CUSC Workgroup Consultation

CMP324 & CMP325 Generation Zones – changes for RIIO-T2 and Rezoning – CMP324 expansion

Overview: The CUSC requires that generation zones, used for Transmission Network Use of System (TNUoS) tariff setting, are reviewed at the start of each price control period. CMP324 and CMP325 seek to change the zones and the underlying methodology used to establish them. CMP325 was raised to widen the defect of CMP324.

Modification process & timetable

1. **Proposal form**
   - 12 September 2019
2. **Workgroup Consultation**
   - 26 February 2020 - 18 March 2020
3. **Workgroup Report**
   - 16 April 2020
4. **Code Administrator Consultation**
   - 27 April 2020 - 19 May 2020
5. **Draft Code Modification Report**
   - 20 May 2020
6. **Final Code Modification Report**
   - 9 June 2020
7. **Implementation**
   - 01 April 2021

Have 5 minutes? Read our Executive summary

Have 20 minutes? Read the full Workgroup Consultation document

Have 30 minutes? Read the full Workgroup Consultation document and annexes

Status summary: Workgroup Consultation. The Workgroup are seeking your views on the work completed to date to form the final solution(s) to the issue raised

This modification is expected to have a: high impact	Generator Users liable for generation TNUoS and National Grid ESO
Governance route	This modification will be assessed by a Workgroup and Ofgem will make the decision on whether it should be implemented
Who can I talk to about the change?	**Proposer:** Grahame Neale, National Grid ESO grahame.neale@nationalgrideso.com 07787 261242
	
	Code Administrator Chair: Joseph Henry joseph.henry2@nationalgrideso.com 07970 673220
How do I respond?	Send your response proforma to cusc.team@nationalgrideso.com **by 5pm on 18 March 2020**

Executive Summary

The CUSC requires that generation zones, used for Transmission Network Use of System (TNUoS) tariff setting, are reviewed at the start of each price control period. CMP324 and CMP325 seek to change the zones and the underlying methodology used to establish them. CMP325 was raised to widen the defect of CMP324.

What is the issue?

14.15.37 of CUSC requires that the ESO establishes generation charging zones to be used during each price control period; the next price control period for transmission commences on 1 April 2021.

The current method creates 27 generation zones and if the same method was applied for 2020/21, it is predicted this would create between 40 to 50 zones, changing again ahead of the next TO price control period, which is expected to start in 2026/27. This is likely to lead to significant investment uncertainty and tariff disturbances for TNUoS-liable generation.

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

Proposers solution: Replace the existing rezoning methodology with a statement that demand and generation zones have been determined to be 14 in number and shall be the Grid Supply Point (GSP) Groups.

Proposers solution implementation date: This CMP should be approved no later than mid-October 2020 to be able to be implemented on 1 April 2021. Delayed implementation is not possible without a further CUSC change, an ESO derogation or an extension to price control.

What is the impact if this change is made?

Who will it impact?

Generators liable for TNUoS are directly affected by CMP324 and CMP325.

Increased stability in zoning should provide better certainty regarding long-term investment signals to generators, potentially improving competition in the wholesale and Contracts for Difference (CfD) markets.

There may be a short-term implementation shock to individual generator's tariffs because zonal tariffs would be averaged across a wider range. There may also be a reduced locational granularity of tariffs.

Workgroup Consultation

This document is the CMP324/325 **Workgroup's Consultation.** This document outlines:

- **What is the issue?**
- **What is the solution?**
  - Proposer's solution
  - Workgroup considerations
  - Potential solutions
  - Draft legal text
- **What is the impact of this change?**
- **When will the change take place?**
- **How to respond**
- **Acronym table and reference material**

The Workgroup is seeking views on the proposed change and what it has worked on so far. The questions it is seeking answers on are embedded within the document and outlined in the **How to respond** section.

What is the issue?

Background – what are generation zones and why are they needed?

1.0 Transmission Network Use of System (TNUoS) charges recover the cost of installing and maintaining the National Electricity Transmission System (NETS) in England, Wales, Scotland and Offshore. National Grid ESO calculate TNUoS tariffs by using the methodology which is set out in the Connection and Use of System Code (CUSC) and charge users on behalf of Transmission Owners. All tariffs are based on which geographical zone users are connected to.

