Charging Futures

Reforming electricity charging together

TNUoS Task Force

Meeting 16

30th May 2024

Agenda

9:30 – 10:45

- 09:30 Introduction & Welcome
- 09:45 Signals sub group
- *10:45 Break*

11:00 – 12:30

- 11:00 Backgrounds sub group
- 12:00 Data Inputs sub group
- *12:30 Lunch*

13:30 – 14:30

- 13:30 Security factors
- 14:30 Break

14:45 – 15:45

- 14:45 Ofgem update
- 15:45 AoB
- 16:00 Close

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Signals sub group :

Lauren Jauss

The objective of this session is to provide:

- Discuss draft modification proposal
- Agree draft can proceeded to TCMF

Signals Subgroup Have Considered Two Alternative Options for Demand TNUoS Charging Periods

Option 1

Peak Tariffs for all Final Demand change to being levied on Chargeable Energy Capacity metered energy consumption over the period **16:00 hrs to 19:00 hrs inclusive every day over the Financial Year** i.e. in the same way as NHH consumption is currently charged.

AND

Year Round Tariffs for all Final Demand change to being levied on **total annual consumption**.

Option 2

Peak charges as above

AND

Year Round charges for all Final Demand change to ALSO being levied on metered energy consumption over the period **16:00 hrs to 19:00 hrs inclusive every day over the Financial Year**

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Current Approach for Deriving p/kWh Tariffs

CUSC 14.16 Derivation of the Transmission Network Use of System Energy Consumption Tariff and Short Term Capacity Tariffs

14.16.1 For the purposes of this section, Lead Parties of Balancing Mechanism (BM) Units that are liable for Transmission Network Use of System Demand Charges are termed Suppliers.

14.16.2 Following calculation of the Transmission Network Use of System £/kW HH Locational Demand Tariff (as outlined in Chapter 2: Derivation of the TNUoS Tariff) for each GSP Group a NHH Demand Locational Tariff is calculated as follows:

$$\text{p/kWh Tariff} = \frac{(NHHD_F * \text{£/kW Tariff} - FL_G)}{NHHC_G} * 100$$

Where:

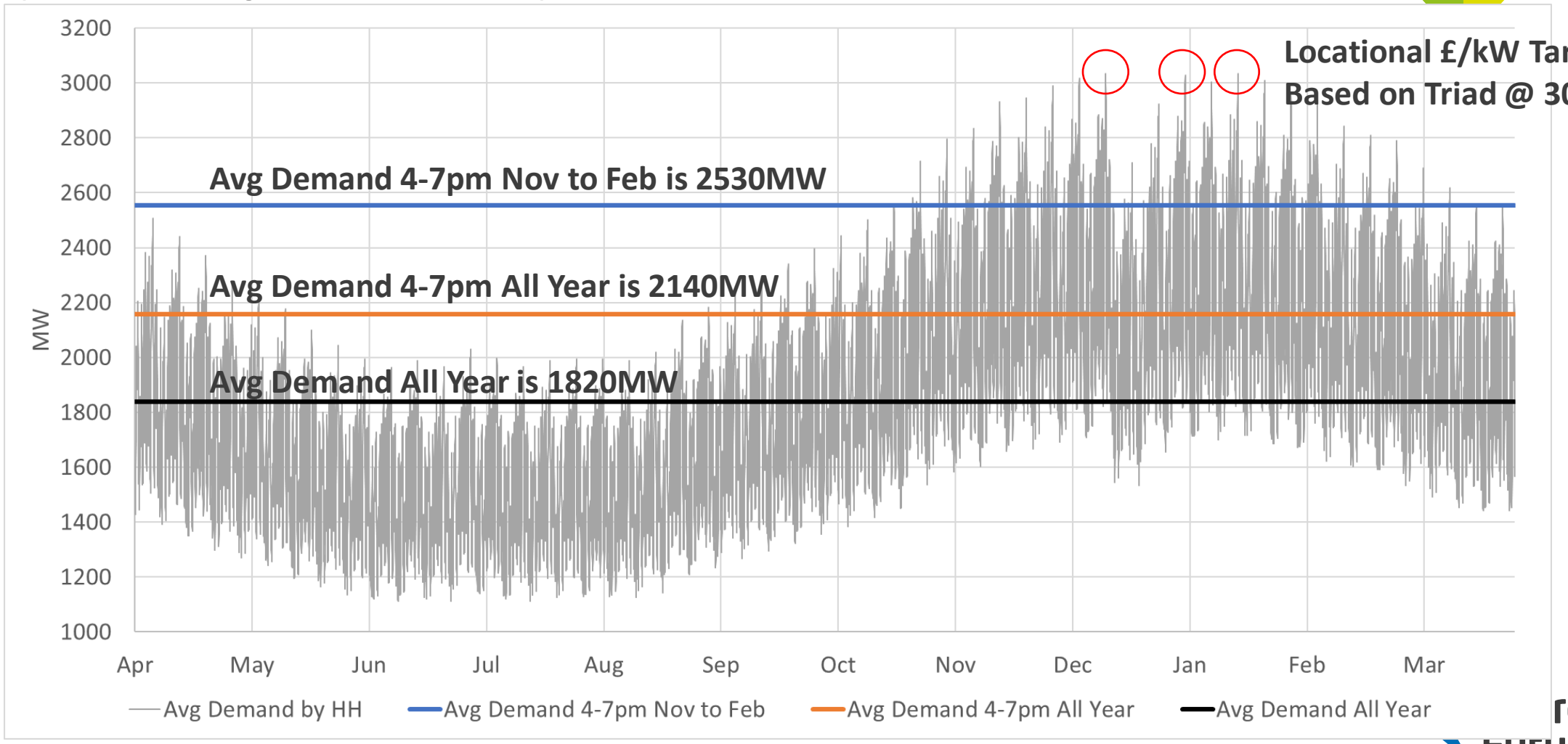
£/kW Tariff = The £/kW Effective HH Demand Locational Tariff (£/kW), as calculated previously, for the GSP Group concerned.

