Public

Transmission Charging Methodologies Forum and CUSC Issues Steering Group

5 June 2025

Agenda

1	Introduction, meeting objectives and review of previous actions - Dan Arrowsmith, NESO	10:00 - 10:10
2	Generation Weighted Reference Node CMP423 – John Tindal, SSE	10:10 - 10:40
3	Code Administrator update – Code Administrator NESO	10:40 - 10:50
4	Transmission Connection Asset Charging Defect - Joe Colebrook, Innova	10:50 – 11:10
5	AOB and Meeting Close - Dan Arrowsmith, NESO	11:10 – 11:20

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TCMF Objective and Expectations

Objective
Develop ideas, understand impacts to industry and modification content discussion, related to the Charging and Connection matters.
Anyone can bring an agenda item (not just the NESO!).

Expectations
Explain acronyms and context of the update or change.
Be respectful of each other’s opinions and polite when providing feedback and asking questions
Contribute to the discussion
Language and Conduct to be consistent with the values of equality and diversity
Keep to agreed scope

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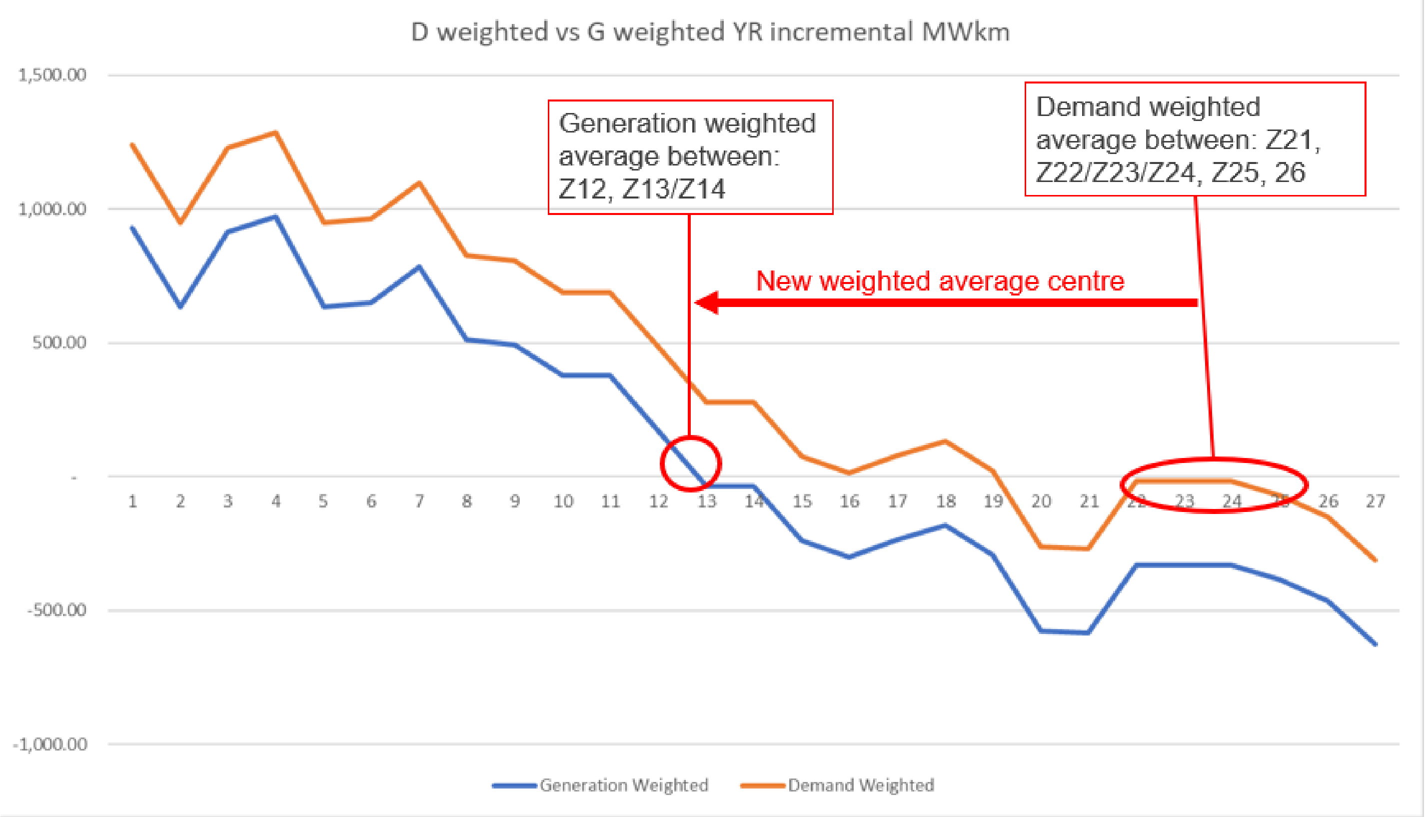
Review of previous action

