

# Gas Charging Review UNC0621



NTSCMF – 22 November 2017  
UNC0621 Workgroup

# Agenda

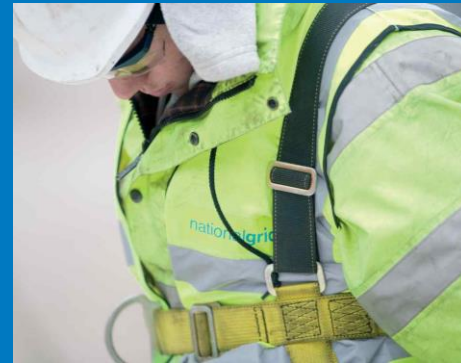
| Area   | Detail   |
|--|--|
| UNC0621 Workgroups                             | <ul style="list-style-type: none"><li>• Diary planning</li></ul>   |
| UNC Modification 0621 key areas                | <ul style="list-style-type: none"><li>• Main objectives and deliverables for UNC0621</li><li>• Transition package, aspects of transition, timescales</li></ul>   |
| UNC Modification 0621 proposals                | <ul style="list-style-type: none"><li>• Updates on the proposals and rationale behind proposals and areas of discussion</li><li>• Additional thinking and development on certain aspects</li><li>• Focus on Transmission Services Revenue Recovery, Avoiding inefficient bypass, interruptible</li></ul> |
| Plan and GB/EU Consultation and change process | <ul style="list-style-type: none"><li>• Impact Assessment – what should be included?</li><li>• Requests received to date</li></ul>   |
| Next Steps                                     | <ul style="list-style-type: none"><li>• Next Steps for UNC0621</li></ul>   |

## Gas Charging Review



UNC Modification 0621  
Diary planning for workgroups

## Gas Charging Review



UNC Modification 0621

Changes for 2019 and 2021 – Transition into new arrangements

# Gas Charging Review:

## Main objectives and deliverables for UNC0621

| Area       | Detail  |
|------------|---|
| Compliance | <ul style="list-style-type: none"><li>• The intention for the overall proposal for UNC0621 is that it will be compliant with the EU Tariffs Code and this includes any transition arrangements</li><li>• We recognise there may be areas where compliance with aspects of the EU Tariff Code may require further discussion and clarification and potential updates</li></ul>   |
| Delivery   | <ul style="list-style-type: none"><li>• UNC0621 proposes a methodology to be in place to adjust payable prices from 2019.</li><li>• The proposal acknowledges that it should deliver a methodology that provides a framework for changes and refinements for 2019 and beyond</li><li>• To refine and update key parts of the proposed methodology over the short term<ul style="list-style-type: none"><li>• There will be a number of ways this could be done and the modification will be updated appropriately</li></ul></li><li>• To support the evolution of the charging regime</li></ul> |

# Gas Charging Review: Transition 2019 and 2021 (1)

---

- UNC0621 proposes a comprehensive update to the charging framework effective from 2019. At the core is a new Capacity Weighted Distance (CWD) Reference Price Methodology (RPM).
- Other major changes are new multipliers, interruptible pricing, storage treatment and avoiding inefficient bypass charges.
- Challenges to implementing changes include forecasting capacity booking behaviours, the continued need to manage revenue recovery and the potential impact on Customers that all interact.

# Gas Charging Review: Transition 2019 and 2021 (2)

---

- Transition arrangements:
  - Given the scale of change, to help manage the introduction of the new RPM, UNC0621 proposes a two stage predictable approach to updating the FCC, in 2019 and 2021.
  - Transmission Services Revenue Recovery charges to manage anticipated under or over recovery. UNC0621 proposes commodity from 2019 and capacity from 2021. From 2021, due to updated FCC, should be greatly reduced overall charge.
  - Any other aspects for if linked to the above
- All other components of the methodology are to be implemented from 2019
- At the end of the transition period UNC0621 achieves 100% recovery from capacity charges from 2021.

# Gas Charging Review: Transition 2019 and 2021 (3)

---

- In our updated thinking, using the transition approach between 2019 and 2021 could help manage:
  - The unpredictable capacity booking behaviour that all the proposed changes could drive as part of the changes proposed to the charging framework.
  - Revenue recovery, give more certainty on the timing of the step changes in charges and give time for the new charges and impacts on capacity booking behaviours to bed in.
- The alternative of not having a transition would bring forward some of the changes to 2019. Welcome any further views on the transition proposal and of the alternative(s).



