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CMP405: TNUoS Locational Demand Signals for Storage

Workgroup 8
19 November 2026

Online Meeting via Teams

NESO
National Energy System Operator

WELCOME



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Expectations of a Workgroup Member

- Contribute to the discussion
- Be respectful of each other's opinions
- Language and Conduct to be consistent with the values of equality and diversity
- Do not share commercially sensitive information
- Be prepared - Review Papers and Reports ahead of meetings
- Complete actions in a timely manner
- Keep to agreed scope
- Email communications to/cc'ing the .box email

Your Roles

- Help refine/develop the solution(s)
- Bring forward alternatives as early as possible
- Vote on whether or not to proceed with requests for Alternatives
- Vote on whether the solution(s) better facilitate the Code Objectives

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Agenda

Topics to be discussed	Lead
Welcome, actions and decisions from WG7	Chair
Purpose of WG8 and CMP393 context	Chair
CMP393 overview and relevant analysis	Proposer
Authority decision on CMP393	Proposer / All
Comparison of CMP393 and CMP405	Proposer / All
Potential implications for the CMP405 defect and solution	All
Position against ToR B and ToR E, including evidence gaps	Chair / All
Future Terms of Reference and Workgroup priorities	Chair / All
Any Other Business	Chair
Next Steps	Chair

Objective: Understand what CMP393 proposed and why it was rejected, consider how CMP405 differs, and identify what evidence may still be required to demonstrate that the CMP405 demand-side solution addresses the relevant concerns.

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Workgroup Membership

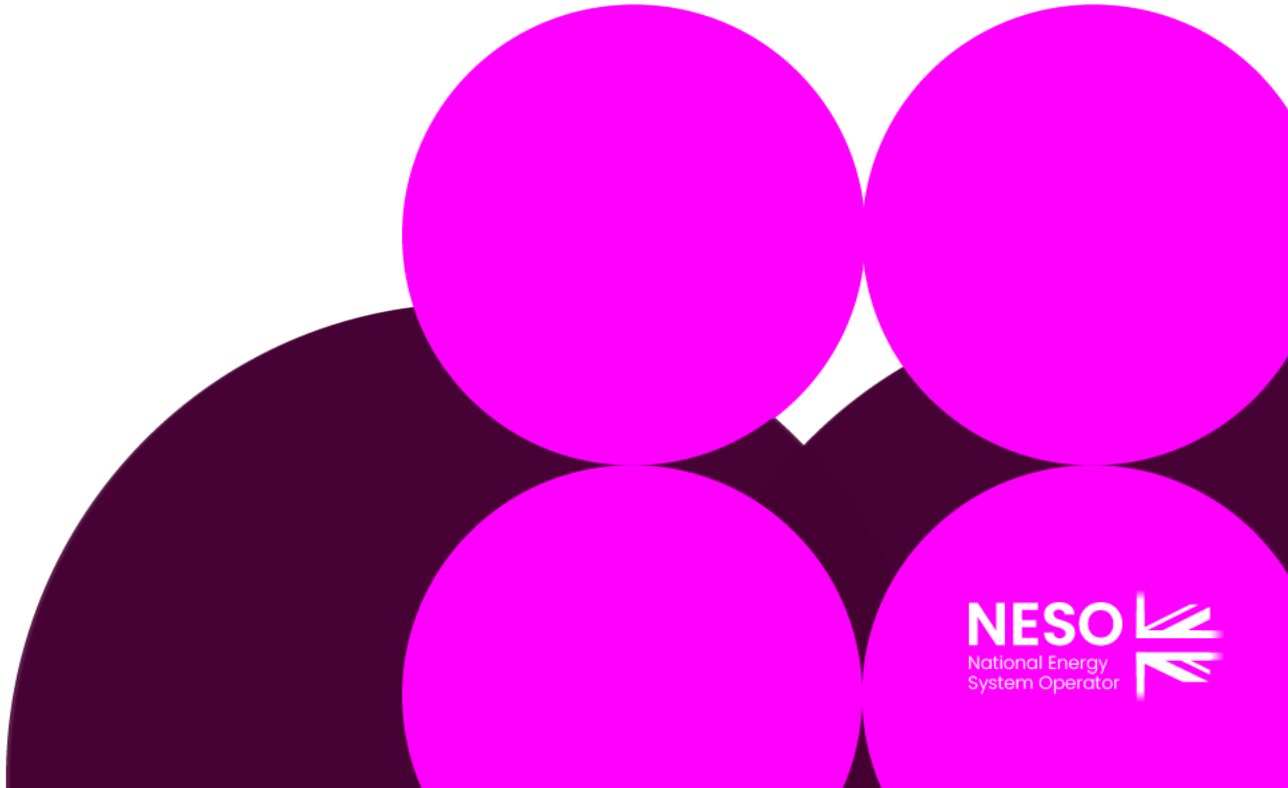
Role	Company	Name	Alternate
Proposer	SSE Generation	Damien Clough	Susan Stead /John Tindal
Workgroup Member	NGET	Benchohra Sayah	Matthew Paige Stimson
Workgroup Member	Field Energy	Andrew Enzor	Damian Jackman
Workgroup Member	Energy Grid Power Ltd	John Prime	Damian Bach
Workgroup Member	CUSC Panel member	Kyran Hanks	
Workgroup Member	Sembcorp	Mark Field	
Workgroup Member	Qair Renewables UK Limited	Lamin Saidy Vulart	Vivek Kodige
Workgroup Member	Drax	Paul Youngman	
Workgroup Member	Statera Energy	Phoebe Finn	Callum Chalmers
Workgroup Member	Scottish Power	Priyanka Mohapatra	Ryan Ward
Workgroup Member	Octopus Energy	Sam Whitworth	Emma Burns
Workgroup Member	ENGIE	Richard Gow	Andrew Rimmer
Workgroup Member	NESO	Stephen Dale	
Workgroup Member	Zenobe	Tom Palmer	
Workgroup Member	RWE	Tom Steward	Xuefei Zheng
Authority Representative	Ofgem	Daniel De Wijze	
Observer	SSE	Angeles Sandovall Romero	
Observer	Pulse Clean Energy	Hudson Farley-Moore	Oisin Donelly
Observer	Qair Renewables UK Limited	Thomas O'Neill	