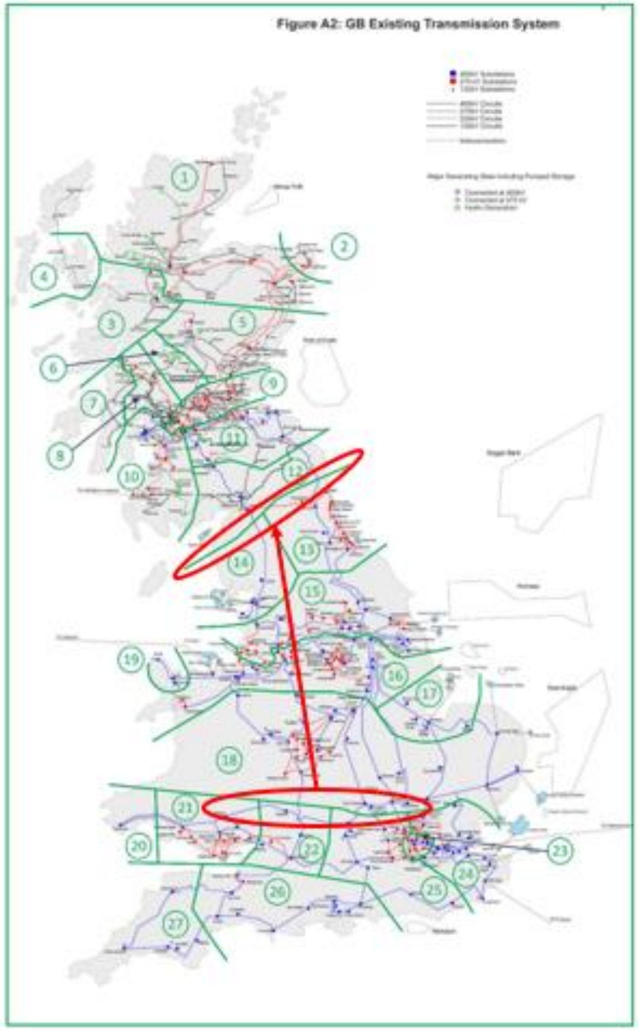
ID	Month	Description	Owner	Notes	Target Date	Status
24-12	July	Post implementation analysis of CMP376: Inclusion of Queue Management process within the CUSC.	DA	NESO will reopen this action in April 2025, as that will be 12 months after CMP376 was included in contract terms.	From April 2025	On Hold
24-14	October	Data post CMP376 implementation on the TEC register around projects moving forward, backward or staying the same.	DA		May 2025	Ongoing
24-15	May	Consider how to report meaningful connections data following the recent 'Pause' in connections reform activity.	JS	Whilst there is a pause in the new connection data being shared at TCMF, JS to consider how data can be made more accessible to Industry	Sept 2025	Ongoing

Generation Weighted Reference Node CMP423

John Tindal, SSE

Change reference node from demand weighted to generation weighted.

