfare (see section I above).</p>	
<p>Respondent H agree with this change and have no further feedback.</p>	<p>Thank you for the feedback in support of this change.</p>
<p>Please share your feedback on the proposal to allow negative prices for buy orders, sell orders, and market clearing prices (see section J above). Will there be impacts to provider settlement systems? Do you have any recommendations to NGENSO?</p>	

<p>Respondent H supports the introduction of negative pricing but note there will be some impact to our settlement systems to take into account the new calculations.</p>	<p>Thank you for making us aware, if there is any support we can provide please let us know.</p>
<p>Please share your feedback on the proposed changes to performance monitoring for frequency response to accommodate stacked services (see section K above).</p>	
<p>The changes to the formulae provided in the schedules appear mostly reasonable. We appreciate the effort ESO has gone to in trying to make the complicated output of stacked services clear for participants. However, it is disappointing that the new language uses “contracted volume” and “V” to refer to what was previously “Contracted Quantity” or “Power”. “Volume” is already used elsewhere in the document to refer to an energy quantity. Therefore, using it to refer to a power makes an already-confusing formulae even more difficult.</p> <p>We urge ESO to provide clear guidance around State of Charge management, as this will be key to ensure accurate performance monitoring. Similarly, to reiterate our points made above, we strongly urge ESO to ensure penalties are enforced for poor performance. Currently this is not enforced robustly, which is in turn presenting a very real risk to system security.</p>	<p>Thank you for this feedback. We have amended the new text in the Service Terms to be consistent with previous usage, so that “quantity” and “Q” refers to power capacity in MW rather than energy in MWh.</p> <p>We will be publishing an updated State of Energy Management document to reflect the requirements when services are stacked.</p> <p>ESO is currently working on improving monitoring the non-compliance in the dynamic service market. ESO will implement extra checks to identify providers behaviour including providers offering capacity exceeding the asset capabilities. Non-compliance will be addressed in line with the Service Terms enforcement actions.</p>
<p>Please share your feedback on the proposal to amend the settlement formula to accommodate negative prices, and to ensure a meaningful settlement adjustment in case the market clearing price is close to £0/MW/h (see section L above). What are your thoughts on NGESO’s proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance?</p>	
<p>The Availability Payment formula has been altered to take the new pricing adjustments into account. However, we consider the resulting equation and explanatory text to be confusing. It appears to obscure the intent of the formula to follow a different pattern depending on which of the x1 and x2 thresholds the price is above or below. We suggest making this clearer by removing the “Pricing adjustment factor” and instead providing formulae for an “Effective Price” which is defined piecewise across each threshold. We feel this gives ESO more flexibility to adjust the different patterns as they need to and gives more clarity to readers.</p>	<p>The ESO acknowledges the concerns raised by respondents regarding the consequences of the settlement adjustment methodology when the market clearing price is negative, and the potential adverse outcomes on market participation and market clearing. We will therefore modify the proposed settlement adjustment methodology in line with the suggestion of some respondents and propose instead a fixed settlement adjustment for poor performance when the market clearing price is negative, rather than an adjustment equal to the absolute value of the market clearing price.</p>

$$S_{aij} = \text{round} \left((P_{aj} - (1 - K_{aij}) \times PF_{aj}) \times V_{aij} \times 0.5 \times F_{aij}, 2 \right)$$

replace with

$$S_{aij} = \text{round} (PE_{aij} \times V_{aij} \times 0.5 \times F_{aij}, 2)$$

$$\text{where } PE_{aij} = \begin{cases} P_{aj} \times K_{aij} & \text{if } P_{aij} \geq [x_2] \\ P_{aj} - (1 + K_{aij}) \times [X] & \text{if } [x_2] > P_{aij} > [x_1] \\ P_{aj} \times (2 - K_{aij}) & \text{if } [x_1] \geq P_{aij} \end{cases}$$

Additionally, for the effective price calculated from the clearing price, the price adjustment factor and the K factor does not have sudden jumps, we would like to request that the absolute values of X and x1 and x2 are all set to be equal. That is, even if the proposed X= 1, x1=-1, x2=1 set is not used, we'd like to see the continuous curves these values create maintain with whatever other set of values is chosen.

With regards to NGESO's proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance, we would like to ask ESO to first provide clear rationale around the penalty calculations for very low pricing, including why a threshold of £1 was chosen. Once we have a greater understanding of this, we would be glad to provide more robust feedback to ESO on whether we believe this to be appropriate.

We would also welcome a conversation with ESO around how they foresee the high-performance penalties for poor performance under negative pricing impacting the market and behaviour of participants. Respondent H advocates for penalties that are proportionate to the clearing price and are keen to work with ESO on determining the most appropriate penalty regime.

Our revised proposal for the settlement adjustment methodology defines a "Minimum Adjustment Price", which we propose to be £1/MW/h. If the market clearing price is greater than or equal to the minimum adjustment price, then the settlement adjustment price is equal to the market clearing price; while if the market clearing price is less than the minimum adjustment price, then the settlement adjustment price is equal to the minimum adjustment price.

For example, if a unit has a K-factor equal to zero for a particular frequency response service, the settlement will be £0/MW/h if the market clearing price is greater than or equal to £1/MW/h (i.e., consistent with the current methodology). If the market clearing price is less than £1/MW/h, then the settlement will be equal to the market clearing price less £1/MW/h, which will result in a payment from the provider to the ESO. For example, if the market clearing price is £0.25/MW/h, then settlement will be £ -0.75/MW/h (resulting in a payment to the ESO), while if the market clearing price is £ -6/MW/h, then the settlement will be £ -7/MW/h (rather than £ -12/MW/h under the methodology proposed by the ESO in the Consultation documents).

Alongside this proposed change to the methodology for settlement adjustment in case of poor performance, we will simplify the drafting of Schedule 3 of the Service Terms.

Regarding the derivation of the "Minimum Adjustment Price" (i.e., - x1 = x2 = X in our previous formulation), we had the objective that this price should be set to a level that is not unduly punitive but nonetheless creates a financial incentive for good performance, even in cases where the market clearing price is just a few pence. We wished to avoid a complex indexation formula to derive this price, and we favoured the simplicity a fixed, round number. We examined the distribution of clearing price outcomes for LF frequency response services over the period January to May 2023, and noted that the 10th percentile of