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CMP405 Actions Log

Ayo Bammeke – NESO Code Administrator



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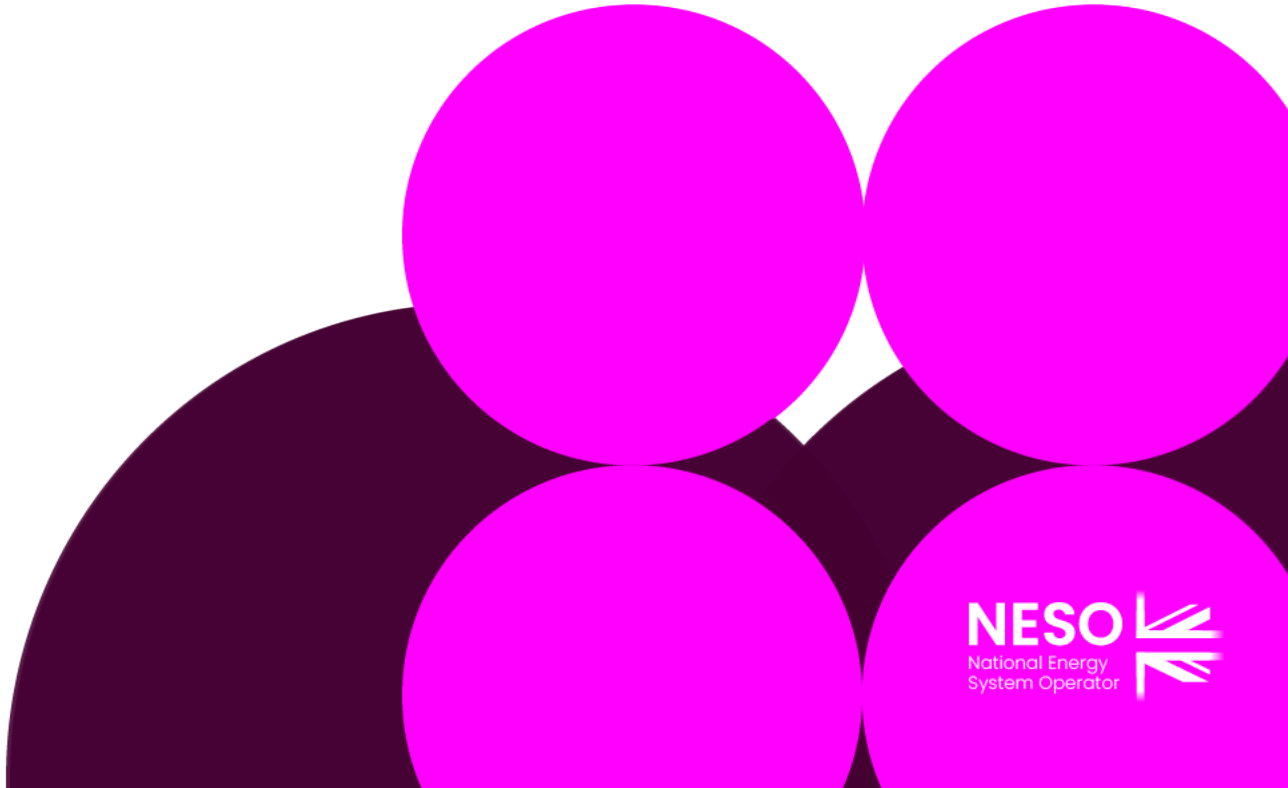
CMP405 Actions Log

