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| Modification proposal: | **Connection and Use of System Code (CUSC) CMP268: 'Recognition of sharing by Conventional Carbon plant of Not-Shared Year-Round circuits' (CMP268)** | | |
| Decision: | The Authority[1] directs that this modification be made[2] | | |
| Target audience: | National Grid Electricity Transmission PLC (NGET), Parties to the CUSC, the CUSC Panel and other interested parties | | |
| Date of publication: | 15 September 2017 | Implementation date: | 1 April 2018 |

## Background

The ongoing costs of the transmission networks are recovered by Transmission Network Use of System ("TNUoS") charges, which are recovered from generators and demand users. These charges are a combination of forward-looking charges and residual charges. The forward-looking charges are designed to reflect the different costs of demand and generation at various locations on the network and incentivise the efficient use of the system. The residual charges aim to ensure the networks' allowed revenues are recovered from the network users. The forward-looking TNUoS charges for generators are split into two broad categories: Wider[3] Generation charges and Local[4] Generation charges.

As part of the changes brought in by CMP213 (Project TransmiT), the Wider Generation TNUoS charging methodology ("the charging methodology") recognises that different types of generators impose different costs on the transmission network. Post-CMP213, the charging methodology was required to reflect that system investment and operation has to efficiently balance longer-term costs, such as the use of infrastructure investment, with short-term network costs through system operation, such as constraining off[5] generators. It also recognises the costs of meeting the needs of the system under different supply scenarios. This change was seen to provide a better representation of the drivers of transmission investment than the then status quo, because it more closely aligned the charging methodology to the transmission investment decision making criteria[6].

The charging methodology splits the Wider Generation TNUoS tariff into two parts: the "Peak Security" tariff (relating to the costs driven by generators' use of the system at peak times) and the "Year-Round" tariff (relating to the costs driven by use of the network throughout the year). Only "Conventional generators" (dispatchable generation, whether Carbon or Low Carbon) are charged the former but all generators, including "Intermittent" generators (which are not dispatchable and are all Low Carbon), are subject to the latter. How the Year-Round tariff is applied depends on the zone and takes account of the level of diversity between Carbon and Low Carbon generation and the likelihood of coincident running of generators.

[1] References to the "Authority", "Ofgem", "we" and "our" are used interchangeably in this document. The Authority refers to GEMA, the Gas and Electricity Markets Authority. The Office of Gas and Electricity Markets (Ofgem) supports GEMA in its day to day work.
[2] This document is notice of the reasons for this decision as required by section 49A of the Electricity Act 1989.
[3] These reflect the cost associated with the main interconnected transmission system (MITS).
[4] These reflect the cost of local circuits that the generator uses to export onto the MITS.
[5] Constraint costs arise from payments made to generation parties by the System Operator to manage congestion on the system where there is insufficient network capacity.
[6] Investment criteria are set out in the Security and Quality of Supply Standard (SQSS) which sets out technical standards for the investment in the system.



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To achieve the two modelled "backgrounds" used to derive tariffs, the charging methodology splits the network's circuits between the two backgrounds using similar assumptions to those used in the transmission investment planning standards described above. The Year-Round tariff is further broken down into two elements, "Year-Round Shared" element (YRS) and "Year-Round Not-shared" element (YRNS).

The proportion of charges that fall on the YRS and YRNS elements is determined by the proportion of Low Carbon generation in a zone. If the level of low carbon plant in a zone is 50% or less, then the entire Year-Round tariff is shared. Once this percentage exceeds 50%, an increasing proportion is considered to be 'non-shared'.

The YRS element is linked to a generators' load factor and their capacity. The YRNS element is charged on a generator's capacity alone. As a generator's load factor is always less than 100%, applying the load factor reduces the level of the tariff when compared to the capacity alone.