	<p>clearing prices was £0.934/MW/h over this period. We finally concluded that £1/MW/h was a reasonable choice of this parameter to separate “low” market clearing prices from “normal” market clearing prices.</p> <p>As stated above, we propose that the minimum adjustment price should be £1/MW/h, unchanged from our previous proposal (i.e., $-x_1 = x_2 = X = 1$). We commit to monitoring the impact of this settlement methodology, to reviewing the level of the minimum adjustment price, and to revising it if necessary. We remain open to further feedback from market participants on the derivation of this parameter.</p>
<p>NGESO plans to enable separate disarming codes for each frequency response service (DC, DM, DR). This is a prerequisite for enabling the stacking of frequency response services. What are the impacts of this change on providers (units providing frequency response, control technology, internal systems, etc.)? What recommendations and advice do you have for NGESO?</p>	
<p>The separated disarming codes will not cause a problem for us, provided the Control Room’s systems are adequate enough to make this system workable for them and it does not lead to mistakes.</p> <p>We would like to re-emphasise that we do not feel EDL reason codes or ASDP are fit for purpose as enduring solutions for communicating with providers and hope the OBP is taking into account the need for this capability when designing new protocols. We would welcome further engagement on this.</p>	<p>Thanks for the suggestion we will ensure this is appropriately considered by the team leading on our OBP project, will put forward the proposal for further engagement in due course</p>
<p>Do you have any additional feedback on the proposed new Reserve/Response Procurement Rules?</p>	
<p>There is a lack of clarity around references to ‘reserve/response procurement rules’, given that the quick and slow reserve products have been delayed until 2024 and therefore procurement rules do not yet exist.</p> <p>We are also unsure around what combined procurement rules for response and reserve means in practice and would welcome clarification from ESO in this regard.</p> <p>Until we have clarity around the reference to reserve procurement rules, we are unable to provide feedback at this stage.</p>	<p>The new Reserve/Response procurement rules will become effective from a date which ESO will publish upon Ofgem approval under EBR. That date will be the first Auction Opening Time, from which participants will be able to submit orders for the service days from and including the EAC Go-live Date (the 14th day after the Auction Opening Time). In the meantime, the existing Response procurement rules (for DM, DR and DC) will continue to operate but will cease operation in respect of service days from and including the EAC Go-Live Date. These new Reserve/Response procurement rules will initially cover Response (DM/DR/DC) only, but when ESO is ready to publish new service terms</p>

	for the new Quick/Slow reserve products and those service terms are approved by Ofgem under EBR, they will be used for procurement of those reserve products in addition.
Do you have any additional feedback on the proposed amendments to the Frequency Response Service Terms?	
<p>We would like to pose an additional question around Response Energy Reservation:</p> <p>Response energy reservation is summed when stacking multiple services, if there is a loss of energy capacity on the asset (e.g. batteries isolated) taking the capacity below the required reservation, will all services become unavailable or is there a priority ordering (by market or volume)? We would welcome clarification from ESO on this along with appropriate guidance.</p>	<p>Currently partial availability is not allowed. A unit should declare either available or unavailable for the contracted services.</p>

Respondent I

Please share your feedback on NGENSO's overall strategy for frequency response and reserve, including the plan to move to a single, simultaneous, co-optimised auction, and the new market design and auction platform (please see sections A, B, and C above).	
<p>We support NGENSO's strategy for frequency response and reserve markets. We believe the co-optimised and simultaneous approach will provide greater market liquidity in all products and allow the response and reserve markets to operate more efficiently. Through the use of stacking, splitting, linked orders and ability to curtail asset owners and optimisers will be able to apply more complex bidding strategies to reflect the true operating capabilities of the asset technologies in their portfolios. This should further cement the role of BESS at the heart of the meeting flexibility requirements in a net zero electricity system and provide reassurance to NGENSO and Government that new technologies can provide system security services to allow legacy thermal assets to come off the system.</p> <p>We do have some concerns that the changes will introduce new complexity into response and reserve bidding and this will involve significant change by asset operators and owners. We assume that the cost of this change is</p>	<p>Thank you for feedback on the market design. Many of the features of the market design, such as co-optimisation and stacking, have been requested by market participants in their responses to previous consultations. Furthermore, we believe the project has a strong business case. Previous analysis has indicated substantial improvements to market welfare from co-optimisation (compared to the counterfactual without co-optimisation). We also expect the new methodology for overholding, based on paradoxical acceptance of buy-orders, to reduce the quantity of service contracted in excess of ESO requirements, compared to the current methodology (where an elastic buy order curve with steeply declining bid prices is submitted for quantities in excess of the core ESO requirements).</p> <p>The market clearing algorithm has passed performance testing by the developer, N-SIDE, in which they proved that the algorithm</p>

outweighed by the overall welfare benefits delivered by these changes. We are not aware that NGENSO has examined this.

The significant increase in bidding complexity, particularly the use of multiple baskets containing parent and child orders, needs rigorous testing to ensure that the auction clears and results are checked and published in as short a time as possible. More details are required on how the auction will be rigorously tested, particularly edge cases e.g., where a large number of participants submit the maximum number of baskets fully loaded with parent-child orders.

Another concern we have regards the use of the Single Market Platform to access the auction. Our experience as a market participant looking to register assets on the platform has been mixed. We would urge NGENSO to ensure the platform is fit for purpose and able to cope with the increase in scope and functionality required.

It is disappointing that market participants will not be able to engage in end to end testing with NGENSO systems. Participating in mock auctions is welcome, provided it allows the full range of stacking and splitting to be tested. Market participants would also welcome the opportunity to test the application NGENSO performance monitoring to service delivery to ensure the service terms are fully understood and interpreted into end user systems. Market participants would also be keen to test the interface with NGENSO settlement systems so that invoice validation routines can be tested adequately and billing system changes implemented

could find valid clearing solutions within the allotted calculation time. Performance testing included “stress tests” with triple the number of baskets as we expect in the actual auctions.

Market Providers will be able to access the EAC platform via DEP or via SM, we are working to ensure this is an easy transition. The process to do this will be very different to that when registering assets, the SMP page will simply have an access button for the EAC platform where some credentials may be required.

The mock auctions will allow market participants to test the full range of new features relating to sell orders and auction clearing (such as stacking and co-optimisation) but unfortunately this won't be extended to performance monitoring or the settlements systems. If you have any specific concerns surrounding this I would encourage you to reach to us via the account manager or the Future of Balancing Services .box and we can maybe address those queries with the individual teams.

Please share your feedback on the proposal to amend the existing frequency response procurement rules to enable a cutover to the new platform and auction clearing algorithm.

Paragraph 8.9 and 20.1 of the procurement rules doc states that it is the responsibility of the auction participant to ensure that all bids are within the maximum registered product capacity. Paragraph 8.15 deems that NG may reject any orders they deem to be invalid when the algorithm runs, but the fact that the auction platform can accept volumes above maximum registered

Validation of sell orders in the new market will be consistent with current practice in the existing frequency response auction. In the new market, sell orders will be validated against the maximum registered product capacity (in MW), as explained in paragraphs 8.6 and 8.8. This validation will run at the time the

<p>capacity in the first place seems inefficient. We believe that the validation routine should run when an order is submitted and reject the order before the auction clearing algorithm us run</p> <p>It is not clear from the procurement rules that sell orders can be submitted before D-1 as is the case with the current auction platform. If not, this is a backward step and a change made to allow this.</p> <p>There is also no clarification on exact auction and auction results time. We believe these should be in the procurement rules and would like to ensure that results are published before 15:00 to ensure we have sufficient time to reoptimize our portfolio in the DA power auction at 15:30.</p>	<p>order is submitted, and if the order fails validation, it will be rejected immediately. Sell orders are not validated for their energy (in MWh), because for energy-limited units this depends on the unit's state-of-charge, which is not known to the ESO at the time the order is submitted. Paragraph 8.9 therefore requires participants to take responsibility for ensuring their offers are deliverable by the unit. Paragraph 8.9 also requires, for example, that if following the submission and validation of a sell order there is a change in the capability (in MW) of a unit to deliver the service, the provider must modify or cancel the sell order prior to gate close. Paragraph 8.15 is a safety net for unforeseen circumstances rather than a provision to cover an operational process that is foreseen. We have no reason at all to expect that under normal business operations we would regularly accept sell orders onto the platform and then cancel them later.</p> <p>We expect that, consistent with current practice, the gate open time will be well in advance of D-1. We do not expect that the duration of the operational processes to run the auction between gate close and results publication to be longer than at present. Results will be published as soon as they are available and verified.</p>
<p>Please share your feedback on the proposed design of co-optimisation in the new market clearing algorithm (please see section F above).</p>	
<p>The high-level design looks like it will deliver the co-optimisation requirements however as noted above it is complex and will require rigorous testing. It would be highly beneficial for market participants to review a more detailed design of the algorithm or be able to test the algorithm in a stand alone manner as well as through the industry mock auctions</p>	<p>The project has planned a full programme of performance and functional testing of the algorithm to ensure it conforms the behaviour outlined in the Procurement Rules.</p> <p>We plan a series of Market Trials, where providers will have the opportunity to submit offers into simulated auctions that are cleared against representative ESO buy orders. Full results will be available to all participants.</p>