Action number	Workgroup Raised	Owner	Action	Due by	Status
1	WG7	AB	Contact EDF to establish whether replacement Workgroup representatives should be nominated.	WG3	To Close today
2	WG7	AB	Inform the CUSC Panel of the agreed attendance and voting approach at October panel.	WG3	To Close today
3	WG7	AB/DC	Identify the priority Terms of Reference and supporting evidence for Workgroup 8, and circulate the proposed topics in advance.	WG3	To Close today
4	WG7	PM/SD	Share the publicly available LCP and Frontier Economics supporting analysis with the Workgroup.	WG3	To Close today

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Purpose of WG8 and CMP393 context

Ayo Bammeke – NESO Code Administrator



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CMP393 in Simple Terms

What did CMP393 propose?

- CMP393 concerned the **generation-side TNUoS treatment** of electricity storage.
- The existing Annual Load Factor primarily reflected electricity exported by storage.
- CMP393 proposed recognising both imports and exports in the calculation.
- The final approach was broadly:

ALF = gross generation minus gross demand, floored at zero

- Because storage normally imports more electricity than it exports due to efficiency losses, many storage ALFs were expected to reduce to **zero or close to zero**.
- This would have significantly reduced the Year Round elements of storage generation TNUoS.
- The Workgroup and CUSC Panel supported CMP393 by majority, but Ofgem rejected it in October 2024.

Baseline	CMP393	Main question
ALF mainly based on exports	Imports deducted from exports	Does annual net energy accurately reflect storage's long-run network cost?

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Why Did Ofgem Reject CMP393?

Limited evidence

- Analysis focused mainly on the B6 boundary.
- It used a limited number of storage assets and sample periods.
- It did not provide a sufficiently representative GB-wide assessment.

Long-run network costs

- Zero or near-zero ALFs implied that storage made little or no contribution to Year Round transmission-network costs.
- Ofgem considered that storage still required network capacity to be available.

Investment versus operation

- Ofgem viewed TNUoS primarily as a **long-run investment signal**.
- It considered that CMP393 reflected how storage operated, rather than the transmission investment associated with storage.

Competition and existing market signals

- Other flexible demand could also respond beneficially to constraints.
- Ofgem questioned whether storage would receive an advantage unavailable to comparable technologies.
- Ofgem also identified a **potential risk** of overlap with Balancing Mechanism and wholesale-market rewards.

Key point: CMP393 was not rejected solely because of potential double counting. The wider concern was whether the proposed charging metric reflected long-run transmission-investment costs.

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Why Is CMP393 Relevant to CMP405?