Zones[7] that are dominated by Low Carbon generation (such as Wind or Nuclear generation) have charges that place more emphasis on the generation capacity in the zone than those zones with lower levels of Low Carbon generation. As the proportion of renewables within a zone increases in zones where the proportion of Low Carbon exceeds 50%, , the charging methodology allocates larger proportions of the relevant area's transmission costs on a capacity basis, rather than on a load factor-adjusted capacity basis. In zones where the proportion of Low Carbon is below 50%, increasing the proportion of renewables will result in no change to charges until the share reaches 50%. Until this point, it will remain charged on a load factor-adjusted capacity basis. Figure 1 shows this relationship.

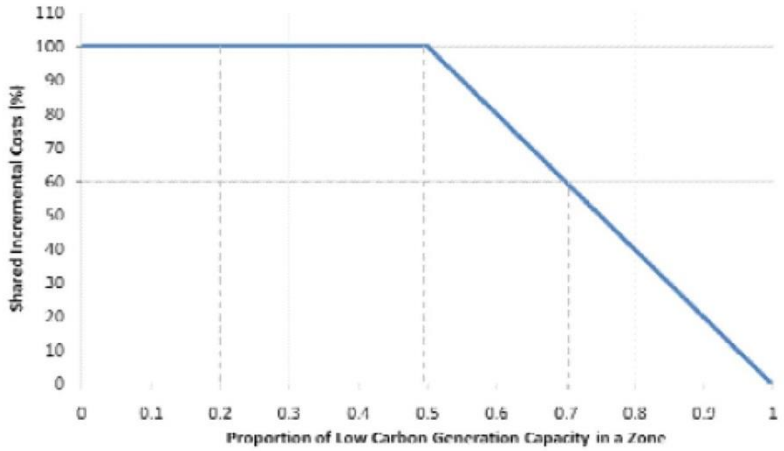


*Figure 1 - CMP213 relationship between diversity and network sharing*

This reflects the evidence produced for the CMP213 Workgroup that shows that in zones dominated by Low Carbon plant, generators are less able to share network capacity, and the total generation capacity in a zone has a larger impact on network costs, both in

[7] For the purpose of simplicity we refer to "zones" here. The methodology looks at proportions of generation behind a boundary. For more information see the CMP213 decision at https://www.ofgem.gov.uk/sites/default/files/docs/2014/07/project_transmit_decision_on_proposals_to_change_the_electricity_transmission_charging_methodology.pdf

terms of investment and constraint costs, than it would do if there was a range of plant types in a zone. In more diverse areas with lower proportions of Low Carbon plant, costs tend to remain in line with an individual generator's load factor (recognised in the methodology as Annual Load Factor ("ALF")).

**The Modification Proposal**

CMP268 proposes to increase the existing number of generator classes from two – Intermittent and Conventional – to three[8]. Under CMP268, the Conventional generator class would be split into two further classes, "Conventional Carbon"[9] and "Conventional Low Carbon"[10]. This would give three generator classes overall: Intermittent, Conventional Carbon and Conventional Low Carbon.

In their rationale for CMP268, the Proposer, SSE ("the Proposer"), suggests that the current system of charging for Conventional generation is not cost-reflective for all the plant it currently applies to. The Proposer therefore proposes splitting the Conventional generator class into two classes - Conventional Carbon and Conventional Low Carbon - which will face different treatment under the charging arrangements. Conventional Carbon are the subset of Conventional generators that are fuelled by fossil fuels and whose running decisions are largely driven by market prices, fuel and emissions costs. This means they are relatively inexpensive to constrain off. In contrast, Low Carbon generation (in the form of Intermittent or Conventional Low Carbon generation) is in general likely to be more expensive to constrain off due to subsidy schemes or technical factors[11].

This proposal reflects the Proposer's argument that the current methodology's use of the YRNS element (where larger proportions of transmission costs are levied on a capacity basis, rather than on load factor-adjusted capacity basis), leads to a level of charges on Conventional Carbon generators which is not cost-reflective.