Please share your feedback on the proposed design of service stacking for frequency response services (pleases see section G above). Do you expect any problems to comply with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services?	
<p>We believe the design of service stacking looks fine and that the requirement to comply with the fastest acting service presents no issues.</p> <p>We note that assets have not been tested by NGENSO in their ability to deliver stacked or split services. Will all current assets need to be re-tested on their ability to provide each service when stacked? If so, NGENSO need to state this soon and allow market participants to start testing and re-registering units</p>	<p>Each asset in a unit must be fully compliant with the service that the unit is procured to deliver. In other words, for a unit to deliver auction products under stacking / splitting, all its constituent assets must be tested and qualified for each individual auction product.</p> <p>For example, evidence of correct delivery of Dynamic Containment and correct delivery of Dynamic Regulation from a unit is enough for us to allow stacking of those services from that unit. It is up to the participant to ensure DR is delivered at the speed of DC or incur in performance penalties if stacking.</p>
Please share your feedback on the proposed changes to the specification of sell orders (please see section H above).	
<i>Removed for confidentiality.</i>	
Please share your feedback on the proposed changes to the clearing algorithm to NGENSO buy orders to be paradoxically accepted (“overholding”) to increase overall market welfare (see section I above).	
Nothing to add	
Please share your feedback on the proposal to allow negative prices for buy orders, sell orders, and market clearing prices (see section J above). Will there be impacts to provider settlement systems? Do you have any recommendations to NGENSO?	
We welcome the opportunity to submit negative prices as this on occasions will reflect the true economic position of an asset.	Thank you for the feedback in support of this change.
Please share your feedback on the proposed changes to performance monitoring for frequency response to accommodate stacked services (see section K above).	
We would like to see much more detail on how NGENSO will monitor the performance of an asset delivering stacked frequency response services before being able to provide feedback. This detail is missing from the service terms.	ESO will manage performance from a unit providing stacked services by calculating a single performance K factor in each direction (one K factor for LH services and one K factor for HF service) for the whole unit. This value is derived from the contribution from all stacked services in that unit.

<p>We also need to see what rules/guidance will apply to state of charge management to ensure they are logical, workable and commercially acceptable. These should have been available for this consultation</p> <p>We note that the requirement to conform to maximum ramp rates has not altered from the previous version of the service terms. Currently, the requirement to conform has been 'suspended' by NGENSO whilst the need for maximum ramp rates and any impact on system integrity was reviewed. NGENSO stated they would provide further guidance earlier this year. We are not aware that any further guidance has been issued. Can NGENSO confirm their position on maximum ramp rates and if the contractual obligation is going to continue to be ignored, paragraph 6.8 should be removed</p>	<p>Regarding ramp rate restrictions, the intention is for further industry engagement to be conducted from September 2023 which will enable a ramp requirement methodology to be reintroduced along with a revised monitoring system as part of Response Release 2 go-live planned in Spring 2024.</p> <p>We understand the concern around the state of energy rules. We will be publishing an updated State of Energy Management document to reflect the requirements when services are stacked.</p>
<p>Please share your feedback on the proposal to amend the settlement formula to accommodate negative prices, and to ensure a meaningful settlement adjustment in case the market clearing price is close to £0/MW/h (see section L above). What are your thoughts on NGENSO's proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance?</p>	
<p>Without seeing more detail on how NGENSO will carry out performance monitoring it is difficult to feedback on this point. We would recommend the service is introduced with the settlement formula NGENSO propose with a review based on market participant feedback after 6 months of operation.</p>	<p>The methodology for performance monitoring is described in Schedule 3 of the Service Terms.</p> <p>We commit to monitoring the impact of this settlement methodology, to reviewing the level of the minimum adjustment price, and to revising it if necessary. We remain open to further feedback from market participants on the derivation of this parameter.</p>
<p>NGENSO plans to enable separate disarming codes for each frequency response service (DC, DM, DR). This is a prerequisite for enabling the stacking of frequency response services. What are the impacts of this change on providers (units providing frequency response, control technology, internal systems, etc.)? What recommendations and advice do you have for NGENSO?</p>	
<p>We would challenge whether the cost market participants incur in ensuring assets can arm/disarm by service is really cost beneficial to NGENSO.</p>	<p>The proposal to introduce new disarming and rearming codes is currently under development. We expect to go-live with stacking at the same time as we launch the new EAC platform, and the new disarming and rearming codes will follow at a later date. We included this question in our Consultation to give early visibility of the issue to Frequency Response providers and to get initial feedback that could support the development of the proposal.</p>

	<p>We will update market participants with our detailed proposal when it has been developed further.</p> <p>Thank you for highlighting this particular issue around the potential costs to market participants. We will address these in our detailed proposal.</p>
<p>Do you have any additional feedback on the proposed new Reserve/Response Procurement Rules?</p>	
<p>It is unclear what happens if the auction does not clear or if one service fails to clear. Is the auction re-run?</p>	<p>Within the auction run, there are options available to NGENSO to re-run an auction if needed, this would also be communicated to providers.</p> <p>We also have a BCP process approved which can be used if the auction fails to run. In brief, NGENSO will enact a call with providers telling them the auction platform has failed. In this call, NGENSO will notify the providers of steps to take in order to take part in a manual auction.</p>
<p>Do you have any additional feedback on the proposed amendments to the Frequency Response Service Terms?</p>	
<p>No more comments</p>	

Respondent J

<p>Please share your feedback on NGENSO's overall strategy for frequency response and reserve, including the plan to move to a single, simultaneous, co-optimised auction, and the new market design and auction platform (please see sections A, B, and C above).</p>	
<p>We support the principle of more coordinated procurement of different ancillary services products. We recognise that co-optimisation of response and reserve procurement will improve liquidity in these markets and (subject to effective product and auction design) improve pricing efficiency. While we recognise the co-optimisation of DC, DM, DR and QR and SR as a positive step towards a coherent procurement strategy for Ancillary Services we see this project as only part of an overall strategy.</p> <p>Services notable by their omission from the program include static Firm Frequency Response and Balancing Reserve. These services are procured (or are planned to be procured) at the Day-ahead stage and we see no reason</p>	<p>Thank you for the feedback and your support of the co-optimisation of services. Our initial priority is to migrate the dynamic Response suite to the EAC platform as we expect the new functionality to deliver the greatest benefits to these services. Our next priority would be to launch the new Reserve services as we also see significant benefit to be delivered by these. Following this there are already discussions underway to prioritise the future activities. Included in these discussions are the options for both intraday procurement and having a day-ahead static Response service on the platform with the range of</p>

