

Modification proposal:	Connection and Use of System Code (CUSC) CMP282: 'The effect Negative Demand has on Zonal Locational Demand Tariffs'		
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:	28 November 2017	Implementation date:	1 April 2018

Background

Generators and demand users pay for the ongoing costs of the transmission network via Transmission Network Use of System (TNUoS) charges. These charges are a combination of cost-reflective charges and residual charges. Cost-reflective TNUoS charges are designed to reflect the different costs of demand and generation at various locations on the transmission network, and to incentivise the efficient use of the system.

Calculation of the cost reflective TNUoS charge is based on the DC Load Flow (DCLF) model, which calculates the marginal costs of investment in the transmission system required as a consequence of an increase in demand or generation at different locations ('nodes') on the network. The signals derived from the model indicate whether adding an increment of generation at a specific location will increase or decrease system flows, and therefore system investment. Nodal signals are grouped into zones to calculate Zonal demand tariffs using the Tariff model³.

The zonal demand tariff for each of the 14 demand zones is based on the locational signal at each node within that zone and the demand at that node. The Tariff model weights the locational signal at each node by the demand, so that locations with comparatively larger amounts of demand or generation have a greater impact on the zonal tariff. This ensures the zonal tariff reflects the locational signal within that zone.

When all demand nodes import power from the transmission system the zonal demand tariff should accurately reflect the underlying locational signals. However, where a demand node is exporting to the transmission system, the tariff calculation can become distorted.

The modification proposal

CMP282 was raised by NGET on 30 June 2017. The modification proposal seeks to ensure that zonal demand tariffs more accurately reflect the underlying locational signals derived by the DCLF model. It seeks to achieve this by addressing a defect in the tariff model calculation, evident where nodes within a demand zone export power at peak.

The defect was identified due to a step change between 2017/18 tariffs and forecast 2018/19 tariffs in the north Scotland demand zone (Zone 1). Under the current charging arrangements, half-hourly (HH) demand tariffs in north Scotland are forecast to increase from £29.01/kW to £52.14/kW and for non half-hourly (NHH) from 10.18p/kWh to

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. This decision is made by or on behalf of GEMA.

² This document is notice of the reasons for this decision as required by section 49A of the Electricity Act 1989.

³ For demand, the residual is then added to these tariffs.

5.64p/kWh between charging years 2017/18 and 2018/19⁴. CMP282 aims to address the tariff model defect ahead of final tariff setting for charging year 2018/19 to ensure that the defect is not carried forward into actual 2018/19 tariffs⁵.

The proposer requested that CMP282 be treated as urgent in order to meet TNUoS tariff setting deadlines. We decided not to grant urgency, as both the urgent and standard timetables presented would enable the modification, if appropriate, to be implemented ahead of the final tariff setting in January 2018⁶.

Summary of the defect

The model defect arises from the mathematical treatment of Embedded Generation (EG) and the demand weighting model calculating the zonal demand tariff. The defect manifests itself when net demand at individual nodes is negative (exporting) while overall zonal demand is positive (importing).

Exporting nodes (or Grid Supply Points (GSPs)), where EG exceeds local demand, are represented as negative demand in the DCLF model. Negative demand impacts the demand weighting average across a zone, and can lead to increases in the locational demand tariff when the underlying locational signals indicate that it should decrease. This could lead to distorted tariffs and creates inefficient investment signals, where locational signals do not accurately reflect the costs imposed on the system.

The defect has become particularly pronounced in the north Scotland demand zone due to an increasing proportion of EG, and, unless addressed, is forecast to have a material impact on tariffs in charging year 2018/19.

CMP282 proposed solution

The CMP282 workgroup have submitted one proposal (the original proposal). In developing this proposal, the workgroup also considered three alternative options. The workgroup ruled out two of these options ('weighted demand' and 'absolute weighted demand') on the basis that they were not cost-reflective solutions to the defect and were seen as manipulating data. The third option ('treat exporting GSPs as generation') was also ruled out by the workgroup on the grounds that data required to 'scale' EG and therefore implement this option was not currently available.

CMP282 proposes to alter the treatment of exporting nodes (where EG exceeds demand) for the purpose of calculating zonal demand tariffs (both HH and NHH). This is achieved by setting negative GSPs to zero within the tariff model, removing them from the demand weighting calculation. This results in the zonal demand tariffs more accurately reflecting the underlying locational signal. The proposed solution will not change the structure of the tariffs or alter how demand is forecast.