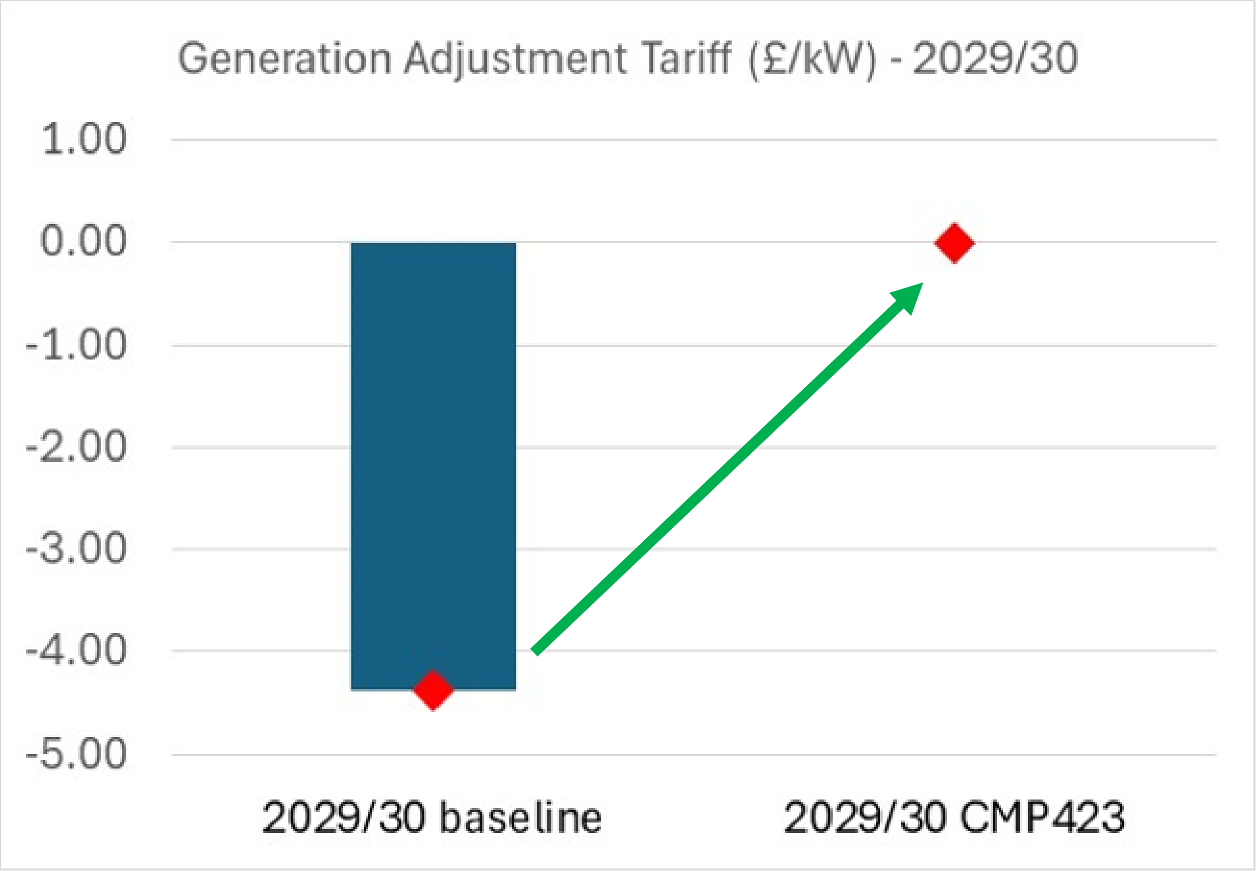




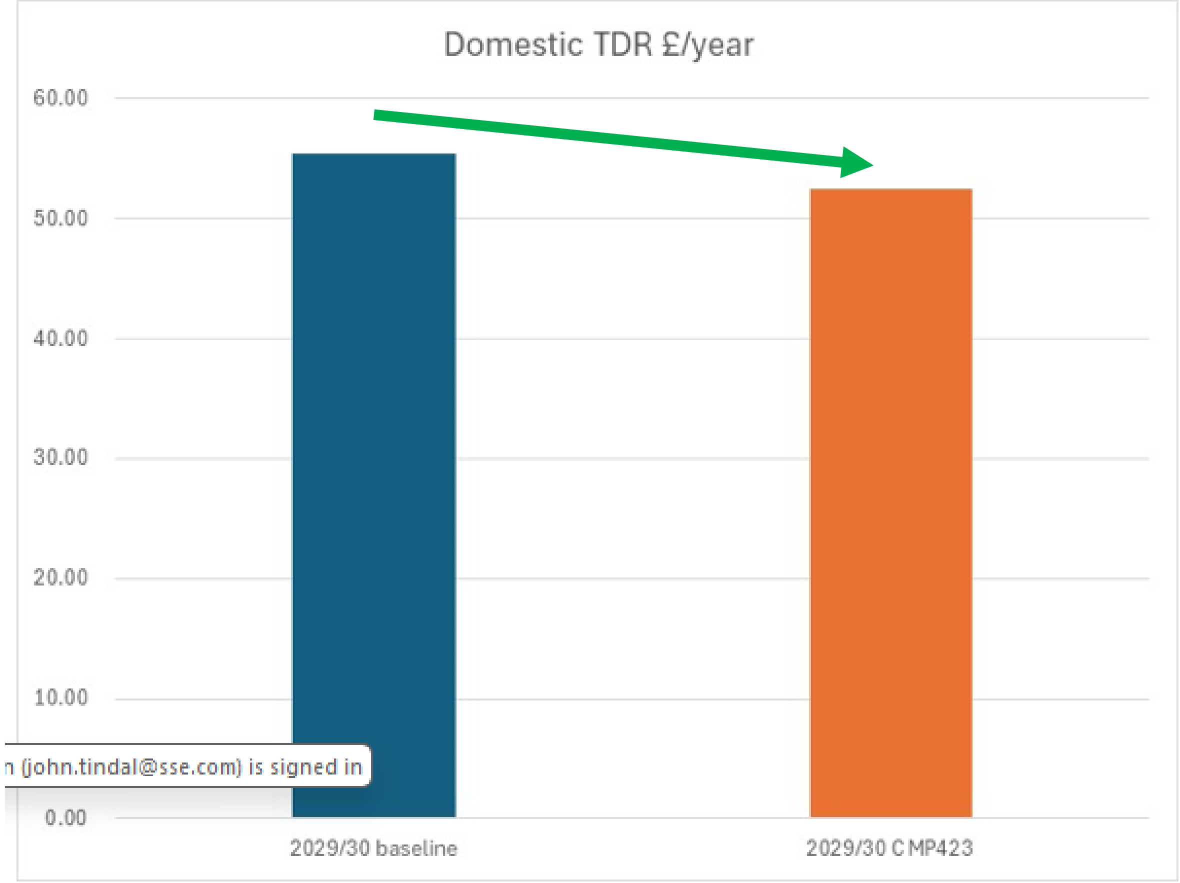
Note: MWkm values for parallel zones are averaged

