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Final Modification Report

CMP424:

Amendments to Scaling Factors used for Year-Round TNUoS Charges

Overview: This modification seeks to introduce a mechanism which sets a lower limit on the variable generation scaling factors used for the purpose of Year-Round Background tariff calculation. This is to address a defect in current methodology which, without any change, we expect to calculate negative scaling factors within the next few years.

Modification process & timetable

1. **Proposal Form** — 12 October 2023
2. **Workgroup Consultation** — 07 March 2024 - 27 March 2024
3. **Workgroup Report** — 18 April 2024
4. **Code Administrator Consultation** — 30 April 2024 - 22 May 2024
5. **Draft Final Modification Report** — 20 June 2024
6. **Final Modification Report** — 09 July 2024
7. **Implementation** — 01 April 2025

Have 2 minutes? Read our Executive summary

Have 40 minutes? Read the full Final Modification Report

Have 90 minutes? Read the full Final Modification Report and Annexes.

Status summary: This report has been submitted to the Authority for them to decide whether this change should happen.

Panel recommendation/determination:
The Panel has recommended unanimously that the Proposer's solution is implemented.

This modification is expected to have a: Low impact on Generators, Transmission System Operators, Interconnectors

Governance route	Standard Governance modification which has been assessed by a Workgroup	
Who can I talk to about the change?	**Proposer:** Martin Cahill Martin.cahill1@nationalgrideso.com 07840 722302	**Code Administrator Chair**: Claire Goult Claire.Goult@nationalgrideso.com 07938 737807

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Executive summary

This modification seeks to introduce a mechanism which sets a lower limit on the variable generation scaling factors used for the purpose of Year Round Background tariff calculation. This is to address a defect in current methodology which, without any change, we expect to calculate negative scaling factors within the next few years.

What is the issue?

As connected wind generation (which has a fixed scaling factor of 70%) increases it results in a smaller variable scaling factor over time. Using the TEC register and applying best view, the ESO (Electricity System Operator) expect that this will eventually result in negative variable scaling factors within the next few years.

What is the solution and when will it come into effect?

Proposer's solution:

- Introduce a 10% minimum value for variable scaled factors in the Year Round Background
- 'Fixed' scaling factors can be adjusted for Year Round Background calculations if required to ensure variable factor remains above 10%
- When the variable scaling factor is increased to meet the 10% floor, all 'fixed' scaling factors are adjusted by a uniform amount so that the total of all scaled generation capacity is equal to ACS Peak Demand
- No changes to be made for Peak Security

Implementation date: 01 April 2025.

It is believed that this will be a relatively simple solution to implement, and 2025 delivery is achievable.

Panel Recommendation: Panel will meet on 28 June 2024 to carry out their recommendation vote.

What is the impact if this change is made?

ESO's tariff model does not work if any scaling factors are negative. As there is the real possibility that variable scaling factors could turn negative this modification is crucial to allow future TNUoS charges to be set, whilst having minimal impact on tariffs. This modification will not replace or stop other ongoing Industry work around what are the appropriate Scaling Factors to input into the model and some of that work may replace the solution proposed in this modification. This proposal will ensure that the impact of additional flexible generation is included in the Transport Model, whilst again noting that any impact to tariffs is minimal. The proposal addresses an issue expected in the near future, whilst allowing time for more fundamental questions and answers to be concluded around the most appropriate scaling factors to use.

Interactions

The choice to follow the SQSS (Security and Quality of Supply Standard) for scaling factors was made under CMP213 (Project TransmiT). While this proposal does not directly interact with SQSS, it means that the tariff process will deviate from SQSS in

certain circumstances. Any deviation is minimal, as the proposal purely introduces a minimum level for the variable scaling factor, with all other factors adjusting uniformly so that scaled generation is still equal to ACS peak demand. Any impact on tariffs is also minimal.