$NHHD_F$ = **The Company's** forecast of Suppliers' non-half-hourly metered Triad Demand (kW) for the GSP Group concerned. The forecast is based on historical data.

FL_G = Forecast Liability incurred for the GSP Group concerned.

$NHHC_G$ = **The Company's** forecast of GSP Group non-half-hourly metered total energy consumption (kWh) for the period 16:00 hrs to 19:00hrs inclusive (i.e. settlement periods 33 to 38) inclusive over the period the tariff is applicable for the GSP Group concerned.

Illustrative Example Of ESO Forecast Supplier Demand with Dummy Data (GSP Group H Southern)



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Example Calculation Using Current NHH Approach

- Zone 13, GSP Group H, Southern HH Demand Tariff is £6.86/kW for 2024/25
- If GSP Group average demand 4-7pm All Year is 2092MW, where there are 3 x 365 = 1095 hours 4-7pm all year, this is equivalent to 2092 X 1095 = 2,291,092MWh
- p/kWh Tariff = £6.86/kW x 3020 MW x 100 ÷ 2,291,092 MWh = 0.904p/kWh
- Consumer with “flatter” than average consumption profile pays more than equivalent £6.86/kW for ACS Peak consumption e.g.:
  - Baseload consumer (e.g. industrial) would pay 0.904p/kWh x 1095 = **£9.90/kW**
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Key Challenge for this Potential Mod

- The wider the charging period used as a triad/TEC proxy, the less representative of ACS peak demand, and less cost reflective the approach
- How can we ensure that a new proposal is more cost reflective than the current arrangements, and does not unduly increase tariffs for consumers in zones with positive locational charges? Possible Options:
  - Make charging period as short as possible within year
    - If we assume green levies plus wholesale power is a minimum of £100/MWh in total and locational TNUoS is no less than -£50/kW/year then baseload consumption measured over 500 hours would always have positive charges. Nov-Feb 4-7pm is 360 hours.
  - Continue with existing charge measurement approach (e.g. use triads) for positive charges, and only use widened charging period for negative zones & tariffs
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Break

Next session starts at 11:00

Backgrounds sub group :

John Tindal

The objective of this session is to provide:

- Discuss draft modification proposal
- Agree draft can proceeded to TCMF

Proposed new backgrounds modifications

Modifications for now

1) **Review generation scaling factors**
   - Interconnectors and storage should be scaled at/near 0% in Year Round. Would better resolve the negative scaling issue being addressed by CMP424
   - Review scaling factor of other technologies
   - Consider if the 10% floor proposed by CMP424 still makes sense vs e.g. 0% floor

2) **Technology classifications: Carbon vs Low Carbon**
   - Codify the technology classification in the CUSC, so a CUSC modification is needed to add/change it
   - Improve terminology to better reflect intent of the classifications, e.g. "Low cost of constraints" vs "High cost of constraints". The rationale is based on a combination of: i) correlation with constraints, combined with ii) cost of turning down to mitigate constraints
   - Review classification of technologies, especially the case for classing as "Carbon" : CCUS, generation from hydrogen, flexible hydro

3) **Other technology classification issues**
   - Could PV be classed as "Carbon", or the relevant updated term, because PV has low correlation with constraints that are associated with wind. This is a material issue in locations that have a large Not-Shared Year-Round tariff

4) **Model design: Parallel zones**
   - Changes in one zone (e.g. degree of sharing) can materially impact charges in adjacent zones in a non-cost reflective way
   - Potential solution: calculate each zone's split between Shared Year Round vs Not Shared Year Round based on the relevant sharing factor
   - Consider interactions with re-zoning modification and offshore wind

5) **Sharing: reflect that low carbon shares with low carbon**
   - Raise floor of sharing from 0% to something higher e.g. 10% to 30%
   - Consider wind bid prices will get cheaper as ROC support ends and more wind operates as merchant. Relevant to consider now, especially if long-term fixing is introduced

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Proposed new backgrounds modifications

Modifications for later

1. **Demand – Wait for Signals sub-group demand charging review**
   - Should PS and YR have different demand scenarios to reflect the way flexible demand responds in different conditions? E.g.
     - Peak Security demand should include peak avoidance actions
     - Year Round demand should include flexible demand more likely to turn-up, such as EV and electrolyser demand.

2. **Embedded generation - Leave this with the "data inputs" workstream**
   - Can the data inputs be improved so that demand and embedded generation can each be modelled on a gross basis in the T&T model backgrounds?
   - ESO to clarify what the week 24 data actually includes
   - Is the Week 24 data only available net, or could it be provided gross?
   - Should DNOs provide something different from week 24 data?

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Proposed new backgrounds modifications

Don’t need a new modification from Task Force

1. MITS node definition

- Is the current MITS node definition still suitable for all locations, including both onshore and offshore situations, or do some amendments need to be put in place to ensure the modelling is reflective. Is this being adequately dealt with elsewhere?

2. Offshore grid

- Consider how the model needs to be developed to take account of Offshore grid, including things like offshore local charges.
- For consistency, should offshore local circuits be included in the T&T model background load flow calculations in the same way as current onshore local circuits?

Data Inputs sub group :

Dan Hickman/ Martin Cahill

The objective of this session is to provide:

- Discuss next steps and timelines for Data Inputs SG

Data Inputs update

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Lunch

Next session starts at 13:30

Security factors case for change

John Tindal

The objective of this session is to provide:

- Raise questions/ queries ahead of Workgroups.

