





UNC Modification	At what stage is this document in the process?
<h1>UNC 0636:</h1> <h2>Updating the parameters for the NTS Optional Commodity Charge</h2>	<div style="display: flex; flex-direction: column; gap: 5px;"> <div style="border: 1px solid green; padding: 2px; display: flex; align-items: center; gap: 5px;">01 Modification</div> <div style="border: 1px solid blue; padding: 2px; display: flex; align-items: center; gap: 5px;">02 Workgroup Report</div> <div style="border: 1px solid purple; padding: 2px; display: flex; align-items: center; gap: 5px;">03 Draft Modification Report</div> <div style="border: 1px solid orange; padding: 2px; display: flex; align-items: center; gap: 5px;">04 Final Modification Report</div> </div>
<p><b>Purpose of Modification:</b></p> <p>To update the parameters used in the derivation of the Optional Commodity Charge tariff in order to reduce the current level of effective cross subsidy by gas customers who cannot avail of the Optional Commodity Charge.</p>	
	<p>The Workgroup recommends that this modification should be:</p> <ul style="list-style-type: none"> <li>• considered a material change and not subject to self-governance</li> <li>• <b>proceed to Consultation</b></li> </ul> <p>The Panel will consider this Workgroup Report on <b>18 January 2018</b>. The Panel will consider the recommendations and determine the appropriate next steps.</p>
	<p><b>High Impact:</b></p> <p>Users opting for the Optional Commodity Charge could expect an increase in the tariff. Note that it is expected that the tariff would still be available as an option to avoid inefficient bypass of the NTS.</p> <p>The Standard Commodity tariff would be consequentially reduced.</p>
	<p><b>Medium Impact:</b></p>
	<p><b>Low Impact:</b></p>

Contents	
1 Summary	3
2 Governance	4
3 Why Change?	4
4 Code Specific Matters	45
5 Solution	75
6 Impacts & Other Considerations	76
7 Relevant Objectives	2320
8 Implementation	2522
9 Legal Text	2522
10 Recommendations	2522
Timetable	
<b>Modification timetable:</b>	
Initial consideration by Workgroup	06 November 2017
Workgroup Report presented to Panel	18 January 2018
Draft Modification Report issued for consultation	19 January 2018
Consultation Close-out for representations	08 February 2018
Final Modification Report available for Panel	12 February 2018
Modification Panel decision	15 February 2018

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## 1 Summary

### What

The NTS Optional Commodity Charge (OCC) was introduced in 1998 and the tariff has not been updated for nearly 20 years. Therefore, it is proposed that the parameters within the NTS OCC formula need to be updated to be more reflective of the current costs and pipeline utilisation.

### Why

The OCC was introduced in 1998 with the express intention of providing a mitigating option for shippers seeking short distance transportation, and was justified on the basis of avoiding inefficient bypass of the NTS. Given that the tariff has not been updated in nearly 20 years whilst standard commodity charges have risen significantly over the same period, the OCC has become a very attractive option even for exit points that are increasingly distant from an associated entry point.

National Grid NTS have advised the NTSCMF1 that Users opting to avail of the OCC during the current Gas Year (17/18) will pay an estimated £48.5 million in optional commodity charges but, in doing so, will avoid paying nearly £195 million in standard commodity charges. This represents a potential cross-subsidy to those OCC Users of about £146 million per annum at the expense of those sites which are unable to benefit from the option of the OCC.

### How

It is therefore proposed to give effect to this modification by way of two changes to the UNC TPD, Section Y paragraph 3.5 "NTS Optional Commodity Rate".

1. Replace the current formula with that proposed in 2015 as Option 2 by National Grid in its discussion document NTS GCD11<sup>2</sup>.
2. Adjust the assumed capacity of the alternative by-pass pipeline against which the OCC charges are calculated. Specifically replace the MNEPOR in the current formula with the average daily flow at the exit point from the previous Gas Year divided by 75%.

It is proposed that the changes arising from this code modification be implemented by 01 April 2018 thereby saving up to £220<sup>3</sup> million in cross subsidies relative to the base case of waiting until October 2019<sup>4</sup>.

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<sup>1</sup> NTSCMF 26 September 2017

<sup>2</sup> <http://www2.nationalgrid.com/UK/Industry-information/System-charges/Gas-transmission/Charging-methodology/Gas-Charging-Discussion-papers/>

<sup>3</sup> This value assumes an equal load profile throughout the Gas Year.

<sup>4</sup> It is anticipated that Modification Proposal 0621 will propose changes to the Optional Commodity tariff for implementation from October 2019 for compliance with the EU Tariff Code.

## 2 Governance

### Justification for Authority Direction

National Grid NTS have advised the NTSCMF<sup>5</sup> that Users opting to avail of the OCC during the current Gas Year (17/18) will pay an estimated £48.5 million in optional commodity charges but, in doing so, will avoid paying nearly £195 million in standard commodity charges. This represents a potential cross-subsidy to those OCC Users of about £146 million per annum at the expense of those sites which are unable to benefit from the option of the OCC. It is proposed that the changes arising from this code modification be implemented by 1 April 2018 thereby saving up to £220<sup>6</sup> million in cross subsidies relative to the base case of waiting until October 2019<sup>7</sup>.

This Modification should be considered likely to have a material on competition in, or commercial activities related to, the shipping, transportation or supply of gas. It therefore should be sent to the Authority for decision.

### Requested Next Steps

This modification should:

- be considered a material change and not subject to self-governance; and
- proceed to Consultation

Workgroup participants agreed that the report was suitable for consultation and direction by the Authority.

## 3 Why Change?

The parameters within the NTS Optional Commodity Charge (OCC) formula need to be updated to be more reflective of the current costs and pipeline utilisation.

The OCC is available as an alternative (instead of the Standard Commodity Charges) to Users nominating a "point to point" path for transportation from an NTS entry point to an NTS offtake point. If a User elects for the OCC, all NTS Entry and Exit (SO & TO) Commodity Charges are avoided. The NTS OCC is derived from the estimated cost of laying and operating a dedicated pipeline of NTS specification. This is defined in UNC TPD Section Y. The OCC was introduced in 1998 with the express intention of providing a mitigating option for shippers seeking short distance transportation, and was justified on the basis of avoiding inefficient bypass of the NTS. Given that the tariff has not been updated in nearly 20 years whilst standard commodity charges have risen significantly over the same period, the OCC has become a very attractive option even for exit points that are increasingly distant from an associated entry point. The parameters on which the OCC tariff is predicated are no longer considered to be appropriate as

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<sup>5</sup> NTSCMF 26 September 2017

<sup>6</sup> This value assumes an equal load profile throughout the Gas Year.

<sup>7</sup> It is anticipated that Modification 0621 will propose changes to the Optional Commodity tariff for implementation from October 2019 for compliance with the EU Tariff Code.

1. The formula used to calculate the current Optional Commodity rates uses the costs of building and operating a dedicated pipeline at the time of introduction in 1998<sup>8</sup> and has not been amended since. The Transco Consultation Report on PC9A (December 1997) provided the opportunity to update the costs although this has, so far, not been effected.<sup>9</sup> National Grid sought to update the cost inputs in 2015. While Code Modification 0563S facilitated the inclusion of the formula into the UNC TPD, Section Y from the NTS Transportation Statement, the update to the original OCC formula is still outstanding as National Grid decided to wait until there was more clarity on the EU Tariff Code rather than any suggestion that it was inappropriate to update the charging formula.
2. Load factors at exit points are very low in relation to the design capacity assumption embedded within the OCC charge – nowhere near the 75% assumption, meaning that the OCC is too low. National Grid NTS advised at a recent NTSCMF (17 July) that the average load factor of short-hauled gas has declined to about 20% during the 16/17 Gas Year.

National Grid NTS have advised the NTSCMF<sup>10</sup> that Users opting to avail of the OCC during the current Gas Year (17/18) will pay an estimated £48.5 million in optional commodity charges but, in doing so, will avoid paying nearly £195 million in standard commodity charges. This represents a potential cross-subsidy to those OCC Users of about £146 million per annum at the expense of those sites which are unable to benefit from the option of the OCC.

1. Users opting for the OCC during the current Gas Year will pay an estimated £48.5 million in optional commodity charges but, in doing so, will avoid paying nearly £195 million in standard commodity charges. This represents a potential cross-subsidy to those OCC Users of about £146 million per annum at the expense of those sites unable to benefit from the option of the OCC.
2. The proposal requires a change to the charging methodology contained within Section Y of the UNC and Section B3.12.10 (b).
3. If the change is not made there will be up to £220 million in cross subsidies by Users unable to benefit from the OCC (largely within the Distribution Networks) in the interim period between April 2018 and October 2019 before Modification 0621 could be expected to address the issue.

The proposer is aware that National Grid is planning to address this cross-subsidisation from October 2019 as part of Modification 0621 but is concerned that this will not address the on-going cross-subsidisation in the interim. The proposer doesn't wish to burden National Grid unduly in the administration of an amended OCC and also appreciates the need to develop a fairly simple solution that can be implemented relatively quickly and which will materially address the cross-subsidisation in the

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<sup>8</sup> Using 1997 construction and operational costs, annuitized over a ten year project life using a 10% project discount rate.