CMP393 and CMP405 are related, but materially different

Issue	CMP393	CMP405
Charging side	Generation TNUoS	Demand TNUoS
Defect	Generation ALF did not recognise imports	Zero floor removes a potentially beneficial demand locational signal
Approach	Imports deducted from exports	Eligible storage imports used to calculate a demand benefit
Main effect	Reduced Year Round generation charge	Demand locational credit or reduced demand charge
Generation charge	Could be substantially reduced	Retained and unchanged
Storage activity	Annual import and export volumes	Potentially more targeted eligible imports
Main unresolved test	Did net ALF reflect network-investment cost?	Do eligible imports represent an enduring network-investment benefit?

Questions for today

- What lessons from the CMP393 analysis remain relevant to CMP405?
- Which reasons for rejecting CMP393 could also apply to CMP405?
- Does CMP405's demand-side approach materially address those concerns?
- What network cost is the proposed CMP405 credit intended to represent?
- What evidence will CMP405 need to demonstrate:
  - a long-run transmission-investment benefit;
  - proportionate treatment of storage;
  - an appropriate relationship with other market signals; and
  - a net consumer benefit?

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CMP405

History of the Mod

29/10/26



General

CMP393 Decision & Discussion

- The CMP393 proposes to introduce a new term, Gross Demand Volume. The proposed change would see the ALF calculated by subtracting net energy imports from net exports.

- The CUSC Panel (the “Panel”) met on 31 May 2024 and voted on CMP393 against the ACOs. Six out of nine of the Panel members considered that CMP393 better facilitated the ACOs than the existing provisions within the CUSC (the ‘Baseline’), and therefore recommended its approval. However, some Panel members highlighted significant specific concerns during the voting, in particular that this change would reward storage assets for operational actions (already provided for in balancing services and included in the Balancing Mechanism) within TNUoS charging, and therefore there was a risk of double counting.

General

CMP393 Decision & Discussion

- Ofgem view on the technical analysis:

We consider there are some limitations to the analysis undertaken. It is limited in scope to investigate only the B6 boundary. No consideration is given on how this modification would affect storage operators located in the South-East in areas dominated by synchronous generation. No examples are given for effect on generator tariffs per zone or other constrained boundaries beyond the B6 boundary. While this limitation is driven by a lack of data on other network boundaries and covers the most commonly used example of system constraints, it does not provide a full and clear picture of the system wide impacts of storage assets and therefore the full picture of the impact of this change. Furthermore, the historical data presented during B6 constraint is based on a small number of assets and sample hours – some assets removed due to Balancing Mechanism investigations and fines. In addition, the analysis makes use of only a small number of sample hours due to COVID peaks

CMP393 Decision & Discussion

- Among the responses from Panel members who found this modification to be negative or neutral against ACO (a) questioned the cost reflectivity of the locational signal and considered that the Proposal would result in a potential unfair advantage for storage technologies when compared to other forms of generation, with a risk of double counting system benefits within TNUoS charges that are already rewarded in the Balancing Mechanism
- We consider that other large demand users can also help the system by turning up or down in response to system constraints. While storage assets may operate differently to other conventional carbon technologies, current TEC types are designated solely with regard to the flexibility of dispatch of an asset, resulting in storage being classified as Conventional Carbon. We believe that this modification could result in storage receiving undue advantage when compared with other technology types, by reducing their charges, providing an impediment to fair competition within the market. This distortion could also result in storage receiving an undue advantage over other forms of flexible demand such as Demand Side Response which could also help during system constraints CMP440 has subsequently being raised and sits with Ofgem

CMP393 Decision and Discussion

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CMP393 Decision and Discussion

- We consider established market mechanisms such as the BM are an appropriate method by which to reward flexible responses that benefit the system at times of constraint. Rewarding all storage assets through lower TNUoS charges for operational actions that may or may not further contribute to constraints could potentially double count these payments or even reward assets for actions that have little or no impact on system constraints.
- The ability of storage assets to both import and export may have material impact on the cost of maintaining and developing the transmission system, but the proposed solution would result in most battery storage and pumped hydro plants having their ALF set at, or close to, the proposed floor of zero and, therefore the Year Round components of their TNUoS charges also at, or close to zero. This would imply they have no impact on the long run expansion costs of the transmission network. We consider that storage, although unique in its characteristics as an import and export asset, still requires network capacity to be built and therefore the associated infrastructure costs should be reflected in its charges. Does it tend to generate at the same time as other Generators or does it share the system and Generate around them?