CUSC Modification Proposal Case for Change

Improve "Locational Onshore Security Factor" for TNUoS Wider Tariffs

March 2024

Contents:

Rationale for TNUoS Charges

"The underlying rationale behind Transmission Network Use of System charges is that efficient economic signals are provided to Users when services are priced to reflect the ***incremental costs*** *of supplying them."*

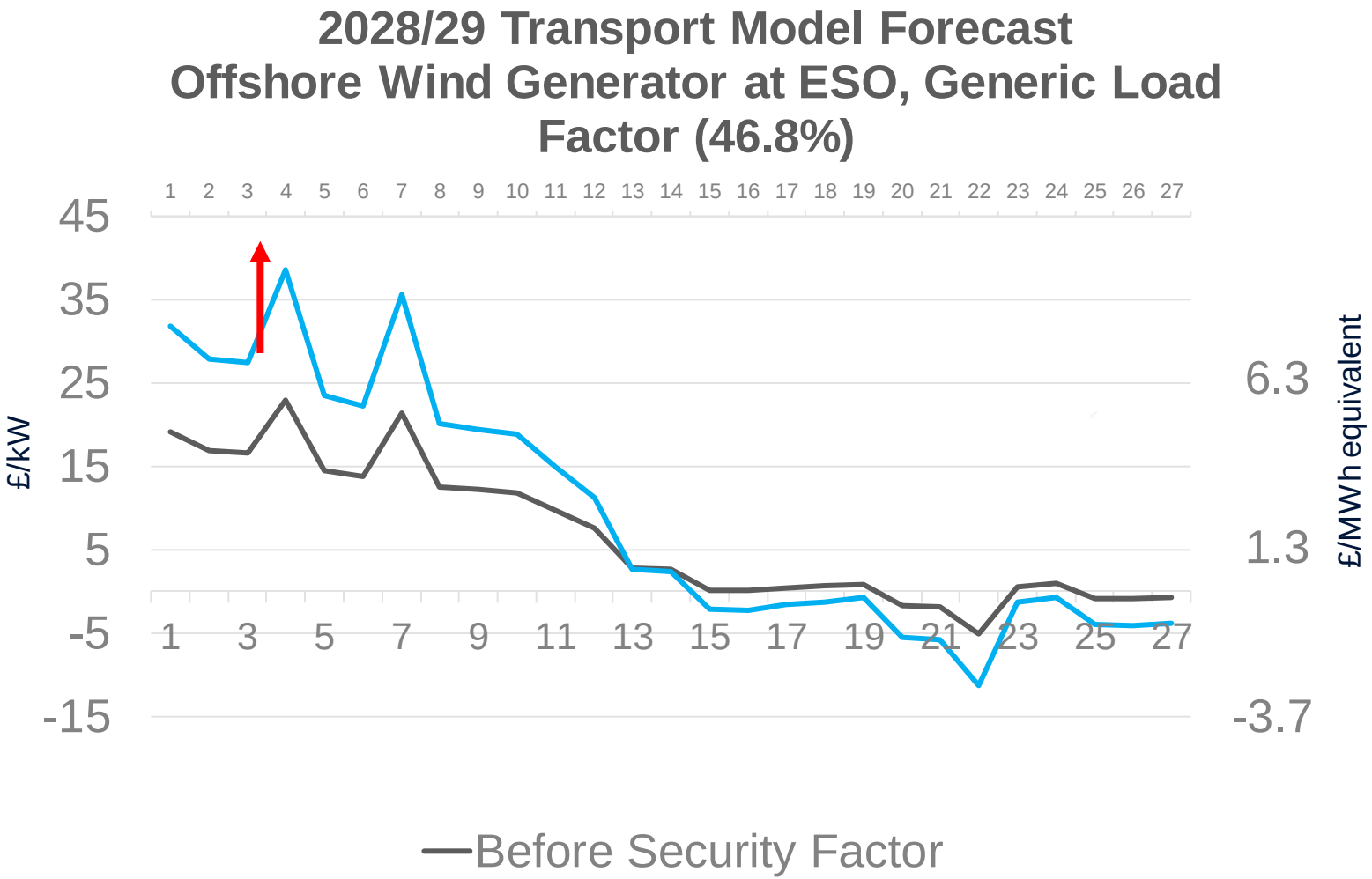
(CUSC 14.14.6 – underlying rationale behind TNUoS Charges)

SQSS requires that MITS Transmission network is already sufficiently secure, so:

...if additional MITS network capacity does not require additional redundancy for security

...TNUoS Wider locational price signal should not charge for additional redundancy for security

Security Factor amplifies locational signal



Security Factor multiplies Wider locational tariffs by 1.76

- Increases Zone 4 charges by £3.85 per MWh (from £5.66 to £9.51 per MWh)
- Increases Zone 22 credit by £1.53 per MWh (from -£1.26 to -£2.79 per MWh)
- Max-min spread increases by £5.39 per MWh (from £6.92 to £12.30 per MWh)