<sup>9</sup>

**Secondly, in the interests of keeping the level of the tariff in line with current pipeline costs, we propose that the function should be reviewed at the same time as the annual review of general transportation charges, and updated in line with a suitable escalator.**

<sup>10</sup> NTSCMF 26 September 2017

period to October 2019. Use of "Option 2" as proposed by National Grid in its discussion document NTS GCD11<sup>11</sup>.

1. This Modification is seeking to use pipes that are more reflective of those that may be built as alternatives to the NTS and to use more up-to-date costs that would be more cost reflective.
2. This proposal proposes the use of Option 2 as detailed by National Grid in 2015 in its discussion document NTS GCD11. In summary, this option retains the underlying assumptions of the current OCC charge and maintains the same structure in the formula. The update inflates the current portfolio of unit costs using publicly available indices and also adds in those larger pipe sizes for which National Grid received target efficient unit costs. The application of a combination of steel and RPI indices are applied so as to result in a consistent set of cost data. The topic was discussed during NTSCMF meetings leading up to the GCD11 paper and has been further discussed as part of the wider charging review in 2017. Alternative cost data for pipe building has been requested as part of both these processes. The response has been limited potentially because of commercial confidentiality. The data underlying Option 2 therefore represents a pragmatic estimate to facilitate the calculation of an OCC rate that could be applied across all distances and load sizes.
3. The following is an extract from NTS GCD11 listing the steps NG used in the derivation of the original "short-haul" tariff and their review as detailed in NTS GCD11.

The NTS Optional Commodity charge function was produced using the following steps:

- a) Uses a pipeline portfolio that, through using flow rates and distances, allocates a specific pipe size from the portfolio to a certain distance and flow rate combination;
- b) Produce a cost for each distance/flow rate combination by using a fixed element, relating only to the pipe diameter (this can be thought of as the "connection cost" to the NTS) and a distance related (cost per km) element which applies to a range of pipe diameters;
- c) Produce an annual capital cost based on an annuity period of 10 years;
- d) Produce commoditised unit costs (in terms of p/kWh) determined assuming a standard 75% load factor.
- e) Measure the average p/kWh using a comparison between the costs at 0km and 50km.

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<sup>11</sup> <http://www2.nationalgrid.com/UK/Industry-information/System-charges/Gas-transmission/Charging-methodology/Gas-Charging-Discussion-papers/>

## 4 Code Specific Matters

### Reference Documents

The Statement of Gas Transmission Transportation Charges  
<https://www.gasgovernance.co.uk/sites/default/files/ggf/book/2017-09/Transportation%20statement%20October%2017%20.pdf>

### Knowledge/Skills

Understanding of the NTS charging methodology in respect of the Optional Commodity Charge.

## 5 Solution

The proposal requires a change to the charging methodology contained within Section Y (3.5 NTS Optional Commodity Rate) and Section B3.12.10(b) of the UNC.

The parameters of the NTS Optional Commodity charge formula are derived from flow rates, pipeline distances and underlying costs. The current formula is as follows:

$$p/kWh = 1203 \times M^{-0.834} \times D + 363 \times M^{-0.654}$$

Where:

D is the direct distance of the site or non-National Grid NTS Pipeline to the elected Entry Terminal

M is the Maximum NTS Exit Point Offtake Rate (MNEPOR) at the site, converted into kWh/day

^ means 'to the power of..'

The proposed formula is as follows:

$$p/kWh = 1247 \times M^{-0.78} \times D + 1422 \times M^{-0.708}$$

Where:

D is the direct distance of the site or non-National Grid NTS Pipeline to the elected Entry Terminal

M is the aggregate of the allocated daily energy in kWh/day at the exit point from the previous Gas Year divided by the number of days in the previous Gas Year and further divided by 75% except:

(i) where the site is new and hence there is no flow history, retain the existing formula for M of 24 times the Maximum NTS Exit Point Offtake Rate

(ii) for an NTS Exit Point in respect of a pipeline interconnector having no physical exit capability, M is the aggregate of the allocated daily energy in kWh/day from the previous Gas Year divided by the number of days in the Gas Year and further divided by 75% to the NTS at the System Entry Point associated with such Connected Delivery Facility.

^ means 'to the power of..'

The update to the parameters would be effective for all sites availing of the OCC from the time of implementation of the Mod and no further updates are envisaged prior to October 2019.

Thereafter, an annual process would update M each April commencing April 2019 for effect from the following October in the event that this Mod is not superseded by code changes necessary for EU TAR compliance.

For the avoidance of doubt:

- (i) At the time of calculation of the charge rates (which will be subject to the 2 months' notice of charges), the average aggregate allocated daily energy will take the latest gas year for which data is available – For example implementation anytime between 1 April and 1 October 18 will use data from the Gas Year October 16 to September 17.
- (ii)  $M = (\sum E) / N \times 100 / 75$  where E is the allocated daily energy for each day of the relevant Gas Year at the exit point and N is the number of days in the relevant Gas Year
- (iii) The 75% divisor converts an annual daily load to a notional peak day load which determines an appropriate pipe building cost estimate which is then used to derive the unit rate. The value of 75% is consistent with the assumption embedded in the current OCC formula.
- (iv) A new site ceases to be new if at the annual update it has at least a full Gas Year's allocation history (even though some allocations could be zero)
- (v) M for a seasonal site will have its value calculated in the same way as a non-seasonal site and zero allocation values will be included in the calculation of  $\sum E$ .

## 6 Impacts & Other Considerations

### Does this modification impact a Significant Code Review (SCR) or other significant industry change projects, if so, how?

There is no impact on an SCR. The proposer believes there is no impact on the current charging review that is due for implementation in 2019 for compliance with the EU Tariff Code.

### Consumer Impacts

The following is a summary of the workgroup assessment and it is included here to complete this consumer impacts section. The reader is recommended to read the assessment for full details of the analysis conducted and views of the workgroup.

<u>0636-1206</u>	<u>18/12/17</u>	<u>MH will confirm the National Grid NTS view on cross-subsidy and confirm what the current regime is with regards to cross-subsidy or re-distribution of costs.</u>	<u>National Grid NTS (MH)</u>	<u>Pending</u>
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~~If implemented, the modification will lead to a redistribution of transportation costs among the shippers.~~

~~The proposer stated that the information provided during the development of Modification 0621 (raised by National Grid NTS) included an analysis of the level of the cross-subsidy arising through the current OCC. The Proposer has requested that NG clarifies whether it sees this redistribution of collected revenue as a potential cross-subsidy.~~

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National Grid NTS has provided some data on the current OCC rates and those anticipated under the Mod 0636 Proposal. The Proposer has analysed this data to determine the impacts, including those on consumers. Since the Standard Commodity charges are estimated to fall by 15% it is expected that consumers within the distribution networks and sites directly connected to the NTS which are currently not availing of the OCC will see corresponding reductions in charges in due course (assuming flows on the system do not change).

Some workgroup members felt that the increased OCC could put some of those customers out of business and/or if demand fell on the Interconnection Points because the price is too high, increased costs could be picked up by consumers.

The Proposer highlighted that no specific detail has been provided to support the risks highlighted by these workgroup members. As the OCC rate will still be available and still at a very attractive price as compared to the Standard Commodity charges the Proposer believes that there will be limited effects in terms of possible changes in flow levels.

Some Workgroup members also felt the proposed timeframe for the adoption of this Modification means that the overall impact on key end users may not have been subjected to an adequate Cost-Benefit Analysis (or those end users having time to assess the impact of the Modification on how they operate).

<a href="#"><u>0636-1205</u></a>	<a href="#"><u>18/12/17</u></a>		<a href="#"><u>SH will confirm if the Impact on consumers should include Northern Ireland</u></a>	<a href="#"><u>Ofgem (SH)</u></a>	<a href="#"><u>Pending</u></a>
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The Proposer believes the timeframe for this Modification allows for indicative and actual charges to be provided with the usual Licence notice periods of 5 and 2 months respectively. The actual date of implementation would also be determined by Ofgem following the UNC Consultation.

<a href="#"><u>0636-1204</u></a>	<a href="#"><u>18/12/17</u></a>		<a href="#"><u>DH to update the Consumer Impact Assessment table and provide the text to be included.</u></a>	<a href="#"><u>Proposer HK/DH</u></a>	<a href="#"><u>Pending</u></a>
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### Consumer Impact Assessment

*(Workgroup assessment of proposer initial view or subsequent information)*

Criteria	Extent of Impact
Which Consumer groups are affected?	Customers connected to the NTS or Distribution Networks that are currently incurring charges based on the standard commodity rates.

