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Code Administrator Consultation Response Proforma

CMP432: Improve “Locational Onshore Security Factor” for TNUoS Wider Tariffs

Industry parties are invited to respond to this consultation expressing their views and supplying the rationale for those views, particularly in respect of any specific questions detailed below.

Please send your responses to usc.team@nationalenergyiso.com by **5pm** on **06 May 2025**. Please note that any responses received after the deadline or sent to a different email address may not receive due consideration.

If you have any queries on the content of this consultation, please contact usc.team@nationalenergyiso.com

Respondent details	Please enter your details	
Respondent name:	John Tindal	
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Email address:	John.tindal@sse.com	
Phone number:	Click or tap here to enter text.	
Which best describes your organisation?	<input type="checkbox"/> Consumer body <input type="checkbox"/> Demand <input type="checkbox"/> Distribution Network Operator <input checked="" type="checkbox"/> Generator <input type="checkbox"/> Industry body <input type="checkbox"/> Interconnector	<input type="checkbox"/> Storage <input type="checkbox"/> Supplier <input type="checkbox"/> System Operator <input type="checkbox"/> Transmission Owner <input type="checkbox"/> Virtual Lead Party <input type="checkbox"/> Other

I wish my response to be:

(Please mark the relevant box)

☒ **Non-Confidential** (this will be shared with industry and the Panel for further consideration)

☐ **Confidential** (this will be disclosed to the Authority in full but, unless specified, will not be shared with the Panel or the industry for further consideration)

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For reference the Applicable CUSC (charging) Objectives are:

- d) That compliance with the use of system charging methodology facilitates effective competition in the generation and supply of electricity and (so far as is consistent therewith) facilitates competition in the sale, distribution and purchase of electricity;*
- e) That compliance with the use of system charging methodology results in charges which reflect, as far as is reasonably practicable, the costs (excluding any payments between transmission licensees which are made under and accordance with the STC) incurred by transmission licensees in their transmission businesses and which are compatible with standard licence condition C11 requirements of a connect and manage connection);*
- f) That, so far as is consistent with sub-paragraphs (a) and (b), the use of system charging methodology, as far as is reasonably practicable, properly takes account of the developments in transmission licensees' transmission businesses and the ISOP business*;*
- g) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency **; and*
- h) Promoting efficiency in the implementation and administration of the system charging methodology.*

** See Electricity System Operator Licence*

***The Electricity Regulation referred to in objective g) is Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (recast) as it has effect immediately before IP completion day as read with the modifications set out in the SI 2020/1006.*

For reference, (for consultation question 5) the Electricity Balancing Regulation (EBR) Article 3 Objectives and regulatory aspects are:

- a) fostering effective competition, non-discrimination and transparency in balancing markets;*
- b) enhancing efficiency of balancing as well as efficiency of national balancing markets;*
- c) integrating balancing markets and promoting the possibilities for exchanges of balancing services while contributing to operational security;*
- d) contributing to the efficient long-term operation and development of the electricity transmission system and electricity sector while facilitating the efficient and consistent functioning of day-ahead, intraday and balancing markets;*

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- e) *ensuring that the procurement of balancing services is fair, objective, transparent and market-based, avoids undue barriers to entry for new entrants, fosters the liquidity of balancing markets while preventing undue market distortions;*
- f) *facilitating the participation of demand response including aggregation facilities and energy storage while ensuring they compete with other balancing services at a level playing field and, where necessary, act independently when serving a single demand facility;*
- g) *facilitating the participation of renewable energy sources and supporting the achievement of any target specified in an enactment for the share of energy from renewable sources.*

What is the EBR?

The Electricity Balancing Regulation (EBR) is a European Network Code introduced by the Third Energy Package European legislation in late 2017.

The EBR regulation lays down the rules for the integration of balancing markets in Europe, with the objectives of enhancing Europe's security of supply. The EBR aims to do this through harmonisation of electricity balancing rules and facilitating the exchange of balancing resources between European Transmission System Operators (TSOs). Article 18 of the EBR states that TSOs such as the NESO should have terms and conditions developed for balancing services, which are submitted and approved by Ofgem.

Please express your views in the right-hand side of the table below, including your rationale.