The Proposer suggests that the existing methodology's shift in charges to capacity in zones dominated by Low Carbon generation should occur only for those generators who have characteristics that lead to higher constraint costs, while charges for those that do not lead to higher constraint costs should remain on a load factor-adjusted capacity basis. Conventional Carbon generators, the Proposer suggests, provide a relatively lower-cost option to manage constraints and are less likely than Conventional Low Carbon plant to have a running profile that coincides with Intermittent plant dispatch. CMP268 will continue to charge Conventional Carbon generators on a load factor-adjusted capacity basis regardless of the proportion of renewable generation in a zone. This is achieved by continuing to scale the YRNS element of the tariff by the generator's annual load factor in the case of Conventional Carbon generators.

The proposer suggests that the current methodology disincentivises the location of dispatchable Conventional Carbon generation in areas dominated by Low Carbon generation where those areas have positive YRNS tariffs[12]. The Proposer considers that

[8] The number of plant types listed in the legal text will change from two to three. No plant currently exist that would be Intermittent but not Low Carbon, so no such category is set out in the methodology.
[9] This is a new category set out by this modification for conventional plant that are not Low Carbon
[10] This is a new category set out by this modification for conventional plant that are Low Carbon
[11] Intermittent generation (such as wind generation), is more expensive to constrain off as this would lead to a loss of revenue from the receipt of volumetric renewable subsidies. Other Conventional Low Carbon generation (such as nuclear power stations) may have a relative lack of flexibility that also leads to higher constraint costs. These characteristics or running profiles lead these generators to have low or negative bid prices in the balancing mechanism, which lead to higher constraint costs.
[12] Currently all zones with negative YRNS tariffs are fully diverse, i.e. none of these zones have a proportion of Low Carbon that exceeds 50%.

this is likely to lead to higher costs and adverse system operation impacts. The Proposer argues that higher costs could create a feedback loop that makes the locating of Conventional Carbon generation prohibitively expensive in a non-cost-reflective manner. The modification proposal suggests that different types of generation, and particularly Intermittent and Conventional Low Carbon plant lead to different network investment needs and so different costs, and aims to better recognise this in the methodology. If such a defect exists and is not addressed, the Proposer considers that it may not be commercially viable for Conventional Carbon plant to operate in areas dominated by Low Carbon generation, which may prevent the necessary flexible capacity locating in the areas where it is needed.

**CUSC Panel[13] recommendation**

At the CUSC Modification Panel meeting on 15 November 2016, the Panel agreed by a majority that the baseline better facilitated the Applicable CUSC Objectives. On the 2 December 2016, we directed that the CMP268 Final Modification Report (FMR) should be revised and resubmitted to us, following further analysis and assessment of the potential impacts.

Following further work by the workgroup, the proposal returned to the CUSC Panel meeting on 4 July 2017. No majority was reached for or against proposal CMP268, with an equal number of votes recorded for and against the proposal. Following resubmission of the revised FMR to us on 4 July 2016, we wrote to the Panel setting out our view that the legal text proposed in the modification report would not be effective in bringing about the change to the charging methodology that is set out in the FMR. We therefore directed that the FMR be revised and resubmitted to us. We noted the requirements we set out in our 2 December 2016 to have been fulfilled, and noted that further analysis and assessment of the impacts had been carried out and properly included in the FMR.

Following this second Authority send back letter, on 14 August 2017, the CUSC Panel agreed the amended legal text. The Panel confirmed that their 4 July 2017 view remained unchanged. The revised FMR was resubmitted to us with the updated legal text on 30 August 2017.