What costs or benefits will pass through to them?	The load analysis conducted suggests the following potential savings (approx.) could be passed on to customers through a 15% reduction in the standard Commodity charge (per annum): <ul style="list-style-type: none"> <li>• Domestic Consumers - £1 to <del>£23</del></li> <li>• Small non-domestic Consumers - <del>£110</del></li> <li>• Large non-domestic Consumers - £40 to £4K</li> <li>• Very Large Consumers - £40K to £160K</li> </ul>
When will these costs/benefits impact upon consumers?	<del>The Above</del> benefits could be seen from the date the new commodity rates are applied <u>on an annual basis</u> (assuming these are passed on at the same time to consumers) <u>and until October 2019</u> (assuming further changes are made at this point in time by Modification 0621).
Are there any other Consumer Impacts?	See above concerns about the potential impacts of increasing the OCC.
<b>General Market Assumptions as at December 2016 (to underpin the Costs analysis)</b>	
Number of Domestic consumers	21 million
Number of non-domestic consumers <73,200 kWh/annum	500,000
Number of consumers between 73,200 and 732,000 kWh/annum	250,000
Number of very large consumers >732,000 kWh/annum	26,000

### Cross Code Impacts

There is no impact expected.

### EU Code Impacts

None – this change is for the interim period until the charging review is implemented in 2019 for compliance with the EU Tariff Network Code. The proposer anticipates that the wider charging review will include a more comprehensive update of the OCC.

However, should the OCC remain unchanged as part of the charging methodology under the Modification 621 Proposal, compliance with the TAR Code will need to be checked. The interactions between Modifications 0636 and 0621 are covered further in the workgroup assessment section of this report.

### Central Systems Impacts

See section 6 assessment of implementation costs.

### Workgroup Impact Assessment

#### Summary of Workgroup Impact Assessment

The Workgroup sought clarification of several matters referred from Panel, identified within initial representations (submitted by Gazprom, Petronas and Energy UK) and relating to this change proposal. These can be summarised as below:

- Understanding the objective
- Consider the links, relationship and impacts with the relevant elements of modification 0621 – Amendments to Gas Transmission Charging Regime.

- Assessment of alternative means to achieve objective
- Development of Solution (including business rules if appropriate)
- Assessment of potential impacts of the modification
- Assessment of implementation costs
- Assessment of legal text.

The workgroup assessment considers each of the above points in turn.

## 1. Understanding the objective

### Background and context around GCD11

In July 2015, National Grid NTS published an NTS Gas Charging Discussion Document “NTS GCD11 - Updating the Cost Inputs to the NTS Optional Commodity Charge Function” (GCD11) and the document can be found in Appendix 1 of this report. GCD11 set out for discussion options for updating The Statement of Gas Transmission Transportation Charges, in respect of the NTS Optional Commodity charge (known as the NTS “Shorthaul” rate). The table below includes details of the 2 options.

Options	Option Details
<b>Option One</b>	Using pipe sizes and unit costs that were provided under the RIIO-GT1 Price Control.
<b>Option Two</b>	Updating the current portfolio of unit costs using publicly available indices and including the pipe sizes and unit costs that were provided for under the RIIO-GT1 Price Control.

The intention was to update the cost inputs and consequently the NTS Optional Commodity charge rate. It was highlighted that all NTS Optional Commodity rates would change as a result of updating the formula and they will apply to all those shippers currently on or who may request the NTS Optional Commodity charge in the future.

The NTS Optional Commodity charging product was introduced in 1998 to seek to avoid inefficient by-pass of the NTS by large sites located near to entry terminals. As the charge is an alternative to investment, the formula to calculate individual NTS Optional Commodity charge rates is derived from an estimated cost of laying and operating a dedicated pipeline of NTS specification (i.e. the estimated cost of by-passing the NTS). Shippers can elect to pay the NTS Optional Commodity charge as an alternative to the NTS SO and TO, Entry and Exit Commodity charges.

Since its introduction in 1998 the function used to calculate the Optional Commodity rates has not been amended and so is based on the costs used in 1998. National Grid’s view at the time was that a review of the cost inputs to the NTS Optional Commodity charge function was required.

In December 2015, National Grid NTS published “NTS GCD11R - Updating the Cost Inputs to the NTS Optional Commodity Charge Function” (GCD11R). A copy of GCD11R can be found in Appendix 2 to this workgroup report. National Grid NTS decided not to proceed with either of the proposed options given under NTS GCD11, to allow the UNC Modification process for UNC 0563S<sup>12</sup> to conclude before

<sup>12</sup> UNC Modification 0563S – Moving the NTS Optional Commodity Charge Formula into the UNC (UNC 0563S) was subsequently implemented in January 2016 and moved the existing NTS Optional Commodity charge formula which is specified in the NTS Transportation Charging Statement (The

making any further proposals for potential changes to the NTS Optional Commodity charge, which could include any EU TAR NC / GTCR impacts or issues.

Governance around the current methodology for the OCC

Currently there is no detailed methodology to describe how the NTS Optional Commodity Charge Formula is derived within the UNC. However, it is contained in Charging methodology documentation which preceded the inclusion of Section Y within the UNC. The Proposer believes that this Modification contains sufficient information to support the revised formula. Note: that the existing formula was included in the UNC as a result of Mod 0563S and was considered robust enough to justify the underlying methodology.

Notwithstanding the above, some workgroup members felt that a standalone methodology was required in the UNC to help Shippers understand how the NTS Optional Commodity Charge Formula is derived.

Issues with GCD11 incl. GCD11 Formula not subject to full stakeholder review

Some workgroup members were concerned that the GCD11 Formula was not subject to a full stakeholder review. The spreadsheet provided to help industry to understand the derivation of the formula was only published after consultation on GCD11 had closed and includes dummy values.

<u>0636-1207</u>	<u>18/12/17</u>		<u>DH to look at the section Y (DN Entry) and the description of formula to see if there can be anything added that will aid the approval from the Workgroup to be able to move forward. To provide some additional detail.</u>	<u>Proposer HK/DH</u>	<u>Pending</u>
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The proposer has undertaken a thorough review of the spreadsheet provided to support the current underlying methodology and believes it is robust. This spreadsheet is available [insert JO website link on page for Mod 0636]. In addition, Appendix 5 [x] provides a summary of the steps in the process in a more compact form to aid understanding of the methodology.

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For sensitivity and transparency of the National Grid cost information, see below ~~in regard to~~ regarding pipeline costs. The proposer indicated that for the formula to remain credible it must be updated and believes NG have used the best available data in GCD11. Appendix 3 provides a comparison of pipeline construction costs provided during the Modification 0621 Workgroup meetings as part of the recent and ongoing charging review. Also, as part of the review for Modification 0621 stakeholders have been asked to provide cost data and views on cost inputs for the OCC. Those views that have been provided to date are consistent with GCD11 outcomes.

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Statement of Gas Transmission Transportation Charges) into TPD Section Y (Charging Methodologies) of the UNC.

Pipeline Sizes: Inclusion of larger and smaller sizes

The current NTS Optional Commodity Charge calculation used in determining the formula, was completed based on the pipe sizes available and utilised in 1998 (specific flow rates and diameters are allocated to a specific pipeline size).

Maximum flow in the 1998 formula was 15 mcmd and maximum distance was 50 km. Small pipes were necessary for shorter distances and lower flows. Large pipes are necessary to cater for unlimited distance and 60 mcmd flows. The table below shows the current and proposed portfolio of pipe sizes.

1998 – Original Portfolio (Current)	GCD11 Option Two (proposed)
50 mm	50 mm
100 mm	100 mm
150 mm	150 mm
200 mm	200 mm
300 mm	300 mm
450 mm	450 mm
600 mm	600 mm
	610 mm
	915 mm
	1220 mm <sup>13</sup>

GCD11 highlighted that option 2 reflects the pipes NTS or providers of by-pass pipes would have to construct and these have changed significantly from those anticipated in 1998 as take-up of the OCC has increased.

<u>0636-1208</u>	<u>18/12/17</u>	<u>MH to provide further justification on the pipeline size suggestions that were used as part of Option 2 (GCD11).</u>	<u>National Grid NTS (MH)</u>	<u>Pending</u>
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Some workgroup members felt the costs for pipeline diameters are included when these are far beyond the pipe size that would be required for most sites (CCGT) that would consider by-pass. A 600mm pipe would be more than sufficient for a 2GWe CCGT.

The proposer believes that the pipeline data set used in the regression analysis should be consistent with the range over which the formula is applicable and National Grid NTS confirmed that the pipe sizes were approved as part of RIIO T1.

<sup>13</sup> Although this pipe size is one of the three pipe sizes where costs have been approved as part of the RIIO Price Control and included in Option 2 it is in fact not actually used in the derivation of the formula as it is too large for the assumed maximum flow rate and distance of 50km.

~~Otherwise it would be appropriate to consider restrictions to the pipe size and distance over which users could elect for the OCC. The current methodology does not incorporate any such restrictions, which might be deemed discriminatory, and maintains the credibility of the formula and its application.~~

An Initial Rep asked the Transparency of Maximum NTS Exit Point Offtake Rate (MNEPOR) values need to be considered?

The Proposer believes there is no lack of transparency, although National Grid NTS do not publish MNEPOR values per site, they are available to the specific Shipper or DN.