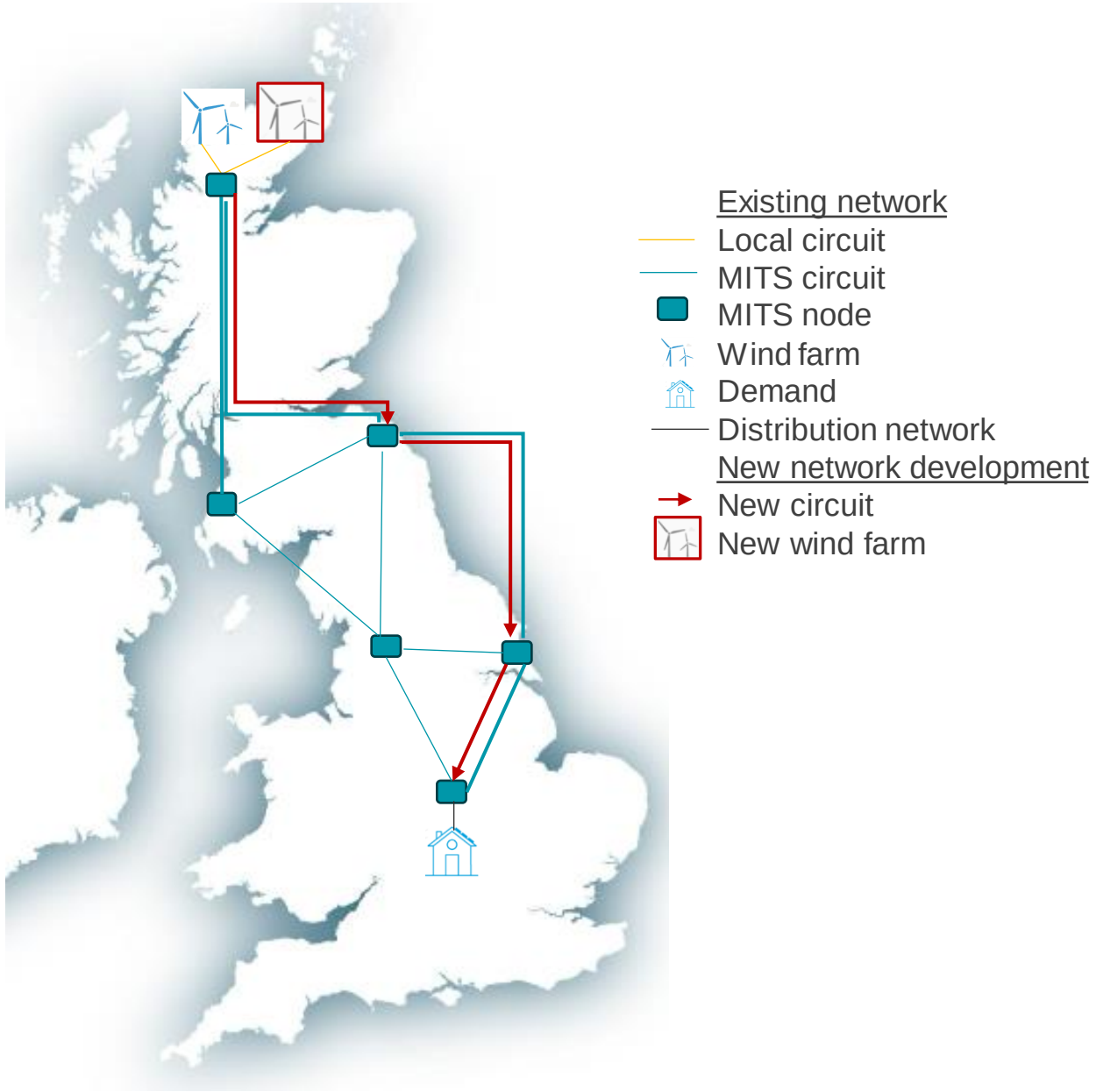
Note: Includes impact on Generator Adjustment Credit

Illustrative Reinforcement for Additional Generation

New wind farm:
+1GW transfer capacity

Economic reinforcement:
+1GW across the network

Transport model assumes:
+1.76GW across the network



What is the issue?

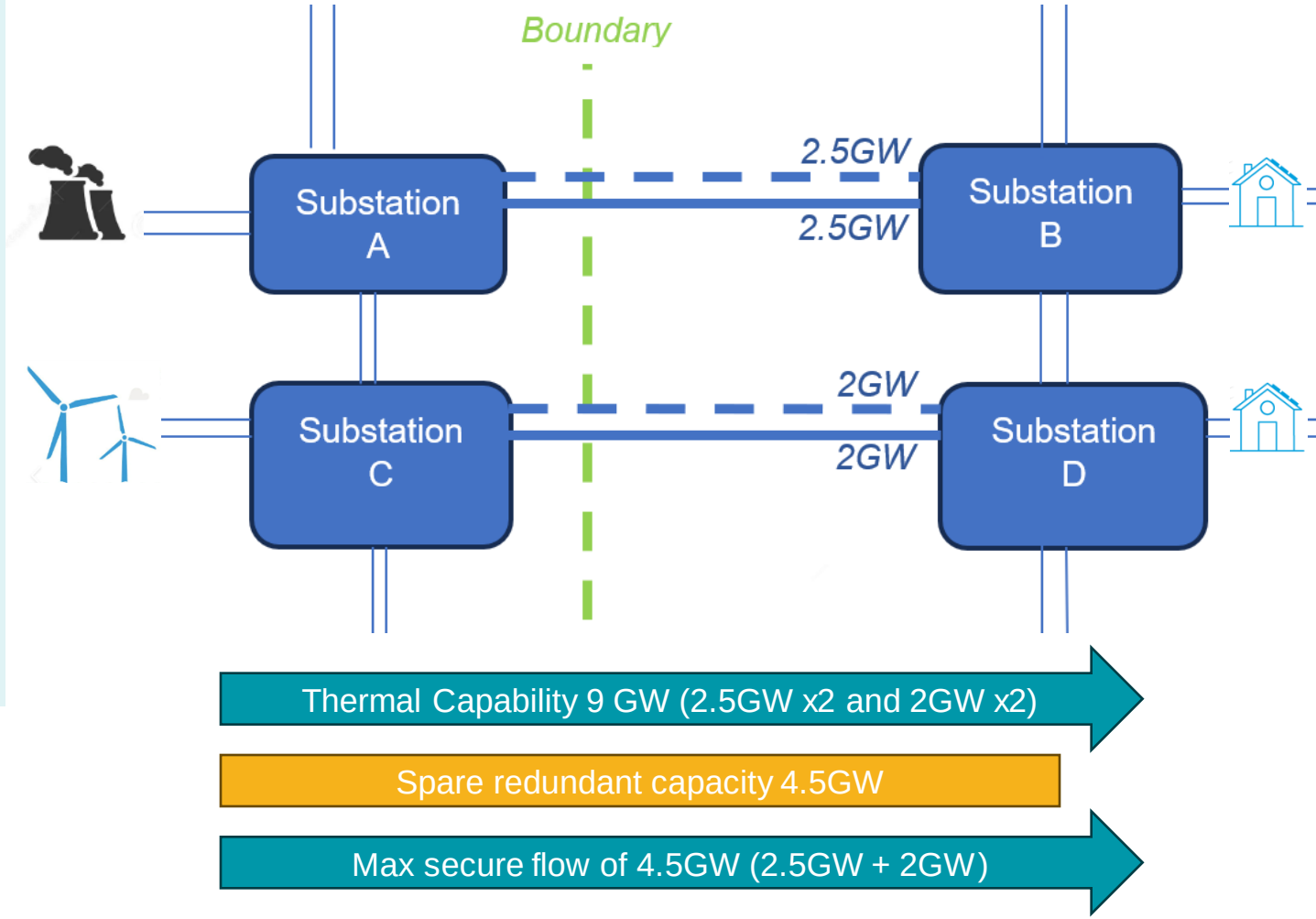
SQSS says: MITS network is already sufficiently secure

SQSS

TOs plan network additions using SQSS criteria
Surplus capacity is required in case of faults or outages including:

- *"N-2" : O*utage on two largest separate circuits

- *Boundary is initially secure*



What is the issue?