1.1 The CUSC currently applies different methods for determining generation and demand zones. Demand is zoned using the 14 Grid Supply Point (GSP) Groups on the distribution network. Generation is zoned by grouping together nodes which have a total marginal cost of the generation connecting at each node to be within +/-£1/kW (14.15.42[1] of CUSC). At the start of the current price control, this method created 27 generation zones.

1.2 TNUoS charges give locational signals which show where on the network more investment may be needed. Generation zones are set before each price control period to i) dampen nodal marginal cost fluctuations; ii) provide stability ahead of a price control period in as much as the zones will be fixed for that specific period; and iii) enable a reduction in tariff volatility, whilst maintaining locational price signals.

What is the issue?

1.3 14.15.37 of CUSC requires that the ESO establishes generation charging zones to be used during each price control period; the next price control period for transmission commences on 1 April 2021.

Why is it an issue?

1.4 The current method has created 27 generation zones and, if the same method was applied for 2020/21 ahead of the RIIO T2 price control period, it is predicted this would create between 40 to 50 zones, which would need to be changed again ahead of the next TO price control period[2], which is expected to start in 2026/7. This is likely to lead to significant investment uncertainty and tariff disturbances for TNUoS-liable generation.

[1] 14.15.42 - 14.15.45 relate to generation zoning. In practice, zones are set by reference to expansion constant and expansion factors, the security factor and the output of the nodal TNUoS tariff.

[2] The Workgroup's interpretation is that as the ESO and TO price controls are not aligned post legal separation in April 2019. The Workgroup determine that the relevant price control on which generation zones must be reviewed for is the TO price control.

What is the solution?

Proposer's solution - Aligning generation and demand charging zones

2.0 The existing provisions of 14.15.42 - 45 should be removed and replaced with a single paragraph stating that the number of generation zones has been determined as 14, corresponding to the 14 GSP groups as they are currently defined[3]. This wording already exists in 14.14.5 of CUSC. There will be consequential changes to other parts of Section 14 solely to the extent that generation zones are referenced – in practice there would cease to be 'demand' or 'generation' zones, instead just 'zones'.

2.1 Using the existing fixed demand zones (the 14 GSP groups) for the purposes of generation charging would resolve the noted defect, namely that the current zoning criteria is no longer fit for purpose, as the output is overly-complex and does not lend itself to long-term investment signals. This is because;

- Whilst generation TNUoS is reflective of a long run marginal cost, the wider tariffs are sensitive to regional generation fuel mix. Regional generation mix is determined by boundaries of zones, as well as the assumed "connectivity map" that forces flows along a single path (i.e. no parallel paths are allowed between zones).
- If both the inputs into the wider zonal tariff methodology, and the boundaries/connectivity of zones are subject to repeated change in the short to medium term, the wider tariff therefore cannot provide a useful long-term capacity investment signal to generators.
- As demand zones are fixed based on GSP Groups, an alignment between zones will lead to greater stability for generator users seeking to connect, as well as for those users already connected.

2.2 It is expected that constant zones will also support generators looking over the longer term at bidding into Contracts for Difference (CfD) auctions, keeping costs lower in line with reduced uncertainty.

2.3 Aligning the demand and generation zones could also facilitate options under consideration by the Significant Code Review (SCR), and as a further potential benefit, increases the ESO's ability to provide locational signals to demand and generation.

2.4 There are multiple drivers for changes to zones, including but not limited to:

- changes in demand and generation output over the long-term;
- changes in network topology, including assets moving between being in scope of local circuit charges to being in scope of the wider tariffs;
- the addition of circuits between Main Interconnected Transmission System (MITS) nodes (for instance, the HVDC lines) and
- the number and size of generation connections within a price control period.

2.5 It can be the case that a single generator connection would, under the current methodology constitute a zone in itself, particularly in lower voltage areas (e.g. Scotland) where the "unit costs" of circuits are high. The ESO is then required to calculate and apply zonal tariffs for that single generator. Whilst this is accepted as being cost-

[3] It is the proposer's intention that the original solution would use the current 14 GSP groups and would not necessarily be subject to change if there were any subsequent changes to GSP groups, as defined in the CUSC.

reflective, it is not the most efficient way to ensure cost-reflectivity, and does not send appropriate, or sufficiently stable, investment signals to generators seeking to connect.

2.6 The Proposer believes that locational TNUoS tariffs should reflect the relative Long Run Marginal Cost (LRMC) of the building and maintenance of the transmission system, and that tariffs should therefore provide long-term investment signals to the parties connecting. Whilst tariffs do change year-on-year, it is likely that maintaining the status quo in relation to rezoning will lead to greater volatility in Generator TNUoS than would occur if the methodology underpinning zoning were more likely to lead to fairly static zones over the longer term.