### Cost Data

Actual values for costings of three pipe-sizes in GCD11 are commercially sensitive and therefore dummy values are in the Excel spreadsheet supporting GCD11. The consequences of this are that the formula used does not match exactly that derived in the spreadsheet. However, the individual steps in the process are well documented and National Grid NTS are able to share the commercially sensitive material with Ofgem if required.

#### a) Use of Steel Index and RPI

The three Initial Reps sought for further clarification on the use of the Steel Index (a major cost component of pipelines) and RPI.

The GCD11 report indicates that the steel index is only used to uplift costs from 1998 to 2009/10 and this is consistent with the National Grid Price Control RIIO-GT1. From 2009/10 to 2015/16 RPI has been used similarly for consistency with the RIIO-GT1 approach. In the absence of recent real cost data, the Proposer believes this is a pragmatic way to update the costs.

Note: allowed revenues increase with indices derived from the price control. Standard commodity rates increase (assuming stable flows). Shortfalls in capacity revenues are also recovered by standard commodity charges.

#### b) Cost of Building Pipeline

The workgroup asked if the proposed charge still an appropriate alternative to investment?

The proposer believes the answer is yes but highlighted that there is no long term commitment in terms of recoverable revenue and routes can be switched with a very short notice period. The proposer was also not aware of any Users considering building a by-pass pipe and encouraged any that were to provide the details to National Grid or Ofgem (if details are confidential and could not be provided within this Workgroup Report).

The proposer indicated that the OCC charge should be sufficient to prevent a real threat of by-pass but not so low as to raise accusations of predatory pricing and highlighted that Tranco commented on this in the PC9a Consultation Report at the time of introduction of the OCC:

- *"We recognise that, depending on economic circumstances, bypasses may still occur. Indeed if we were to set prices on an individual site basis to prevent all bypasses we might be accused of predatory pricing. The intention of this tariff is to offer an alternative commodity charge which is more cost-reflective than the current NTS charge and can be assessed alongside other options available to users.*
- *The level of the tariff also reflects the benefits of being connected to the NTS, which users will wish to consider when deciding which option to pursue. Users may of course choose to accept an interruptible supply and hence avoid incurring exit capacity charges."*

## 2. Consider the links, relationship and impacts with the relevant elements of modification 0621 – Amendments to Gas Transmission Charging Regime.

Modification 0636 is intended to be an interim step forward in the period prior to October 2019, as it will update the underlying costs to 2015. There will be no restriction in terms of distance and eligibility for the OCC. It will continue to be an optional replacement for both the TO and SO standard commodity charges.

National Grid NTS have confirmed that Modification 0621 will update whatever code is in place at the time. Therefore Modification 0621 is not constrained by Modification 0636 but if Modification 0621 does not propose changes to the OCC, the updated formula will continue to operate at the same levels introduced by 0636.

It was expected that Modification 0621 will reflect updated underlying costs for the OCC. It is also anticipated that there will be a distance restriction of [50] Km for eligibility for the OCC. However, it is currently (January 2018) uncertain as to what will be proposed in Modification 0621 with regards to the OCC.

## 3. Assessment of alternative means to achieve objective

Some Workgroup members felt the current formula for deriving the OCC should remain in place for existing off-takes utilising short-haul; shippers and consumers should not be penalised for having made historical decisions to use the OCC rather than invest in alternative transportation arrangements at historical cost levels.

The proposer believes this would not achieve the objective. There has been no commitment made by Users of the OCC tariff to contribute a level of revenue consistent with the costs of building such alternative pipelines. Analysis of the likely contributions made by OCC users has been provided during recent meetings of NTSCMF which highlights the relatively low contribution to revenue made by OCC users. [Appendix 4Z is an extract from a document provided to the NTSCMF which estimates that sites using the OCC pay around 10% of the annuitised capital and operating costs. This is less than 50% of what it would cost just to operate the by-pass pipelines.](#) The introduction of revenue commitments is something that could be considered within the Modification 0621 proposals but is not part of this current 0636 proposal.

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## 4. Development of Solution (including business rules if appropriate)

The Proposer has undertaken minor development to improve the clarity of the solution during the Workgroup and subsequently following meetings with National Grid NTS and Xoserve. The Amended Modification incorporates the minor clarifications that were necessary.

## 5. Assessment of potential impacts of the modification

### Interim changes

Some members of the workgroup highlighted that parties thought OCC would be static until October 2019 as GCD11R indicated that any proposal could consider the EU TAR Network Code and this is due to take effect from this date. Any changes before then could have an impact on investment.

In response, the proposer highlighted that Standard Commodity charges change at least twice a year and capacity charges change on an annual basis. There are many considerations for investment decision making which typically have long lead times and necessarily include suitable scenario analyses. The Workgroup has not been made aware of any current investment decisions that would be impacted in the period prior to 2019.

On the subject of Interconnectors, one Workgroup member stated that the current formula has no benefits for IPs from 2019 because of provisions of the EU tariff code which meant funding needed to be recovered by capacity charges and not commodity charges at IPs. Discrimination issues were raised and CH is to provide detail for the Workgroup Report on the impacts to the EU Tariff code? One Workgroup member also suggested that when considering the merits of the modification proposal, the EU gas network access regulations should be taken into account, which stipulate that 'tariffs shall neither restrict market liquidity nor distort trade across borders of different transmission systems'.

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<u>0636-1203</u>	<u>07/12/17</u>	<u>2.1</u>	<u>CSy to summarise the point being made regarding Network access regulations and forward it in for the Workgroup Report.</u>	<u>Shell</u>	<u>Carried Forward</u>
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This proposal is for the interim period until 2019. The proposer anticipates that when Modification 0621 is will expected to also address the OCC but. The Proposer has stated and National Grid has confirmed that the Mod 636 proposal will continue to work post 2019 should at the time of writing this report the content of Modification -0621 was still being developed not supersede it. The OCC rate under Modification 0636 will remain available as an alternative to any standard commodity charges in effect at the time. Post 2019, there will remain a "non-transmission services" commodity charge applicable at IPs of a similar magnitude to the SO commodity.

#### Determination of cost recovery redistributed to Non-OCC Users from OCC Users [cross-subsidy]

Current OCC rates are significantly below the costs of building the required pipeline. Some workgroup members felt that the current OCC arrangements had led to a two tier system. The choice of OCC is not available for most DN connected load since the commodity charge is applied at Supply Point level rather than the DN offtake. However, there is no difference in the NTS service (covered by Commodity Charges) at the DN Offtake as compared to NTS Direct Connects.

If true costs of pipe-building were known then a more accurate value for the level of redistributed costs to Non-OCC Users from OCC Users could be determined but it is unlikely parties will share information about potential investment decisions.

#### Analysis of OCC utilisation and OCC rates

The proposer has undertaken analysis based on data on provided by National Grid NTS with regard to OCC utilisation and OCC rates (as calculated under the Mod 0636 proposal) for comparison with the standard commodity rates. Points to note about the following analysis are as follows:



- Current OCC rates are used in the analysis but are anonymised
- Historic exit flows have been used for Gas Year 2015/6 for "M"
- Average 17/18 commodity rates, flows and revenues and the short-haul data (volumes and revenues) are as included in the October Final charge setting process.

a) [Impact on number of sites and distances](#)

The analysis confirms that there are currently 49 sites (including interconnectors) where the OCC is being utilised. The analysis conducted implies that this would reduce to 27 (or less) if Users choose the cheapest option under Modification 0636.

The average distance for OCC routes is at present 89km with a maximum distance of 274 km. This reduces to an average distance of 30km but retains a maximum distance of 262km if Users choose the cheapest option under Mod 0636.

b) [Breakdown of revenues from current OCC flows](#)

The table below provides a breakdown of the annual revenue from current OCC flows. The following information supports the table:

- "Remainers" are flows which are currently using OCC via a particular route which remain on the OCC following Mod 0636
- "Leavers" are flows which are currently using OCC via a particular route which switch to standard rate following Mod 0636
- "Never on OCC" are flows which are currently using Standard Commodity rates.

Scenario and Impact	Breakdown of Annual Revenue from Current OCC Flows			Amount re-distributed to "Never on OCC"
	OCC "Remainers"	OCC "Leavers"	Total from OCC flows	
No OCC - Standard Commodity only	£132.93 m	£65.50 m	£198.43 m	-
Current	£14.30 m	£34.00 m	£48.31 m	£150.12 m
Mod 0636	£54.60 m	£75.45 m	£130.05 m	£68.38 m
Impact of Mod 0636	£40.30 m	£41.45 m	£81.74 m	-£81.74 m
Retained benefit after Mod 0636	£78.33 m	-£9.95 m	£68.38 m	

In conclusion Modification 0636 reduces the amount "re-distributed" by £82m and the remaining OCC flows still save £78m compared to Standard rates.

c) [Impact of Mod 636 on Non-OCC Users by Annual Load Size per Annum](#)

The following table shows the annual impact (where negative values represent a saving) for Non-OCC Users split by annual load size. This relates primarily to DN connected loads, both Domestic and I & C, but may also include some loads directly connected to the NTS. The impact assumes that there is no change in the flow levels as a result of Modification 0636.