CMP393 Decision and Discussion

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- The ability of storage assets to both import and export may have material impact on the cost of maintaining and developing the transmission system, but the proposed solution would result in most battery storage and pumped hydro plants having their ALF set at, or close to, the proposed floor of zero and, therefore the Year Round components of their TNUoS charges also at, or close to zero. This would imply they have no impact on the long run expansion costs of the transmission network. We consider that storage, although unique in its characteristics as an import and export asset, still requires network capacity to be built and therefore the associated infrastructure costs should be reflected in its charges. CMP405 doesn't touch the Generation Charge but seeks to reinstate the Demand Locational Charge

CMP393 Decision and Discussion

- CMP393 attempts to reflect operational behaviours of storage and its potential to mitigate system constraints through its operational behaviour. This modification would reward storage based on how it operates as opposed to the costs it confers on network investment. We have been clear on the role of TNUoS as a long run investment signal which represents the transmission investment triggered by storage Year Round operation, not its operational behaviour. We continue to believe that TNUoS is not the appropriate place to reflect operational behaviour of assets and that signals sent through TNUoS should solely seek to influence the investment decisions of system users and not real-time operation.
- The TNUoS charging methodology was not designed to consider whether import/export behaviour is balanced at operational times, it considers and signals what capacity on the network must be built to accommodate each asset as a long run investment signal.16 Operational mechanisms fall to the market, but this modification would also include such operational signals within TNUoS charges. We believe this Proposal to be negative in this regard, as it would send a distorted locational investment signal by including these operational consideration in the signal sent by TNUoS.