# Gas Charging Review: Transition and enduring compliance

---

- Some areas where compliance is under discussion
  - Use of commodity for Transmission Services for the purposes of revenue recovery
  - Application of revenue recovery charges for IPs
  - Application of revenue recovery charges for Existing Contracts
  - Application of revenue recovery charges for Entry capacity booked after EIF of the TAR NC and before implementation of UNC0621

## Gas Charging Review



UNC Modification 0621

Amendments to Gas Transmission Charging Regime

# Gas Charging Review: UNC0621 – Modification proposals

---

- Updated draft of UNC0621 published on the 22 November workgroup pages for UNC0621 that reflects latest thinking

<https://www.gasgovernance.co.uk/0621/221117>

- This has been updated from the published UNC0621 available on the modifications page

<https://www.gasgovernance.co.uk/0621>

# Gas Charging Review:

## UNC0621 – Key topics and proposals

---

- At recent NTSCMF meetings we have shared our updated thinking on the main aspects of the charging framework under review
- Further thoughts are provided in the following slides on the main topics including additional material for some including latest thinking ahead of final proposals in some cases

# Gas Charging Review: Reference Price Methodology (RPM)

| Area                                      | Detail   |
|---|--|
| Proposal in draft discussed on 13 October | <ul style="list-style-type: none"> <li>Capacity Weighted Distance for the methodology to calculate reference prices and subsequent reserve prices (through any applicable adjustments)</li> <li>Introduces updated (or floating) payable price for capacity for Entry and Exit at all points.</li> </ul>   |
| Additional thinking for 22 November       | <ul style="list-style-type: none"> <li>CWD still the approach to focus on for the proposal</li> <li>Netting off the Existing Contracts and Interim Contracts* ensures that required target revenue is recovered across the targeted capacity (subject to FCC being updated over time)</li> </ul>   |
| Rationale for the proposal                | <ul style="list-style-type: none"> <li>Moves to a methodology that provides greater stability, reduced volatility and better predictability for capacity charges</li> <li>Reflects more the use of the network given that the NTS is not in a state of continued expansion</li> <li>Extensive work undertaken to review impacts of changing the current LRMC approach and comparisons to a CWD approach</li> <li>CWD provided a simpler framework and also improvements in line with target objectives for the charging methodology and stakeholder developed objectives.</li> </ul> |
| Further Discussion                        | <ul style="list-style-type: none"> <li>Treatment of CWD generated zero prices – reviewing magnitude of use of alternatives to assess materiality and likelihood.</li> <li>Treatment of Existing Contracts and Interim Contracts and revenue recovery approach.</li> </ul>  |

# Gas Charging Review: Forecasted Contracted Capacity (FCC)

| Area                                      | Detail  |
|---|---|
| Proposal in draft discussed on 13 October | <ul style="list-style-type: none"> <li>To use Obligated Capacity and transition to a forecast in the short term</li> <li>Have a transition arrangement to accommodate this change</li> </ul>  |
| Additional thinking for 22 November       | <ul style="list-style-type: none"> <li>Anticipate unpredictable capacity booking behaviours given the range of changes proposed under UNC0621.</li> <li>Revenue recovery and impacts on charges a concern to mitigate</li> <li>Believe move to an updated FCC linked to some evidence of behaviours is reasonable</li> <li>More certain proposals for transitioning FCC needed. Obligated from October 2019 and using a National Grid generated forecast from October 2021.</li> </ul>  |
| Rationale for the proposal                | <ul style="list-style-type: none"> <li>Whilst accept that Obligated may not be the most appropriate to use, that to deliver the most cost reflective prices would require it to be based on a forecast of bookings, it is a reasonable starting point to be in keeping with objectives and deliver improved cost reflectivity in the short term.</li> <li>Moving from one framework to another, especially moving away from zero capacity prices, will drive unpredictable behavioural changes.</li> <li>Believe benefit from evidence of these changes post 2019 and in the short term move to a forecast of capacity bookings linked to this evidence.</li> </ul> |
| Further Discussion                        | <ul style="list-style-type: none"> <li>Zero CWD generated prices – other options besides using the nearest non-zero priced Entry or Exit Point’s reference price</li> <li>Compliance and Transition</li> </ul>  |

