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Online workshop – TNUoS reference node

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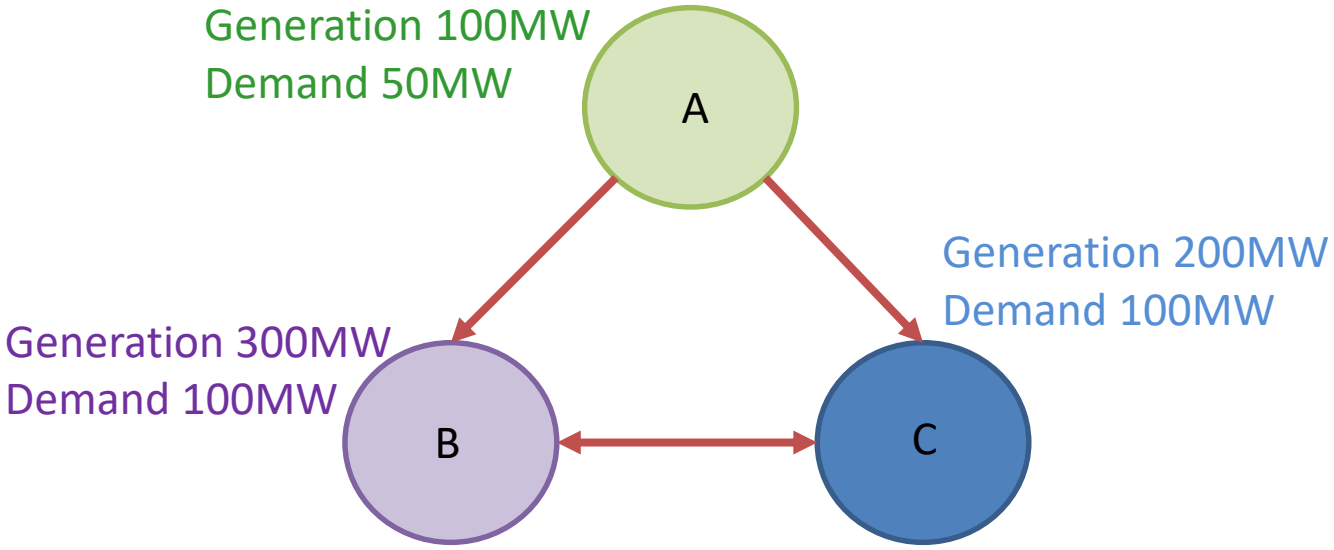
What is 'the reference node'?

There is not a singular 'node' on the network against which flows are measured for charging purposes. In practice, TNUoS charges are based on the costs of transporting 1MW of generation to multiple sources of demand.