Processes such as Network Options Assessment (NOA), Holistic Network Design (HND) and Electricity Ten Year Statement (ETYS) have been introduced separately to SQSS for network planning processes. These use different methodologies which do not require the use of scaling factors as per SQSS.

This modification will only change the approach used in CUSC. Scaling factors in SQSS will remain the same but may be changed separately during the next SQSS review.

What is the issue?

Scaling factors are used in the calculation of TNUoS tariffs (Year-Round Background and Peak Security). There are fixed (directly scaled) and variable scaling factors which are detailed in SQSS (Appendix E) gives the different parameters (for directly scaled plant) and calculation (for variable scaled plant) to be used.

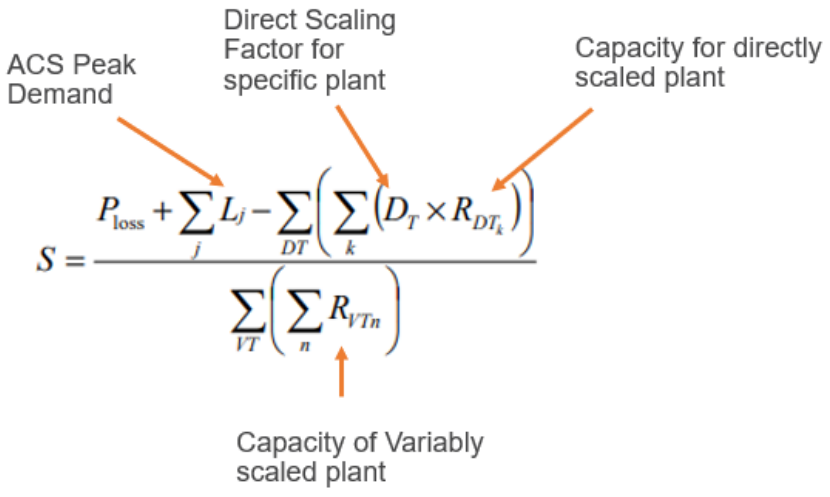
CUSC section 14.15.7 currently aligns to the scaling factors used in SQSS for Tariff setting.

Generation Plant Type	Peak Security Background	Year Round Background
Intermittent	Fixed (0%)	Fixed (70%)
Nuclear & CCS	Variable	Fixed (85%)
Interconnectors	Fixed (0%)	Fixed (100%)
Hydro	Variable	Variable
Pumped Storage	Variable	Fixed (50%)
Peaking	Variable	Fixed (0%)
Other (Conventional)	Variable	Variable

Scaling factors are designed to scale capacity of generation to equal the ACS Peak Demand (estimated unrestricted winter peak demand on the national electricity system for the average cold spell), with variable factors adjusting to ensure total scaled capacity and ACS Peak Demand are equal.

The fixed and variable scaling factors then feed into the Transport model to scale Nodal generation and calculate the Peak Security or Year Round costs for each circuit. CUSC 14.21 gives examples to show how these are applied.

The following formula is used to calculate the variable scaling factors used in the model:



For Year Round Background:
As connected wind generation (which has a fixed scaling factor of 70%) increases, the top line of the formula above decreases, resulting in a smaller variable scaling factor. Using the TEC register and applying best view, the ESO expect that this will eventually result in negative variable scaling factors within the next few years.

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Why change?

ESO's tariff model does not work if any scaling factors are negative. It would also not be cost reflective to use negative scaling, as this would in effect model a reduction in generation when adding any flexible generation.

As forecast TEC (Transmission Entry Capacity) regularly changes, it is not known exactly when negative scaling factors could be seen, but the ESO expect it to be within the next few years, with a higher risk from 26-27 onwards. It is important to introduce a change which addresses this issue at an early opportunity.

TNUoS Taskforce is separately carrying out a wider review of backgrounds, including appropriate scaling factors for each generation type. This is expected to be raised as a future modification alongside other Taskforce workstreams, while a review of chapter 4 of the SQSS is also planned. However, it is not known how long these projects could take, and not implementing any action now risks negative scaling factors becoming a reality before a fix is in place. As this modification introduces a backstop to the minimum variable level only, it is envisaged that any future change can still work alongside it.