# Gas Charging Review: Multipliers

| Area                                      | Detail   |
|---|--|
| Proposal in draft discussed on 13 October | <ul style="list-style-type: none"> <li>To have a multiplier as a default, proposal was [1] and to be updated through a subsequent consultation</li> <li>Multipliers will not be 0, Calculated ex ante</li> </ul>   |
| Additional thinking for 22 November       | <ul style="list-style-type: none"> <li>More certainty for October 2019 needed.</li> <li>An ex ante value of 1 for all products eligible for a multiplier for October 2019.</li> <li>Multipliers more linked to driving behaviours than revenue recovery</li> <li>Provide flexibility to update in future years using appropriate governance.</li> </ul>  |
| Rationale for the proposal                | <ul style="list-style-type: none"> <li>A value of 1 places no preference between incentivising Long Term or Shorter Term Capacity bookings</li> <li>Do not want to have multipliers that put too much downward pressure on the capacity charges thereby driving recovery of revenues elsewhere into the methodology</li> <li>Generally with little scarcity of capacity, incentivising either Long term bookings or short term bookings for the purposes of signals for investment less necessary</li> <li>Gives those who book the choice of booking long or short term without any cost differential given choice of when to commit, with the same liability</li> <li>Provides framework to review and update this on an annual basis</li> </ul> |
| Further Discussion                        | <ul style="list-style-type: none"> <li>Timeline and method for updates beyond 2019</li> </ul>  |

# Gas Charging Review: Interruptible Proposal for Interruptible/Off-peak Reserve Price

---

- Principle: application of a non-zero reserve price.
- Discount based on ex-ante approach for all points (GB & IPs)
  - Probability factor X Adjustment factor expressed as %
  - 0621 proposes that the same discount will apply on Entry and Exit - the text will allow for the potential for these to be different as a result of future consultations
- Modification proposes discount of 10% Entry & Exit



# Gas Charging Review: Interruptible Proposal for Interruptible/Off-peak Reserve Price

---

- Probability calculations (Entry & Exit)
  - A range of probability calculations have been conducted using historical data to inform predictions.
  - As previously indicated the probability is very low.
- Application of an Adjustment factor
- Chosen to reflect economic value of product – value on both sides has to be considered.
- Application of an adjustment factor of between 1 – 100 to probability factor.
- Results sit within the predicted range of 0 -10% hence our proposal stands at 10% discount.

# Gas Charging Review: Interruptible/Off-peak

| Area   | Detail  |
|--|---|
| <p>Proposal in draft discussed on 13 October</p> | <ul style="list-style-type: none"> <li>• Interruptible will be a discount from corresponding firm capacity product</li> <li>• To have an adjustment calculated through subsequent consultation</li> <li>• Interruptible adjustment will not allow zero reserve prices</li> <li>• Calculated ex ante, Single approach for all points</li> </ul>  |
| <p>Additional thinking for 22 November</p>       | <ul style="list-style-type: none"> <li>• To have an ex ante value in the proposal for October 2019</li> <li>• Value linked to a probability of interruption and the 'A' factor</li> <li>• Likelihood of interruption is very low.</li> <li>• Propose ranges (e.g. 10% bands) for adjustments linked to the outcome of the Interruptible calculation.</li> <li>• Initial views are that interruptible would be priced 90% of firm (i.e. a 10% discount) using this approach.</li> </ul>  |
| <p>Rationale for the proposal</p>                | <ul style="list-style-type: none"> <li>• Acknowledge there is a probability of interruption even though it would likely be small, would be subject to National Grid's forward view of interruption probability. Therefore not zero for probability.</li> <li>• Can use the EU TAR NC framework for interruptible which would use a combination of the probability and an 'A' factor linked to the economic value associated to the interruptible capacity.</li> <li>• Combination of elements increases likelihood of discount from firm.</li> <li>• Use of ranges helps manage variances of resulting calculations.</li> </ul> |
| <p>Further Discussion</p>                        | <ul style="list-style-type: none"> <li>• Timeline and method for updates beyond 2019.</li> </ul>  |