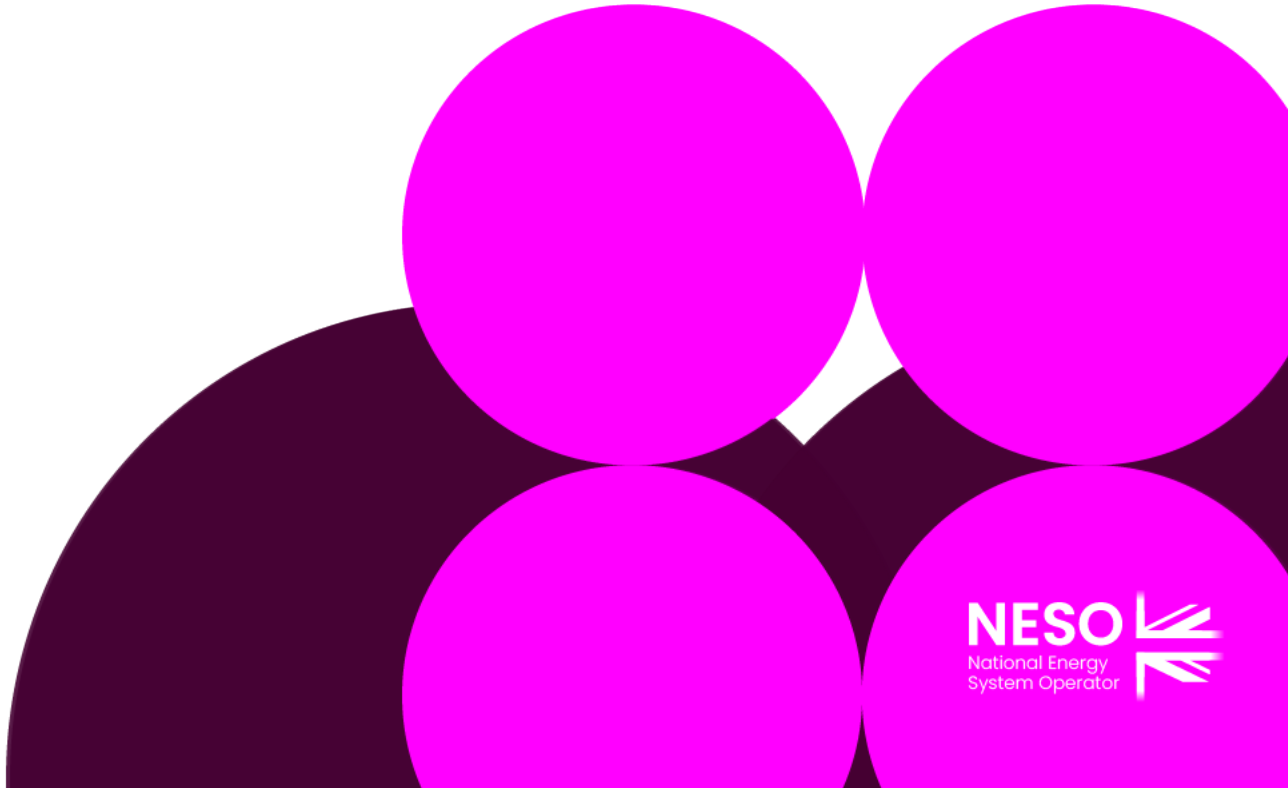
CMP393 Overview

- Concerned around Double Counting
  - Proposed solution removes double counting
- Operational Signals and TNUoS
  - TNUoS should reflect investment
  - CMP405 maintains Generation Charge , whereas CMP393 removed it
- Removal of Locational Signal
  - CMP405 maintains Generation Charge , whereas CMP393 removed it
  - CMP405 works on reinstating the existing Demand Locational Signal which we accept as being cost reflective for other Imports

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Terms of Reference

Ayo Bammeke – NESO Code Administrator Proposer



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Terms of Reference

Workgroup Term of Reference	
a)	Consider EBR implications
b)	Consider the analysis was undertaken as part of CMP393
c)	Consider the principles of wider TNUoS methodology, and the interaction between the cost of constraints and cost of transmission
d)	Consider the analysis done in the TNUoS Storage Subgroup
e)	Consider the Authority Decision for CMP393 and the impacts on CMP405
f)	Consider whether storage connected at Distribution should receive this benefit
g)	Consider crossovers with LDES Cap and Floor programme, in particular work on the licence condition around operating as LDES
h)	Consider ongoing NESO work on storage behind constraints and Ofgem work on repetitive retrading
i)	Consider interactions with ongoing Ofgem policy work on RNP

CMP405 TOR Discussion

- a) Consider EBR Implications
  - We aren't seeking to change Balancing Services costs, Prices or Offers or introduce and Operational Singal
- b) Consider analysis undertaken by CMP393
  - This has now been superceded by analysis undertaken by CMP405 and the Storage Subgroup. It has a similar question. Storage subgroup and CMP405 both concluded that Storage can provide a benefit to the System when located behind a constraint and this benefit is correlated to the duration of the Storage i.e. longer duration givers greater benefit
- c) Consider the principles of wider TNUoS methodology, and the interaction between the cost of constraints and cost of transmission
  - Worth going over some of this again as a workgroup. CMP405 previously spent a lot of time discussing how constraints is already reflected in TNUoS charges and is the cornerstone of Year Round Charges. If investment is made when you

CMP405 TOR Discussion

- c) Consider the principles of wider TNUoS methodology, and the interaction between the cost of constraints and cost of transmission
  - Worth going over some of this again as a workgroup. CMP405 previously spent a lot of time discussing how constraints is already reflected in TNUoS charges and is the cornerstone of Year Round Charges. When the costs of constraints are greater than the cost of network build, you build. If you reduce the cost of constraints you essentially create spare capacity.

d)	Consider the analysis done in the TNUoS Storage Subgroup
e)	Consider the Authority Decision for CMP393 and the impacts on CMP405

  - Worth having a session on the analysis done within the subgroup.
  - We've considered the authority decision for CMP393 and what we now need to be aware of within CMP405