	Annual Load MWh	Impact £ per annum
<b>Domestic<sup>14</sup></b>		
Low	8	-£1.19
Medium	12	-£1.78
High	17	-£2.52
<b>Non-Dom Retail<sup>15</sup></b>	73.2	-£10.85
<b>Industrial<sup>16</sup></b>		
I1	< 277.8	-£41.19
I2	277.8 - 2,778	-£412
I3	2,778 - 27,780	-£4,119
I4	27,780 - 277,800	-£41,192
I5	277,800 - 1,111,200	-£164,769

Note: Where the annual load is a range the impact of the top of the range is shown.

Commented [JO1]: Any further info to be added?

d) Impact of Mod 0636 on Standard Commodity Charges (Assuming Shippers Choose Cheapest Option)

The table below shows the impact of Mod 0636 on Standard Commodity charges (assuming Shippers choose the cheapest option).

Commodity Charges	Current p/kWh	Mod 0636 p/kWh	Variance	No OCC
TO Combined Commodity Rate	0.0751	0.0643	-14%	-
SO Combined Commodity Rate	0.0212	0.0172	-19%	-
SO+TO Combined Commodity Rate	0.0963	0.0815	-15%	0.0707

<sup>14</sup> Source: <https://www.ofgem.gov.uk/gas/retail-market/monitoring-data-and-statistics/typical-domestic-consumption-values>

<sup>15</sup> Source: <https://www.ofgem.gov.uk/publications-and-updates/retail-energy-markets-2016>

<sup>16</sup> Source: <https://ec.europa.eu/energy/en/data-analysis/market-analysis>

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In Conclusion:

- Standard Commodity charges will fall by 15% all other things being equal.

e) [Comparison of average rates in p/kWh for OCC versus non-OCC](#)

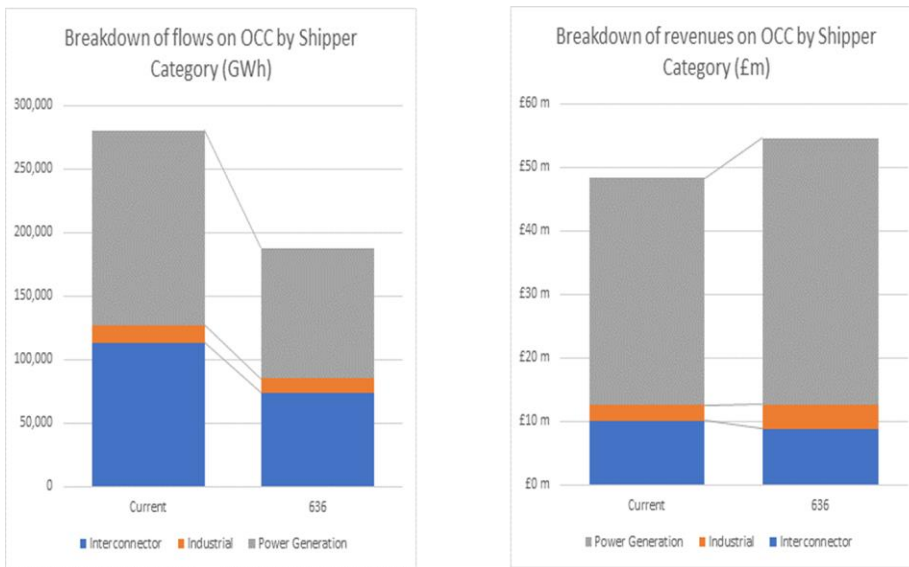
	Current	636	Rate with no OCC
OCC users "remainers"	0.0076	0.0291	0.0707
previous OCC "leavers"	0.0367	0.0815	0.0707
Non OCC users	0.0963	0.0815	0.0707

f) [Raised contribution towards SO charges](#)

The revenue recovered via the OCC will continue to contribute to the SO allowed revenues.

g) [Distributional effects on charges for OCC Users](#)

[Comparison of Flows and Revenues for OCC Users by Shipper Category](#)



The following tables provides the data to support the above graph.

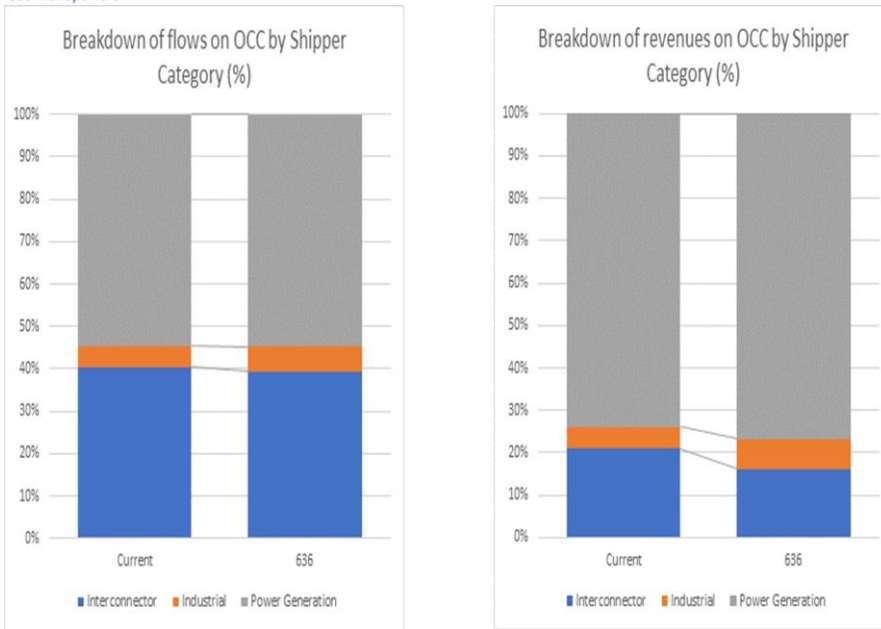
Breakdown of revenues on OCC by Shipper Category (£m)		
	Current	636
<b>Interconnector</b>	£10 m	£9 m
<b>Industrial</b>	£2 m	£4 m
<b>Power Generation</b>	£36 m	£42 m
<b>Total</b>	<b>£48 m</b>	<b>£55 m</b>

Breakdown of flows on OCC by Shipper Category (GWh)		
	Current	636
<b>Interconnector</b>	113,277	74,142
<b>Industrial</b>	13,857	10,909
<b>Power Generation</b>	153,429	102,901
<b>Total</b>	<b>280,562</b>	<b>187,952</b>

In conclusion:

- Average rates for flows remaining on OCC increase by a factor of 4 and for flows "leaving" OCC increase by a factor of 2
- OCC flows reduce in absolute terms for all shipper categories although the % split by shipper category hardly changes
- Revenues from OCC flows increase despite lower flows.

[Comparison of Flows and Revenues for OCC Users by Shipper Category – percentages](#)



The following tables provides the data to support the above graph.

Breakdown of flows on OCC by Shipper Category (%)		
	Current	636
<b>Interconnector</b>	40.37%	39.45%
<b>Industrial</b>	4.94%	5.80%
<b>Power Generation</b>	54.69%	54.75%

Breakdown of revenues on OCC by Shipper Category (%)		
	Current	636
<b>Interconnector</b>	20.89%	16.23%
<b>Industrial</b>	5.16%	7.01%
<b>Power Generation</b>	73.96%	76.76%

In conclusion:

- Standard Commodity charges will reduce by 15%

[Resulting Impacts on OCC Users from changes to the OCC](#)

Some workgroup members felt that the proposed changes will have significant distributional impacts; a small number of parties seeing a large increase in transportation charges whilst others see a small

decrease. Some workgroup members also felt that the increased OCC could put some of those customers out of business and/or if demand fell on the Interconnection Points because the price is too high, increased costs (gas and electricity) could be picked up by consumers.

The proposer felt that although OCC Users will see increases in their charges, that these are to be more reflective of the costs underlying a by-pass pipeline that they would have to build if they did not want to avail of the NTS. The Proposer also considers the costings in Modification 0636 to be conservative in nature as the assumed pipe-size is lower than that may be necessary to meet peak consumption levels and believes there are still considerable benefits to Users availing of the OCC (such as the flexibility to change routes, no requirement for up-front investment costs and access to the NBP).

An Initial Rep highlighted that the GCD11 Option 2 (proposal) results in a greater contribution towards SO costs by shorthaulers and felt the validity of this outcome needs to be investigated if the charges are to be deemed to be cost reflective.

The proposer believes standard commodity charges are levied as a combined commodity rate. The OCC rate is defined as an SO charge for National Grid reporting purposes only. The proposer felt that if this is an important issue National Grid could re-apportion/allocate. This will have no impact on the underlying cost reflectivity of the costs of pipe-building.

#### Contractual arrangements

The Workgroup considered contracts in relation to the timing of the proposed change. Although standard commodity charges are changed in April & October each year, there was an expectation amongst some Workgroup members that the current formula would remain ASIS until October 2019.

