Public

Constraints Collaboration Project webinar – 25 June 2026

Q&A pack

The following questions were submitted by stakeholders collaborating with NESO on Thursday, 25th June as part of NESO's latest quarterly update on the ongoing Constraints Collaboration Project.

List of Abbreviation

ASTI - Accelerated Strategic Transmission Investment

BESS – Battery Energy Storage System

BFS – Boundary Flow Smoothing

BM – Balancing Mechanism

BMUs – Balancing Mechanism Units

BOA – Bid-offer acceptance

CBA – Cost Benefit Analysis

CfD – Contract for Difference

CFI - Call for Input

CCP – Constraints Collaboration Project

CMM – Constraints Management Market

CMIS – Constraint Management Intertrip Scheme

DESNZ – Department for Energy Security and Net Zero

DfC – Demand for Constraints

DFS – Demand Flexibility Service

FCL – Final Consumption Levy

FES – Future Energy Scenarios

GC – Grid Code

HMG – His Majesty's Government

HT – Holistic Transition

MDO/B - Maximum Deliverable Offer/Bid

NESO – National Energy System Operator

RNP – Reformed National Pricing

RRT – Repetitive Re-trading

TCLC - Transmission Constraint Licence Condition

TO – Transmission Operator

	Questions	Answers
1.	**Boundary flow smoothing -** On boundary smoothing, what time scales are you shorting (slide 9). The X axis is seconds. Can you give me a feel for the time peak to peak?	The graphs on the 'what is boundary flow smoothing' are to illustrate the concept rather than intended to show real numbers in terms of time or power. The full report includes data analysis that provide a sense of the variability of flows.
2.	**Boundary flow smoothing -** For the BM cost saving of boundary flow smoothing, what time period is that over?	The BM savings presented in the conclusion of £0.7M-£4M were annualised figures for the 2024/25 period studied.
3.	**Boundary flow smoothing -** What are the numbers if the modelling is projected forward vs expected constraints costs in the next 5 years?	Whilst we didn't forecast future figures, we wouldn't anticipate any drivers that would lead to an increase in value. Increasing constraints would probably reduce available value due to increased bottlenecks within the nested boundaries.

4.	**Boundary flow smoothing -** Why aren't NESO progressing Boundary Flow Smoothing, even on a trial basis? Shouldn't all saving opportunities be progressed in the interest of the consumer? Especially with the RRT work minimising the utilisation of storage during constraints?	The feasibility study was needed to test the underlying technical and economic case before considering whether further development or trial activity would be proportionate. Based on the findings, NESO does not currently see sufficient evidence of consumer value to justify progressing to a trial. A trial could provide useful operational learning, particularly on dispatch, communications, control-room processes, and asset response - however, to prioritise resources to establish this would need to be based on a feasible route to generating worthwhile consumer benefit.

5.	**Boundary flow smoothing -** Within the Boundary Flow Smoothing Feasibility Report, it was suggested that some more targeted analysis might provide useful information in relation to viability of the service. Has the decision been taken to NOT proceed with further analysis?	The feasibility study by Frazer-Nash Consultancy was required to test the underlying technical and economic case before considering whether further development of the concept would be an appropriate. Based on the findings, NESO does not currently see sufficient evidence of consumer value to justify further resources to progress this concept further. We welcome feedback on this minded-to position.
6.	**Storage behind constraints -** On repetitive retrading please can you comment on how RRT interacts with the Generation Licence TCLC?	Ofgem have published their view on RRT and how it interacts with TCLC: **Repetitive Re-trading (RRT) by electricity storage in transmission constraint periods**

7.	**Storage behind constraints –** For 3A, does NESO have a view if it would reduce system costs, noting that storage (even when RRT'ing) may be cheaper that generation	NESO's analysis demonstrates that the current behaviour of RRT leads to additional system costs mostly due to increased volumes of energy that need to be procured as replacement energy once the constraint is active. Individual BM actions may appear cheaper in isolation, but the cumulative additional generation that needs to be bought out and replaced owing to the increased energy volume behind constraints is in aggregate more costly.
8.	**Storage behind constraints –** Difference between 3A and 3AA is that 3A discards wind energy when there's space in a battery somewhere to store it. Surely this is wrong, and you should reject 3A in favour of 3AA? If this is not apparent from your evaluation, I suggest you go seek out the anomalies in your metrics.	If the market is significantly oversupplied and wind is likely to be curtailed, we'd expect the wholesale price to be low and for this to provide enough of an incentive to drive efficient charging of storage behind constraints. Should this happen, the volume of storage charging to avoid the curtailment of wind/solar could/should be similar between the options.
9.	**Storage behind constraints –** Option 3A. To what extent do higher bid prices of renewable generators (more negative) reduce the benefit of dispatching them over storage that could lead to RRT? Has a CBA been done to assess this?	The issue with RRT is that the control room will still bid off the renewable generator as in each period in which a PN returns which originally displaced a renewable asset this is additional energy on the system meaning we must take off the storage asset AND the renewable asset in each subsequent period as a result of that first bid. Regarding prices, this is a complex question because most of the renewables negative price is a sunk subsidy cost so there is a breakeven point for each unit at which it is cheaper for the consumer in that individual period which is not strictly the bid price. This modelling has been done through BSC Modification P462 but is intentionally excluded from the logic of NESO's RRT analysis which tries to isolate the cost consequence of RRT directly by ignoring the first cycle period in which the asset is bid off.