What is the solution?

- Introduce a 10% minimum value for variable scaled factors in the Year Round Background
- 'Fixed' scaling factors can be adjusted for Year Round Background calculations if required to ensure variable factor remains above 10%
- When the variable scaling factor is increased to meet the 10% floor, all 'fixed' scaling factors are adjusted by a uniform amount so that the total of all scaled generation capacity is equal to ACS Peak Demand
- No changes to be made for Peak Security

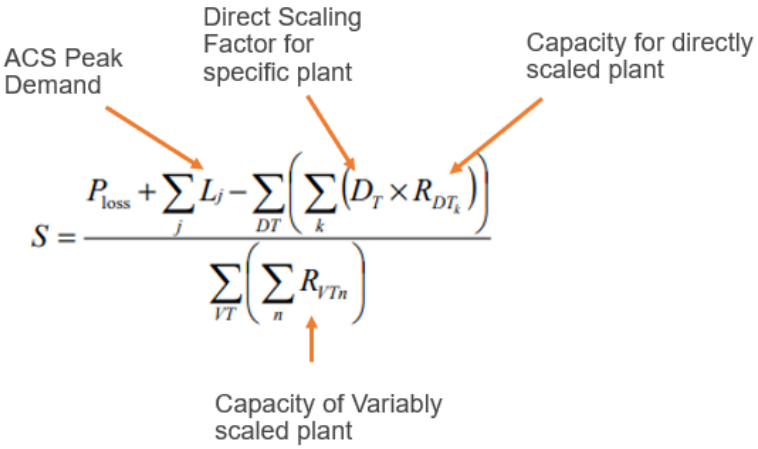
The intention of this solution is to align predominantly to existing methodology whilst introducing the above controls as a backstop to ensure that the tariff model still operates as intended, and impact of flexible generation is still considered. 10% has been chosen as it retains a positive element for modelling, has minimal impact on tariffs, and is close to the expected initial scaling factor upon implementation.

This change is expected to be low impact, as the minimum allowed scaling factor is in a similar range to recent tariffs. This means that there will be no significant shifts in calculated tariffs, and the proposal does not provide an advantage or disadvantage to any generation type.
If the scaling factors in SQSS are changed in due course, a further CUSC modification could be expected.

The process would work as follows:

1. The starting point for the calculation of variable scaling factors remains unchanged:

Generation Plant Type	Peak Security Background	Year Round Background
Intermittent	Fixed (0%)	Fixed (70%)
Nuclear & CCS	Variable	Fixed (85%)
Interconnectors	Fixed (0%)	Fixed (100%)
Hydro	Variable	Variable
Pumped Storage	Variable	Fixed (50%)
Peaking	Variable	Fixed (0%)
Other (Conventional)	Variable	Variable



2. If this initial calculation results in a variable scaling factor below 10%, an adjustment must be calculated:

$$Adjustment = \frac{ACS_{Peak} - \sum(Capacity \times 10\%)_{Variable\ Plant}}{\sum(Capacity \times Scaling\ Factor)_{Direct\ Plant}}$$

$$Adjusted\ Fixed\ Scaling\ Factor = Adjustment \times Scaling\ Factor$$

3. The adjustment is then multiplied by each of the fixed scaling factors to give an adjusted value.
4. Adjusted fixed scaling factors and floored variable scaling factors are then used as per existing methodology for setting tariffs.

Annex 4 shows a worked example for this methodology.

Legal Text

The Proposer informed Workgroup members that CMP316 also proposes changes to the same paragraph in Section 14.15.7 and have the same implementation date. However, as CMP316 does not conflict with any of the changes proposed by CMP424, both are able to be incorporated into the legal text, if approved with no issue.