Workgroup Considerations

3.0 The Workgroup convened 4 times between November 2019 and February 2020 to discuss the perceived issue, detail the scope of the proposed defect, devise potential solutions and assess the proposal in terms of the Applicable CUSC Objectives.

Context

3.1 The workgroup discussed the principles on which they will judge potential solutions for determining generation zones. They discussed that the solution should have positive impacts in one or more of the below areas:

- cost reflectivity,
- electrical proximity – as per the electrical boundaries in the Electricity Ten Year Statement (ETYS),
- impact of distributional effects,
- effective competition – i.e. transparent price signals
- stability and;
- practicality.

3.2 There are a variety of different methods that can be used to determine generation zones. In each method, the total amount recovered via generation TNUoS (across all zones) would remain unchanged. What differs in each method is who pays the charges (i.e. how much of the total is recovered from each zone). The workgroup discussed to what extent each method achieves the above areas. The current method of zoning (outlined in the "***What is the issue*?"** section) is considered to be a flexible method, as zones adapt to changes in nodal prices. A potential solution to increase the current figure used to achieve zones in line with RPI is also seen as a flexible method. It was discussed that the flexible methods had stronger arguments for cost reflectivity as they adapt with nodal prices and expansion of the network. They also have arguments for practicality as there is less requirement for the methodology to be reviewed ahead of each price control period, if an enduring solution, as suggested under the CMP324 original is implemented.

3.3 The original solution to CMP324 is to fix generation zones to the 14 GSP groups contrasts with more flexible methods of zoning (such as the status quo and adjusting by RPI), as the zones would stay fixed irrespective of any changes in nodal prices or network expansion. Another potential solution was considered to fix the current 27 generation zones. Fixed zones were seen by some workgroup members to have less association with economic drivers or electrical proximity, however can have benefits in that they may create more stability of prices for TNUoS payers and strong arguments for practicality as there is less requirement for the zones to be reviewed.

3.4 Another potential solution was discussed which uses the zones published in the ETYS statement. This method would have both fixed and flexible aspects, as the zones would change in line with changes to the ETYS zones, which are amended to reflect changes in network. This method has merit in that it is based on electrical proximity, and there is less requirement for zones to be reviewed, however the method is less practical given the number of ETYS zones and methodology required to merge zones.

Each of the above potential solutions were discussed in more detail, which can be found further on in this section.

The below two potential solutions were discounted by the workgroup and are not included further on in this section.

3.5 The present methodology uses a fixed range of +-£1/kW to achieve a number of zones considered to be reasonable in 1992 when the range was set. These were also electrically and geographically proximate. The workgroup considered that the current £1/kW could be increased incrementally by a set amount (e.g. by 10p) until it achieves a fixed number of zones considered to be reasonable today (e.g. 25-30 zones); these zones would then be fixed for the duration of the TO price control. From then on, the range could be inflated in line with RPI or the process repeated to stay within the 25-30 zone range. This solution would have merit in that it flexes without intervention and would provide locationally granular price signals. However, this potential solution was discounted by the workgroup because it was believed not to add any benefits compared with to the other solutions which could deliver a similar result, such as inflating the +-£1 by RPI.

3.6 For completeness, the workgroup discussed Nodal Charging. It was stated that Ofgem's direction of travel on Distribution Use of System Charge (DUoS) is to achieve more granular charges, and that the proposed solution may be against that direction of travel in industry. The workgroup discussed whether it would be possible to charge all generators based on their own node. They agreed that they would need to ensure consistency with the distribution network. This method offered benefits of cost granularity and cost reflectivity. However, the workgroup concluded that this method would not achieve simplicity, stability or practicality.

Considerations and interactivity

3.7 The workgroup is mindful of the interactivity of the RIIOT2 price control, CUSC modifications CMP315[4], CMP317[5], CMP320[6], and the modifications stemming from Ofgem's Targeted Charging Review direction[7] (CMP327, CMP334 and CMP333)[8]. They are also conscious that it would be beneficial if their solution facilitated (or did not hinder) the ability for TNUoS to be charged to embedded generators in a way that is consistent

[4] CMP315: TNUoS: Review of the expansion constant and the elements of the transmission system charged for

[5] CMP317: Identification and exclusion of Assets Required for Connection when setting Generator Transmission Network Use of System (TNUoS) charges

[6] CMP320: Island MITS Radial Link Security Factor

[7] https://www.ofgem.gov.uk/publications-and-updates/targeted-charging-review-decision-and-impact-assessment

[8] https://www.ofgem.gov.uk/system/files/docs/2019/12/full_decision_doc_updated.pdf

with transmission connected generators, as they are aware that this and other changes may be taken forward as an output of Ofgem's Access and Forward-Looking Charges Significant Code Review[9].