<p>why procurement of these services should not be co-optimised with other response and reserve products, with clearly defined 'stackability' criteria. We also note that EAC does not address procurement of intraday response (i.e. Mandatory Frequency Response) and that BESS participation in MFR is artificially limited by legacy ESO systems giving undue advantage to legacy providers.</p> <p>We would like the ESO to publish a full strategy for all Ancillary Services which commits to maximising stacking subject to technical constraints alone, avoiding bias towards legacy providers, setting a clear roadmap of code modifications to remove costs of complying with legacy requirements and delivering the dispatch systems to realise the above.</p>	<p>benefits the platform offers. We expect to be in a position to start sharing information on these future activities in the coming months and would welcome any feedback or information to support the prioritisation of these activities.</p> <p>Alongside the delivery of these enduring reform activities, we continue to investigate opportunities to reduce barriers to our existing services and procurement methods. Again, we welcome any feedback or suggestions you have on this and will consider the implications and benefits of any proposal.</p>
<p>Please share your feedback on the proposal to amend the existing frequency response procurement rules to enable a cutover to the new platform and auction clearing algorithm.</p>	
<p>We agree with the proposal to amend the existing rules to enable the cut-over.</p>	<p>Thank you for the feedback in support of this change.</p>
<p>Please share your feedback on the proposed design of co-optimisation in the new market clearing algorithm (please see section F above).</p>	
<p>We agree that the proposed auction design will improve liquidity and pricing efficiency in DC/M/R markets. We support the principle of clearing to maximise net welfare.</p>	<p>Thank you for the feedback in support of this change.</p>
<p>Please share your feedback on the proposed design of service stacking for frequency response services (pleases see section G above). Do you expect any problems to comply with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services?</p>	
<p>We agree with the proposed design for service stacking but regret the lack of stacking of services where stacking is technically feasible. For example, Positive Reserve and High Frequency services. We believe the ESO expediate enabling stacking of QR/SR with D* as well as including other Ancillary Services in the matrix.</p> <p>We agree that provision of DR should match the speed of provision of other services when stacked but we are concerned that only requiring this of DR providers when stacked will create a two-tier DR market leading to inefficient procurement of the service. We believe that the ESO should be indifferent to 'which' providers (stacked or unstacked) are selected and that different delivery speeds essentially create a separate product. Further, we do not see</p>	<p>Thank you for your feedback. Stacking among frequency response services will unlock the capability to procure ancillary services more efficiently. However, ESO needs to ensure that this transition does not impact system security. Having this in mind, our initial priority is to stack fully compatible services in terms of design and monitoring. Stacking methodology and rules will be studied across more markets in the future to enable more opportunities in the market.</p> <p>Thank you for supporting the DR stacking provisions. Our studies shows that DR delivery needs to match the fastest service when stacked. DR delivery time widow is longer compared to the other</p>

<p>how the ESO will manage to effectively set response requirements without knowing the speed of delivery of the (aggregate) service it procures - this being a key factor in sizing the total response needs.</p> <p>We propose that the ESO simply change the speed of delivery requirement for DR to match DM and DC to avoid the risks above and maintain a homogenous product.</p>	<p>services; however, fast DR delivery is still within the DR standard delivery. Current data shows that the majority of DR providers are responding within the fast DR timings. Based on this the market will not experience any impact by procuring stacked services.</p>
<p>Please share your feedback on the proposed changes to the specification of sell orders (please see section H above).</p>	
<p>We agree that the proposed auction design will improve liquidity and pricing efficiency in DC/M/R markets.</p>	<p>Thank you for the feedback in support of this change.</p>
<p>Please share your feedback on the proposed changes to the clearing algorithm to NGESO buy orders to be paradoxically accepted (“overholding”) to increase overall market welfare (see section I above).</p>	
<p>We agree with the principle of overholding where doing so increases net welfare. We note that this should not only occur at ‘very low or negative’ prices and trust that the ESO will consider the wider costs of response provision in its bid pricing.</p> <p>We are interested to find out if the over procurement can cause the increased use of disarm instructions, i.e. how likely it is that these instructions will become business as usual, as opposed to current, quite exceptional use.</p>	<p>Overholding is possible over a wide range of price levels, and it depends on the change in net welfare (and not the price directly). Here is an example:</p> <ul style="list-style-type: none"> • Buy Order 1: 100MW, £100/MW/h • Buy Order 2: 100MW, £0/MW/h • Sell Order 1: 50MW, £10/MW/h • Sell Order 2: 51MW, £90/MW/h <p>Assume the sell orders are non-curtailable. Accepting sell order 2 increases the total welfare by £410/h (compared to rejecting the order). The welfare maximising solution is to accept both sell orders, the market clears 101 MW (with 1MW overholding) and the market clearing price is £90/MW/h. In fact, in this example, the algorithm will always choose to overhold if Sell Order 2 is priced below £98/MW/h.</p> <p>We do not expect that overholding will result in the increased use of disarm instructions. We expect the excess quantity of procured services (above the quantity required to secure the system) will be a very small proportion of the total ESO service requirements. Allowing paradoxical acceptance of a buy order is</p>

	<p>a new feature that replaces the current methodology for overholding, where the ESO uses an “elastic buy order curve” (i.e., a linear buy order with steeply declining bid prices for quantities in excess of the ESO requirements). Compared to the current practice, we expect the quantity procured by the new algorithm will decrease.</p>
<p>Please share your feedback on the proposal to allow negative prices for buy orders, sell orders, and market clearing prices (see section J above). Will there be impacts to provider settlement systems? Do you have any recommendations to NGENSO?</p>	
<p>We agree with the principle of allowing negative pricing.</p>	<p>Thank you for the feedback in support of this change.</p>
<p>Please share your feedback on the proposed changes to performance monitoring for frequency response to accommodate stacked services (see section K above).</p>	
<p>We agree that as a consequence of service stacking the performance monitoring rules must change. We would like further explanation on this. The presentation from webinar in February shows that there will be three separate k-factors, however from the consultation documents it seems there will be just one (for each side of the service). The ESO should allow a sufficient grace period between confirming performance monitoring for stacked services and enabling service stacking to allow providers to make the requisite systems changes.</p> <p>We believe the performance for stacked services should be assessed based on one k-factor for each side, low and high, of how the asset performed against the combined frequency curve.</p>	<p>Thank you for your feedback. The 3 factors mentioned in the webinar referred to the service volume factor defined in the new service terms Schedule 2 General dynamic service delivery curve. This factor defines the proportion of each contracted service in respect to the total contracted volume. The k factors that define the final scores are calculated in schedule 3 of the service terms. There are two k factors, a single k factor for low services and single k factor for high services.</p>
<p>Please share your feedback on the proposal to amend the settlement formula to accommodate negative prices, and to ensure a meaningful settlement adjustment in case the market clearing price is close to £0/MW/h (see section L above). What are your thoughts on NGENSO’s proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance?</p>	
<p>We strongly disagree with the proposal to invert the settlement adjustment in the case of negative prices. The proposal is based in a failure to properly account for the energy and contract volume flows associated with providing the service. Specifically, the cost/benefit of providing the response service is not just from the holding payment but also the value of energy imported/exported in service provision and adjustments to imbalance</p>	<p>Thank you very much for this detailed response. The ESO acknowledges the concerns raised by respondents regarding the consequences of the settlement adjustment methodology when the market clearing price is negative, and the potential adverse outcomes on market participation and market clearing. We will therefore modify the proposed settlement adjustment</p>

position via ABSVD. (See Example).