Section 14.21 is also proposed to be amended but does not conflict with any other modifications.

The legal text for CMP424 can be found in **Annex 8**

A spreadsheet version of the example in Section 14.21 can be found in **Annex 12**.

Following a discussion at the CUSC Panel on 26 April 2024, a Panel member suggested to add the following equation to the legal text for clarity.

$$Adjustment = \frac{ACS_{Peak} - \sum(Capacity \times 10\%)_{Variable\ Plant}}{\sum(Capacity \times Scaling\ Factor)_{Direct\ Plant}}$$

$$Adjusted\ Fixed\ Scaling\ Factor = Adjustment \times Scaling\ Factor$$

The Proposer agreed with the suggestion and amended the legal text accordingly.

What is the impact of this change?

Proposer's assessment against the Applicable Objectives

Proposer's assessment against CUSC Charging Objectives	
Relevant Objective	**Identified impact**
(a) 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;	Positive More cost reflective charging (as per b) will help facilitate a level playing field for competition in future years.
(b) 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 C26 requirements of a connect and manage connection);	Positive This proposal will ensure that the impact of additional variable generation is included in the Transport Model.
(c) 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;	Neutral

(d) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency *; and	Neutral
(e) Promoting efficiency in the implementation and administration of the system charging methodology.	Positive Without this modification or an alternative, the TNUoS tariff model will not work in future years
**The Electricity Regulation referred to in objective (d) 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.	

Code Administrator Consultation Summary

The Code Administrator Consultation was issued on the 30 April 2024, closed on 22 May 2024 and received two non-confidential responses. No confidential responses were received. Both responses can be found in **Annex 13**.

Code Administrator Consultation summary	
Question	
Do you believe that the CMP424 better facilitates the Applicable CUSC Objectives?	Both respondents stated the Original better facilitates the CUSC objectives than the Baseline. One respondent stated the Original Proposal better facilitates objectives a, b, and e. One respondent stated the Original Proposal better facilitates objectives b and e.
Do you support the proposed implementation approach?	Both respondents stated they support the proposed implementation approach. One respondent stated precedent should be placed on implementation to ensure future ESO forecasts are reflective of this change.
Do you have any other comments?	The following reasons were given by the respondents in support of the Original Proposal: • Mitigates the short-term risk of negative scaling factors. • Ensure a more cost reflective charging approach by ensuring generators such as CCGTs (which have a variable scaling

	factor) are modelled as having a net positive output. • Impacts on tariffs will be minimal. • Ensures the existing tariff model would be able to accommodate the projected growth in flexible generation.
Legal text issues raised in the consultation	
No legal text issues were raised.	

Panel Recommendation Vote

The Panel met on the 28 June 2024 to carry out their recommendation vote.
They will assess whether a change should be made to the CUSC by assessing the proposed change and any alternatives against the Applicable Objectives.

Vote 1: Does the Original, facilitate the objectives better than the Baseline?

Panel Member: **Andrew Enzor – Users Panel Member**

	Better facilitates AO (a)?	Better facilitates AO (b)?	Better facilitates AO (c)?	Better facilitates AO (d)?	Better facilitates AO (e)?	Overall (Y/N)
Original	Neutral	Yes	Neutral	Neutral	Yes	Y
Voting Statement						
The Original solution is a pragmatic, minimum change option to ensure that generation assumptions in the Year Round background remain no less reflective of actual dispatch than they are today. As a result, I consider it better facilitates ACO(b) and ACO(e) with no impact on other objectives. The modification highlights that broader reform is overdue, and should be implemented at pace following the formal conclusions of the TNUoS Task Force.						