RIIOT2 Data

3.8 The intent of the proposer is that any modification to the zonal configuration should be implemented before the next price control. It is expected the RIIOT2 data will be available in October 2020. *The workgroup highlight this to readers and state that any tariffs presented as part of this analysis will be subject to change and will be formally presented to industry in October 2020 and January 2021 as per the current charge setting process.*

3.9 Several data items in the analysis undertaken by the ESO, for discussion by the workgroup, was based upon the latest RIIO1 data and was not adjusted to predicted RIIOT2 values. This is due to the ESO not having sufficient information available at the time of the analysis to accurately estimate this data. The ESO modelled how many generation zones there would be in the next price control period if the existing methodology was applied and if the existing parameters stayed the same (see Annex 6, slide 5). Out of the current 27 generation zones, 17 zones would exceed the £1/kW range currently used in each generation zone. The ESO also looked at what would happen if the RIIO-T2 Weighted Average Cost of Capital (WACC) was introduced to the current 27 zones and the £1/kW range (see Annex 6, slide 6) The results show that only 6 of the current 27 zones would fall within the specified range. An increase in the number of zones is highly likely to increase tariff volatility and add more complexity to tariffs, which highlights the need for change.

3.10 The main data items that would need to be adjusted for RIIOT2 data are;

- Expansion Constant: This is the indexed cost of 1MWkm of 400kV overhead line and is the base that the Expansion Factor[10] is applied to for all circuits that are not 400kV overhead lines. Changes to the expansion constant will change £/MWkm value of nodes and could increase or decrease these nodal values depending on how they change compared to the current figures.

- Transmission Owner (TO) Annuity Factor and Overhead % rate: The Annuity Factor takes into account of; asset depreciation, regulated rate of return and the overhead rate which reflects TOs' operation and maintenance costs. These figures feed into Expansion Constant (which is the annualised cost of building and maintaining 1km and 1MW of 400kV OHL capacity), and therefore affect the nodal prices and tariffs directly. This is currently set at 5.8% (annuity factor) and 1.8% (overhead factor) respectively[11] and are under review as part of establishing the RIIOT2 price control.

[9] Access and Forward Looking Charges – Summer 2019 working paper - https://www.ofgem.gov.uk/system/files/docs/2019/09/000_-_working_paper_-_summer_2019_-_exec_summary_final.pdf

[10] The current Expansion Constant can be found here: https://www.nationalgrideso.com/document/162431/download)

[11] Find the latest charging statement here https://www.nationalgrideso.com/document/140751/download

- Expansion Factor: The TNUoS Transport model is designed around calculating the marginal cost of moving 1MW over 1km (see Annex 4 for more information about the Transport Model). The assets that do this with the lowest marginal cost is 400kV Overhead Line. The TNUoS Transport Model therefore assumes that all other assets (voltage level, underground cable or HVDC) are more expensive as a multiple of the 400kV overline cost (this multiple is the Expansion Factor). Changes to these expansion factors will change £/MWkm value of nodes (unless they are connected by 400kV overhead line) and could increase or decrease these nodal values depending on how they change compared to the current figures.

Workgroup consideration of Proposers solution

Proposers solution: Aligning generation zones with demand zones (GSP Groups)

Stability

3.11 The Workgroup discussed that many CUSC parties have said in the past that they value stability and predictability in the forecasting of TNUoS. By mapping the generation zones to the GSP groups, there would be no need to re-zone at each price control period, and this would tend to increase long-term stability for generation sites. It was recognised that charges would obviously change year to year, reflecting changes on the transmission network.

Alignment

3.12 The ESO conveyed that this solution may also bring about better alignment between embedded generators and transmission-connected generators. The workgroup explored whether the current method for zoning demand is appropriate, given that the proposer's solution is to use the same method for generation. Some Workgroup members took the view that the way demand is currently zoned has been practical, but potentially not as cost-reflective as other zoning solutions. It was suggested by some workgroup members that it would be beneficial to have greater alignment between generation and demand charges. Embedded generators are exposed to zonal demand forward looking locational charges. If the demand and generation zones were aligned, this would be the inverse of generation forward looking locational charges.