Standard Code Administrator Consultation questions

1	Please provide your assessment for the proposed solution	Mark the Objectives which you believe the proposed solution better facilitates than the current baseline:	
		Original	<input checked="" type="checkbox"/> d <input checked="" type="checkbox"/> e <input checked="" type="checkbox"/> f <input type="checkbox"/> g <input checked="" type="checkbox"/> h <input type="checkbox"/> none

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	<p>against the Applicable Objectives against the current baseline?</p>	<p>d “Effective competition”: Better. Removing Security Factor would be better for effective competition for both generators and demand through: Firstly, deliver better predictability of Wider locational TNUoS charges, for both Generators and demand, by reducing the sensitivity of charges to changes in elements such as: Expansion Constant, Expansion Factors, or location of generation, demand and new network. Currently, the impact on charges from changes in any of these elements is amplified by multiplying their impact by the 1.76 Security Factor. Secondly improve international competition for Generators because the Security Factor would no-longer inappropriately amplify the cost of network charges compared with the network charges paid by generators in other markets.</p> <p>e “Cost reflectivity”: Better. Removing the Security Factor would be better for cost reflectivity for both Generator and demand charges. This is because the change would result in Wider locational TNUoS charges that better reflect the cost of incremental network investment for the reasons given in the consultation document and further described in our answer to question 2 below.</p> <p>f “Developments in transmission business”: Better. As the planned growth of the Transmission network increases to meet net zero, it is becoming increasingly apparent that such new network is being built for economic reasons to increase power transport capacity. It is increasingly clear that such new network investment is not being built with accompanying pro-rata additional surplus redundant network capacity for security purposes.</p> <p>g “Electricity Regulation”: Neutral</p>
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		<p>h “Efficient implementation and administration”:</p> <p>Better. Removing the Security Factor calculation and its application to Wider charges would make the administration of the charging methodology more efficient by removing the need for NESO to operate the Secure Load Flow model (SECULF) that is currently used to calculate the Security Factor or implement its results into the charging methodology.</p>
2	Do you have a preferred proposed solution?	<p><input checked="" type="checkbox"/> Original</p> <p><input type="checkbox"/> Baseline</p> <p><input type="checkbox"/> No preference</p>
		<p>The Original proposal to remove the Security Factor entirely is better than Baseline</p> <p>The Original proposal to remove the Security Factor completely is consistent with the rationale in Ofgem’s February 2005 Impact Assessment, that if security considerations are unrelated to incremental capacity requirement then it is more cost reflective to have no security factor.</p> <p><i>“4.84. If adopting a security factor results in a more accurate estimate of incremental transmission requirements, then the resultant tariffs might be expected to be more cost-reflective than under an approach which does not recognise security considerations. Conversely, if security considerations are unrelated to incremental capacity requirement then adopting a security factor might result in less cost-reflective tariffs.”</i></p>