SQSS says: Want 1GW, build 1GW

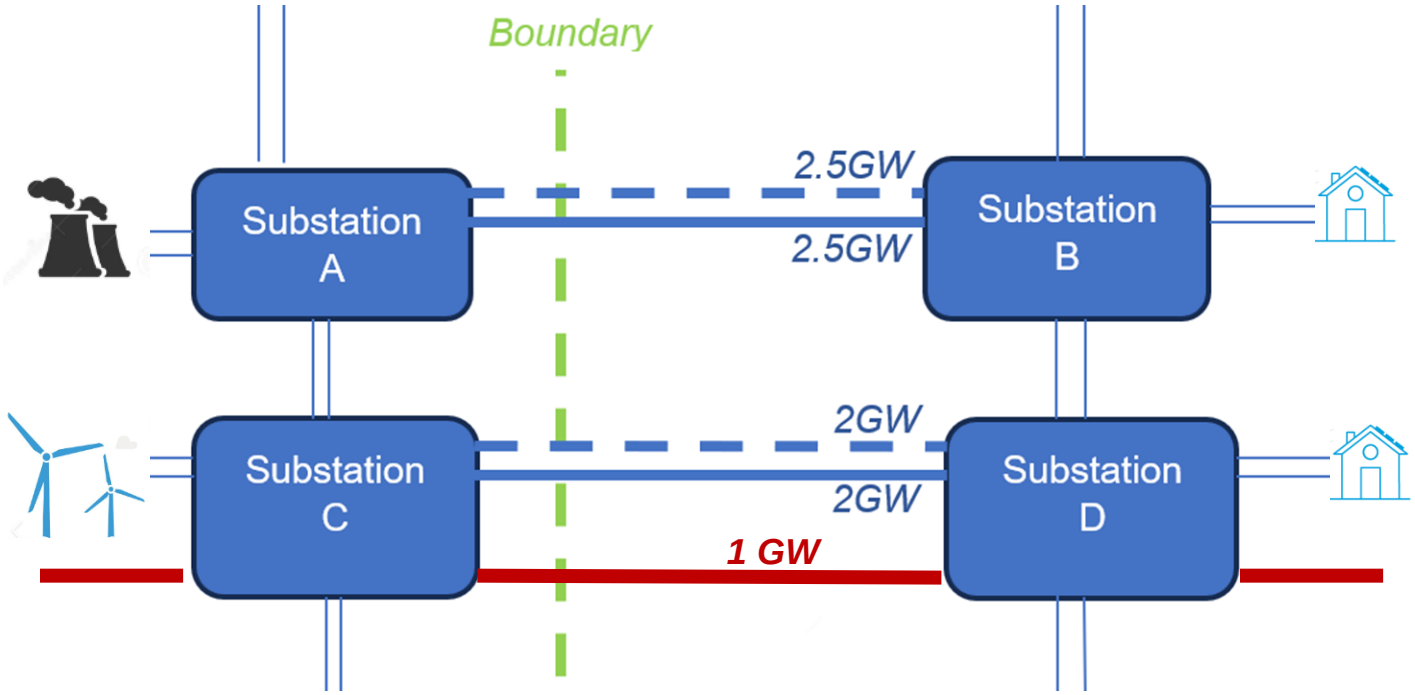
SQSS

TOs plan network additions using SQSS criteria Surplus capacity is required in case of faults or outages including:

- *"N-2" : O*utage on two largest separate circuits
- *Worst case fault scenario remains the same*
- *Boundary is still secure*

An additional 1GW of network capacity is required for new generation

➢*Build a new 1 GW circuit*
➢*Boundary remains secure under SQSS*



Thermal Capability 10GW (9GW + **1GW new**)

Spare redundant capacity same 4.5GW

Max secure flow 5.5GW (4.5GW + **1GW new**)

What is the issue?