The ESO's analysis shows providers being 'better off' by not providing a service when holding prices are negative. If this were true, providers would simply not bid at negative prices.

Negative prices are only achieved where providers expect a benefit from acquiring energy through the service, for which they are subsequently made whole, by the provision of ABSVD volumes.

Provided that ABSVD volumes are linked to the physical delivery of the service, the provider has no incentive to 'underdeliver' on a negatively priced contract. If they underdeliver, they pay less to access the contract, but this is outweighed by the loss of revenue from the response energy and subsequent ABSVD.

The proposal would see providers who fail to deliver on a negative priced contract lose opportunity cost, continue to pay the contract price, then pay the contract price again through the settlement adjustment. For positively priced contracts, providers would continue only to incur the opportunity cost. In practice, the proposal will lead to providers needing to incorporate risk premiums into bids for HF services raising prices for both the ESO and consumers.

Further, the proposal refers to the settlement adjustment being small when the price is close to zero. For the reasons discussed above, the contract price is not an accurate proxy for the incentive for providers to deliver. A better proxy of the incentive to deliver is the producer surplus.

We believe the ESO should continue without adjustment to the settlement formula. However, a preferred alternative would be to introduce a modest, positive, offset to the auction price 'clawed-back' on non-delivery to make non-performance more penal. This would increase the cost of non-performance by a fixed amount regardless of the producer surplus or directionality of clearing price. Any such offset would necessarily be priced into bids - to the extent that providers are not able to avoid all sources of underperformance. We do not believe the ESO has presented any evidence to

methodology in line with the suggestion of some respondents, and propose instead a fixed settlement adjustment for poor performance when the market clearing price is negative, rather than an adjustment equal to the absolute value of the market clearing price.

Our revised proposal for the settlement adjustment methodology defines a "Minimum Adjustment Price", which we propose to be £1/MW/h. If the market clearing price is greater than or equal to the minimum adjustment price, then the settlement adjustment price is equal to the market clearing price; while if the market clearing price is less than the minimum adjustment price, then the settlement adjustment price is equal to the minimum adjustment price.

For example, if a unit has a K-factor equal to zero for a particular frequency response service, the settlement will be £0/MW/h if the market clearing price is greater than or equal to £1/MW/h (i.e., consistent with the current methodology). If the market clearing price is less than £1/MW/h, then the settlement will be equal to the market clearing price less £1/MW/h, which will result in a payment from the provider to the ESO. For example, if the market clearing price is £0.25/MW/h, then settlement will be £ -0.75/MW/h (resulting in a payment to the ESO), while if the market clearing price is £ -6/MW/h, then the settlement will be £ -7/MW/h (rather than £ -12/MW/h under the methodology proposed by the ESO in the Consultation documents).

make the case that non-delivery is insufficiently penalised at present.

Example: If a provider expects to import 10 MWh of energy from providing a 100 MW DRL contract for 1 hour, and be made whole for the imbalance via ABSVD: they are willing to pay up to the value of the 10 MWh. e.g. if the 10 MWh is worth £750 they can bid -£7.5/MW/hr for the DRH contract. If the DRH auction clears at -£5/MW/hr then the provider's surplus/profit is £2.5/MW/hr (or £250/hr).

Without the proposed change to the settlement adjustment, if the provider fails to deliver the contract, they will be returned the £500/hr paid for the contract but they will fail to take delivery of energy worth £750/hr and ABSVD adjustment, leaving them worse off than delivering on the contract.

The ESO's proposal would see the provider continue to pay the contract price (£500/hr) further penalised by an additional £500/hr, taking the provider to a £1000/hr loss in addition to the lost £250/hr opportunity cost.

Conversely, to provide a 100 MW DRL contract the provider expects to lose the same 10 MWh and must recover the costs of the energy via the holding price. Using the same valuation, the provider must bid £7.5/MW/h for the DRL contract. If the contract clears at £10/MW/hr giving the same expected surplus profit of £2.5/MWh and the unit fails to deliver they make £0, losing the £250/hr opportunity cost.

Under the status quo they would lose £250 in either case.

With the proposed amendment, In the case of the negative HF contract price, the provider loses £1250. In the LF case they lose £250.

The proposal does not correct an asymmetry - it introduces one.

NGESO plans to enable separate disarming codes for each frequency response service (DC, DM, DR). This is a prerequisite for enabling the stacking of frequency response services. What are the impacts of this change on providers (units providing frequency response, control technology, internal systems, etc.)? What recommendations and advice do you have for NGESO?

<p>NGESO should make the new reason codes public as soon as possible to enable the industry to prepare the solutions. We propose matching the reason code with ASDP reason codes separate for each side of the service.</p>	<p>We will aim to share the new rejection reason codes as soon as practicable. Thank you for this feedback.</p>
<p>Do you have any additional feedback on the proposed new Reserve/Response Procurement Rules?</p>	
<p>The new bidding strategies will most likely be very complicated including multiple baskets and multiple assets. We think that inputting the bids manually through the user interface is very time consuming and prone to human errors. From our perspective it's not a good alternative to the API. We propose that participants should be able to input their bids via csv upload in cases where the API is unavailable.</p> <p>We would not support going live with a user-interface only solution.</p>	<p>NGESO have communicated that API upload and UI upload will be ways to submit sell orders and that the EAC platform does not support csv upload. In production, the User Interface will have the capability to clone a basket, which may then be edited. Users can use this facility to create their own templates.</p> <p>With the market design (basket concept), a csv file would be too complicated for the platform to manage and validate against the market rules hence the reason to move away from csv. Plus, with more auctions planned on the EAC and the potential to interact with each other, API is the more suitable way to place orders. Majority of auctions across Europe use API as an order upload facility, following industry feedback we see this as the way forward and best to support future enhancements on the platform.</p>
<p>Do you have any additional feedback on the proposed amendments to the Frequency Response Service Terms?</p>	
<p>No additional comments.</p>	

Respondent K

<p>Please share your feedback on NGESO's overall strategy for frequency response and reserve, including the plan to move to a single, simultaneous, co-optimised auction, and the new market design and auction platform (please see sections A, B, and C above).</p>	
<p>We support the overall strategy for reform of the ESO's frequency response and reserve markets, and in particular the objectives that will be delivered via the Enduring Auction Capability (EAC) project.</p> <p>The move to a single market and integrated platform should enable participation in a broader range of services and reduce overall complexity</p>	<p>Thank you for supporting the overall reform strategy and the EAC objectives.</p> <p>We endeavour to clearly communicate our intentions and expected timelines for reform work as early as possible via our newsletters and webinars, although urgent operational requirements can necessitate short notice changes to these plans.</p>