Some workgroup members indicated that some contracts are in place that will be impacted by this proposal; some are multiple year, and some were struck based on view that no changes were expected before October 2019.

A discussion was had by the workgroup on the value of including a specific question in the consultation to gather supporting evidence for the workgroup report or whether it needed to be provided to Ofgem direct. In conclusion it was assumed that contracts and specific investment projects will be confidential and therefore parties would be best to share details with Ofgem.

## 6. Assessment of implementation costs

The solution will cost at least £4,000, but probably not more than £7,000 to develop.

## 7. Assessment of legal text.

The Workgroup has considered the Legal Text and is satisfied that it meets the intent of the Solution.

<u>0636-1209</u>	<u>18/12/17</u>		<u>MH to advise the National Grid NTS team that legal text will be required by 4 January 2018 for review by the workgroup.</u>	<u>National Grid NTS (MH)</u>	<u>Pending</u>
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## Rough Order of Magnitude (ROM) Assessment

The ROM response has been published under change proposals (XRN 4543A) and a summary is as follows. A summary of the ROM received from CDSP is as follows:

- Change Costs (implementation): The solution will cost at least £4,000, but probably not more than £7,000 to develop. This change will only impact DSC BCM Service area 7.
- Change Costs (on-going): The on-going costs are likely to be negligible and have not been included.
- Timescales: The development of the change could start early 2018 and is likely to take 10 to 15 business days to deliver.
- Assumptions: The numeric parameters in the formula have never been changed so it is assumed but not yet confirmed that these can be changed through normal price change procedures and the formula work as required thereafter.

## 7 Relevant Objectives

Impact of the modification on the Relevant Objectives:	
Relevant Objective	Identified impact
a) Efficient and economic operation of the pipe-line system.	None
b) Coordinated, efficient and economic operation of (i) the combined pipe-line system, and/ or (ii) the pipe-line system of one or more other relevant gas transporters.	None
c) Efficient discharge of the licensee's obligations.	None
d) Securing of effective competition: (i) between relevant shippers; (ii) between relevant suppliers; and/or (iii) between DN operators (who have entered into transportation arrangements with other relevant gas transporters) and relevant shippers.	None
e) Provision of reasonable economic incentives for relevant suppliers to secure that the domestic customer supply security standards... are satisfied as respects the availability of gas to their domestic customers.	None
f) Promotion of efficiency in the implementation and administration of the Code.	None
g) Compliance with the Regulation and any relevant legally binding decisions of the European Commission and/or the Agency for the Co-operation of	None

Energy Regulators.	
Impact of the modification on the Relevant Charging Methodology Objectives:	
Relevant Objective	Identified impact
a) Save in so far as paragraphs (aa) or (d) apply, that compliance with the charging methodology results in charges which reflect the costs incurred by the licensee in its transportation business;	Positive
aa) That, in so far as prices in respect of transportation arrangements are established by auction, either: (i) no reserve price is applied, or (ii) that reserve price is set at a level - (I) best calculated to promote efficiency and avoid undue preference in the supply of transportation services; and (II) best calculated to promote competition between gas suppliers and between gas shippers;	None
b) That, so far as is consistent with sub-paragraph (a), the charging methodology properly takes account of developments in the transportation business;	Positive
c) That, so far as is consistent with sub-paragraphs (a) and (b), compliance with the charging methodology facilitates effective competition between gas shippers and between gas suppliers; and	Positive
d) That the charging methodology reflects any alternative arrangements put in place in accordance with a determination made by the Secretary of State under paragraph 2A(a) of Standard Special Condition A27 (Disposal of Assets).	None
e) Compliance with the Regulation and any relevant legally binding decisions of the European Commission and/or the Agency for the Co-operation of Energy Regulators.	None

Adjustments to the OCC rate will reduce the Standard Commodity rates (all other things being equal) and improve its cost reflectivity – relevant objective (a).

An OCC rate that better reflects the underlying costs of appropriately sized alternative by-pass pipelines will better facilitate effective competition between shippers and suppliers – relevant objective (c) and specifically, help reduce transportation costs to domestic gas customers.

Increasing take-up of the OCC over longer distances has led to a need to review the parameters within the OCC rate calculation – relevant objective (b).



## 8 Implementation

- The usual date for charging changes is October or April in any year (but changes can be implemented at other dates subject to Ofgem approval). Ideally the proposer would like to implement the modification proposal as soon as possible.
- If decision to implement is received after 31 July 2018, implementation 2 calendar months following the decision to implement.

Should the proposal proceed, National Grid will be asked to give (on a "reasonable endeavours" basis) 150 days' indicative notice that the OCC rate may change at exit points availing of the OCC and if possible an indicative rate. Similarly, National Grid will be asked to give 2 months' notice of the actual charges should the Modification be approved.

## 9 Legal Text

Commented [BF2]: Awaiting formal legal text – due 16/1/18

### Text Commentary

None

### Text [ proposer suggested text]

Uniform Network Code – Transportation Principal Document Section B

3.12.10 For the purposes of paragraphs 3.12.9 to 3.12.14 (inclusive), the capacity of the Specified Exit Point shall be the Supply Point Capacity, provided:

- (a) in the case of an LDZ Supply Point the capacity shall be determined in accordance with Section G5.4.1, except for a LDZ Shared Supply Point in which case the capacity shall be determined in accordance with Section G1.7.17;
  - (i) for an LDZ CSEP the capacity shall be determined in accordance with paragraph 4.5.2;
- (b) in the case of an NTS Exit Point the capacity shall be equal to ~~24 times the Maximum NTS Exit Point Offtake Rate~~ the aggregate of the allocated daily energy (where this value is positive) in kWh/day at the exit point from the previous Gas Year divided by the number of days in the previous Gas Year and further divided by 75%, except:
  - (i) where an NTS Exit Point has no flow history then equal to 24 times the Maximum NTS Exit Point Offtake Rate
  - (ii) for an NTS Exit Point in respect of a pipeline interconnector having no physical exit capability which is both a Connected Offtake System and a Connected Delivery Facility, the capacity shall be equal to ~~24 times the amount (where positive) determined as the instantaneous rate (in kWh/Hour) which the Transporter determines to be the maximum instantaneous rate at which it is feasible to deliver gas~~ the aggregate of the allocated daily energy in kWh/day from the previous Gas Year divided by the number of days in the previous Gas Year and further divided by 75% to the NTS at the System Entry Point associated with such Connected Delivery Facility.

Uniform Network Code – Transportation Principal Document Section Y (3.5 NTS Optional Commodity Rate)

The NTS Optional Commodity Rate (in pence per kWh) is site specific and is calculated by the following equation:

$$1203.1247 \times [(M)^{-0.834-0.78}] \times D + 363.1422(M)^{-0.654-0.708}$$

Where:

- D = the direct distance from the site or non-National Grid NTS pipeline to the Specified Entry Point in km;
- M = ~~Maximum NTS Exit Point Offtake Rate (MNEPOR) converted into kWh/day at the site~~ the aggregate of the allocated daily energy in kWh/day at the NTS Exit Point from the previous Gas Year divided by the number of days in the previous Gas Year and further divided by 75% except:
- (i) where the NTS Exit Point has no flow history. M = 24 times the Maximum NTS Exit Point Offtake Rate
  - (ii) for an NTS Exit Point in respect of a pipeline interconnector having no physical exit capability which is both a Connected Offtake System and a Connected Delivery Facility, then M shall be equal to the aggregate of the allocated daily energy in kWh/day from the previous Gas Year divided by the number of days in the previous Gas Year and further divided by 75% to the NTS at the System Entry Point associated with such Connected Delivery Facility.; and
- ^ = to the power of

## 10 Recommendations

### Workgroup's Recommendation to Panel

The Workgroup asks Panel to agree that:

- ~~[This proposal requires further assessment and should be returned to Workgroup.]~~
- ~~This modification should proceed to consultation.~~

## Appendix 1

GCD11 document:

"42342-NTS GCD11 - Optional Commodity Charge Change V1.3"

<https://www.gasgovernance.co.uk/sites/default/files/ggf/book/2017-11/42342-NTS%20GCD11%20-%20Optional%20Commodity%20Charge%20Change%20V1.3.pdf>

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## Appendix 2

GCD11 Discussion report:

"NTS GCD11R - Updating the Cost Inputs to the NTS Optional Commodity Charge Function"

<https://www.gasgovernance.co.uk/sites/default/files/ggf/book/2017-11/44428-NTS%20GCD11R%20Discussion%20Report.pdf>

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## Appendix 3 – Comparison of Pipeline Construction Costs

As part of the recent Charging Review work, stakeholders were asked to provide any data that they could share in regard to recent pipe-building costs so as to consider the validity of the underlying costs used within the GCD11 Discussion and hence Modification 0636. There was a limited response to the request potentially because of the confidential nature of pipe-building costs and associated investment decisions amongst the shipper community. The data that has been provided is summarised below and shows consistency between these data sources. In the absence of more comprehensive data (which Workgroup members stated was unlikely to materialise<sup>17</sup>) these costs are considered by the Proposer to be appropriate for the purposes of bringing the OCC rate to a more realistic value, than those currently underlying the OCC rates.