Impact on Residual charges
Rebalance charges from residual to locational

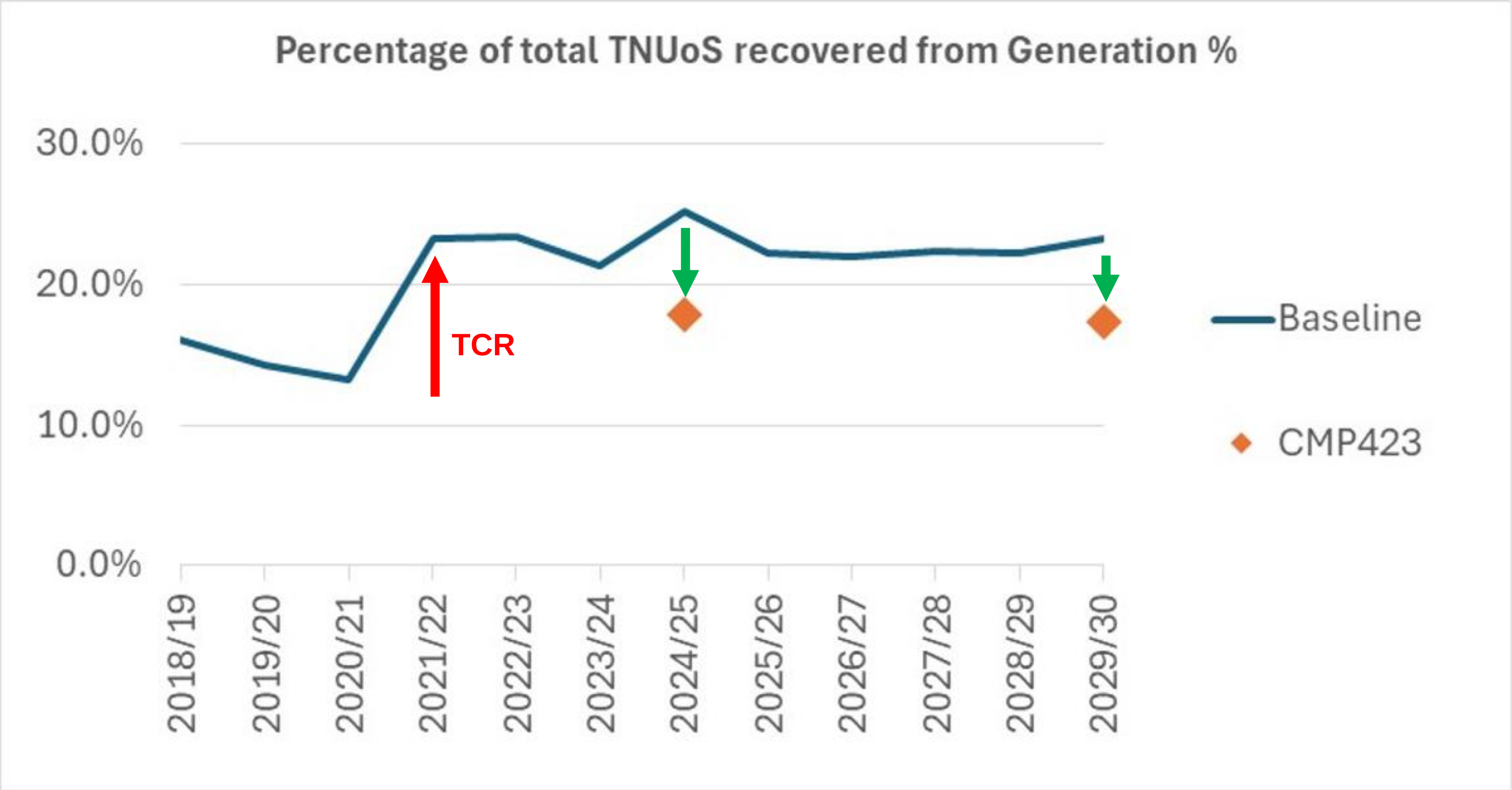
Generator adjustment credit 2029/30



Demand Residual 2029/30

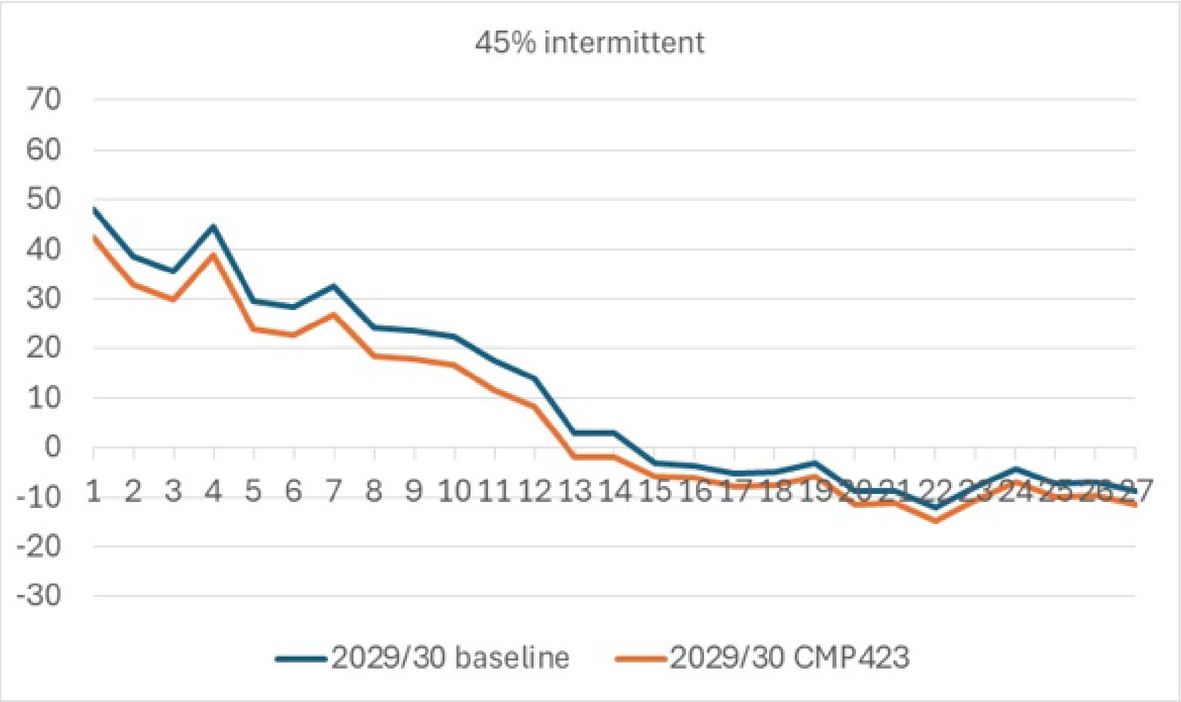


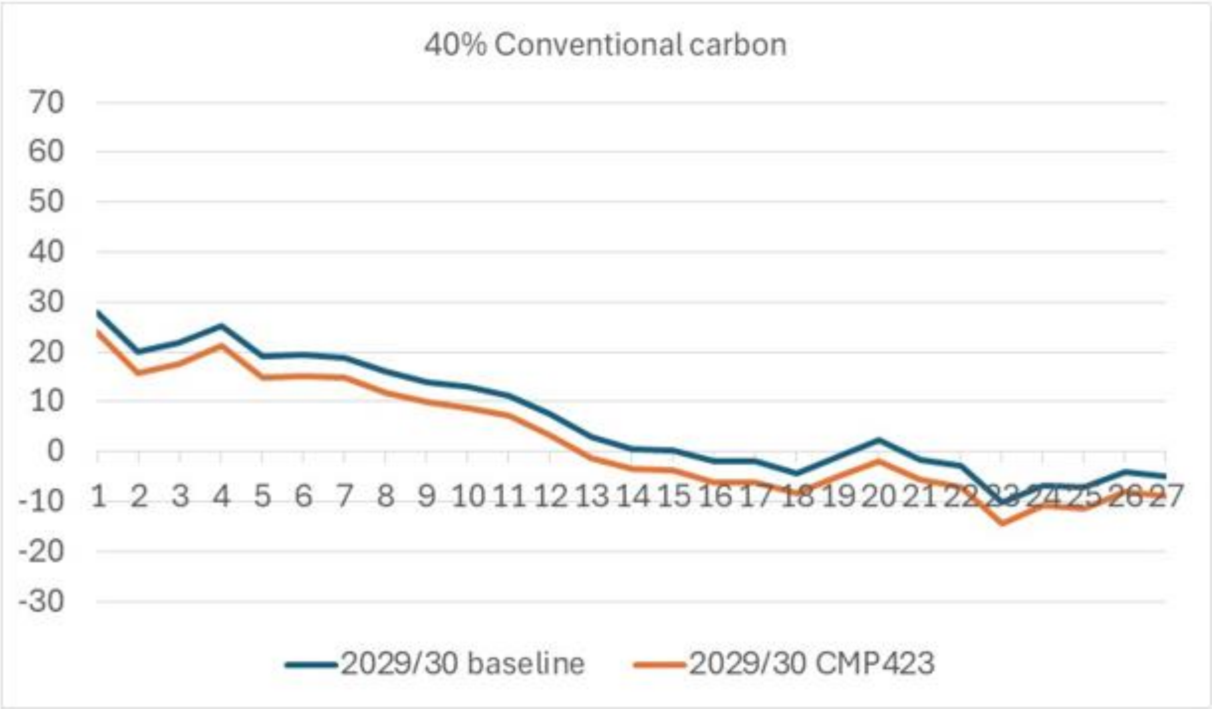
Revenue proportions
Mitigates part of 2021/22 TCR increase