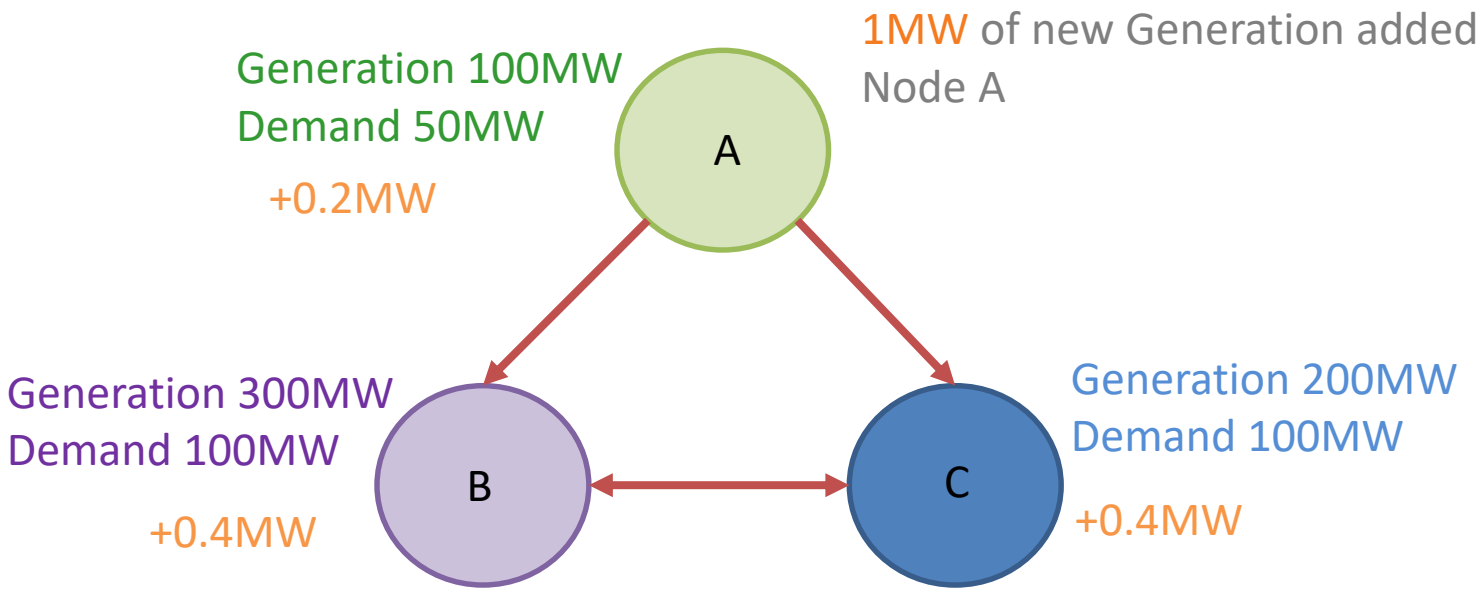


The 'transport model' contains a representative network map of around 900 nodes.

Each node has demand and/or generation capacity, to create the 'baseline' system.

TNUoS charges are derived by adding generation capacity and measuring the flows that generation would create.

What is 'the reference node'?



1MW of generation capacity is added to a node on the network. As the system has to be in balance, 1MW of demand has to be added too.

The 1MW increment is added to demand nodes based on their proportion of total demand.

Total demand in this example is 250MW. Node A accounts for 20% of that total demand, so 20% of the incremental 1MW is assigned to Node A.
Nodes B and C both represent 40% of total demand, so both pick up 40% of the new 1MW

The costs of transporting that new 1MW from Node A to demand at Nodes A, B and C creates a nodal £/kW figure for generation. The inverse nodal £/kW applies to new demand. These £/kW rates are grouped together to form zonal tariffs.

Potential benefits of change

The mechanics of the existing model lead to low overall forward looking demand revenue and higher generation revenues. This would appear to be consistent with the evidence from TOs indicating that generation is currently the principal driver of their load-related reinforcement

Two possible benefits have been suggested for a change to the reference node methodology:

1 - Improved competition between generators, including those different sizes and types of generation:

Currently, TG face TNUoS charges, while SDG and OSG currently face inverse demand charges (which are capped at zero for SDG and exporting OSG). A change to the reference node has been suggested as a means to ensure similar charges (in absolute terms) are payable by all types of generators.
The argument has also been made that Generation in GB faces different charges to their counterparts in the rest of Europe, and that that could be distorting cross-border competition.

2 - Improved compliance with EU cap on generation charge levels

Regulation 838/2010 restricts the average transmission charges paid by generators in (EU) member states to an allowable range, which in GB is €0-2.5/MWh. This is to ensure a level-playing-field between generators within the internal market. The level of forward looking generation revenue currently significantly exceeds this in GB, requiring adjustments to the charges.

Changes to the reference node has been suggested as a means to ensure more forward-looking revenues are recovered from demand, with less recovered from generation. We will need to consider whether EU cap compliance continues to be something requiring charge adjustment after TCR implementation and in the context of other modifications, such as CMP317.

1 - Improved competition between generators

- Different types of GB generator
- Cross-border competition

Different types of GB generator:

- At a nodal level, the charges faced by TG and SDG/OSG are equal and opposite;
- A change to the reference node would retain the inverse nature of the charges and would only redistribute total revenue (i.e. the G/D split);
- It is not clear, therefore how changing the reference node would achieve commonality in absolute TNUoS terms given that – without other changes to TNUoS arrangements – SDG and TG would still face significantly different absolute charges

Cross-border trade:

- EC Regulation 838/2010 Part B sets ranges of charges, not a target for each state;
- Whilst Generators in some EU Members States do not pay TNUoS (i.e. they face the minimum of the range), the ranges were prescribed to facilitate competition;
- It is unclear therefore how recovery of closer to €0/MWh would better facilitate competition than recovery of, for example €2/MWh, given that both are in a range which has already been determined, by the Commission, to aid cross-border trade

1. Do you believe that changes to the reference node would deliver increased similarity of TNUoS for different types of GB generators? If so, why/how?