3.13 It was raised that nodal prices are averaged into zonal prices differently for demand as they are for generation, which may create distortion. However it was noted that locational investment signals for generators from TNUoS in this solution would potentially be weaker due to there being fewer generation charging zones.

Distributional effects

3.14 It was noted that users are currently allocated to zones, and as such will be allocated to different zones resultant of this modification. Some users will see charges go up, whilst some will see a reduction. It was also noted that remote island connections could significantly increase average charges in the North of Scotland as nodal charges on islands tend to be higher. Annex 5 includes a tool which can be used to calculate example tariffs for all zones (instructions on how to use the tool can be found in Annex 9, slide 3).

Modelling

3.15 The ESO's Transport Model was used to understand the impact of the ESO's proposed solution. The Workgroup hypothesised that aligning Demand and Generation zones should help create equal and opposite price signals. The model showed that in most zones this was not the case and generation tariffs were greater in magnitude than demand tariffs. This is because the nodal prices are averaged across the zone, and generally generation is connected in more expensive nodes within the zone. The Workgroup noted that averaging would have the impact of reducing tariff prices in more expensive nodes within a given zone, but making currently cheaper nodes more expensive to connect in.

3.16 It was noted by the Workgroup that this method of zoning does not create equal and opposite signals for demand and generation due to the assumptions used in the ESO's Transport Model (such as using net GSP demand, not gross GSP demand). Moreover, if the generation residual is set to zero, there could be further distortion in signals.

GSP Groups in the TNUoS Transport Model

3.17 The ESO presented how using GSP groups would work in their Transport Model which they use to calculate TNUoS tariffs (see Annex 4 for more information about the Model). The model uses a connectivity map to apply the methodology for zoning. The ESO demonstrated how GSP groups would work on the connectivity map. The map sees zones in a single path, flowing into each other until they reach the demand centre[12]. The model works on a waterfall basis; when an additional MW of energy is added, it is worked out how many flows it goes through before it gets to the demand centre. By using the existing rules in CUSC (14.15.50), the ESO showed how the current network could be simplified to use GSP groups in the Transport Model. See Annex 8 slides 4-9 for illustrations of the connectivity map with GSP groups.

Electrical and Geographical Proximity

3.18 The workgroup discussed CUSC 14.15.42. ii.) "The nodes within zones should be geographically and electrically proximate". To use GSP groups would indicate the removal of 14.15.42 i) and ii) from CUSC, because geographic and electrical proximity would no longer be criteria used in the zoning methodology.

3.19 The workgroup discussed whether interpretation of "electrical proximity" is material in the proposed change. It was raised that "electrical proximity" takes a judgement from the ESO and this is not defined. It was stated that the Workgroup is not to get a reasonable geographic spread, but to get a justified basis of zoning. It was discussed that that the method sought would be the one which has the best balance between cost reflectivity, stability and practicality and that the best solution may move away from electrical proximity. It was also highlighted by the workgroup that GSP Groups are by their nature geographically and electrically proximate.

Backgrounds

3.20 To work out Year Round charges, ESO takes each circuit on the transmission system and categorises it as either Year Round or Peak, depending on the generation

[12] a hypothetical point on the system representing the centre of demand.

connected to it. The background with the most MWkm is then used to calculate and allocate the nodal prices - this has been the Year Round background historically.

3.21 A workgroup member suggested that ESO should investigate adding both Year-Round and Peak backgrounds together. This is because in Scotland the Year Round background dominates whereas in England and Wales the Peak dominates. It was suggested that Scotland could be zoned on Year Round and on Peak in England and Wales. ESO responded that the backgrounds are mutually exclusive, and that combining backgrounds would be a significant piece of work which would go into the nodal price calculation, which is out of scope of this modification. Currently the backgrounds are mutually exclusive, as generation is scaled differently in the two backgrounds as per chapter 4 of the SQSS.