As a result of CMP282, tariffs in north Scotland would reduce from £52.14kW to £29.01kW for HH consumers and £10.18kWh to £5.64kWh for NHH consumers, and tariffs in other zones would increase slightly (between £0.25kW and £0.52kW for HH

⁴ Figures used from the Final Modification Report CMP282 The effect Negative Demand has on Zonal Locational Demand Tariffs' <http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/CUSC/Modifications/CMP282/>

⁵ Final Modification Report CMP282: 'The effect Negative Demand has on Zonal Locational Demand Tariffs' <http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/CUSC/Modifications/CMP282/>

⁶ Our decision letter on urgency is here:

<https://www.nationalgrid.com/sites/default/files/documents/CMP282%20urgency%20response%20letter.pdf>

consumers and £0.03kWh and £0.07kWh for NHH consumers). The total amount of TNUoS Allowed Revenue recovered from zonal demand charges by NGET would not change but it would be redistributed across demand zones.

CUSC Panel⁷ recommendation

At the CUSC Panel meeting on 20 October 2017, the Panel unanimously agreed that CMP282 would better facilitate the CUSC objectives and recommended its approval.

Our decision

We have considered the issues raised by the modification proposal and the final Modification Report (FMR) dated 25 October 2017. We have considered and taken into account the responses to the Code Administrator consultation on the modification proposal which are attached to the FMR⁸. We have concluded that:

- implementation of the modification proposal will better facilitate the achievement of the applicable objectives of the CUSC;⁹ and
- directing that the modification be made is consistent with our principal objective and statutory duties.¹⁰

Reasons for our decision

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

In particular, we consider CMP282 to be more cost-reflective than the current methodology and support the implementation of this modification.

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;

If not amended the defect is forecast to distort demand tariffs in zone 1 beginning in 2018/19 based on the information presented in the FMR. It is important to address this to ensure that tariffs more accurately reflect underlying locational signals. Where Demand tariffs do not reflect underlying costs, end users will pay more or less than required (if someone pays more, then someone will pay less). This creates inefficient investment signals which may incentivise adverse behaviour to the investment signal.

EG are paid the HH demand tariff based on their output at Triad. The defect could give a competitive advantage to EG located in demand zone 1 compared to EG located in other demand zones because the tariff of the EG's in other demand zones would be higher as a result of the defect. Similarly, demand users directly-connected to the transmission

⁷ The CUSC Panel is established and constituted from time to time pursuant to and in accordance with section 8 of the CUSC.

⁸ CUSC modification proposals, modification reports and representations can be viewed on NGET's website at <http://www.nationalgrid.com/uk/Electricity/Codes/systemcode/amendments/>

⁹ As set out in Standard Condition C10(1) of the electricity Transmission Licence, see: <https://epr.ofgem.gov.uk/Content/Documents/Electricity%20transmission%20full%20set%20of%20consolidated%20standard%20licence%20conditions%20-%20Current%20Version.pdf>

¹⁰ 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.

system in zones 2-14 who pay the HH demand tariff would be disadvantaged relative to comparable users in other zones, where their tariff is higher as a result of the defect. It is important for competition to ensure that these tariffs are cost reflective so that users of the network are charged fairly, and relative differences between tariffs are accurate.

As CMP282 would ensure that zonal demand tariffs more accurately reflect the underlying locational signals and that differences between signals are more accurately reflected in tariffs than under the existing methodology, our view is that CMP282 would better facilitate this objective.

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);

The primary objective of CMP282 is to ensure zonal demand tariffs more accurately reflect underlying locational signals. By treating negative demand as zero, the signals from the exporting nodes (distortions that are causing tariffs to diverge from the underlying locational signal) are suppressed. This results in a more accurate and cost reflective tariff.

We believe that the implementation of CMP282 will suppress the effects relating to this defect to ensure that more cost reflective locational signals are sent and that the actual costs incurred by the system are more accurately charged. As such we consider the implementation of CMP282 better facilitates this objective.

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;

CMP282 aims to suppress the effects from the defect within the tariff model that has caused the current charging methodology to provide signals that are not reflective of underlying locational signals.

The proposer must ensure that the charging methodology is kept under review to provide accurate tariffs and the implementation of CMP282 will help facilitate this objective.

Further work

We recognise that CMP282 aims to resolve the identified defect and, as set out above, that it better facilitates the CUSC objectives. However, we consider that it may be appropriate for further work to be conducted, to consider the impact of and, if appropriate, address the treatment of exporting GSPs in the charging methodology. We recognise that CMP282 is a pragmatic solution in the near-term and acknowledge the defect needed to be addressed ahead of final tariff setting for 2018/19 when tariffs would otherwise be distorted in the north Scotland demand zone.

However, we believe there is a potentially wider issue regarding the treatment of exporting GSPs. We consider the option explored by the workgroup of treating exporting GSPs as generation should be considered further once the Security and Quality of Supply Standards (SQSS) workgroup regarding the scaling of EG in the DCLF model has concluded.

Decision notice

In accordance with Standard Condition C10 of NGET's Transmission Licence, the Authority, hereby directs that modification proposal 'CMP282: The effect of negative demand on zonal locational demand tariffs' be made.

Chris Brown

Head of Core and Emerging Policy, Energy Systems Integration

Signed on behalf of the Authority and authorised for that purpose