2. Do you believe that changes to the reference node would aid cross-border trade? Why?

2 - Improved compliance with EU cap on generation charge levels

- Changes to the reference node would only affect **Wider** GTNUoS charges – Local Circuit and Local Substation charges would not be affected;
- CMPs 317 and 327 seek to deliver a £0 TGR and a compliant definition of the connection exclusion (charges for the physical assets required for connection) – we are yet to make a decision on either CMP and therefore **cannot conclude that it is only the Wider element which should be considered** for the purposes of compliance;
- Some approaches to changing the reference node could reduce Wider GTNUoS to nearer £0 – the TDL recovered c.-£2m in CY 18/19 and so there is the **chance that we would need a positive 'adder'** to prevent charges falling through the floor;
- Given the potential scale of the shift in DTNUoS in a relatively short period of time, it is important to understand whether changes to the reference node are the **best way** to achieve compliance with the range;
- Currently we do not have evidence that this is the case, and therefore that changes would be **proportionate** vs. other ways of achieving compliance;
- **We would welcome submissions from industry on this point**

3. Do you believe that changes to the reference node are the best way to facilitate compliance with the €0-2.50/MWh range? Why?

Based on the evidence we have seen so far, we are not currently convinced that there is a clear case for changing the approach to the demand-weighted distributed reference node.

We invite industry to provide supporting evidence and/or robust qualitative justification for any changes, by 6 April 2020 – please email futurechargingandaccess@ofgem.gov.uk

This workshop will now outline the options we have been presented with, and our assessment of those options. Please use Menti to ask questions or to provide your feedback.

Several industry stakeholders have approached us with their view as to how changes to the reference node could be made, were we to determine that changes were warranted. To date, we have conducted a qualitative assessment of each one.

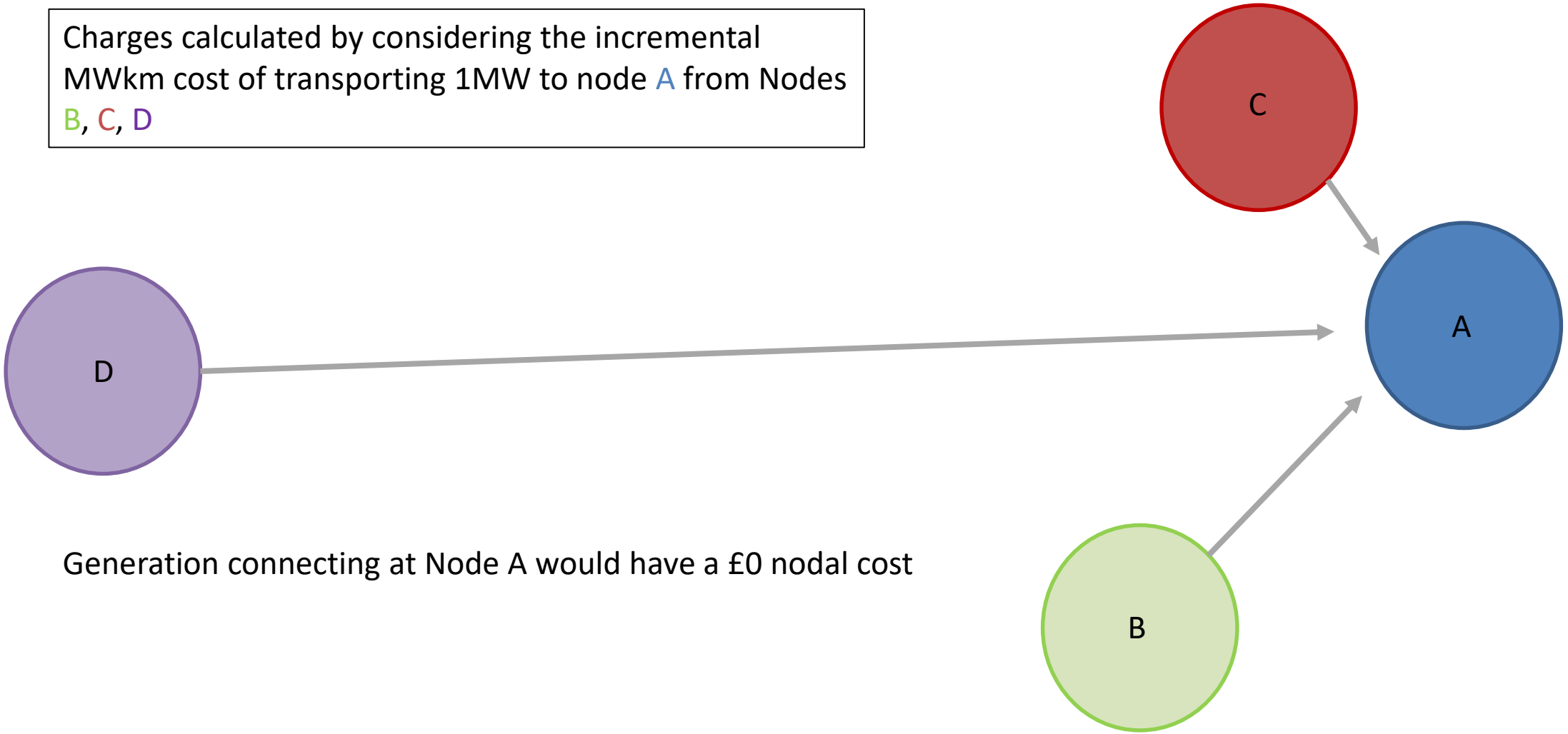
We've been approached about:

- Reverting to a single reference node methodology;
- Reversing the flows in the Transport model;
- Reducing generation at each node rather than increasing demand;
- Increasing demand at each node pro rata to the generation capacity not the demand capacity; and
- Adding the extra demand to the same node as the generation is being added to

Option 1 – Single Node

Reverting to a single reference node

Charges calculated by considering the incremental MWkm cost of transporting 1MW to node A from Nodes B, C, D



Generation connecting at Node A would have a £0 nodal cost

Reverting to a single reference node

Background:

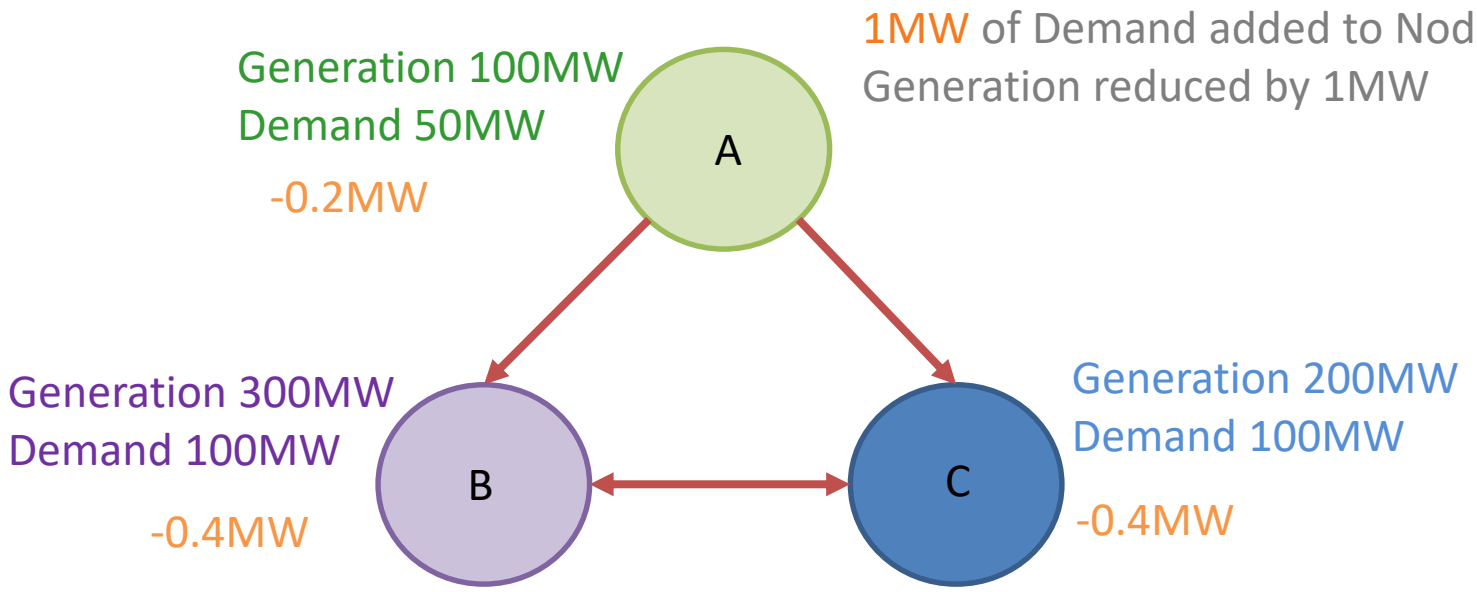
Before Project TransmiT, there was a single reference node. Charges were created by deriving the cost of transporting generation load to a specific point on the network.