TNUoS says: Want 1GW, build 1.76GW

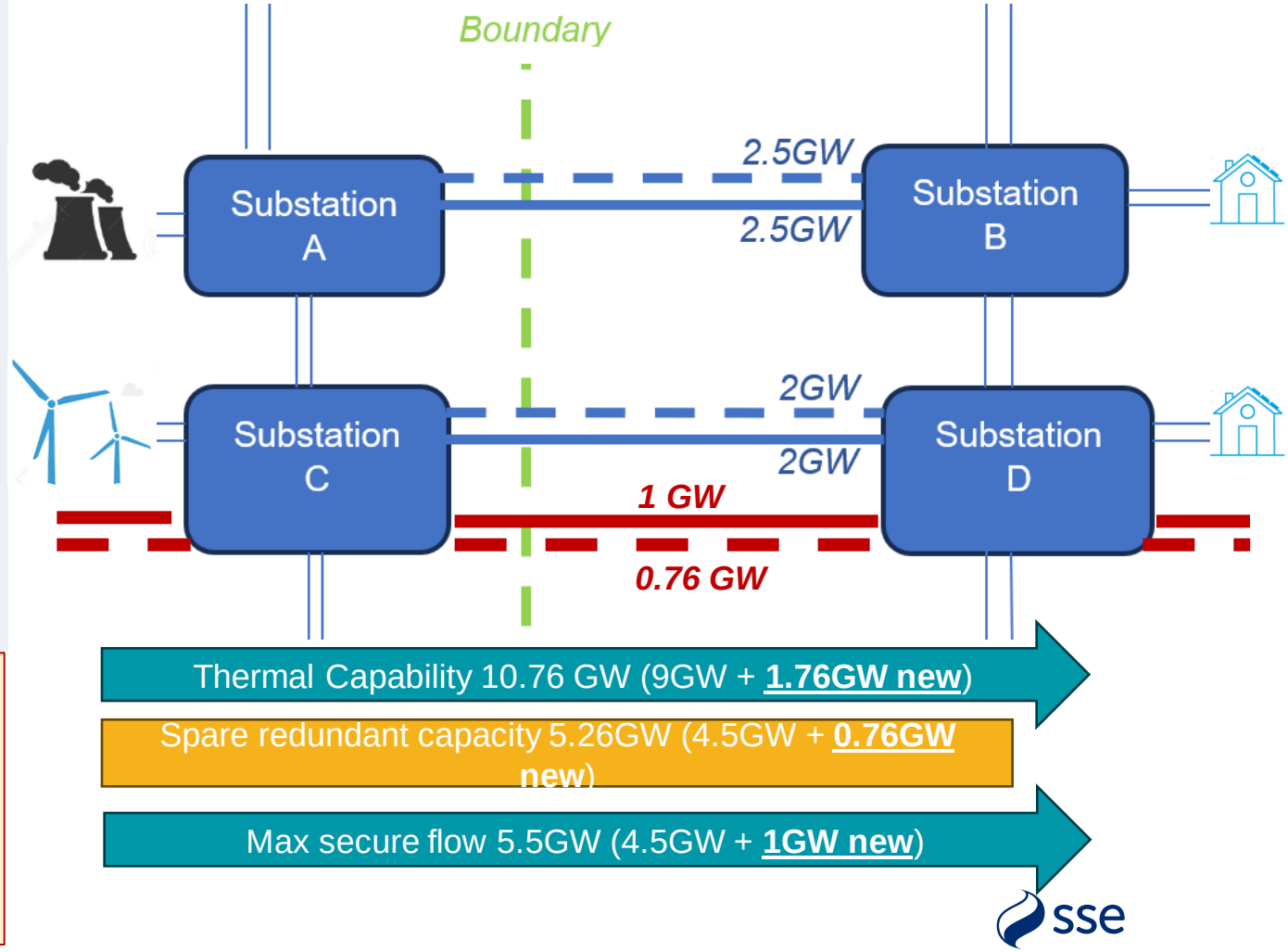
TNUoS

Transport and Tariff model assumes security is a ratio:

- *For each 1MWkm of new network, 1.76x this capacity is developed*
- *Boundary security modelled to increase pro-rata*
- *2.5GW + 2GW + 0.76GW = 5.26GW spare capacity*

An additional 1GW of network capacity is required

- *Build 1.76 GW of network under CUSC methodology*
- *Boundary is over-secure under SQSS*

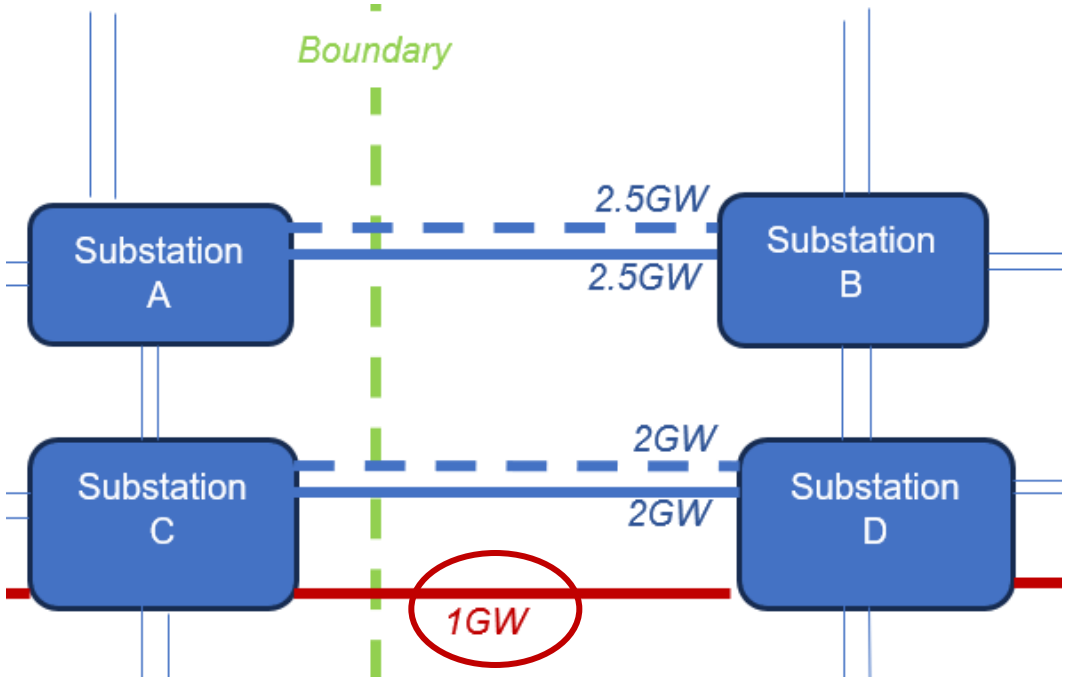


What is the issue?

A difference between how networks are planned vs how the TNUoS model reflects this