10.	**Storage behind constraints –** On RRT, have we looked at whether the cost or volume of RRT has increased in line with the size of the constraint volumes and costs?	Constraints volumes are increasingly each year as more generation sources connect at the edges of the grid, often behind constraints, at a faster pace than the network is being augmented. The amount of RRT has increased due to the growing connection of batteries behind these constraints. More storage behind constraints leads to more constraints, which, in turn, results in a higher incidence of RRT.
11.	**Storage behind constraints –** For storage behind constraints, will the CBA on the long-term options include options being considered under other workstreams, e.g. hybrid dispatch?	The timeframe for the long-term options is actions which can be implemented in 1-2 years, whereas the dispatch reform options are likely to take longer than this. Still, we are aware of the complementarities and will ensure that the work is progressed in a coherent way.
12.	**Storage behind constraints –** But with the introduction of MDO/B, on your response Ben, should GC166 parameters not take care of any TCLC issue where a unit can't PN more than it can deliver as it can then be seen it's violation of TCLC. It should resolve the any illegit issue.	The issue with RRT is that the units can legitimately deliver the energy volumes at all instances in time because it is predicated on the volume being bought back in the BM and therefore still available for wholesale trade whereas it wouldn't have been before (i.e., in an unconstrainted system). Selling energy, you do not have capability to deliver is a breach of REMIT and TCLC but is not presently considered to be a likely issue as it would already be a breach of market rules. GC166 parameters make it easier to identify.

13.	**Storage behind constraints -** What assurances can NESO provide that it will deliver the enduring solution for repetitive retrading and does not just leave the short-term solution in place?	The short- and long-term categories refer to the amount of time that would need to implement them, i.e., 3-6 months versus 1-2 years. The options are not mutually exclusive and some of them could be combined in the enduring solution.
14.	**Storage behind constraints -** On an earlier question on 3A vs 3AA: Isn't the issue that there are in fact periods when the wholesale signal tells batteries to discharge when there is excess wind? This is what is causing RRT. When the wholesale signal is low enough that storage is charging, then we would not be seeing RRT.	This is the reason for need for intervention on RRT - the wholesale market signals do not align to the BM market signals providing an arbitrage between acting rationally in the wholesale market and acting rationally in the BM. This creates an incentive to discharge and be bought out/charged when that energy was not useful. Option 3A removes the irrational market outcome from behaving rationally in both markets by leaving the wholesale market signal fully intact but removing the conflict between this and the BM.
15.	**Storage behind constraints –** Following up on the choice between 3A and 3AA; if a battery has space to charge within the gate but no PN to charge, only NESO can make use of that volume, by BOAing a charge. Why would you not do that?	Option 3AA would still allow for the inefficient market design arbitrage described in our answer to Q27. However, if NESO doesn't buy out the discharge volume and only buys the charge volume, the aggregate replacement energy nets to 1x rather than 2x (or more) the volume curtailed, if the energy comes back in to be replaced. Option 3AA would 'soak up' more wind but is expected to cost consumers more because storage does not need to be TCLC-compliant on the charge cycle which tends to make these actions more expensive.

16.	**Constraint management market -** "Constraints are hard to predict" pops up a lot. Surely this is no longer a risk - they are more likely than not, and the factor gets higher with every new connection and every allocation round. Is your thinking out of date here?	Some of the constraints (e.g. driven by intermittent renewable source & regional generation/demand balance & network outages) are much more predictable than other constraints (e.g. driven by flexible bi-directional assets and market prices).
17.	**Constraint management market -** Unit level bidding seems to be being ruled out by NESO, as part of RNP, so not sure that's a good idea as part of mitigations for CMM	Unit bidding has not been ruled out as part of RNP. If you have views on why unit level bidding information won't be a useful mitigation for the risks presented in CMMs, please get in touch with Saskia.
18.	**Constraint management market -** Are you being consistent in your modelling of wholesale markets in CMM evaluation and elsewhere? Cost of gas replacement is regularly reported by NESO without evaluation of wholesale impact of RRT. Is that the counterfactual to CMM? If so, you may have an inconsistency affecting the results.	A difference to bear in mind is that the analysis on the cost of RRT is considering historical data and the CMM analysis is based on a forward view of the network, so they are not directly comparable. But we will take a consistent approach to the wholesale market modelling of the future options.
19.	**Constraint management market -** Does the current CMM analysis consider some sort of 'spatial eligibility rule' rather than letting any unit join?	It is not clear what this question means, please contact Saskia on Saskia.Barker@neso.energy.
20.	**RNP -** Simon, how much are you/NESO thinking about seeking to increase baseload demand in Scotland? Rather than mostly flex demand (if that's fair?)	The RNP document outlines how we will do this specifically for data centres. In the longer-term discussion of incentivisation of demand was included as part of Ofgem's CFI, available **here**. I know Simon Gill has been working on demand located in specific places helping with constraints and we discussed it with him earlier this week.
21.	**RNP -** You mentioned a trial removing FCLs for Demand Turn Up, where can we find out more about this and/or get involved?	DESNZ is working on this now, we will look to engage suppliers and aggregators over the summer.