Panel Member: **Andy Pace – Consumers' Panel Member**

	Better facilitates AO (a)?	Better facilitates AO (b)?	Better facilitates AO (c)?	Better facilitates AO (d)?	Better facilitates AO (e)?	Overall (Y/N)
Original	Yes	Yes	Neutral	Neutral	Neutral	Y
Voting Statement						
This mod introduces a lower limit on the variable generation scaling factors to ensure that negative scaling factors do not become an issue in future years when setting TNUoS. We recognise that this is an interim measure with an enduring solution to be presented from the TNUoS taskforce backgrounds sub-group. If this change is not made it will not be possible to run the TNUoS tariff model and therefore we assess this mod as better meeting applicable objective (a) by facilitating effective competition in the generation and supply of electricity and applicable objective (b) by ensuring charges reflect, as far as is reasonably practicable, the costs incurred by transmission licensees in their transmission businesses.						

Panel Member: **Binoy Dharsi – Users Panel Member**

	Better facilitates AO (a)?	Better facilitates AO (b)?	Better facilitates AO (c)?	Better facilitates AO (d)?	Better facilitates AO (e)?	Overall (Y/N)
Original	Neutral	Yes	Neutral	Neutral	Yes	Y

Voting Statement

This modification is an important solution, that if not resolved, would break the principle that generators are scaled using a positive co-efficient. The identification that the existing model has limitations and that a pragmatic solution can be used to rectify this is wholly appropriate. This should not replace a wider review (through the TNUoS Task Force) of other potential issues and updates to the values and methodologies that feed into the charging models. In this instance the solution to remove the possibility of introducing a negative scaling factor meets Applicable CUSC Objective b) and e)

Panel Member: **Dan Arrowsmith – ESO Panel Member**

	Better facilitates AO (a)?	Better facilitates AO (b)?	Better facilitates AO (c)?	Better facilitates AO (d)?	Better facilitates AO (e)?	Overall (Y/N)
Original	Yes	Yes	Neutral	Neutral	Yes	Y

Voting Statement

The proposal will ensure a more cost reflective charging approach by ensuring that generators such as CCGTs (which have a variable scaling factor) are modelled as having net positive output. The primary aim of the modification is to ensure that the tariff model does not include any negative scaling factors, and functions as intended.

ESO notes that a wider review of backgrounds is taking place through the TNUoS Taskforce which could make further changes to scaling factors to improve cost reflectivity.

Panel Member: **Garth Graham – Users Panel Member**

	Better facilitates AO (a)?	Better facilitates AO (b)?	Better facilitates AO (c)?	Better facilitates AO (d)?	Better facilitates AO (e)?	Overall (Y/N)
Original	Yes	Neutral	Neutral	Neutral	Yes	Y

Voting Statement

No statement provided.

Panel Member: **Joseph Dunn – Users Panel Member**

	Better facilitates AO (a)?	Better facilitates AO (b)?	Better facilitates AO (c)?	Better facilitates AO (d)?	Better facilitates AO (e)?	Overall (Y/N)
Original	Neutral	Yes	Neutral	Neutral	yes	Y

Voting Statement

Positive against ACO B
As the growth of renewable energy deployment, especially wind and battery storage, is forecasted to grow in GB, it is becoming more certain that the current SQSS methodology would generate negative Scaling Factors. It is acknowledged ‘as-is’ that

this will result in 'breaking' the tariff model, impacting the CUSC process to establish the Year-Round background tariffs, raising challenges with cost reflectivity and wider functionality of the tariff model.

The proposal ensures the existing tariff model would be able to accommodate the projected growth in flexible generation.

Positive against ACO E
By amending negative Scaling Factors approach, the proposal would mitigate the short-term risk of negative Scaling Factors. The change would continue to reflect the transmission costs by technology types currently established within the SQSS and CUSC methodologies.

Panel Member: **Lauren Jauss – Users Panel Member**

	Better facilitates AO (a)?	Better facilitates AO (b)?	Better facilitates AO (c)?	Better facilitates AO (d)?	Better facilitates AO (e)?	Overall (Y/N)
Original	Yes	Yes	Neutral	Neutral	Yes	Y

Voting Statement

The Original is better than the Baseline because ESO's tariff model does not work if any scaling factors are negative, and hence the Original is better than having no Wider Tariffs at all as per the Baseline. I have not seen any evidence that the design of the proposed Original solution is more cost reflective than any of the other potential alternatives that the workgroup discussed. A much more in-depth analysis will need to be conducted to be able to make such an assessment.