Workgroup consideration of three other potential solutions

1: ETYS Zones

3.22 Electricity Ten Year Statement (ETYS) zones[13] are published by the ESO each year. They are used to simplify analysis as part of Future Energy Scenarios work carried out by ESO. The zones are reviewed within the to the System Operator Transmission Owner Code (STC) by the ETYS subgroup. These consist of zones labelled by letters A-T which are then subdivided further to give 96 zones. ETYS zones are reviewed annually and when they are published they are fixed for the year. The zones are driven by engineering judgement and only change significantly if reinforcement works instigate a boundary to change or if levels of generation and demand change significantly. ETYS zones are currently used to calculate cancellation charges for connections.

Modelling

3.23 A Workgroup member created a model using a version of the ESO Revenue Team's Transport Model[14], which is used to model tariffs. This was used to model what the tariffs would look like using the ETYS zones as their zoning criteria in contrast to the proposer's solution which uses GSP groups. The work showed that for most of the zones in England and Wales, the tariffs were close in price. However, in the North of Scotland, the differential between zones was significant. The zonal difference is larger in Scotland because there are more megawatt kilometres between zones. The model suggested that there should be more zones in Scotland and fewer in England and Wales.

3.24 The ESO undertook analysis (Annex 9, slides 6-7) on ETYS zones which showed that this method has a large averaging effect for Scottish zones but for England and Wales the nodal values are used for many zones due to there being only one user connected in some zones.

Stability

3.25 It was considered that the ETYS zones are reviewed annually and so could change every year, as for example, there are regular debates on whether Dumfries-and-Galloway should be a separate zone. To counter this, the Workgroup considered whether zones

[13] https://www.nationalgrideso.com/document/133181/download

[14] Direct Current Load Flow Investment Cost Related Pricing (DCLF ICRP) Transport Model is used by ESO to calculate TNUoS tariffs

could be set based on what the ETYS zones were at the start of any given price control period, which would arguably create more stability. However, it was noted that one of the reasons for suggesting the use of ETYS zones was to attain better cost reflectivity, and this could be impacted if the ETYS zones were only used at the start of a specific price control period, which could last several years.

Simplicity

3.26 The Workgroup considered how they could reduce the number of the ETYS zones from 96 to make this method simpler and more practical. If the current zoning method was applied for the next price control, the number of zones would rise from 27 to between 40-50 which ESO believe are too many to charge practically. The Workgroup considered that the subgroups within each ETYS zone letter could be merged if they were within a certain £ amount. E.g. if zones C1 – C7 were all within +- £1.50 they could be merged. As part of the analysis undertaken by the ESO, the ESO grouped the ETYS zones in to the major ETYS zones (i.e. by letter).

3.27 It was noted that the TNUoS Transport Model relates to load flow and disregards existing spare network capacity. It was suggested that it would be less cost reflective to define charging zones based on ETYS boundaries which are defined by existing network constraints.

3.28 The Workgroup discounted this as a potential solution due to its creation of a large number of zones which would lead to near-nodal pricing in some parts of the country whilst having a large averaging effect in other parts, and therefore not achieve principles of practicality or simplicity.

2: Fix current 27 zones

3.29 It was suggested that in favour of short-term stability, the current 27 zones could be secured. It was discussed that this could be achieved either by removing the zoning methodology or adding to the methodology to delay when to apply them. It was discussed that the outcome of the Access and Forward-Looking Charges Significant Code Review[15] could have an impact on zoning in the next few years, so this could provide stability in the short term. This would provide the lowest short-term risk for generators because it would avoid shock changes to TNUoS charges faced by generators switching between zones.

3: Inflating the range in line with RPI

3.30 ESO highlighted that the £1/kW range has not been amended to rise with inflation since it was set in 1992. The proposer believes that solely index-linking the +/-£1/kW range would not prevent the need for a broader review of zones. Analysis by the ESO confirms that a move to +/-£2.25/kW would create 21 zones (see Annex 9 slides 8-9). It was noted that this approach would retain the cost reflectiveness of the baseline approach of placing nodes together in zones based on the cost of those nodes being similar to each other. It was argued by some members that this approach would retain a greater level of cost reflectivity as zones would be able to flex in response to changes in

[15] https://www.ofgem.gov.uk/publications-and-updates/targeted-charging-review-decision-and-impact-assessment

generation and demand on the network. This would also ensure that the level of averaging which would take place in a particular zone would be limited, which would restrict the extent to which generators with lower nodal costs in the zone would subsidise the costs of those with higher costs. This was demonstrated by analysis which calculated the ranges of nodal costs which would occur within each zone using different methodologies (Annex 9). This showed that other potential solutions could contain a wider range of outcomes, particularly in Scotland where the range between highest and lowest nodal charges in a zone could be around £30/kW.