TCR: Targeted Charging Review

Impact on generator charges

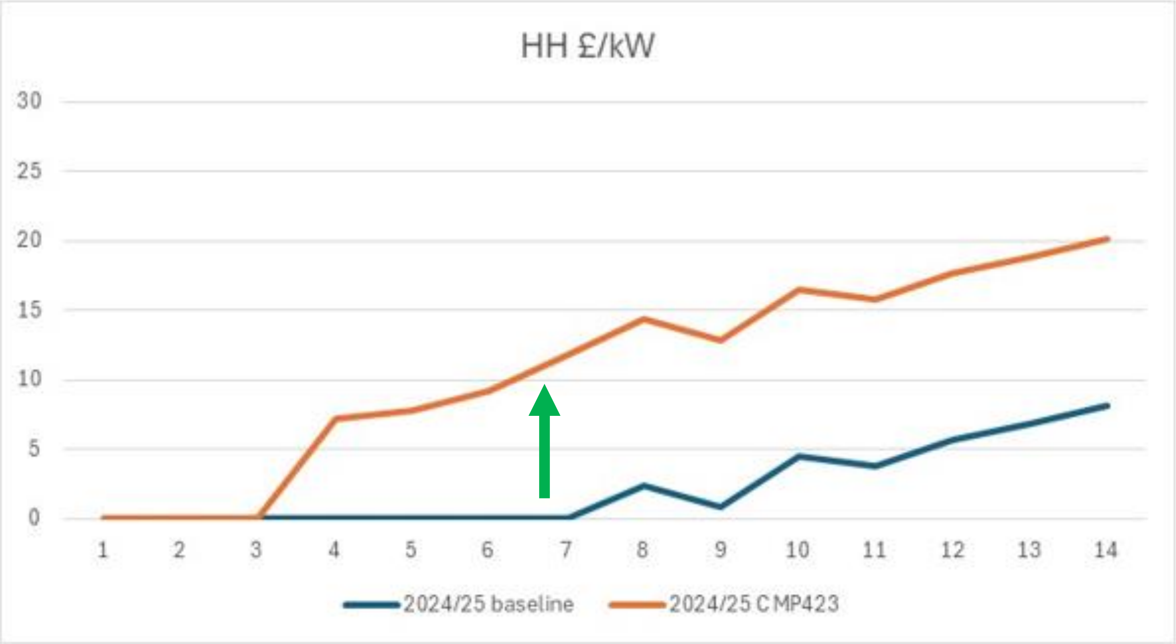




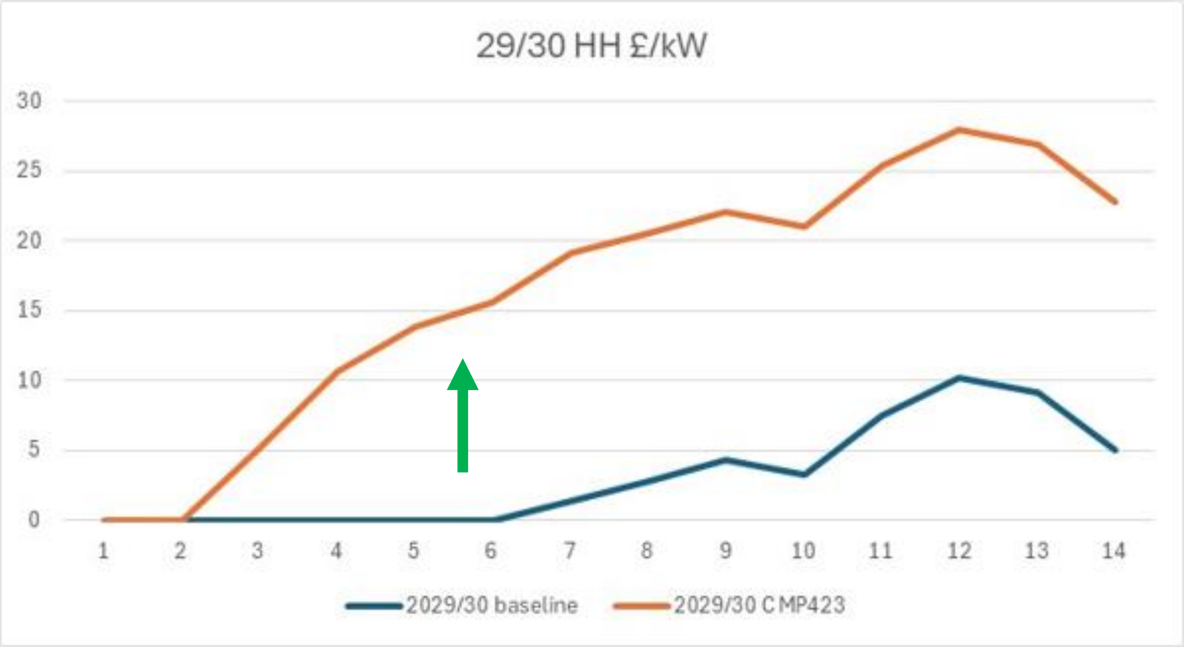
Interactions include: CMP444 Cap and Floor, CMP432 Security Factor

Impact on demand locational charges
Reduces severity of “floor at £zero” defect

Demand TNUoS 2024/25



Demand TNUoS 2029/30



Interactions include: CMP440 Reinstate TNUoS Demand Credits

Summary

Proposer justification: Better cost reflectivity for generation & demand

- Better reflect how system responds to changes in User decisions (generation and demand) - more cost reflective price signals

Proposer justification: Better effective competition by rebalancing charges from residual to locational

- **Better for Generation:**
  - Versus other markets by bringing generation wider locational charges closer to the €0 to €2.50 range and reducing the magnitude of generator adjustment credit
- **Better for Demand:**
  - Between demand locations by largely reinstating locational demand charges
  - Between demand and generation by making charges more equal/opposite

Next steps

- **Workgroup consultation:** Open until 5pm 20th June 2025
- **Final modification report:** December 2025
- **Implementation:** April 2027

Code Administrator Update

Key Updates since last TCMF

New Modifications / Nominations

- **CMP453** ‘Bill BSUoS on a net basis at BSC Trading Units’ – raised on 30 April

Decisions

- **CMP446** ‘Increasing the lower threshold in England and Wales for Evaluation of Transmission Impact Assessment (TIA)’.