<p>once the transition is complete. However, transparency of how the clearing algorithm is selecting offers and the outcomes for market participants will be key to building confidence in the reformed markets.</p> <p>Alongside many other market participants and the ADE, We remain disappointed with the repeated delays to Quick and Slow Reserve, and the delay in implementing 'Day 2' improvements to the response products (DC, DM and DR) that are outside of the scope of the EAC-related changes. We similarly share market participants frustration at the emerging issues and delays associated with the ESO's Balancing Programme to update the ENCC systems which seem to underpin the delays to a) product development and b) removal of barriers to smaller and aggregated assets participating in ESO markets.</p>	<p>As we move to a more mature phase of the new Response markets we are looking to prepare and communicate our longer-term plans for Response and Reserve reform which we hope will inform expectations on the timescales of changes. Our objective will continue to be to prioritise changes that deliver the greatest benefit across the breadth of internal and external stakeholders. We are always open to feedback on our chosen priorities and would particularly welcome information to improve or inform our CBA.</p> <p>We recognise that the delay of Quick and Slow Reserve is not welcome news for the industry. The decision was taken considering the significant changes that would have been required in our existing, legacy balancing systems and processes, given the complexity of the new service designs. Amid a complex and rapidly evolving systems change environment, we believe it was more prudent to re-evaluate these changes to consider if implementation into our legacy systems was still appropriate, as opposed to direct implementation into our Open Balancing Platform (OBP). At present, we are still re-examining our proposed service design options for Quick and Slow Reserve and evaluating our IT solutions. NGENSO are committed to working with you and hope to be able to seek further feedback on this development work in September.</p>
<p>Please share your feedback on the proposal to amend the existing frequency response procurement rules to enable a cutover to the new platform and auction clearing algorithm.</p>	
<p>We support the approach.</p> <p>Please note our request for transparency around operation of the clearing algorithm in our response to Q1.</p>	<p>The clearing algorithm is explained in detail in Appendix 2 of the EAC Market Design Report published by N-SIDE. Clearing of sell orders will conform to the Chapter 9 ("Market Clearing Rules") of the Procurement Rules.</p> <p>The publication of the buy orders and sell orders will be enriched with additional clearing information, including the clearing status</p>

	<p>of the order, cleared quantity, and clearing price. The clearing status of the order is currently either “Accepted” or “Rejected”, but on the new platform each rejected sell order will have a rejection code to provide additional information regarding the order’s clearing. Participants will have a better view of why an order is rejected.</p>
<p>Please share your feedback on the proposed design of co-optimisation in the new market clearing algorithm (please see section F above).</p>	
<p>We support co-optimisation and the proposed approach but highlight that reporting of auction results and transparency of how the algorithm is selecting bids will be a key requirement.</p>	<p>Clearing of sell orders will conform to the Chapter 9 (“Market Clearing Rules”) of the Procurement Rules. We will continue to publish all auction data after each auction on the ESO’s data portal as part of the market transparency data set, including all buy orders and sell orders. The publication of the buy orders and sell orders are enriched with additional clearing information, including the clearing status of the order, cleared quantity, and clearing price. The clearing status of the order is currently either “Accepted” or “Rejected”, but on the new platform each rejected sell order will have a rejection code to provide additional information regarding the order’s clearing.</p>
<p>Please share your feedback on the proposed design of service stacking for frequency response services (pleases see section G above). Do you expect any problems to comply with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services?</p>	
<p>Support the implementation of service stacking and the overall proposed design. The requirement for service delivery to be aligned to allow stacking seems reasonable.</p> <p>No, we do not expect any problems complying with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services.</p>	<p>Thank you for the feedback in support of this change.</p>
<p>Please share your feedback on the proposed changes to the specification of sell orders (please see section H above).</p>	
<p>Removed for confidentiality.</p>	<p>Removed for confidentiality.</p>
<p>Please share your feedback on the proposed changes to the clearing algorithm to NGESO buy orders to be paradoxically accepted (“overholding”) to increase overall market welfare (see section I above).</p>	

<p>We support this approach – but would like more information on the detail of its implementation.</p> <p>The proposed approach to overholding makes sense, but we would like more detail around how this will work in practice e.g., what the parameters for accepting larger offers will be. The mechanism’s ability to deliver efficient outcomes will need to be monitored and adjustments made if it is found to increase overall service costs by selecting excessive volumes at lower prices.</p>	<p>An explanation of the implementation of overholding is provided in Section 5.3 (“How are buy orders treated by the EAC algorithm?”) of the EAC Market Design Report published by N-SIDE. An example is provided in the EAC Market Design Explainer document published by ESO. Please see Example 2b in Section “Market Clearing Rules – More Definition” (slide 56 in the June 2023 version).</p> <p>Allowing paradoxical acceptance of a buy order is a new feature that replaces the current methodology for overholding, where the ESO uses an “elastic buy order curve” (i.e., a linear buy order with steeply declining bid prices for quantities in excess of the quantities required to secure the system). Compared to the current practice, we expect the new algorithm to both decrease procured volume and decrease the clearing price, which will reduce the overall costs of balancing and benefit consumers.</p>
<p>Please share your feedback on the proposal to allow negative prices for buy orders, sell orders, and market clearing prices (see section J above). Will there be impacts to provider settlement systems? Do you have any recommendations to NGENSO?</p>	
<p>We strongly support this approach.</p> <p>We think that negative pricing is important for efficient market functioning.</p>	<p>Thank you for the feedback in support of this change.</p>
<p>Please share your feedback on the proposed changes to performance monitoring for frequency response to accommodate stacked services (see section K above).</p>	
<p>Not answered.</p>	
<p>Please share your feedback on the proposal to amend the settlement formula to accommodate negative prices, and to ensure a meaningful settlement adjustment in case the market clearing price is close to £0/MW/h (see section L above). What are your thoughts on NGENSO’s proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance?</p>	
<p>We recommend increasing the minimum settlement adjustment to £2/MW/h.</p>	<p>Regarding the derivation of the “Minimum Adjustment Price” (i.e., - $x_1 = x_2 = X$ in our previous formulation), we had the objective that this price should be set to a level that is not unduly punitive</p>

<p>Independently of the level of the minimum settlement adjustment, we recommend that NGESO keeps an attentive watch on whether assets are structurally arbitraging between frequency services delivery and participation in other markets (imbalance chasing, intra-day).</p>	<p>but nonetheless creates a financial incentive for good performance, even in cases where the market clearing price is just a few pence. We wished to avoid a complex indexation formula to derive this price, and we favoured the simplicity a fixed, round number. We examined the distribution of clearing price outcomes for LF frequency response services over the period January to May 2023, and noted that the 10th percentile of clearing prices was £0.934/MW/h over this period. We finally concluded that £1/MW/h was a reasonable choice of this parameter to separate “low” market clearing prices from “normal” market clearing prices. As stated above, we propose that the minimum adjustment price should be £1/MW/h, unchanged from our previous proposal (i.e., $x_1 = x_2 = X = 1$). We commit to monitoring the impact of this settlement methodology, to reviewing the level of the minimum adjustment price, and to revising it if necessary. We remain open to further feedback from market participants on the derivation of this parameter.</p> <p>ESO is currently working on improving monitoring the non-compliance in the dynamic service market. ESO will implement extra checks to identify providers behaviour including providers offering capacity exceeding the asset capabilities. Non-compliance will be addressed in line with the Service Terms enforcement actions.</p>
<p>NGESO plans to enable separate disarming codes for each frequency response service (DC, DM, DR). This is a prerequisite for enabling the stacking of frequency response services. What are the impacts of this change on providers (units providing frequency response, control technology, internal systems, etc.)? What recommendations and advice do you have for NGESO?</p>	
<p>Not answered.</p>	
<p>Do you have any additional feedback on the proposed new Reserve/Response Procurement Rules?</p>	
<p>Removed for confidentiality.</p>	<p>Removed for confidentiality.</p>
<p>Do you have any additional feedback on the proposed amendments to the Frequency Response Service Terms?</p>	

The new service terms state that ABSVD will continue to only be applied to BM assets. We recommend that NGESO approaches ABSVD in the same way for both BM and non-BM assets as it currently creates disparities between batteries and discrepancies in the pricing of low and high frequency markets.