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		<p>(Ofgem, The proposed transmission use of system charging methodology of the GB system operator, An Impact Assessment, February 2005, Appendix 7, emphasis added)</p> <p>Why the Original proposal is best</p> <p>Network reinforcement can increase boundary transfer capacity on a 1:1 basis with a security factor of 1, equivalent to no security factor at all.</p> <p>This was demonstrated empirically in Annex 16 (CMP432 Proposer's Slides 1) p5 quoting NESO documents that showed network reinforcement delivered a 1:1 increase in boundary transfer capacity in line with the capacity of network added.</p> <p>This 1:1 relationship was also explained in the Trident Economics report for SSE (annex 5 – CMP432 Trident Economics – Setting the locational Security Factor) that explained why the security factor should be 1 (or removed).</p> <p>Annex 16 (CMP432 Proposer's Slides 1) p10 &11, as well as Annex 16a (CMP432 Proposer's Slides 2) p8-11 explained how the SQSS specifies security as an absolute level based on the size of the largest circuit, or circuits. This means that since the network is already secure, network reinforcement can be added on a 1:1 basis with increases in boundary transfer capability because the SQSS does not require additional security every time the network capacity is</p>
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		<p>increased. The SQSS is clear that security is not ever-increasing as a factor of network transfer capability.</p> <p>The Code Administrator consultation annex only included a subset of slides presented to the workgroup. A more detailed explanation of how the SQSS defines security in absolute terms instead of relative terms can be found in the Proposer's presentation p37-41 in NESO CMP432 Workgroup meetings web page "CMP432 Workgroup 1 Papers – 29th January 2025"</p> <p>This 1:1 relationship, consistent with a security factor of 1, or no security factor at all, is consistent with providing a long-run incremental cost signal based on the fault condition, which determines the level of security required, remaining unchanged as the boundary transfer capacity is increased.</p> <p>This conclusion is consistent with reinforcement in the form of new circuits, or upgrade of existing circuits, to a capacity that is no greater than the capacity of the circuits that represented the pre-existing fault condition, which is an appropriate assumption for an incremental price signal because network upgrades will be naturally limited to avoid increasing the fault condition.</p> <p>The natural limitation to avoid increasing the fault condition is due to, firstly network technology limits the practical size of individual circuits so individual circuit size does not progressively increase indefinitely over time. Secondly it would generally be economically inefficient for new network investment</p>
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		<p>to breach the existing fault condition, because the boundary transfer capacity would not benefit from the additional investment, because the new larger circuit would itself become the new fault condition so the additional capacity beyond the previous fault condition could not be used.</p> <p>Annex 16a (CMP432 Proposer's Slides 2) p13&14 described some special case circumstances in which the fault condition may increase, and why this should not be part of an incremental investment signal, summarised below.</p> <p>Firstly, slide 14 describes how the fault condition may be increased as part of a strategic decision to upgrade a region of transmission network to a new, higher standard. As part of such an upgrade to new higher standard network technologies, the first new circuits to be added will contribute little, to no new transfer capability, because they are providing the new, higher security condition of the newly upgraded network. Once the baseline security of the new upgraded network has been put in place, this represents a sunk cost of security, and further incremental network boundary capability increases can then be carried out on a 1:1 basis, consistent with a security factor of 1 (or removed security factor). The network cost caused an individual incremental generator will be consistent with 1:1 network reinforcement to increases in boundary transfer capability.</p>
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		<p>Decisions made by incremental generators do not cause a change in the need for security, so generators should not be charged any additional fee for security.</p> <p>Secondly, slide 13 describes a situation where a new large generator (e.g. Sizewell) may cause a need for an investment in MITS circuits with an additional degree of security, and explained why this is a special niche case that does not apply more widely and should not be part of a general incremental price signal. The reason for this special case was that the size of connection of the large generator was so large that it triggered a largest infeed loss concern, requiring its new local circuits to be built to a higher degree of security than normal for a generator's local circuits. This lead to the large generator's new local circuits being built with a larger than standard number of individual circuits, such that the new local circuits triggered the MITS definition and, themselves became classified as MITS. If industry feels that this is special case is a remaining defect, then it may be better addressed in some other way, such as by considering the definition of a MITS node and the classification of local circuit, versus MITS circuits.</p> <p>Why the Baseline is not appropriate</p> <p>The teach-in and NESO answers to workgroup questions, along with the opportunity to run scenario testing on the SECULF model, confirmed that the SECULF model assumes its own answer to provide a</p>
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		<p>calculation of security that is not appropriate for an incremental price signal, and therefore the baseline SECULF model result should be disregarded.</p> <p>It became clear that the SECULF model does not measure average existing security on either the actual network, or its own modelled network. Neither does SECULF measure how incremental security is built in practice.</p> <p>The reason why the SECULF best fit of nodes exhibits an R squared best fit that is implausibly high at over 99% is not because it is measuring the level of security that exists for those nodes, but instead because the model is making its own, incorrect, simplifying assumption about incremental security and measuring the artificial outcome of its own assumption. The logic of the SECULF model is circular and relies entirely on its own starting assumptions about how security is built. The starting assumption of the SECULF model is not correct and does not reflect how network reinforcement is carried out for security purposes, which results in SECULF over-stating incremental security, for the reasons described below.</p> <p>The SECULF model over-states the incremental level of security required, because it makes the assumption that an incremental IMW at any node will always cause an increase in the fault conditions where it increases flow on the entire network. This comes from the SECULF assumption that network reinforcement will only and always take place by</p>
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		<p>increasing the capacity of all of the existing circuits on the existing network on a pro-rata basis.</p> <p>This SECULF assumption of only and always incrementally increasing the capacity of existing circuits has been inappropriately inherited from ICRP DCLF Transport and Tariff model. This simplifying assumption may be good enough for the Transport and Tariff model to reflect a weighted average cost of incremental transport capability. This is because the simplifying assumption of pro rata expansion is intended to be a proxy for the cost of increasing network transport capability, it is not intended to be a literally true model of how the network will be built.</p> <p>By adopting this inappropriate simplifying assumption that network expansion is only and always achieved by pro rata increasing existing circuits, the SECULF model takes the assumption that the Transport model was using as a proxy and inappropriately treats it as if it is a literally true model of how the network will be expanded. This distorts and over-states the SECULF answer with regards to incremental security in a way that it does not distort the answer for network transport capability.</p> <p>By adopting this simplifying assumption, the SECULF model disregards the SQSS and disregards the reality in practice of how the network is built regarding security considerations. In particular, SECULF disregards that network planners will expand the network through some combination, such as primarily building additional new circuits, make use</p>
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		<p>of quadrature boosters to optimise flow of power on the network, new HVDC technology that enables power flow direction to be controlled, or upgrading particular existing circuit voltages and capacities, all without changing the fault condition. All and each of these network reinforcement approaches add boundary transfer capacity on a 1:1 basis without causing a need for incremental additional security.</p> <p>For situations where upgrading existing circuits does increase boundary capacity, this will tend to be driven primarily by network maintenance issues whereby a circuit may have reached end of life such that it requires replacement and since it is being replaced anyway, it tends to be more efficient to replace it with a larger capacity. By contrast, it would not be an economically efficient way to upgrade the network by replacing and upgrade every network circuit every few years, when the investment case of those circuits was based on a multi-decade asset life.</p>
3	Do you support the proposed implementation approach?	<p><input checked="" type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>
		<p>It is important for industry to receive a decision on this modification in sufficient time to inform CfD AR7 bids.</p>