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Key Updates since last TCMF

Implementations

- **CMP446** 'Increasing the lower threshold in England and Wales for Evaluation of Transmission Impact Assessment (TIA)' - On 12 May 2025, the Authority approved WACM1. Implemented on **13 May 2025.**

Authority Expected Decision Date

Modification	FMR submitted	Expected Decision Date
Review'CMP315 'TNUoS Review of the expansion constant and the elements of the transmission system charged for' and CMP375 'Enduring Expansion Constant & Expansion Factor Review'	07 February 2024	TBC (previously 07 February 2025)
CMP330 & CMP374 'Allowing new Transmission Connected parties to build Connection Assets greater than 2km in length and Extending contestability for Transmission Connections'	10 August 2023	TBC subject to CMP414 send back
CMP397 'Consequential changes required to CUSC Exhibits B and D to reflect CMP316 (Co-Located Generation Sites)'	12 June 2024	30 September 2025 (previously 24 January 2025)
CMP418 'Refine the allocation of Dynamic Reactive Compensation Equipment (DRCE) costs at OFTO transfer'	11 March 2025	TBC
CMP441 'Reducing the credit risk of supplying non – embedded hydrogen Electrolysers'	23 December 2024	TBC – (Minded to consultation to be published in June)
CMP444 'Introducing a cap and floor to wider generation TNUoS charges'	28 March 2025	01 July 2025

The Authority's publication on decisions can be found on their website below:
https://www.ofgem.gov.uk/publications/code-modificationmodification-proposals-ofgem-decision-expected-publication-dates-timetable

Key Consultations in June

Workgroup Consultations

- CMP423 'Generation Weighted Reference Node' - opens 28 May and **closes 19 June**

Code Administrator Consultations

- CMP344 'Clarification of Transmission Licensee revenue recovery and the treatment of revenue adjustments in the Charging Methodology' - opens 12 May and **closes 03 June**
- CMP448 'Introducing a Progression Commitment Fee to the Gate 2 Connections Queue' - opens 10 June and **closes 24 June**

Appeals Window

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Useful Links

Ofgem's expected decision dates/ date they intend to publish an impact assessment or consultation, for code modifications that are with them for decision are available here

Updates on all Modifications are available on the Modification Tracker here

The latest CUSC Panel Headline Report and prioritisation stack are available here

If you would like to receive updates from the Code Administrator on CUSC modifications, please join the distribution list here

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Charging Futures Forum

The next **Charging Futures Forum** is on 18 June 2025 09:30 –12:00

Register for the forum here

CUSC 2025 - Panel dates

	Panel Dates	Papers Day	Modification Submission Date	(TCMF) CUSC Development Forum
December	13	5	28 November	21 November (cancelled)
January	31	23	16	9
February	28	20	13	6
March	28	20	13	6
May (April's Panel)	02	24 April	15 April	10 April (cancelled)
May	23	15	8	8
June	27	19	12	5
July	25	17	10	3
August	22	14	7	7
September	26	18	11	4
October	31	23	16	2
November	28	20	13	6
December	12	4	16	20 November

Transmission Connection Asset Charging Defect

Joe Colebrook, Innova

Kyle Murchie, Roadnight Taylor

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Connection Site Definition

14.2.5 **In general, connection assets are defined as those assets solely required to connect an individual User to the National Electricity Transmission System, which are not and would not normally be used by any other connected party (i.e. "single user assets").** For the purposes of this Statement, all connection assets at a given location shall together form a connection site.

14.2.6 Connection assets are defined as all those single user assets which: a) for Double Busbar type connections, are those single user assets connecting the User's assets and the first transmission licensee owned substation, up to and including the Double Busbar Bay; b) for teed or mesh connections, are those single user assets from the User's assets up to, but not including, the HV disconnector or the equivalent point of isolation; c) for cable and overhead lines at a transmission voltage, are those single user connection circuits connected at a transmission voltage equal to or less than 2km in length that are not potentially shareable.

14.2.7 Shared assets at a banked connection arrangement will not normally be classed as connection assets except where both legs of the banking are single user assets under the same Bilateral Connection Agreement.

14.2.8 Where customer choice influences the application of standard rules to the connection boundary, affected assets will be classed as connection assets. For example, in England & Wales NGET does not normally own busbars below 275kV, where The Company and the customer agree that NGET will own the busbars at a low voltage substation, the assets at that substation will be classed as connection assets and will not automatically be transferred into infrastructure.

Problem Statement

Distribution customers who trigger new Supergrid Transformers (SGTs) currently face a postcode lottery as to how much they must pay depending on the classification of GSP they are connecting into:

- **The SGT works are free to the customer (socialised via TNUoS) if the GSP is an infrastructure site**
- **The SGT works are passed directly onto distribution customers if the GSP is a "customer site"**
  - Where there are multiple embedded generation customers triggering the works most DNOs currently share this cost proportionally between them
  - Where there are demand customers triggering the works some DNOs pass the full cost onto the first demand customers and other customers get a 'free ride'
- **DNOs aren't explicitly funded for all connections led transmission reinforcement (some covered under DNO business plans while remainder covered through customer contributions)**
- **Strategic or general infrastructure reinforcement triggered by the DNO is recovered by ESO/NGET by increasing GSP annual exit charges**

Major issues can occur if there are changes between the above charging scenarios due to additional customers contracting.