3.31 It was discussed that zones calculated by this method which would only include 1 node could be merged by the effect of a possible minimum-number-of-nodes-per-zone rule. Some suggested there should be at least 3 nodes per zone whereas others suggested 5 nodes per zone would be more appropriate. This could help to achieve more stability and cost reflectivity in zones which would include only 1 node by this method.

A Workgroup member is considering raising a Workgroup Alternative for this potential solution.

Other matters discussed in the context of this modification

How often should rezoning happen?

3.32 It is currently a CUSC requirement that re-zoning is carried out before each transmission price control period.

3.33 The proposer highlighted that the costs of building and maintaining the network change between price control periods. Therefore, the allowed revenue that the ESO can recover will also change, which has an impact on the bills that system users would be liable for, and this includes the proportion of TNUoS paid by generators. It was noted that rezoning ahead of each price period ensures that changes are considered.

3.34 They discussed that rezoning each price control may achieve more cost reflectivity but create more volatility. There was concern that methodology which creates a temporary fix may lead to volatile prices for some each time that methodology is reviewed. Under the Original Solution for CMP324, re-zoning would not be required as the zones would be fixed as GSP groups for generation. There was a view that a flexible method of zoning could be more manageable and stable in the long term as it would ensure that zonal charges were closer to the nodal charges within the zone. There was a concern by some members that if a fixed zone approach was adopted, over time the differential of nodal charges within the zone would become so great they become unsustainable and would give inaccurate locational signals for some sites. This would create pressure to revise the zoning methodology again, which would result in generators seeing a greater step change in prices.

3.35 The workgroup discussed that rezoning between price controls may create a ‘shock’ for generator’s whose charges may change significantly due to moving to a new zone between price controls. The workgroup discussed that this can be avoided by either by fixing the zones (as per the proposal) or by rezoning more frequently so the ‘shock’ is smeared over several years.

Boundary Sharing and Sharing Factors

The ESO shared how boundary sharing works with the current methodology (Annex 7).

3.36 Having discussed the zones, the working group discussed how boundary sharing and sharing factors would be applied. The ESO suggested that an additional method may be to simplify connectivity required to make the TNUoS Transport Model work for zones which have multiple inputs leading to multiple outputs. The Transport Model works on zones having one output for boundary mapping purposes. The ESO put forward a simplified model with each DNO zone only having one input and one output (Annex 8, slides 4-9). It was agreed that for zones with more than one output, the longest route to the demand centre should be the one that is selected, as per the current methodology. In the simplified model, some zones are combined. Workgroup members advised that if there are two inputs to a combined zone, a weighting methodology may be required. This would be to reflect the proportion of energy flowing through to each of the combined zones.

3.37 The ESO stated that the sharing factor calculations in the current methodology would stay the same under the original solution.

3.38 A Workgroup member questioned whether under the Original solution, the use of sharing factors would still be appropriate in the methodology. This is because they had doubts that boundary sharing factors would not be reflective when the GSP groups do not align with potential constraint boundaries. It was suggested that the model could be applied without the sharing elements. Alternatively, it was asserted that the current +- £1/kW zoning methodology does not reflect connectivity either.

3.39 Some workgroup members conveyed that Boundary Sharing by GSP groups may work well for Scotland, where the largest flows between boundaries are. It was raised that the GSP groups do not work as well for zones which have smaller boundaries, but that it is less impactful on these zones.

3.40 The workgroup concluded that the approach to sharing is out of scope of this modification. Within baseline, any change in the definition of zones at each price control would need to be taken account of within the sharing methodology anyway, so this modification is no different in this regard. The ESO was asked to demonstrate how the sharing methodology would accommodate 14 GSP groups and presented to the workgroup how this can be appropriately applied. It was noted that with 14 GSP groups, the zonal sharing approach would work best and most clearly where it was most relevant to reflect low carbon generation in northern zones.

Draft Legal text

3.41 Legal text will be drafted after Workgroup Consultation phase has been completed.

What is the impact of this change?

Who will it impact?

4.0 Generators liable for TNUoS are directly affected by CMP324 and CMP325.

What are the positive impacts?

4.1 Increased stability in zoning should provide better long-term investment signals to generators, potentially improving competition in the wholesale and Contracts for Difference markets.