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4	Do you have any other comments?	<p>Yes, see annex to this response with further detail and summarised here, regarding:</p> <p>1) Results of new analysis on SECULF model: New evidence that the Original proposal is better than Baseline</p> <p>We tested a number of sensitivities in the SECULF model and found that it is not measuring the degree of security on the existing network, nor is it measuring the degree of incremental security for incremental reinforcements. A more detailed breakdown of the sensitivities is included in the annex to this consultation response, but summarised below.</p> <p>We were surprised how stable the SECULF calculated security factor was, even with very large sensitivities applied to the model. This further supported the position that the SECULF model is assuming its own answer, while the configuration of generation, demand and network appear almost immaterial to the value of the security factor that it calculates.</p> <p>First sensitivity: Increasing northern generation</p> <p>We increased the capacity of northern generation (by 2GW and 10GW) with the network unchanged. In a real network, this would increase the utilisation of the existing network, and correspondingly substantially reduce the spare network held back for security purposes, so if SECULF were measuring the degree of security in the existing network, then the measured security factor should fall substantially. However, by contrast, in this sensitivity, the security factor calculated by SECULF only slightly increased, which is</p>
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		<p>a change that is too small and in the wrong direction compared with reality.</p> <p>Sensitivity 2: Increase the number, capacity and/or length of network circuit, while keeping the same generation and demand</p> <p>We conducted a range of sensitivities increasing the number of circuits, capacity of circuits and length of circuits. In reality, this should have increased measured security of the network due to the additional spare network capacity and capability, but in all cases, the SECULF model showed a reduction in the calculated security factor. As above, the change in calculated security factor is in the wrong direction compared with reality.</p> <p>Sensitivity 3: Increase in both generation and demand capacities while maintaining the same network.</p> <p>We tested three versions of this sensitivity. Firstly, an increase in both generation and demand at the same node should result in no change in security, but the SECULF model showed a reduction. Secondly, an increase of generation at one node and pro rata increase in demand at all other nodes, should result in a reduction in actual security, but SECULF showed an increase. Thirdly, doubled all generation and demand at all nodes should substantially reduce security, but SECULF resulted in no change to calculated security factor at all.</p> <p>Sensitivity 4: Moving the slack node</p>
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		<p>Changing the slack should not change the measured level of security, because the system (generation, demand and network) has not changed. However, moving the slack node either north to zone 1, or south to zone 24, both resulted in a reduction of the SECULF calculated security factor.</p> <p>2) Original proposal is better value for customers because it can reduce cost to customers of CfD scheme</p> <p>The recent Aurora report (“Consumer savings under TNUoS reform proposals”, Aurora, Commissioned by Ocean Winds, West of Orkney and Spiorad na Mara, April 2025. Published by Scottish Renewables) showed that approving CMP432 Original could deliver a £11.1bn reduction in cost to customers through a reduced cost of the CfD scheme between 2028 to 2050. This equates to an average reduction in cost to customers of £482m per year.</p> <p>Even in Aurora’s downside scenario, approving CMP432 would still save customers £7.5bn over the same period.</p> <p>The reason for this reduction in cost to customers was based on modelling that Scottish windfarms would set the CfD clearing price 90% of the time between now and 2050 so approving CMP432 would reduce the value of the Strike Price required to recover cost of northern TNUoS for the majority of the time.</p>
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	<p>3) Response to points raised in Workgroup Consultation</p> <p>NESO workgroup consultation response</p> <p>We were surprised that while NESO stated a preference for Baseline, they did not provide evidence, or rationale to support their preference for the Baseline methodology of the SECULF model from a cost reflectivity point of view.</p> <p>Instead, NESO provided their rationale for concluding that the Original proposal is worse, as being because it would redistribute costs between generators with northern generators paying less than they otherwise would have done, and southern generators paying more. However, this argument provided by NESO is not a valid rationale within the CUSC objectives. If the CMP432 Original proposal would improve cost reflectivity, then the scale of any resulting redistribution of charges between groups of generators illustrates the large scale of the existing defect and supports the importance of taking urgent action to correct the existing distortion.</p> <p>NESO also argued against the modification proposal on the basis that it would increase the value of the demand residual charge. The NESO response implied that this increase in demand residual charge was due to an increase in revenue collection from demand. However, additional analysis from NESO (CMP432 Code administrator consultation document p 24) shows that from charging year 2026/27</p>
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		<p>onwards, CMP432 would not materially change the revenue proportions between generation and demand, because the generator charges would continue to be limited by the 2.50 Euro cap.</p> <p>Where there is an increase in demand residual, this more accurately reflects in a rebalancing within demand charges with the demand locational charge becoming slightly cheaper, causing the demand residual to correspondingly increase to collect the same total revenue from demand.</p> <p>Uniper workgroup consultation response</p> <p>Suggested that if parts of the country are deemed important from a strategic perspective, then targeted explicit support should be provided rather than through implicit subsidies through network charging. This appeared to be a straw man argument, since the proposer's rationale for CMP432 is to improve cost reflectivity, to correct the baseline over-charging of northern generation, not create a subsidy.</p> <p>Uniper also suggested that rushing through this modification does little to enhance GB's reputation for a stable and fair regulatory environment. However, our view is that, to the contrary, if Ofgem approved CMP432 that would reinforce GB's reputation of stable and fair regulatory environment by taking timely action to correct an identified defect. It would also</p>
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		<p>mitigate the distortionary dramatic increase in TNUoS charges indicated by NESO 5 year and 10 year forecasts, that if allowed to happen, would have presented GB as a market with a higher and more unpredictable regulatory risk in terms of the large magnitude of TNUoS price shocks that the regulator was prepared to let happen.</p> <p>First Hydro workgroup consultation response</p> <p>First Hydro referred to a security factor value of 1.5, however they did not provide any rationale in their workgroup response, or to the CMP432 workgroup itself where this value came from, what it means, or how it could be justified.</p>
5	Do you agree with the Workgroup's assessment that the modification does not impact the Electricity Balancing Regulation (EBR) Article 18 terms and conditions held within the Code?	<p><input checked="" type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>Click or tap here to enter text.</p>