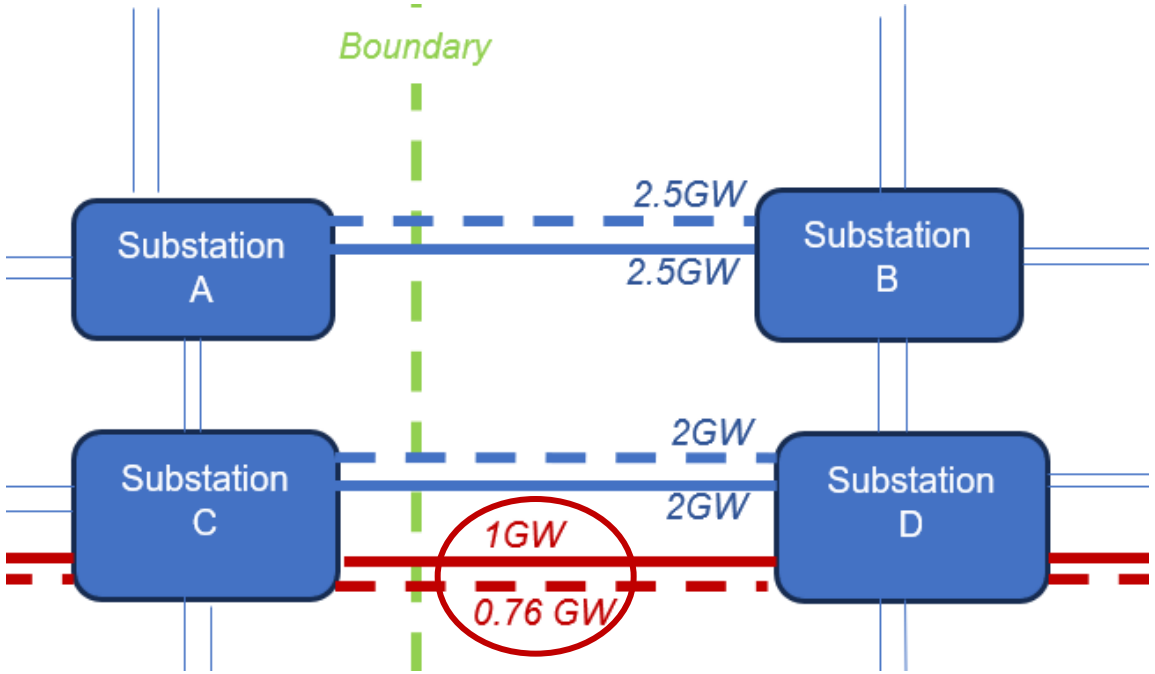
TOs plan network additions using **SQSS** criteria

Need 1GW, build 1GW



TNUoS model assumes redundancy is a ratio

Need 1GW, build 1.76 GW



TNUoS Transport model is over-forecasting how much redundant network will be planned for security

What is the issue?

A difference between how networks are planned & how the TNUoS model forecasts this

Required redundant surplus capacity is an absolute number in MW

If current MITS boundary is already secure, new circuits don't cause need for additional redundancy for security

Although if new circuit is larger than previous worst case fault, then some additional security measures may be needed

TNUoS charging model applies the Security Factor as a multiplier to all new circuits

For every new circuit, an additional 1.76 times that is assumed to be required and built

Note: Some circuits only have a factor of 1 applied, for example some remote island links and some local circuits

- **Issue**: TNUoS Security Factor for Wider charges is **not cost reflective** of network planning
- **Solution:** TNUoS Transport model treatment of redundancy should be more cost reflective

Contents:

What is the Proposed Solution ?
Improve the Security Factor from the Transport model

Analysis of SQSS indicates:

- Locational Onshore Security Factor from Wider Tariffs (Peak Security & Year Round) should be = **1.00**

Options for amending the CUSC and Transport & Tariff model:

- **OPTION 1**: Remove the Locational Onshore Security Factor entirely from all Wider charges
- **OPTION 2**: Amend the Locational Onshore Security Factor for Wider Tariffs to be 1.00

Note: Local charges remain unchanged, but could be investigated separately

TNUoS Task Force

nationalgridESO

Meeting Headline Report

TNUoS Taskforce Meeting 13

Date:	27/02/2024	Location:	Teams - online
Start:	10.00	End:	16:00

Security Factors

Lead: John Tindal

Objective:

The sub-group lead presented a needs case and suggested solutions regarding a potential modification to change the Locational Onshore Security Factor. The purpose was to discuss and obtain feedback from Taskforce members regarding the merits of the needs case, identify further considerations and next steps.

Outcome:

There was strong consensus among Taskforce members that there is currently a defect with the Security Factor which should be addressed. The current Security Factor appears to be not cost reflective, because it is too high, and is over-stating the Wider locational signals.

Next steps will include John Tindal presenting the Security Factor issue at TCMF for broader industry engagement. Also have further discussions with subject matter experts within ESO, before raising a modification.

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Industry Feedback

Following discussions with TNUoS Task Force, TCMF, ESO

1) What if reinforcement was a larger capacity circuit, compared with the previous, increasing the fault condition.

- If the fault condition increased, much of the new circuit will be held in reserve, so limited benefit from the increased capacity. This naturally limits the capacities of new circuits included in network design.
- There will be occasions when an additional circuit may release more transfer capacity than just the specific circuit itself.
- Changing fault conditions should not be part of a long-run marginal cost signal.

2) What if the reinforcement was achieved by upgrading an existing circuit to a larger capacity, therefore increasing the fault condition?

- The decision to upgrade instead of building new (e.g. reconductoring) is primarily driven by ongoing maintenance considerations.
- Also see answer to Question1 above

3) Do some types of technology require additional MITS redundancy, e.g. large inflexible conventional such as nuclear

- Flexible generation, e.g. wind, may require less redundancy, as network outages can be managed through constraints and intertrip contracts
- Security Factor could be charged differently between the Peak-Security versus Year-Round backgrounds
- More detailed analysis is required to consider if security should be applied to charges differently for different technologies