	Diameter	length	equivalent pipeline capacity	cost		comment
<a href="#">GNI Pipeline Scotland<sup>18</sup></a>	914mm	50km	500 GWh/d	€92.9m	£80m	assumed entry and exit pressures 85bar and 70bar
<a href="#">Germany - Gas TSOs<sup>19</sup></a>	900mm	50km		€90.5m	£78m	
<a href="#">NG - derived cost from GCD11 Formula</a>	915mm	50km			£82m	

<sup>17</sup> Users have been asked to provide cost data during both the GCD11 development in 2015 and again more recently during the current Charging Review.

<sup>18</sup> <https://ec.europa.eu/inea/en/connecting-europe-facility/cef-energy/projects-by-country/united-kingdom/5.2-0042-uk-p-m-14>

<sup>19</sup> <http://www.fnb-gas.de/en/network-development/ndp-2016/nep-2016.html>

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## Appendix 4 – Contribution to Costs

The following is an extract from a larger document presented to the NTSCMF on 2 August 2017<sup>20</sup>. Table 1 below shows the estimated costs of by-pass pipelines for the likely NTS direct connections that could benefit from the OCC. A major assumption in the calculation of the current OCC rate is the 75% load factor and National Grid have confirmed that this assumption is significantly higher than the typical load factor observed at present. The following conclusion is also an extraction from the document.

National Grid NTS have advised that only about 60% of gas flows to eligible exit points avail of the NTS Optional Commodity charge. Hence, about £28 million would be paid by these sites by way of the shorthaul tariff as compared to the £298 million that National Grid estimate that the sites would have to pay to fund the construction and operation of the bypass pipelines (NB both figures are on an annual basis). To put this in perspective, the £28 million is less than 50% of what it would cost just to operate the bypass pipelines. The total cost of constructing these bypass pipelines is in excess of £1.6 billion.

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<sup>20</sup> The full document is available on the JO website at <https://www.gasgovernance.co.uk/sites/default/files/ggf/page/2017-08/Inefficient%20Bypass%20of%20NTS%20-%20KEL%20Paper%20for%202%20Aug%20%2717%20NTSCMF.pdf>

Exit Points				Optional Commodity Charge			Cost of Bypass Pipeline			
	Obligated Exit Capacity kWh/day	Historical Flows at Exit kWh/day	Distance to Nearest Entry km	p/kWh	% of TOSO	Amount paid by Users	Option 2 OCC	Annual Cost with Annuitised Pipe	Annual Operating Cost	Cost of Construction
DC1	108,300,000	6,623,287	0	0.0020	2%	£48,823	0.0029	£863,705	£172,741	£4,670,224
DC2	73,210,000	1,057,700	0	0.0026	3%	£10,072	0.0038	£770,386	£154,077	£4,165,630
DC3	121,200,056	72,785,150	7	0.0034	4%	£906,341	0.0070	£2,335,218	£467,044	£12,626,990
DC4	38,120,000	12,697,892	1	0.0047	5%	£219,506	0.0081	£841,680	£168,336	£4,551,134
DC5	28,480,000	2,905,176	1	0.0053	5%	£55,709	0.0086	£669,699	£133,940	£3,621,195
DC6	20,040,000	11,454,140	0	0.0061	6%	£254,519	0.0096	£527,725	£105,545	£2,853,516
DC7	40,940,000	24,029,310	5	0.0064	7%	£557,390	0.0126	£1,410,307	£282,061	£7,625,811
DC8	13,276,800	4,334,319	0	0.0080	8%	£126,072	0.0129	£467,947	£93,589	£2,530,285
DC9	43,540,000	14,946,299	9	0.0081	8%	£443,037	0.0175	£2,085,222	£417,044	£11,275,211
DC10	9,750,000	2,980,266	0	0.0106	11%	£114,817	0.0180	£480,573	£96,115	£2,598,556
DC11	91,000,001	7,732,386	37	0.0125	13%	£352,703	0.0318	£7,990,162	£1,586,032	£42,879,974
DC12	57,830,000	36,749,960	24	0.0128	13%	£1,721,054	0.0312	£4,935,010	£987,002	£26,684,585
DC13	67,000,000	46,408,598	37	0.0160	16%	£2,706,142	0.0403	£7,396,873	£1,479,375	£39,996,369
DC14	3,690,000	258,556	0	0.0184	19%	£17,375	0.0319	£321,977	£64,395	£1,740,996
DC15	38,600,000	5,536,770	29	0.0201	21%	£406,422	0.0490	£5,181,261	£1,036,252	£28,016,116
DC16	68,012,169	12,076,753	50	0.0204	21%	£898,588	0.0525	£9,773,567	£1,954,713	£52,847,632
DC17	40,840,000	17,663,742	32	0.0208	21%	£1,343,647	0.0513	£5,730,910	£1,146,182	£30,988,178
DC18	2,583,336	3,267	0	0.0232	24%	£277	0.0410	£290,142	£58,028	£1,568,856
DC19	66,000,000	33,866,070	67	0.0272	28%	£3,357,465	0.0709	£12,814,427	£2,562,885	£69,290,172
DC20	5,520,000	80,702	6	0.0304	31%	£8,948	0.0629	£950,006	£190,001	£5,136,870
DC21	82,000,000	52,401,011	108	0.0352	36%	£6,726,696	0.0944	£21,180,296	£4,236,059	£114,526,097
DC22	1,000,000	12,345	0	0.0432	44%	£1,948	0.0803	£219,914	£43,983	£1,189,121
DC23	45,000,000	5,502,061	84	0.0455	47%	£913,222	0.1179	£14,520,466	£2,904,093	£78,515,066
DC24	42,020,000	22,596,857	87	0.0496	51%	£4,087,408	0.1282	£14,748,003	£2,949,601	£79,745,404
DC25	137,760,000	29,267,580	265	0.0537	55%	£5,733,502	0.1506	£56,791,478	£11,358,296	£307,082,877
DC26	38,660,000	5,025,400	92	0.0561	58%	£1,029,573	0.1449	£15,340,025	£3,068,005	£82,946,585
DC27	11,700,000	669,969	32	0.0569	58%	£139,215	0.1346	£4,310,496	£862,099	£23,307,712
DC28	36,060,000	3,498,548	92	0.0591	61%	£754,734	0.1521	£15,017,386	£3,003,477	£81,202,008
DC29	9,100,000	3,914,012	27	0.0614	63%	£876,600	0.1428	£3,557,402	£711,480	£19,235,585
DC30	48,650,000	12,027,063	126	0.0621	64%	£2,727,333	0.1634	£21,766,188	£4,353,238	£117,694,133
DC31	37,470,000	7,981,283	101	0.0626	64%	£1,824,141	0.1619	£16,604,167	£3,320,833	£89,782,053
DC32	19,300,000	8,065,992	66	0.0732	75%	£2,155,380	0.1816	£9,596,374	£1,919,275	£51,889,516
DC33	16,890,000	152,750	66	0.0817	84%	£45,528	0.2014	£9,314,022	£1,862,804	£50,362,782
DC34	15,380,000	4,986,083	69	0.0914	94%	£1,663,685	0.2249	£9,466,901	£1,893,380	£51,189,427
DC35	19,600,000	5,288,307	86	0.0917	94%	£1,769,364	0.2292	£12,297,744	£2,459,549	£66,496,361
DC36	12,350,000	6,262,078	59	0.0944	97%	£2,157,438	0.2289	£7,740,107	£1,548,021	£41,852,307
				Totals ==>			£46,154,672	£298,247,769	£59,649,554	£1,612,685,337

Table 1: DC Sites for which the Optional Commodity Charge may be practical option

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## Appendix 5 - Compact version of Methodology Spreadsheet

