What are Scaling Factors?

- Scaling factors are used in the calculation of TNUoS tariffs (Year-Round Background and Peak Security)

- There are pre-defined and variable scaling factors which are detailed in SQSS (Appendix E gives the different parameters (for directly scaled plant) and calculation (for variably scaled plant) to be used

- Factors are used to scale capacity of plants to equal the ACS Peak Demand (estimated unrestricted winter peak demand on the ETS for the average cold spell)

- If any scaling factors are negative the TNUoS tariff model will not work

- e.g. a –ve scaling factor for CCGTs would mean adding 1MW reduces network cost rather than increasing

Table 1.5 Generation scaling factors for the purpose of tariff calculation

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
Electricity Storage (including Pumped Storage)	Variable	Fixed (50%)
Peaking	Variable	Fixed (0%)
Other (Conventional)	Variable	Variable

The statement of use of system charges

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Why is this an issue?

- Large amount of wind on the network shifts the calculation

- Wind has a direct scaling factor of 70%

- As the amount of wind in relation to other generation types on the network increases, the to of the formula becomes smaller and smaller, unti is negative and all variably scaled factors become negative

- This breaks the model for additional calculations on shared tariffs

- In next few years, this will result in negative calculated scaling factors, unless any changes are made

- TEC register regularly changes so difficult to pinpoint exactly when negative tariffs will occur

ACS Peak Demand

Direct Scaling Factor for specific plant

Capacity for directly scaled plant

$$S = \frac{P_{\text{loss}} + \sum_j L_j - \sum_{DT}\left(\sum_k \left(D_T \times R_{DT_k}\right)\right)}{\sum_{VT}\left(\sum_n R_{VTn}\right)}$$

Capacity of Variably scaled plant

What is the proposed solution?

- **Introduce a control to the mechanism which floors Scaling Factors at 10%**

- **Fixed Scaling Factors would uniformly adjust to allow this**

- **This would be introduced as a short term fix, whilst SQSS is reviewed and considers enduring changes to scaling factors**

Why?

- Review of SQSS could take a significant amount of time, and risks –ve scaling factors in calculation before any changes are made

- CUSC currently references SQSS for scaling factors to be used in transport model. This method would maintain alignment to SQSS as much as possible whilst addressing defect

- Relatively simple to implement

- 10% ensures there is some impact included in tariff setting for additional flexible generation (rather than flooring to 0%)

- Variable scaling factors are currently being calculated at around 8% so this would be a minimal change from current state

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What were the alternatives considered?

Option	Pros	Cons
Reduce fixed scaling factors (particularly for wind generation)	• Simple Implementation	• With level of future renewable investment required, this may only delay the issue • Could make model less cost reflective • Discussion about appropriate levels to reduce scaling factor too could make this option more complex
Remove Interconnectors (currently 100%) from calculation	• Quick Fix • Simple Implementation	• With level of future renewable investment required, this may only delay the issue • Impact on Scottish Tariffs (removing contribution of Interconnectors which are predominantly in South
Implement Generic Scaling Factor	• Quick Fix • Simple Implementation	• May reduce cost reflectivity of model
More fundamental methodology change	• May be more cost reflective	• Lengthy Fix • At risk of not being implemented before we see negative factors

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How to Calculate

- **Scaled Generation must always equal ACS Peak Demand**

- **Simplified Network Example: ACS Peak Demand = 400MW**

Plant	Type	Capacity (MW)	Initial Scaling Factor
1	Intermittent	200	0.7
2	Intermittent	300	0.7
3	CCGT	100	Variable
4	Hydro	100	Variable
5	Interconnector	100	1

- **In this example, the variable factor would have to be -0.25 to equal ACS Peak**

- **Under CMP424 proposal, instead the variable scaling factor is fixed at 0.1. Following this, the other factors are all reduced by a uniform ratio so that the total of capacity x SF still equals ACS Peak (400MW)**

- **Worked example provided shows this in more detail**

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Terms of Reference initial thoughts

- This is intended to be a short – medium term fix to address a clear defect which would have an impact within the next few years if left unaddressed

- We are not proposing a more significant change to the methodology

- On this basis believe 10% is an appropriate level to minimise any impact but welcome views from workgroup

- Have not initially identified any implications for other codes/policy

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