CMP405 TOR Discussion

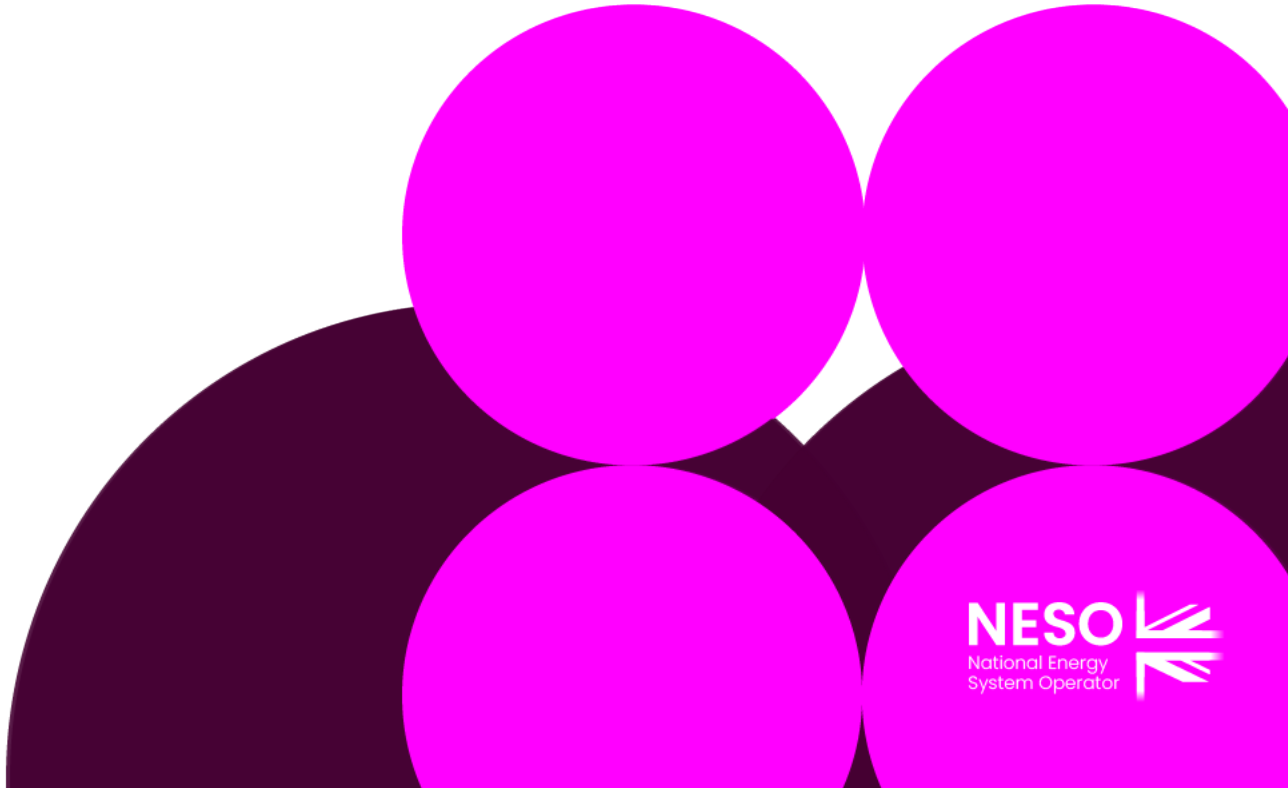
- I think we need to spend a bit of time discussing the below TOR's, some more than others

f)	Consider whether storage connected at Distribution should receive this benefit
g)	Consider crossovers with LDES Cap and Floor programme, in particular work on the licence condition around operating as LDES
h)	Consider ongoing NESO work on storage behind constraints and Ofgem work on repetitive retrading
i)	Consider interactions with ongoing Ofgem policy work on RNP

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Any Other Business + Next Steps

Ayo Bammeke – NESO Code Administrator



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Next Steps

- Capture the key discussion, agreed positions and actions from WG8
- Update the Terms of Reference tracker for **ToR B and ToR E**
- Confirm which CMP393 findings remain relevant to CMP405
- Agree any further analysis required for the CMP405 defect and solution
- Confirm the priority Terms of Reference and evidence for WG9
- **Workgroup 9 – 10 December 2026**