Roadnight Taylor
THE INDEPENDENT SPECIALIST GRID CONSULTANCY

Size and Scale

- Roughly 60% of our GSPs are connection assets, whereby all asset costs are funded by distribution customers
- The cost treatment of those assets has been purposefully overlooked by Transmission Charging Review (TCR) and Significant Code Review (SCR)
- We are funded to develop/maintain these assets through New Transmission Capacity Charges (NTCC) totex allowance and Transmission Connection Point Charges (TCPC) pass through, which can be funded through existing LRE allowances or an existing Uncertainty Mechanism
- As at June 2024, we have ~ £440m of NTCC CAPEX which we have agreed to progress with the ESO, which we have passed through to customers

Solution strategy (proposed for trial)

- Current treatment doesn't explicitly agree socialisation of these costs for generation, so any generation connection triggering these works could be potentially liable for all costs. This is a massive barrier to decarbonisation.

- NGED recommends levelisation of the charging boundary, capacity based charging and implementation of DSO flexibility markets; to do this, it requires the DNO to be allowed to socialise unapportioned costs (via exit charges over 40+ years) – albeit with the expectation we will aim to fully recover all costs. As more customers accept contracts for apportioned capacity, Transmission construction agreements will be revised with NESO to remove any residual unapportioned costs.

- We should not agree to strategic investment in all GSPs, but trigger them based on criteria – i.e. where we can credibly demonstrate the need from demand will follow soon as evidenced from our DFES and stakeholder engagement processes

Actions required for delivery

1
- The currently agreed CCCM table excludes transmission assets and needs to be rewritten
- NGED proposes the additional red rows (added below) and seeks a letter of comfort from Ofgem to progress as a trial
- Ultimately all DNOs need to agree to change the CCCM
- We would need Ofgem to agree with the changes and approve this document:

	Voltage at the POC			
Voltage of Scheme Assets	LV (below 1000V)	HV (above 1kV but less than 22kV)	EHV (above 22kV but less than 72kV)	132kV
Transmission	We fund	Apportioned (>1MW)	Apportioned	Apportioned
Transmission/132kV Substation	We fund	Apportioned (>1MW)	Apportioned	Apportioned
132kV Network	We fund	We fund[1]	Apportioned	Apportioned
132kV/ EHV Substation	We fund	EHV circuit breakers only Apportioned	Apportioned	Not applicable
EHV Network	We fund	Apportioned	Apportioned	Not applicable
132kV/ HV Substation	HV circuit breakers only Apportioned	Apportioned	Not applicable	Not applicable
EHV/HV Substation	HV circuit breakers only Apportioned	Apportioned	Not applicable	Not applicable
HV Network	Apportioned	Apportioned	Not applicable	Not applicable
HV/ LV Substation	Apportioned	Not applicable	Not applicable	Not applicable
LV Network	Apportioned	Not applicable	Not applicable	Not applicable

2

To enable the trial to proceed, NGED requests a letter of comfort from Ofgem declaring:

- It is in line with the SCR decision that transmission reinforcement for demand and generation should be socialised using the same voltage rules identified in the SCR
- NTCC can be used to fund the socialised elements of transmission reinforcement for generation. LRE mechanisms are available if this is outside DNO allowances.
- DSOs would be expected to conduct CBAs for non-wires alternatives ahead of sanctioning reinforcement and may lead to NTCC-funded flexibility markets.

3 NGED will work with the ESO/NGET to provide capacity released figures alongside each construction agreement.

Comparison of a level playing field

	Infrastructure Site	Connection Site
Wider Transmission Strategy and Costs	ESO	ESO
Local Transmission Reinforcement Strategy	ESO	DSO
Local Transmission Reinforcement Costs	ESO/TNUoS	DSO/DUoS
Transmission cost apportionment	Socialised	Recouped from individual projects
Transmission Second Comer rules	N/A	None
Distribution Reinforcement Costs	DSO/DUoS	DSO/DUoS
Distribution cost apportionment	As per CCCM	As per CCCM
Distribution Second Comer rules	As per ECCR	As per ECCR

We want this to be more like distribution reinforcement charges, which are recouped from individual projects where material, but socialised otherwise.

What are other DNOs doing?

There is a difference of approach across DNOs, some of which is due to the regional variation of DER uptake and others due to transmission voltage levels in Scotland.

NGED has the highest volume of DER seeking connection across all DNOs and double the amount of connection asset GSPs than any other DNO, so we are seeing the biggest impact.

Table 1: DNO Methodology Summary

DNO	Current Methodology	Methodology Detail
ENW	Hybrid socialisation of costs through DUoS but passing through ESO Securities.	Hybrid approach: recent situations have been **socialised through DUoS** but with ESO securities passed through to connecting customers. But would most likely charge upfront if there was only one customer triggering the work
NGED	Charged upfront to connection customers, including pass through of securities and liabilities from ESO	Where the BCA outlines work and securities/liabilities these are passed through directly to identified customers through SoW process. **Apportionment occurs based on capacity** across all users identified against the works and is revisited based on amendments to the BCA.
NPG	Charged upfront to the connecting customers	Costs are **apportioned** between customers **based upon required capacity**
SSEN	**Socialisation of costs through DUoS**, but passing through ESO Securities	**Socialisation of costs through DUoS**
SPEN	Charged upfront to connecting customers (including pass through of securities from ESO)	Costs **apportioned** between customers **based upon required capacity.**
UKPN	Charged upfront, following cost profile, to the connecting customers (as well as securitisation profile covering wider works liability)	Costs are **apportioned** between customers above 5MVA / 1MW only, **based upon required capacity** against transmission constraint, i.e. if demand transmission constraint, connecting customers with requested demand > 5MVA would share the cost of the T-work. Smaller generation not subject to Appendix G and demand <5MVA viewed as background load-growth