Our initial thinking:

- The transport model is run under **two scenarios** – Peak, and Year-Round - accounting for different types of generation being active under different system conditions;
- **It is not clear** how a single node could be used under both scenarios – whichever node is chosen would recover £0 under one scenario but would not recover £0 in another;
- We have not been provided with the **economic rationale** for this change, nor are we clear on how it could work in practice;
- We are also mindful that if a single reference node could not be used under both scenarios then it is likely that **choosing a single scenario** would be required, which would unwind the changes made under TransmiT – we have **not seen strong evidence** that this is required, within or without the scope of this AFLC SCR

Option 2 – Reverse the flows

Reversing the flows



Creates a **decremental** approach to generation charging

The flows themselves (xMW over ykm) remain the same

The nodal prices are the **inverse** of today's

If, in practice, today's nodal price for Node C was £5/kW generation, -£5/kW demand, reversal of flows would create -£5/kW for **generation**, £5/kW **demand**

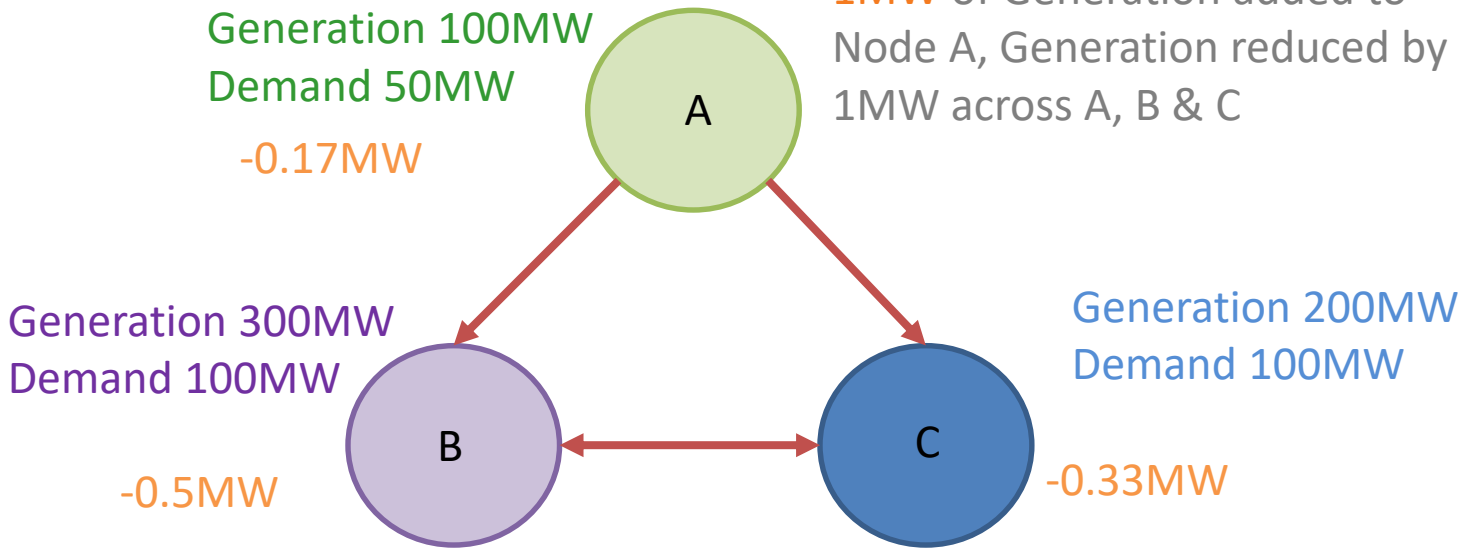
Reversing the flows

Our initial thinking:

- We agree that this approach **could** support the ESO in maintaining compliance with the range;
- The practical effect would be to **significantly increase the TDL** revenue and reduce the TDR and Generation Wider tariffs;
- Currently the model considers that **generation is built to meet demand** – does this approach suppose that generation is the constant and that demand changes to meet output?;
- It is not clear whether the reversal of the flows would **reflect the use of the transmission system** by connecting generators;
- We have seen **no strong evidence** that this approach is the **proportionate solution** to the question of ongoing 838/2010 compliance given the material effect on DTNUoS charges

Option 3 – Reduce generation

Reducing generation at each node rather than increasing demand



Reduces generation at other nodes (i.e. presupposes that 1 new MW of generation replaces another **current** 1MW)

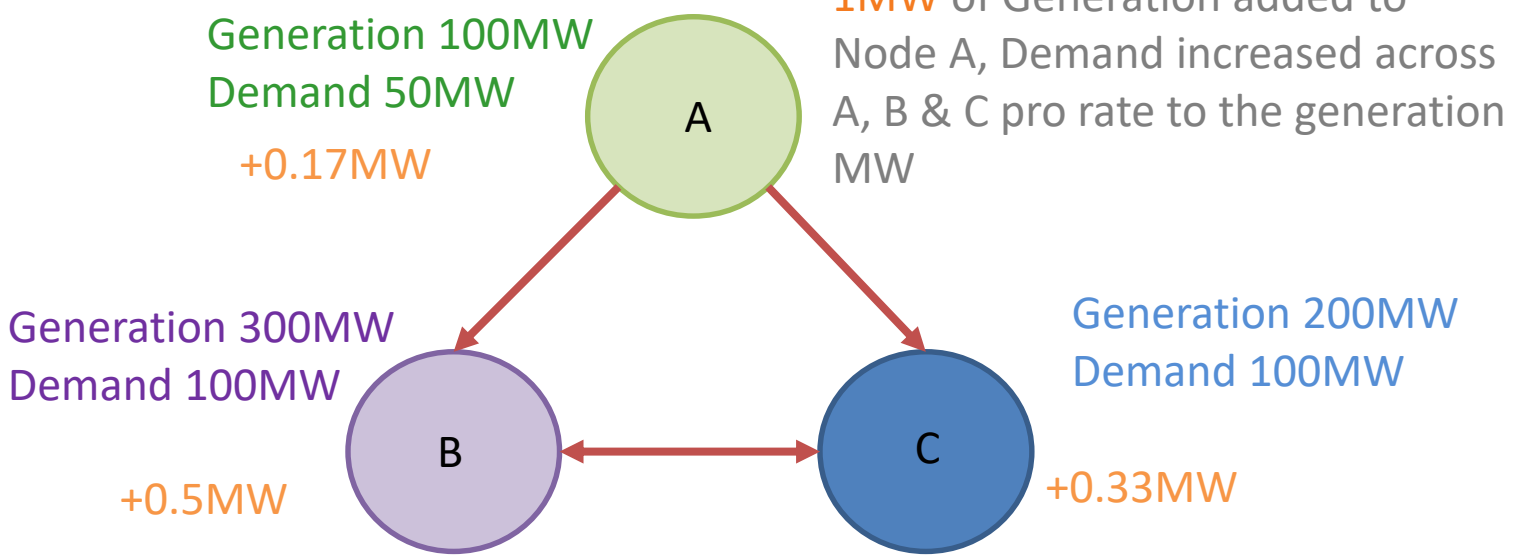
Reducing generation at each node rather than increasing demand