# Gas Charging Review: Specific Capacity Discounts

| Area                                      | Detail   |
|---|--|
| Proposal in draft discussed on 13 October | <ul style="list-style-type: none"> <li>Storage to receive 50% discount from the CWD generated capacity charge</li> <li>No other specific capacity discounts proposed</li> </ul>  |
| Additional thinking for 22 November       | <ul style="list-style-type: none"> <li>No change to proposed values for storage.</li> <li>Include other qualifying categories under TAR NC even if the proposed values would be zero (under this proposal) to allow for future changes as needed or beneficial to do so. (i.e. LNG introduced with 0% discount)</li> </ul>   |
| Rationale for the proposal                | <ul style="list-style-type: none"> <li>We have considered the positions put forward. On some areas we do not agree with the “value” attributed to certain categories and other aspects we understand the desire to consider in making a decision for a proposal however we do not believe we can address all of these as they are subject to the views of other industry participants.</li> <li>We have yet to hear many views in support of any discounts beyond our proposals for Storage and Interconnection (those parties who have formally provided representation to date).</li> <li>Mindful that any discounts have the potential to drive recovery of revenues elsewhere into the methodology</li> <li>Some criteria assessed against are better suited to consideration under an Impact Assessment</li> <li>Aligns with the minimum proposed under the TAR NC therefore ensuring compliance with the TAR NC</li> </ul> |
| Further Discussion                        | <ul style="list-style-type: none"> <li>Timeline and method for updates beyond 2019</li> </ul>  |

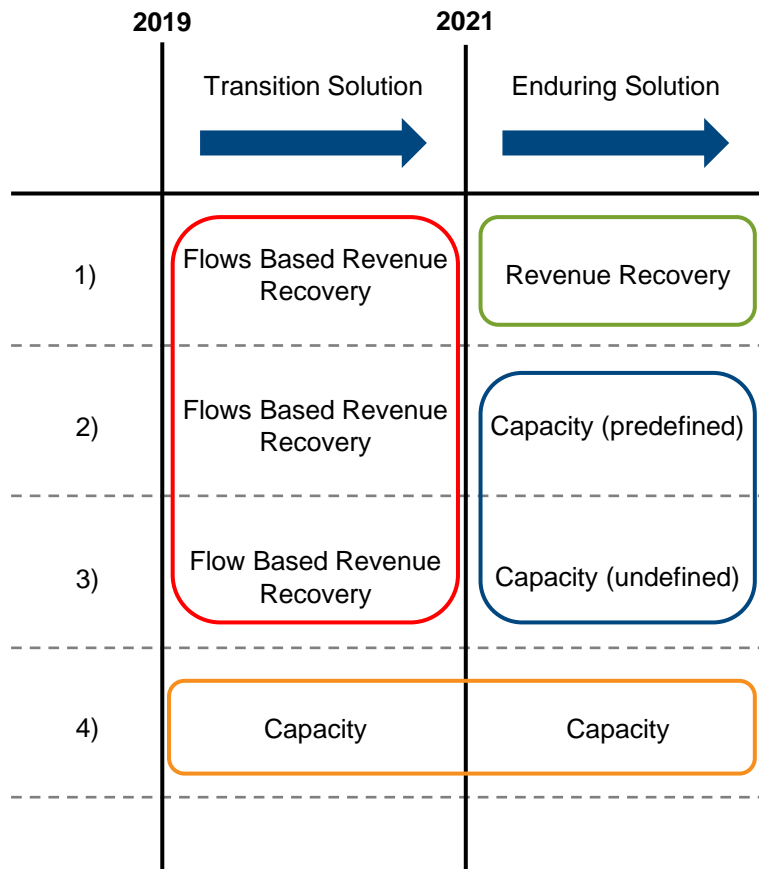
# Gas Charging Review: Avoiding Inefficient Bypass of the NTS

---

- For the avoiding inefficient bypass charge there are a number of potential options under consideration
- Welcome views on the development of these options under UNC0621
  - Option to levy as a capacity charge
  - Option to levy as a commodity charge
- Either approach would be impacted as charging arrangements update as per latest draft proposal of UNC0621
  - E.g. as certain aspects update from 2019 and 2021