**Our decision**

We have considered the issues raised by the modification proposal and the FMR dated 30 August 2017. We have considered and taken into account the responses to the Code Administrator consultation(s) on the modification proposal which are attached to the FMR[14]. We have concluded that:

1. implementation of the modification proposal will better facilitate the achievement of the relevant charging objectives of the CUSC;[15] and
2. that the proposed modification is consistent with our principal objective and statutory duties.[16]

[13] The CUSC Panel is established and constituted from time to time pursuant to and in accordance with the section 8 of the CUSC.
[14] CUSC modification proposals, modification reports and representations can be viewed on NGET's website at http://www.nationalgrid.com/uk/Electricity/Codes/systemcode/amendments/
[15] As set out in Standard Condition C5(5) of NGET's Transmission Licence, see: https://epr.ofgem.gov.uk//Content/Documents/Electricity%20transmission%20full%20set%20of%20consolidated%20standard%20licence%20conditions%20-%20Current%20Version.pdf
[16] The Authority's statutory duties are wider than matters which the Panel must take into consideration and are detailed mainly in the Electricity Act 1989 as amended.

**Reasons for our decision**

We consider this modification proposal will better facilitate CUSC standard objectives (a) and (b) and has a neutral impact against standard objectives (c), (d) and (e).

In particular, we consider CMP268 to be more cost-reflective than the baseline and agree that the CMP213 analysis supports Conventional Carbon generators having lower impact on constraint costs. We also agree with the principle that Conventional Carbon generators are more likely to avoid coincident running with wind and present a lower cost option to constrain off when coincident running does occur as part of normal commercial operations.

We note that this modification would also reduce payments to Conventional Carbon generators in zones with negative YRNS tariffs. We expect that introducing a charging signal that better reflects the costs that are incurred on the system by certain classes of generation, network users will be better able to make efficient commercial decisions on the use of the network. By improving locational signals in areas dominated by Low Carbon generation, CMP268 is likely to lead to lower network costs by retaining diversity in those zones, which we expect to enhance the ability of the transmission network to incorporate Intermittent generation. This is because there will be less of a signal to close low load factor Carbon Conventional plant in these areas. The tariff impacts from closing Conventional Carbon plant will lead to a more cost reflective changes in network costs on the remaining Conventional Carbon plant in that zone, avoiding further increases in charges.

***(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;***

The Proposer argues that CMP268 better facilitates competition through the removal of a disadvantage faced by Conventional Carbon generators in certain zones, which the Proposer considers is not justified on cost-reflectivity grounds. The Proposer considers that this is preventing a level playing field for existing operators and creates a disincentive to site new generation in certain zones. We note NGET's comments in the FMR that state the current methodology "may be discriminatory in itself" as its solution "does not match the [CMP213] analysis" in treating plant with differential system cost impacts in the same way, and their view that "there is clear evidence to alter the methodology to reflect these differences […] Adjusting the Year Round Not Shared by a Generators [sic] Annual Load Factor achieves this differentiation therefore is better than baseline."

We consider that the addition of Intermittent capacity should not lead to incentives that, in the long term, could lead to lower diversity of generation in zones which we consider likely to lead to an increase in consumer costs. Similarly, the generators in such zones should not face substantially different charges than those in other zones where such differences in charges are not reflective of the additional costs those generators impose on the system.

The FMR notes workgroup discussions on the potential for differential treatment of Intermittent and Conventional Low Carbon generation when compared to Conventional Carbon generation in zones with negative YRNS tariffs. We note that the FMR states no

such Intermittent or Conventional Low Carbon plant exist in these locations at this time, so this is, at this point, a theoretical problem only. The treatment of zones without YRNS tariffs is the same under CMP268 as it is under the current methodology.

We consider a distortion to be evident that is addressed by CMP268 and that affected plant are currently in place. We also consider that there could be the potential for another theoretical distortion that may potentially arise from the treatment of different plant in negative zones, but note that this does not currently exist in practice. We therefore consider that, on balance, the expected improvements in cost-reflectivity and competition in positive YRNS tariff zones to be having a greater impact than a theoretical distortion related to negative YRNS tariff zones. We also consider that it is reasonable that, in zones with negative YRNS tariffs, Conventional Carbon plant with higher load factors are more likely to contribute to reduced costs than those with low load factors, and so the use of ALF is appropriate. We therefore consider that CMP268 is more likely than the existing arrangements to better facilitate objective (a) and improve competition. If further material distortions were to arise or be identified, we would expect these to be considered by industry.