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Annex: Results of new analysis on SECULF model: New evidence that the Original proposal is better than Baseline

Testing input changes to the SECULF model - April 2025

Summary tables

Sensitivity 1: Increasing generation, expect reduced security

	Model Output	Change	Result
<i>Baseline 2021.22 model</i>	1.75		
<i>Increased generation by 2GW, same network</i>	1.77	+0.02	Increase rather than expected reduction
<i>Increased generation by 10GW, same network</i>	1.80	+0.05	Increase rather than expected reduction

Sensitivity 2: Increasing number or length of circuits, expect increased security

	Model Output	Change	Result
<i>Baseline 2021.22 model</i>	1.75		
<i>Add 2GW circuit from Scotland to England</i>	1.72	-0.03	Decrease rather than expected increase
<i>Add 10GW circuit from Scotland to England</i>	1.72	-0.03	Decrease rather than expected increase
<i>Increase capacity on a long circuit from 2GW to 10GW</i>	1.75	0	Expected a change when circuit capacities change
<i>Increased length of West coast subsea cable</i>	1.73	-0.02	Longer cable means less security

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Sensitivity 3: Increase in both generation and demand, expect SF to reduce (more power on same network)

	Model Output	Change	Result
<i>Baseline 2021.22 model</i>	1.75		
<i>Increase generation and demand at same node</i>	1.74	-0.01	<i>Expected no change as no change to power flows</i>
<i>Increased generation at one node, increase demand GB wide</i>	1.80	+0.05	<i>Increase rather than expected reduction</i>
<i>Double all generation and demand at each node</i>	1.75	0	<i>Expected a reduction in security, but no change</i>

Sensitivity 4: Moving the slack node north or south, expect no change. Any change should be different between if it moves north or south.

	Model Output	Change	Result
<i>Baseline 2021.22 model</i>	1.75		
<i>Move slack node from zone 15 to zone 1</i>	1.74	-0.01	<i>Expected no change, as demand is scaled to generation</i>
<i>Move slack node from zone 15 to zone 24</i>	1.74	-0.01	<i>Expected at least a different answer than moving north</i>