Pipeline Diameters for a range of distances and peak-day flowrates		Step a	Step b	Total Capital Costs	Annuitised Capex	Annuitised Capex + Opex	Unit Costs	Step e	
		<b>Pipe Diameters</b>	<b>Connection Costs</b>						
This column calculates the supply point capacities using an average load factor of 75% of the SOQ. This is used to calculate the Annual Quantity AQ in Gv/h that will be used to calculate the cost per kWh.		This Column shows the pipe diameters in mm required to meet a range of typical peak day flowrates for a 50km pipeline.	These columns contain a total value of some of the non-distance related costs (e.g. Pipeline connection, Pig traps, Calorimetry, Pressure reduction and volumetric control) for each of the peak day flowrates. Please note these have been indexed to 15/16 prices using RPI.	This column calculates the sum of the connection costs (indexed by RPI) plus pipelaying costs (variable costs indexed by Steel Index and RPI from 2010 onwards, and non-variable costs indexed solely by RPI).	This column calculates the total project cost per annum using the 10 year discount factor calculated in the discount factor table below.	This column calculates the annuitised Capex + Opex costs using the assumptions detailed in the additional costs table.	This column divides the annuitised costs in step c by the annual quantities corresponding to the supply point capacities using an average load factor of 75% to generate a unit cost by supply point capacity, expressed in p/kWh for a range of supply point capacities and for 0 and 50 km.	This column calculates the unit cost per kilometre.	
		<b>Load Factor:</b>	<b>RPI Indexation to:</b>						
		75%	1998 Prices	2009/10 Prices	2015/16 Prices	For pipes of length 0 km			
<b>SOQ(mcmd)</b>	<b>SOQ (KWh)</b>	<b>AQ (mkWh)</b>	<b>Total £'000's</b>			<b>Total Capital Costs</b>	<b>Annuitised Capex</b>	<b>Annuitised Capex + Opex</b>	<b>Unit Costs at 75% LF</b>
60	649,800,000	177,883	3,525	4,779	5,863	£5,862,713	£867,714	£1,147,336	0.00064
50	541,500,000	148,236	3,525	4,779	5,863	£5,862,713	£867,714	£1,147,336	0.00077
40	433,200,000	118,589	3,525	4,779	5,863	£5,862,713	£867,714	£1,147,336	0.00097
30	324,900,000	88,941	3,525	4,779	5,863	£5,862,713	£867,714	£1,147,336	0.00129
20	216,600,000	59,294	3,525	4,779	5,863	£5,862,713	£867,714	£1,147,336	0.00193
15	162,450,000	44,471	3,525	4,779	5,863	£5,862,713	£867,714	£1,147,336	0.00258
12	129,960,000	35,577	3,130	4,244	5,206	£5,205,756	£770,480	£1,033,679	0.00291
10	108,300,000	29,647	2,930	3,973	4,873	£4,873,120	£721,248	£976,131	0.00329
7	75,810,000	20,753	2,630	3,566	4,374	£4,374,166	£647,401	£889,809	0.00429
5	54,150,000	14,824	2,630	3,566	4,374	£4,374,166	£647,401	£889,809	0.00555
4	43,320,000	11,859	2,275	3,085	3,784	£3,783,737	£560,014	£721,134	0.00608
3	32,490,000	8,894	1,940	2,630	3,227	£3,226,571	£477,550	£624,742	0.00702
2	21,660,000	5,929	1,905	2,583	3,168	£3,168,360	£468,935	£614,671	0.01037
1	10,830,000	2,965	1,505	2,041	2,503	£2,503,087	£370,471	£499,575	0.01685
0.5	5,415,000	1,482	1,095	1,485	1,821	£1,821,183	£269,545	£315,075	0.02125
0.4	4,332,000	1,186	1,095	1,485	1,821	£1,821,183	£269,545	£315,075	0.02657
0.3	3,249,000	889	915	1,241	1,522	£1,521,811	£225,236	£263,282	0.02960
0.2	2,166,000	593	915	1,241	1,522	£1,521,811	£225,236	£263,282	0.04440
0.1	1,083,000	296	770	1,044	1,281	£1,280,649	£189,543	£221,559	0.07473
<b>50</b>									
For pipes of length 50 km									
<b>SOQ(mcmd)</b>	<b>SOQ (KWh)</b>	<b>AQ (mkWh)</b>	<b>50 km</b>	<b>Total Capital Costs</b>	<b>Annuitised Capex</b>	<b>Annuitised Capex + Opex</b>	<b>Unit Costs at 75% LF</b>	<b>Unit Costs per Km</b>	
60	649,800,000	177,883	915	£61,872,355	£9,157,448	£10,886,968	0.00964	0.00018	
50	541,500,000	148,236	915	£61,872,355	£9,157,448	£10,886,968	0.01157	0.00022	
40	433,200,000	118,589	915	£61,215,398	£9,060,215	£10,773,311	0.01446	0.00027	
30	324,900,000	88,941	915	£60,882,762	£9,010,983	£10,715,763	0.01929	0.00036	
20	216,600,000	59,294	600	£52,449,162	£7,762,764	£9,375,724	0.01929	0.00036	
15	162,450,000	44,471	600	£52,449,162	£7,762,764	£9,375,724	0.02448	0.00044	
12	129,960,000	35,577	600	£51,858,733	£7,675,377	£9,207,049	0.02680	0.00043	
10	108,300,000	29,647	600	£35,667,625	£5,279,004	£6,640,408	0.07466	0.00135	
7	75,810,000	20,753	450	£35,609,414	£5,270,389	£6,630,337	0.11182	0.00203	
5	54,150,000	14,824	450	£30,069,042	£4,450,383	£5,744,949	0.19378	0.00354	
4	43,320,000	11,859	450	£29,387,137	£4,349,458	£5,560,448	0.37511	0.00708	
3	32,490,000	8,894	300	£27,369,855	£4,050,889	£5,241,707	0.44201	0.00831	
2	21,660,000	5,929	300	£27,070,482	£4,006,580	£5,189,914	0.58352	0.01108	
1	10,830,000	2,965	200	£27,070,482	£4,006,580	£5,189,914	0.87528	0.01662	
0.5	5,415,000	1,482	200	£21,786,114	£3,224,464	£4,351,337	1.46771	0.02786	
0.4	4,332,000	1,186	150						
0.3	3,249,000	889	150						
0.2	2,166,000	593	150						
0.1	1,083,000	296	100						



Pipelaying Unit Costs

Pipe size Diam. (mm)	1998 Unit Cost £/km	Steel Index	RPI Indexation	2015/16 Unit Costs £/km
		2009/10 Prices	2015/16 Prices	
50	125,000	274,091	336,214	336,214
100	150,000	328,909	403,457	403,457
150	187,500	411,137	504,321	504,321
200	202,500	444,028	544,666	544,666
300	238,750	523,514	642,168	642,168
450	355,000	778,419	954,847	954,847
600	414,000	907,790	1,113,540	1,113,540
610		*****	*****	*****
915		*****	*****	*****
1220		*****	*****	*****

This table contains the unit costs per km based on historical planning and design specification for the different pipe sizes based on values used to produce the NTS Optional Commodity Charge formula in 1998 **Please note these have been indexed to 9/10 using steel index and then indexed from 9/10 to 15/16 using RPI.**

This section contains the Ofgem provided unit costs in 9/10 prices and these are indexed to 15/16 using RPI. **Please note because of the sensitivity of these costs they have not been published.**

New pipe sizes	Cost	Pipelaying costs contribution (%)
610	*****	90.95
915	*****	94.21
1220	*****	95.86

This table calculates the split between connection and distance-related (pipelaying) costs for the new pipe sizes to maintain consistency with the original data. This is because the cost of the new pipe sizes are only available as composite values. **Please note because of the sensitivity of these costs they have not been published.**

Additional Costs

Expenditure Type	Additional Costs	Original	RPI Indexation	
			2009/10 Price	2015/16 Price
			1.355873179	1.226649302
Opex	Where flow rate is between 1 and 5 mcmd, inclusive	40,000	54,235	66,527
	Where flow rate is between 7 and 60 mcmd, inclusive	80,000	108,470	133,054
	Where distance is greater than 0km	35,000	47,456	58,211
	Cost per km added to all those with a distance greater than 0km	10,000	13,559	16,632
Capex	Non-variable pipelaying costs at 50km and above	200,000	271,175	332,636
Opex	1% of the annuitised pipeline costs	1%		
	2.5% of the annuitised connection cost	2.5%		

This table contains the additional costs forming the Opex estimation, with RPI indexation.

10 year discount factor

1
0.909
0.826281
0.751089429
0.682740291
0.620610924
0.56413533
0.512799015
0.466134305
0.423716083
<b>6.76</b>

This table shows how the ten year discount factor used in this model is calculated and this discount factor is used to calculate the annuitised cost.

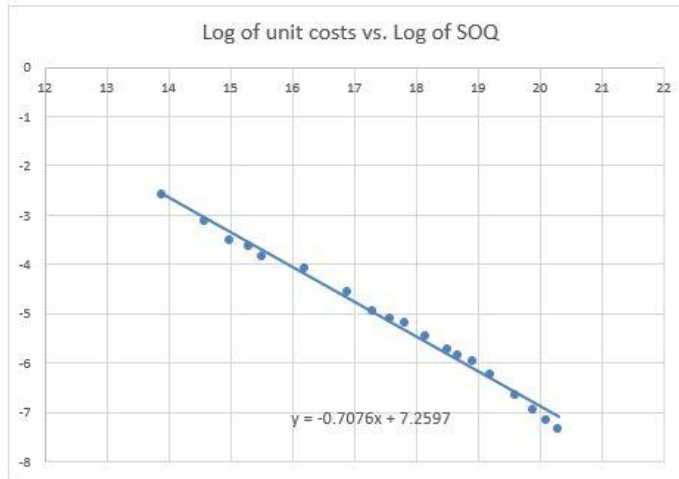
= 10yr discount factor

**Parameters for formula**

Non-distance:

exponent= -0.708

multiplier= 1422



Distance:

exponent= -0.780

multiplier= 1247