Vote 2 – Which option best facilitates the CUSC charging objectives?

Panel Member	Best Option?	Which objectives does this option better facilitate? (If baseline not applicable).
Andrew Enzor	Original	(b) and (e)
Andy Pace	Original	(a) and (b)
Binoy Dharsi	Original	(b) and (e)
Dan Arrowsmith	Original	(a), (b) and (e)
Garth Graham	Original	(b) and (e)
Joseph Dunn	Original	(b) and (e)
Lauren Jauss	Original	(a), (b) and (e)

Panel conclusion
The Panel has recommended unanimously that the Proposer's solution is implemented.

When will this change take place?

Implementation date
01 April 2025.

The Proposer believes that this will be a relatively simple solution to implement, and 2025 delivery is achievable.

Date decision required by
30 September 2024

Implementation approach
Change will be required to tariff setting process.

Interactions

☐Grid Code	☐BSC	☐STC	☒SQSS
☐European Network Codes	☐ EBR Article 18 T&Cs[1]	☐Other modifications	☐Other

The choice to follow the SQSS for scaling factors was made under CMP213 (Project Transmit). While this proposal does not directly interact with SQSS, it means that the tariff process will deviate from SQSS in certain circumstances.

This modification does not introduce any changes to Balancing Services or Imbalance Prices and only relates to inputs used in the internal ESO model for TNUoS tariff calculation. On this basis the Workgroup agreed that there are no EBR implications to consider.

Acronyms, key terms and reference material

Acronym / key term	Meaning
ACS	Average Cold Spell
ACS Peak Demand	The estimated unrestricted winter peak demand (MW and MVAr) on the national electricity transmission system for the average cold spell (ACS) condition. This represents the demand to be met by large power stations (directly connected or embedded), medium power stations and small power stations which are directly connected to the national electricity transmission system and by electricity imported into the onshore transmission system from external systems across external interconnections (and which is not adjusted to take into account demand management or other techniques that could modify demand).
BSC	Balancing and Settlement Code
CCS	Carbon Capture Storage
CMP	CUSC Modification Proposal
CUSC	Connection and Use of System Code
EBR	Electricity Balancing Regulation
ESO	Electricity System Operator
ETYS	Electricity Ten Year Statement
HND	Holistic Network Design
MVAr	Mega Volt Amp Reactive
MW	Mega Watt

[1] If the modification has an impact on Article 18 T&Cs, it will need to follow the process set out in Article 18 of the European Electricity Balancing Guideline (EBGL – EU Regulation 2017/2195) – the main aspect of this is that the modification will need to be consulted on for 1 month in the Code Administrator Consultation phase. N.B. This will also satisfy the requirements of the NCER process.

NOA	Network Options Assessment
STC	System Operator Transmission Owner Code
SQSS	Security and Quality of Supply Standards
TEC	Transmission Entry Capacity
TEC Register	A record of generation projects that hold contracts for Transmission Entry Capacity (TEC) with National Grid ESO
TNUoS	Transmission Network Use of System
T&Cs	Terms and Conditions

Annexes

Annex	Information
Annex 1	Proposal Form
Annex 2	Terms of Reference
Annex 3	Scaling Factors Presentation
Annex 4	Worked Example Scaling Factors
Annex 5	GSR009 SQSS Consultation
Annex 6	Workgroup Consultation Responses
Annex 7	Scaling Factors and System Operation Assessment
Annex 8	Legal Text
Annex 9	Workgroup Vote
Annex 10	Action Log
Annex 11	Attendance Record
Annex 12	Scaling Example for Adjusting to Floor
Annex 13	Code Administrator Consultation Responses