22.	**RNP –** Question for DESNZ: Is there realistically any chance of acceleration of transmission projects given that ASTI projects are already starting to slip, e.g. EGL3 and 4 and Grimsby to Walpole? What are concrete steps which could result in accelerates delivery from current timelines?	HMG is working with Ofgem, NESO and delivery partners including TOs to derisk timely delivery of ASTI and other networks projects needed to delivery CP30.
23.	**RNP** – DESNZ, can you specify what assumptions being used to model constraints? Risk that this over states generation in Scotland, e.g. FES Holistic Transition shows 10.3GW of offshore wind in Scotland, but only 7.5GW in operation or with CfD so HT scenario.	Accelerating network is challenging, we're working with the TOs and NESO through our clean power mission.
24.	**Other –** Thanks for this update on CCP that's now been going for 4-5years. Seems you've made some progress in eliminating a few of the options where no consumer benefit (boundary smoothing etc), but what can you say has been delivered to reduce the £1.4b/y? My DFS turnup is one but this only started recently.	Between January and February 2024, NESO ran the CCP with the industry to find solutions for thermal constraints, which could be implemented and deliver results in the short term. Since then, there have been two services being implemented, i.e. B6 for SCOTEX and interim EC5 service. The calculated constraint management saving has reached to ~£119m since the implementation. The information is published on NESO **2025 Annual Balancing Costs report**. The new service, EC5 enduring service is aimed to start from later this year through to September 2029. The estimated the consumer savings to be anticipated in the region of £170m over the ~3 years. You can find more information from **this letter**. For the extended Scotland CMIS and Demand for Constraints service, we will also clarify the consumer values when the commercial assessment is carried out.

25.	**Other –** Referring to previous question on new ideas, thank you for your answer. Could an open process be set up this year (2026) to elicit new ideas for possible CCP projects?	NESO will keep CCP running as a platform to report back to industry of current projects progress and is the platform working alongside the RNP constraints workstream to appraise ideas. We anticipate that the choices made as part of RNP Dispatch and Balancing reforms will influence the direction of travel for constraint management, hence NESO are keenly engaging with that process. However, we're always open to suggestions or ideas that could reduce constraint costs in the meantime, and we will continue to use CCP as the vehicle for assessing these. Please get in touch with our mailbox **.box.market.dev@neso.energy** with any suggestions.
26.	**RRT + other –** **(1)** Shouldn't NESO be looking at maximising the benefit of storage during constraints rather than focusing on reducing cost? i.e. what would help the system most at the lowest cost and how do we make that happen? **(2)** To that end, why has Intertrip excluded BESS?	**(1)** This is precisely what we are seeking to achieve. In the short term we are looking for an option that retains the welfare-enhancing elements of having storage in the market while minimising the inefficiency from RRT. In the long-term, we could introduce a new service or expand NESO trading if this is likely to lead to lower system costs. **(2)** NESO is inviting wind farms that have a registered Transmission Entry Capacity (TEC) greater than 50 MW to express interest in this constraint management service based on the technical requirements for service duration required, and considering the need to preserve inertia levels on the network. What this means is that throughout the Service Delivery Period, on average a single arming period can be between 8-12 hours long (though this can vary depending on system conditions), therefore long-duration exporting assets are needed for this. BESS assets can only usually export for a maximum

		of c. 2 hours and are therefore not as effective in managing constraints. Additionally, and given that part of the arming process of a generator for CMIS Scotland is the ENCC manually communicating to the TO, and usually also to the generator, to ensure site and network safety and security, they need to be long-duration assets so as the ENCC are not continually having to have new conversations with TO's & generators to ensure that they have been safely armed for CMIS and that the Network is secure. Regarding inertia levels, the ENCC would want to keep synchronous units connected to the network in times of network stress (such as having to trip a generator due to constraint issues). Therefore, the ENCC require no-inertia assets such as Windfarms to be part of CMIS Scotland, as opposed to assets that do provide inertia.
27.	**Other –** Why have NESO excluded storage from intertrip?	Explained as above.