Possible Solutions – RT Open Letter

1

Socialise all SGT reinforcement through **TNUoS**

2

Socialise all SGT reinforcement through **DUoS**

3

Pass SGT reinforcement charges on to triggering distribution customers but **apply a CAF to fix the proportion paid by each customer.**

Roadnight Taylor
THE INDEPENDENT SPECIALIST GRID CONSULTANCY

Possible Solutions – SCG Transmission Charging Reform subgroup

1. Socialise all SGT reinforcement through TNUoS
2. **Socialise all SGT reinforcement through DUoS**
3. Use High-Cost Cap threshold. Socialised below the threshold. Customers pay above threshold
4. **Use a Capacity (MW) Cap and then at a standard cost per MW above the CAP. Socialised below the threshold through DUoS.**
5. **No change to current approach of connecting customers bear full cost. Just standardise approach between DNOs.**
6. Use MW/Fault Level proportioned basis, as with CAF Rules and any cost above High Costs Cap. The proportion that is not charged to the customer will be socialised through DUoS.

SCG group have previously suggested options 2, 4 or 5 are preferred.

Roadnight Taylor
THE INDEPENDENT SPECIALIST GRID CONSULTANCY

Code Change Proposal – OPTION 1

Socialise all SGT reinforcement through TNUoS

- CUSC code change required. New asset classification suggestion:
  - **DNO Shared Connection Asset** – *A Transmission Connection Asset which connects more than one embedded customer via a licensed distribution network*
- Charging rules for these assets to be aligned with those for Infrastructure Assets – i.e. funded solely via TNUoS

Benefits

- Same charging mechanism now for ALL SGTs regardless of whether a GSP is an infrastructure site.
- NESO and TOs could use existing economic assessment mechanisms to determine whether new SGTs are an economically efficient solution to prevent excess TNUoS burden.
- Fairly simple CUSC Code Mod

Disadvantages

- Disadvantages
- Significant additional TNUoS Burden
- Lack of locational incentive for generators to locate under less constrained GSPs
- Not preferred by SCG Workgroup? Find out why?

Code Change Proposal – OPTION 2

Socialise all SGT reinforcement through DUoS

- DCODE code change required.
- DNO Connection Charging Methodology update required

Benefits	Disadvantages
• DNOs in control of solution and could chose to deploy flex alternatives • Fairly self contained DCUSA Code Mod	• Creates different charging arrangements for GSPs which are infrastructure site – no standardisation • What happens when a GSP is re-classified as an infrastructure site because of a new tertiary connection? • Needs to be raised by DCUSA party

Code Change Proposal – OPTION 3

Apply a CAF (£/MW) approach to SGT charging

- DCUSA mod required to allow DNOs to extend DNO charging principles to Transmission Connection Asset Costs
- CUSC code change required to deal with recovery of residual costs if new asset is under-utilised.

Propose all DNOs should charge for SGTs annually to manage potential flip/flopping between different charging rules for infrastructure/customer sites?

Benefits	Disadvantages
• Maintains locational incentive for generators and moveable demand to locate under less constrained GSPs • Provides upfront certainty on cost to connecting customers • Reduces Use of System burden	• Complex changes • Creates different charging arrangements for GSPs which are infrastructure site – no standardisation • Still places significant cost burden on connecting customers • Interaction with High-Cost Cap unclear

Solution Requirements

Requirements

1. Cost (Scope) Certainty
    a. Proportional allocation as done today does not work
    b. Indicative prices very far out from delivery are subject to significant change
2. Cost Reflectivity – Paying for demand capacity required only (e.g. note the whole GSP)
3. Clear and Consistent Scope
4. Securities and Cancellation Charge – Potentially a different Mod that requires to align with the output
5. Understand the Use of System Charge impact of different scenarios
6. Send locational capacity signal?
    a. Potentially for certain technologies (e.g. can't mode a distillery)
    b. Be mindful of the bidder picture. Do not block other changes.
    c. Interaction with SSEP / CSNP / RESP (Does the latter sufficiently cover the T/D interface?)
7. Socialised up to level of the SSEP. Above this the costs are passed to the connection customer concept (potentially with cost protections for above the SSEP?)

Solution Requirements

Requirements … Continued

8. Minimise or remove the distortions seen through the current approach (e.g. relative postcode lottery)
9. Facilitate collaboration to provide the right signals for investment
   a. Assessed at NESO level
   b. Individual contracts for each customer, covering each individual site
10. Do not constrain REMA
11. Lowest overall cost
    a. System / Network Costs note these are not necessarily the same)
    b. Customer / Consumer Bills (note these are not necessarily the same)
12. Urgently remove barriers to connecting projects passing through the reformed connections process (e.g. SGT Charging itself and the downstream barriers and unintended consequences this creates)
13. Complementary to Ofgem End to End review and fill any gaps
14. Timeline – concept to certainty is crucial to investment decisions (rather than urgency of change)
15. Simplification to facilitate net zero and GB decarbonation (linked to point 8)

Your CUSC Panel representatives

- Industry is represented at CUSC Panel by representatives, who would love your input. Their contact details can be found here.
- Panel members represent their industry segments at Panel; the more input they have, the more your voice can be heard.

NESO Senior Manager	Acting Independent Panel Chair		**Joseph Dunn**	Panel Member		**Camille Gilsenan**	NESO Representative
Catia Gomes	Panel Secretary and Code Administrator Representative		**Kyran Hanks**	Panel Member		**Daniel Arrowsmith**	NESO Representative
Ren Walker	Panel Technical Secretary		**Paul Jones**	Panel Member		**Andy Pace**	Consumer Panel Representative
Andrew Enzor	Panel Member		**Cem Suleyman**	Alternate Panel Member		**Rashmi Radhakrishnan**	BSC Representative
Binoy Dharsi	Panel Member		**Mark Duffield**	Alternate Panel Member		**Nadir Hafeez**	Ofgem Representative
Garth Graham	Panel Member		**Lauren Jauss**	Alternate Panel Member		**Harriet Harmon**	Ofgem Representative
Joe Colebrook	Panel Member						

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AOB

Meeting Close