Our initial thinking:

- In principle, this would have a similar effect to the reversal of the flows – the TDL recovery would likely **significantly increase** with a commensurate reduction in Wider tariffs;
- This would **appear** to be more reflective of system use than a reversal of the flows, however it is **unclear** as to whether in reality the **rates of decommissioning and new build** are evenly matched;
- Similarly to flow reversal, we consider that this could support ongoing compliance with the range although the outturn revenues would not necessarily be the same;
- We do not believe that we have sufficient evidence that this change would be **proportionate**, or that it would send **appropriate signals** to connecting parties

Option 4 – Pro rate to Gen capacity

Increasing demand at each node pro rata to the generation capacity not the demand capacity



This is similar to the previous example – flows are based on Generation not Demand capacities however the key difference is that it is demand that changes under this option, rather than generation

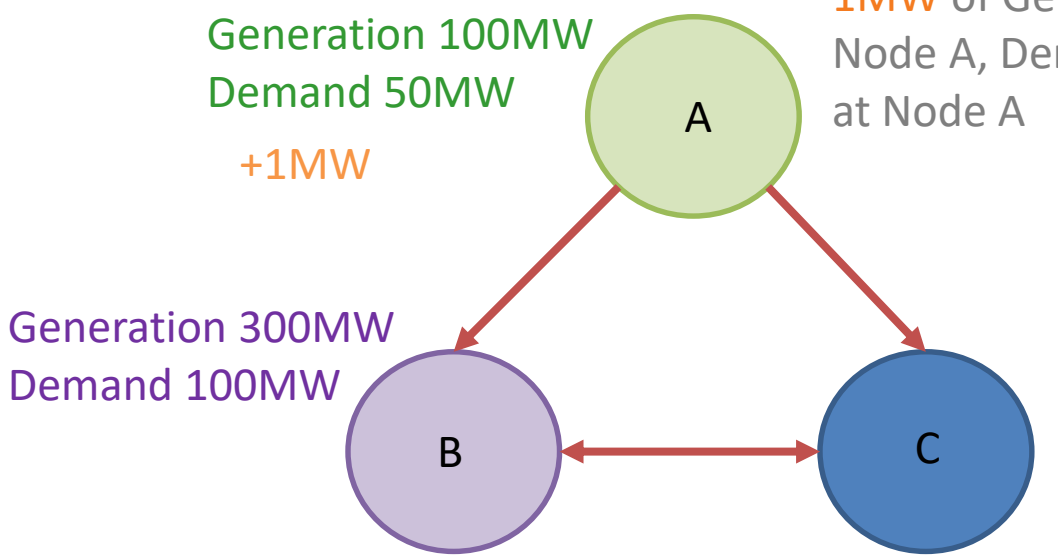
Increasing demand at each node pro rata to the generation capacity not the demand capacity

Our initial thinking:

- We are not sure of the **economic rationale** for this approach, nor do we believe it is clear that this reflects system use;
- As the **system must be in balance**, we understand that an additional 1MW of generation at one node would be offset by demand at other nodes in practice;
- However we believe evidence is needed to indicate **why** a change in demand would be proportional to the existing generation capacities of the nodes;
- It is not clear that this approach would deliver appropriate signals to users given that it is **unclear** that it **reflects how the transmission system is used**

Option 5 – Add demand to the same node as gen

Adding the extra demand to the same node as the generation is being added to



This effectively assumes that there are no flows on the network between one node and another

Adding the extra demand to the same node as the generation is being added to

Our initial thinking:

- This approach assumes that the new 1MW of generation would not use the transmission system;
- We do not believe this could be reflective of the use of the system – in theory, no transmission system would be needed at all if nodal generation and demand were always net zero;
- This approach is unlikely to give appropriate signals to network users;
- The underlying rationale for this assumption is not clear

Next steps

- Our initial assessment of the 5 options we have discussed today, and the evidence we have seen so far for change, means that we are not currently convinced that changes to the reference node are warranted;
- We would, however, welcome industry submissions providing **clear evidence** and/or **rationale** for further work on any of the options discussed today, or any other options not outlined herein;
- Submissions should be sent by **6 April 2020** to futurechargingandaccess@ofgem.gov.uk

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