Proposer's Assessment against Code Objectives

Impact of the modification on the Code objectives:		
Relevant Objective	**Identified impact CMP324**	**Identified impact CMP325**
(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 – increased stability provides better investment signals, longer-term certainty and simplification of the current regime removing a barrier to entry	Positive – this CMP will provide greater long-term certainty to Generator Users through more static zones
(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);	None	None
(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;	None	None
(d) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency. These are defined within the National Grid Electricity Transmission plc Licence under Standard Condition C10, paragraph 1 *; and	None	None

(e) To promote efficiency in the implementation and administration of the CUSC arrangements?	Positive – fixed zones and connectivity map improves transparency and improves efficiency in TNUoS tariff setting and publication processes, as well as simplifying matters on a long term basis.	None (against the baseline however this is incrementally better than CMP324 given it allows a Workgroup to develop multiple solutions).

Workgroup Consultation Question: Do you believe that CMP324 and CMP325 Original proposal better facilitates the Applicable CUSC Objectives?

When will this change take place?

Implementation date:

5.0 The proposer stressed the importance of a decision on any solution by mid-October 2020 to be able to be implemented on 1 April 2021, at the start of the RIIO-2 price control period. This would also be beneficial for the publication of applicable tariffs ahead of the 2021/22 Charging Year.

Implementation approach:

5.1 NGESO are still to complete a full impact assessment of the system changes required for this modification. It is foreseen that there may be potential changes to charging and billing systems.

Workgroup Consultation Question: Do you support the implementation approach?

Standard Workgroup Consultation questions:

1. Do you believe that the CMP324 and CMP325 Original proposals better facilitate the Applicable CUSC Objectives?
2. Do you support the proposed implementation approach?
3. Do you have any other comments?
4. Do you wish to raise a Workgroup Consultation Alternative request for the Workgroup to consider?

Specific Workgroup Consultation questions:

5. What are your views on the potential solutions discussed in the report? Please provide any evidence or rationale for your preferred solution.
6. What are your views on the distributional effects of the potential solutions outlined? Please provide your rationale.

How to respond

The Workgroup is seeking the views of CUSC Users and other interested parties in relation to the issues noted in this document and specifically in response to the questions above.

Please send your response to cusc.team@nationalgrideso.com using the response pro-forma which can be found on the National Grid ESO website via the following link: https://www.nationalgrideso.com/codes/connection-and-use-system-code-cusc/modifications/generation-zones-changes-riio-t2-rezoning

In accordance with Governance Rules if you wish to raise a Workgroup Consultation Alternative Request please fill in the form that can be located at the following link or get in contact with us via email at cusc.team@nationalgrideso.com

https://www.nationalgrideso.com/codes/connection-and-use-system-code-cusc

If you wish to submit a confidential response, please note that information provided in response to this consultation will be published on National Grid ESO's website unless the response is clearly marked "Private & Confidential", we will contact you to establish the extent of the confidentiality. A response marked "Private & Confidential" will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the CUSC Modifications Panel or the industry and may therefore not influence the debate to the same extent as a non-confidential response. Please note an automatic confidentiality disclaimer generated by your IT System will not in itself, mean that your response is treated as if it had been marked "Private and Confidential".

Acronym table and reference material

Acronym	Meaning
CfD	Contracts for Difference
CMP	CUSC Modification Proposal
CUSC	Connection and Use of System Code
DCLF ICRP model	Direct Current Load Flow Investment Cost Related Pricing Model – "Transport Model" for calculating TNUoS tariffs
DNO	Distribution Network Operator
DUoS	Distribution Use of System
ESO	National Grid Electricity System Operator
ETYS	Electricity Ten Year Statement
GSP	Grid Supply Point
HVDC	High Voltage Direct Current
LRMC	Long Running Marginal Cost
MITS	Main Integrated Transmission System
RIIO-T2	Transmission Price Control period
RPI	Retail Price Index
SCR	Significant Code Review
STC	System Operator Transmission Owner Code
TCR	Targeted Charging Review
TNUoS	Transmission Network Use of System
TO	Transmission Owner
WACC	Weighted Average Cost of Capital

Annexes

Annex	Information
Annex 1	CMP324 Proposal Form
Annex 2	CMP325 Proposal Form
Annex 3	Terms of Reference
Annex 4	About the TNUoS Transport Model
Annex 5	ESO Analysis
Annex 6	Workgroup 1 Slides
Annex 7	Workgroup 2 Slides
Annex 8	Workgroup 3 Slides
Annex 9	Workgroup 4 Slides