***(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 in accordance with the STC) incurred by transmission licensees in their transmission businesses and which are compatible with standard condition C26 (Requirements of a connect and manage connection);***

The Proposer argues that CMP268 is more cost reflective, as it better reflects the costs of transmission as evidenced by the analysis produced during the CMP213 process. This evidence found that in areas with higher proportions of Intermittent or Conventional Low Carbon plant, the incremental cost impact of plant classed as Conventional Carbon remains broadly proportional to a generator's load factor, in contrast to Intermittent or Conventional Low Carbon plant, which exhibit a greater incremental cost impact. We agree with the principle that this effect is driven by the lower availability of low-cost ("higher bid price") Balancing Mechanism bids that can be used to turn down generators and manage constraints, such as those that would be expected from Conventional Carbon plant. When instead only high-cost ("low or negative bid price") Balancing Mechanism bids are available, the cost of managing constraints is likely to be higher. We also note new analysis presented in the FMR, which was carried out by NGET using their updated market modelling tools, that supports the position that Intermittent plant generally drives substantially higher constraint costs than Conventional Carbon.

While we note views from the workgroup and consultation responses that suggested that Conventional Carbon may display some coincident running with Intermittent generation, we think that on balance, this is less likely to occur due to lower market prices at these times. Where Conventional Carbon generation is brought on by System Operator ("SO") actions, this is not an incremental cost that can be assigned to that generator, and as noted in the FMR, would be operated within the available network capacity. Broadly, Conventional Carbon Generators would be expected to reduce output during periods of high output from Intermittent generation. Generators with higher load factors and a higher likelihood of coincident running will have higher charges, while those with lower load factors will have correspondingly lower charges, and in either case Conventional Carbon are likely to represent relatively lower cost options to relieve constraints. We therefore agree that it would be more cost reflective to account for a Conventional Carbon generator's load factor for their YRNS element. This would act as a proxy for

recognising that Conventional Carbon are less likely to contribute to costs than other plant by being both less likely to run at the same times and more cost-effective to constrain off when they do. We also agree that CMP268 will better reflect the costs imposed by users on the system and ensure that the signals to locate and operate dispatchable plant in Low Carbon dominant areas are cost reflective. We would expect this to lead to lower constraint costs or lower needs for network investment, and so likely to be in the interests of consumers.

We therefore consider that this modification will reflect that Conventional Carbon generators drive costs differently to Intermittent or Conventional Low Carbon generators. In doing so, this modification better facilitates CUSC objective (b) than the existing methodology in place.

**Further Observations**

We note that there were discussions on the application of the CMP268 methodology to zones with negative YRNS tariffs, which included the treatment of parallel zones and the generation of YRNS tariffs in those zones, which are affected by CMP268. We consider that a further potential defect may exist. We consider CMP268 to be more cost-reflective than the current arrangements, regardless of the possibility of any potential additional defects in this area. As we have recently indicated that we are reviewing the forward-looking charging arrangements[17], we encourage any parties considering raising new modifications to discuss these with us.

**Legal text drafting errors**

In making our decision we note that there are errors in the legal text set out in the FMR. In particular:

• In paragraph 14.18.7, the final formula (relating to Conventional Carbon generation) is missing a closing bracket.

It is the licensee's responsibility to ensure that the requirements of the licence are correctly reflected in the code and that typographical errors are not included in legal text. We consider that these errors should be corrected by way of a housekeeping modification as soon as is reasonably practicable.

**Decision notice**

In accordance with Standard Condition C10 of NGET's Transmission Licence, the Authority, hereby directs that modification proposal CMP268: 'Recognition of sharing by Conventional Carbon plant of Not-Shared Year-Round circuits' be made.

**Frances Warburton**
**Partner, Energy Systems**
Signed on behalf of the Authority and authorised for that purpose

[17] https://www.ofgem.gov.uk/publications-and-updates/our-strategy-regulating-future-energy-system