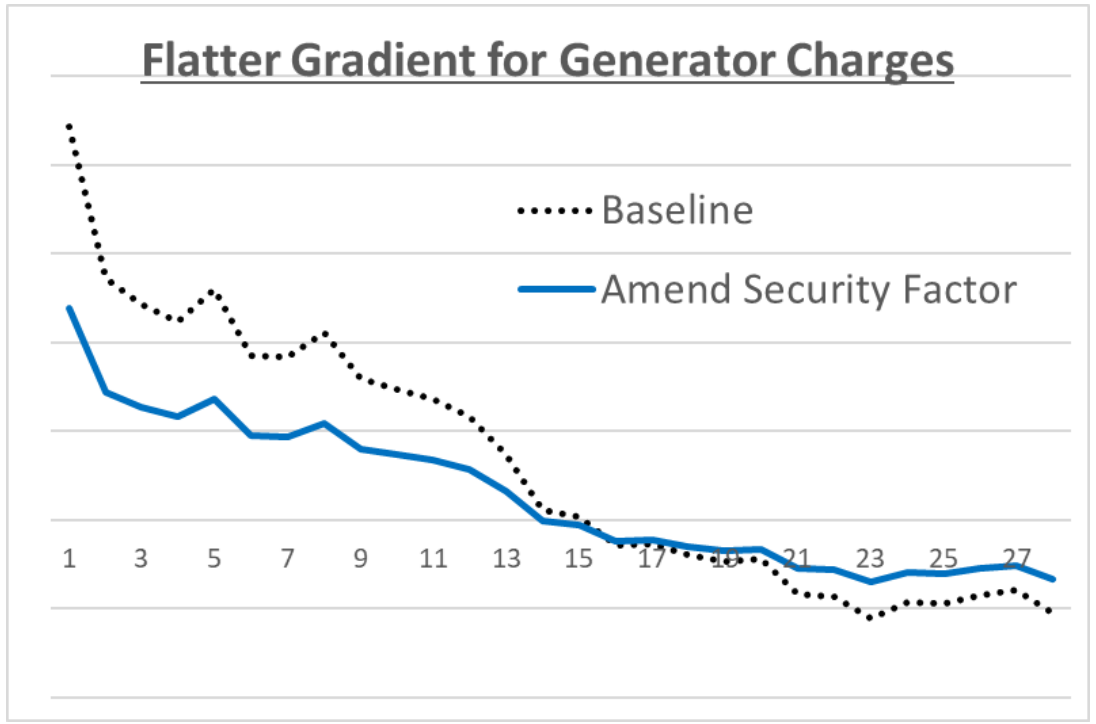
4) What evidence is there that the current Security Factor is reflective of how TOs make network reinforcement decisions

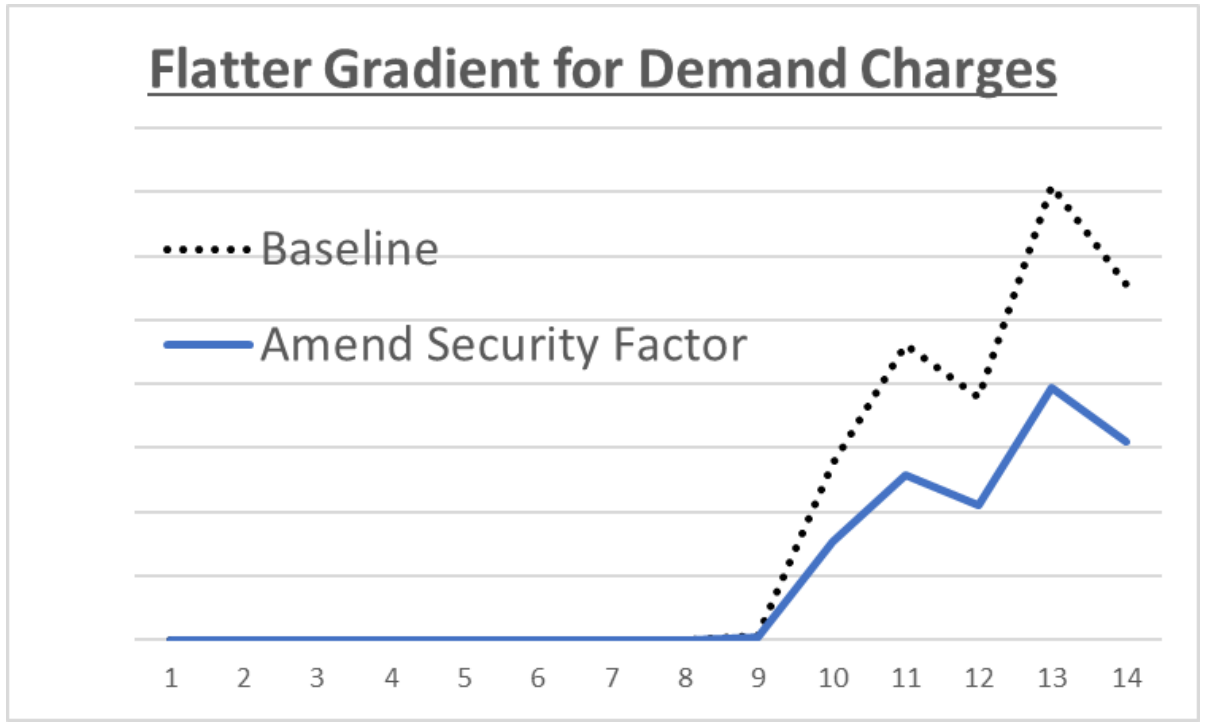
- To be considered by the workgroup

Contents:

What is the Impact of the Change?

Examples of Charges Before and After Amending the Security Factor





Results for Generators:

- **Flatter gradient for locational charges**: reduced differential between North & South
- **Reduced magnitude of generator adjustment credit**

Results for Demand

- **Flatter gradient for demand charges**: reduced Southern charges, Northern floored at £zero
- **Higher Demand Residual charges**: smaller collection from demand locational, and possibly reduced total collection from generation

Examples are for the year 2035. The Generator Charges example is for an intermittent generator, including the effect of the residual change.

Expected process

1) Discussed at Task Force

2) Discussed at TCMF

3) Raised a CUSC Modification

4) Presenting at CUSC Panel

5) CUSC Workgroup

Timing Recommendations

- Decision made before December 2024, to ensure industry has sufficient notice to the potential change
- Implementation April 2026
- Workgroup meetings should be focussed on full days to enable appropriate consideration of the technical issues
- Workgroup meetings should be frequent, e.g. every 2-3 weeks, to keep momentum in people's understanding and developing the final proposal

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Break

Next session starts at 14:45

Ofgem update

Harriet Harmon

AoB and Close

Chris Parsons

AOB

- Final Report
- Meeting dates and locations.
- TCMF rota.

Date	TF Rep
02/11/2023	John Tindal
23/11/2023	Binoy Dharsi
04/01/2024	No update
01/02/2024	Harriet Harmon
29/02/2024	Grace March
04/04/2024	Nick Everitt
09/05/2024	Joe Dunn
06/06/2024	

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Thank you