Thank you for sharing this feedback. We are reviewing ways to align ABSVD for BMUs and non-BMUs as part of our Response reform work. Significant changes to IT systems and processes have already been identified and work has already been undertaken to deliver some of the new systems which would be required. We are working to confirm timelines for addressing the remaining barriers and hope to be able to share these in the next couple of months as part of our Response reform future plans.

Respondent L

Please share your feedback on NGESO's overall strategy for frequency response and reserve, including the plan to move to a single, simultaneous, co-optimised auction, and the new market design and auction platform (please see sections A, B, and C above).

We welcome most changes that come with the new EAC, however, the complexity associated with implementing the stacking of services creates a number of distortions and forces through other changes that do not appear to have been considered holistically.

For this reason, we would request that NGESO implements the new platform but holds off on all changes associated with service stacking whilst further consultation between participants is carried out. As part of this process, NGESO should share a cost/benefit analysis of the proposed changes. Whilst some participants may have requested these features initially, NGESO had to make compromises in a number of areas in order to allow the stacking of services.

Across the industry there are very few auctions with this level of complexity and, whilst the requirements are arguably complex, the proposal contains a large number of significant changes being implemented at the same time.

Specific Points:

Single Market for Frequency Response and Reserve

Thank you for these comments. We expect that participants will have the opportunity to offer to stack services from Day 1 of the go-live of the new platform. However, participants are under no obligation to offer service stacking, and can instead restrict themselves to the submission of baskets each containing only a single service (i.e., either DC or DM or DR). In particular, providers have the opportunity to stack fast and slow services if they wish, but are not obliged to do so, and may therefore protect their battery units against a perceived risk of increase in cycling rates.

In the case where a provider does not offer any baskets containing more than a single service, on EAC Day 1 all rules relating to service delivery and performance monitoring will remain unchanged from current practice. Service stacking is an extension to the current terms for service delivery.

A single provider may authorise up to 20 users on the EAC platform.

- The proposed solution is not really a single market for reserve and response as matrix does not allow stacking of reserve and response services.
- NGENSO claim the changes will reduce "operational complexity" but the EAC seems significantly more onerous on providers.
- It is, however, beneficial to have parallel markets on a common platform.

Integrated Market Platform

- The new Integrated Market Platform featuring APIs and end to end use of SMP for procurement is an improvement as long as NGENSO allows access to a sufficient number of users to perform the different roles and existing units and associated data can be migrated easily from other systems, particularly when QR and SR are added to the platform.

New Auction Clearing Algorithm

- Having a common process/system/documentation for reserve and response services is beneficial and will reduce the burden on participants.
- It is unclear, however, whether the theoretical benefit to the ESO of more efficient clearing/lower procurement costs etc. will be realised, given the additional complexity of the proposed auction clearing algorithm.
- It is also unclear whether the benefit to providers outweighs the cost of the additional complexity.

Updates to Procurement Rules Documents

- Common documentation and procurement rules will be beneficial. NGENSO should indicate clearly on its website where all the prevailing documents associated with a service can be found.

Updates to Frequency Response Service Terms

- Stacking fast and slow services is not an attractive option because the requirement of having to use the parameters of the fast service will result in much higher cycling of the battery.

The distinction between substitutable child orders and linked baskets is explained on pages 21 and 22 of the EAC Market Design Report published by N-SIDE.

We have addressed your additional comments here against the more specific questions below.

Service Stacking for Frequency Response

- The current implementation of service stacking is not necessarily beneficial to all market participants.
- The complexity of the proposed implementation will likely mean that any theoretical gains in market efficiency will be lost and that participants will suffer significant costs. NGENSO have not demonstrated whether the benefits will outweigh the costs.
- The complexity creates a significant barrier to entry for new participants.
- Compromises had to be made to implement service stacking.

New Design for Sell Orders

- Whilst the benefit of stacking orders is not clear, the new functionality to link orders across EFA and across services is beneficial.
- Distinction between functionality/utility/use case for substitutable child orders vs linked basket orders not clear.

Overholding

- Broadly in favour.

Negative pricing

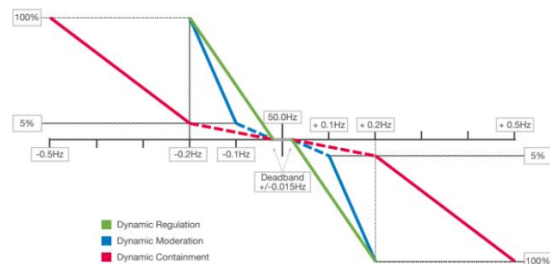
- This is a complex concept and we broadly agree that the need for negative pricing may become more apparent as markets mature. However, all assets have a positive cost to deliver the service, there are no subsidies and assets are not forced to participate in a market for operational reasons. Therefore, no assets would rationally bid at negative prices. The concept of participants paying NGENSO for energy charged during DRH via a negative service payment is not likely to create a fair and level market. It is more likely to exclude non energy constrained assets from participating.

Revised Application of Settlement Adjustments for Non-Performance

- Punitive performance penalties that are disproportionate to the benefit of delivering services are likely to drive participation down as they create a lose-lose scenario for participants.

<p>Enriched Reporting of Auction Results - Broadly beneficial</p>	
<p>Please share your feedback on the proposal to amend the existing frequency response procurement rules to enable a cutover to the new platform and auction clearing algorithm.</p>	
<p>Clause 1A of the existing frequency response procurement rules seems to allow for cutover.</p>	<p>Thank you for this positive feedback.</p>
<p>Please share your feedback on the proposed design of co-optimisation in the new market clearing algorithm (please see section F above).</p>	
<p>Please see comments under question 1.</p>	<p>We expect that the introduction of the new clearing algorithm will have a strong business case, with benefits that outweigh the additional complexity. Co-optimisation reduces risk for market participants, by helping to avoid a participant's offer is not accepted for an oversupplied service while there are unfulfilled requirements for other services. This also mitigates risk for the ESO. During extreme market conditions (such as sustained negative day-ahead prices), providers may "herd" toward a particular service, leaving requirements for other services unfilled. In addition, the new market design also ensures a more efficient market clearing. The co-optimised market clearing has a market welfare that is greater than or equal to a market without co-optimisation. By allowing overholding, the clearing algorithm can select a lower-priced sell order if this better optimises overall market welfare, even if the total procured quantity exceeds the ESO's service requirements.</p>
<p>Please share your feedback on the proposed design of service stacking for frequency response services (pleases see section G above). Do you expect any problems to comply with the requirement that the DR service must be delivered more quickly when stacked with faster-acting services?</p>	
<p>The question relates to fastest service, is this only related to Max time to full delivery or initiation time.</p>	<p>The parameters for lags and ramp times will be defined by the fastest service. This includes the maximum time to full delivery and maximum initiation time. The full table can be found in Schedule 3 determination of k factor.</p> <p>Currently partial availability is not allowed. A unit can be either available or unavailable to provide the contracted services.</p>

Service specification	Description	DC	DM	DR
Initiation time	The maximum time between a change in frequency and change in the delivery of response	0.5s	0.5s	2s
Max time to full delivery	The maximum time between frequency deviation occurring and delivery of the saturation quantity	1s	1s	10s
Delivery duration	Time that an energy limited provider must be capable of sustained delivery	15 minutes	30 minutes	60 minutes



If the Generating unit is unable to deliver full power due to unplanned issue, what is the mechanism for a decision on which stacked services should be determined as unavailable. Will NGE SO have any influence on making this decision?

If DR is to operate at the faster response speeds when stacking this will have an impact on the degradation of the Batteries and will increase the cost of delivery of this service.

Based on previous terms specifically stating that stacked services were not allowed platforms have been developed to prevent any overlapping of services. With this change there will be further development required to build in the new features.

When running stacked ancillary services and participating in the BM, what are the rules for stacking BOA and how MIL and MEL submissions should be calculated based on SoE?

You can refer to the Unlocking Stacking of BOAs with Frequency Response Services document for guidance on stacking with BM.

Please share your feedback on the proposed changes to the specification of sell orders (please see section H above).

N/A	
Please share your feedback on the proposed changes to the clearing algorithm to NGESO buy orders to be paradoxically accepted (“overholding”) to increase overall market welfare (see section I above).	
Agree with this approach, over-holding when there is sufficient market welfare to do so is beneficial to system management as opposed to previous method of rejection, which restricted value attrition.	Thank you for the feedback in support of this change. The algorithm will only overhold if this leads to a net increase in the market welfare.
Please share your feedback on the proposal to allow negative prices for buy orders, sell orders, and market clearing prices (see section J above). Will there be impacts to provider settlement systems? Do you have any recommendations to NGESO?	
<p>There is a risk that systems are unable to process negative pricing. A full analysis and testing of internal systems has not been possible in the timeframes available. There remains the potential for additional costs to update systems to allow negative prices.</p> <p>This feature will require NGESO settlement calculations to be performed in a more timely manner and may represent an increase in queries to the NGESO back office team. Do NGESO have sufficient systems and process to validate delivery and apply penalties?</p>	<p>The new co-optimisation features in the market design (baskets and substitutable children) will enable the provider to simultaneously make offers for different services. Providers will be able to submit sell orders for a particular service (at an offer price at which the provider finds acceptable, either negative or non-negative), and also make offers for other services. If the quantity of a particular service offered at negative offer prices is insufficient to meet the ESO’s requirements, then the remaining part of the ESO’s requirements will be matched against offers with a non-negative offer price. We therefore do not expect that the introduction of negative prices will adversely impact liquidity for any particular service.</p> <p>In the current market design where the minimum market price is set equal to £0/MW/h, units from various technologies may find that they have relative cost advantages or disadvantages when providing specific products under particular market conditions. We do not believe that allowing negative prices in the market is unfair to specific technologies.</p> <p>Sufficient providers have indicated their readiness to settle at negative market clearing prices, and we expect to enable providers to submit sell orders with negative offer prices on Day 1.</p> <p>The ESO is upgrading its performance monitoring and settlement systems and processes to be ready for negative market clearing prices</p>

	on Day 1. The expectation is that the new settlement system will go-live in October 2023 with DC/DM/DR, and that PAP system will be ready to provide performance monitoring results based on the latest methodology, as an input to the settlement process.
Please share your feedback on the proposed changes to performance monitoring for frequency response to accommodate stacked services (see section K above).	
If the Performance monitoring data shows that there is an error in the K factor, as two services are stacked with significantly different revenue on the contracts, how will the value be assigned?	The calculation of the k factors will be divided into low and high. This means that there will be a single k factor calculation for high services (e.g. DCH+DMH+DRH) and a single k factor calculation for low services (e.g. DCL+DML+DRL). Then the final payment calculation will be performed using the formula defined in Schedule 3 calculation of settlement value with the corresponding Market Clearing Price.
Please share your feedback on the proposal to amend the settlement formula to accommodate negative prices, and to ensure a meaningful settlement adjustment in case the market clearing price is close to £0/MW/h (see section L above). What are your thoughts on NGESO's proposal for the minimum settlement adjustment to be £1/MW/h, to ensure a meaningful incentive for good performance?	
This seems a fair and transparent approach.	Thank you for the feedback in support of this change.
NGESO plans to enable separate disarming codes for each frequency response service (DC, DM, DR). This is a prerequisite for enabling the stacking of frequency response services. What are the impacts of this change on providers (units providing frequency response, control technology, internal systems, etc.)? What recommendations and advice do you have for NGESO?	
<p>If a Disarm signal is sent for DC when stacking, can the DR service then respond at the normal speed and will the NGESO settlement process recognise this.</p> <p>Will disarm have any impact on the the generic delivery curve for settlements. If so the performance metering data must be able to distinguish the disarm and availability flags, making both a mandatory field.</p> <p>Will any changes in rules for BOA MIL MEL be changed if stacking ancillary services if one of the services is disarmed? (See item 4).</p> <p>If a signal to disarm a single service is provided can this be based on a single value similar to the Availability flag in the performance monitoring to allow futureproofing of services?</p>	The proposal to introduce new disarming and rearming codes is currently under development. We expect to go-live with stacking at the same time as we launch the new EAC platform, and the new disarming and rearming codes will follow at a later date. We included this question in our Consultation to give early visibility of the issue to Frequency Response providers and to get initial feedback that could support the development of the proposal. We will update market participants with our detailed proposal when it has been developed further.
Do you have any additional feedback on the proposed new Reserve/Response Procurement Rules?	

<p>Paragraph 12 of the Response / Reserve Procurement Rules states that the auction administrator shall make available / publish the outcome of each auction by no later than the auction results time (16.00) which is also the time when the resulting contracts are formed. Since the auction closing time is 14.00, this would allow a 2 hour period to notify providers whether or not they were successful in the auction. NGESO should endeavour to notify results before 15.00.</p>	<p>Pending full solution testing, NGESO plan to make the results post EAC auction available on the data portal by 14:30 each day. Market providers will be able to check their own results on the EAC UI itself prior to this.</p>
<p>Do you have any additional feedback on the proposed amendments to the Frequency Response Service Terms?</p>	
<p>Both the Procurement Rules and the Service Terms are supplemented by a number of additional documents like the Balancing Services Glossary of General Terms and Rules of Interpretation, the Common Flexibility Service Terms and Conditions and the Stacking Guidance to name a few. Could NGESO indicate clearly where the prevailing documents can be found on its website and what change management applies to all documents.</p>	<p>The Balancing Services Glossary of General Terms and Rules of Interpretation is a document published by ESO, and ESO will update from time to time where appropriate upon industry consultation, but insofar as any change constitutes an amendment to the EBR Art 18 balancing services terms and conditions under EBR then ESO will consult and seek Ofgem approval under EBR. In contrast, the Common Flexibility Terms and Conditions is a document published by the ENA and subject to governance overseen by the ENA and can be found here: https://www.energynetworks.org/industry-hub/resource-library/?search=on21-ws1a-p4&id=267 . Other documents referred to in the service terms or procurement rules, for example the stacking guidance and the frequency measurement standard, are typically kept under review and updated from time to time by ESO and are not generally considered to comprise Article 18 terms and conditions.</p>