# Gas Charging Review: Avoiding Inefficient Bypass of the NTS

These four options illustrate the links to the Avoiding Inefficient Bypass Charge as capacity or commodity from 2019 and 2021



- Revenue Recovery during transition period
  - Flow based based revenue recovery would not be applicable at Interconnection Point\* so how do we deal with Avoiding inefficient bypass charges at those points if we carry on with the charge as an optional Transmission Services Commodity charge?
- Revenue Recovery following transition period
  - Following the transition period, less would be collected from revenue recovery mechanism as a result of updating FCC so Avoiding inefficient bypass charge could reduce 'naturally', potentially being very small
- Capacity following transition period
  - Following the transition period it is likely that Avoiding inefficient bypass charge would be most applicable as part of capacity charging. Could either define this as part of Mod 0621 or closer to end of transition period
- Capacity as enduring solution from 2019
  - Could use capacity as the enduring solution from 2019, however limited time to develop a new methodology as part of Mod 0621

\*Subject to the final treatment of the revenue recovery charge

# Gas Charging Review: Avoiding Inefficient Bypass of the NTS

| Area                                      | Detail  |
|---|---|
| Proposal in draft discussed on 13 October | <ul style="list-style-type: none"> <li>• Transmission Services only charge (no link to Non Transmission)</li> <li>• Methodology can be in the UNC, any formula can be outside to allow efficient update over time allowing components to be updated each year.</li> <li>• Use of a distance cap for use of the charge (initial value of [50km] placed in draft)</li> <li>• Recognise this must work with the overall methodology and framework both from October 2019 and with the Transition approach.</li> </ul>      |
| Additional thinking for 22 November       | <ul style="list-style-type: none"> <li>• As per 13 October plus some further work required to fully explore the options.</li> <li>• Exploring capacity or commodity as options to ensure can work with overall methodology, incorporating transition.</li> <li>• Use of distance cap still relevant to maintain the “short” nature. Reviewing what the distance cap should be.</li> </ul>   |
| Rationale for the proposal                | <ul style="list-style-type: none"> <li>• Given the size of the current charges not paid by shorthaul users and paid by non shorthaul users this is something in need of material change</li> <li>• Should be reviewed along with the rest of the methodology given the interaction with other charges</li> <li>• To be in keeping with the objectives of the charge being for “short” distances and not have a material influence on other charges</li> <li>• Should be a genuine alternative to investment.</li> </ul> |
| Further Discussion                        | <ul style="list-style-type: none"> <li>• Further development needed, based on the overall charge calculation.</li> <li>• There are issues with use of capacity or commodity and these need further development as the solution must work with the overall charging framework including links to transition arrangements and the timing of changes.</li> <li>• Consider changes for 2019 and 2021?</li> </ul>  |

# Gas Charging Review:

## Transmission Services Revenue Recovery

---

- The application of the Transmission Services Revenue Recovery charge is to help manage the anticipated under or over recovery for any given year
- It should help mitigate the risk of carrying over significant under or over recoveries into subsequent years impacting charges
- The size of the revenue to recover via this charge should reduce as the FCC is updated as per the Transition arrangements.
- There are a number of areas that need to be considered in the calculation and application of this charge for Transmission Services.

# Gas Charging Review: Transmission Services Revenue Recovery

| Area for consideration              | Comments  |
|-------------------------------------|---|
| Existing Contracts                  | <ul style="list-style-type: none"> <li>• What can and should apply from a revenue recovery charge for Existing Contracts for 2019 and 2021?               <ul style="list-style-type: none"> <li>• Reading between Article 35 and Article 4 necessary to determine if certain charges can apply?</li> </ul> </li> </ul>   |
| Interim Contracts <sup>#</sup>      | <ul style="list-style-type: none"> <li>• What can and should apply from a revenue recovery charge for Interim Contracts for 2019 and 2021?</li> <li>• Not restricted by same TAR NC articles as Existing Contracts, Interim Contract as is a GB concept.</li> </ul>   |
| Interconnection Points <sup>*</sup> | <ul style="list-style-type: none"> <li>• What can and should apply from a revenue recovery charge for Existing Contracts for 2019 and 2021?</li> <li>• TAR NC Article 4 states cannot apply a commodity charge to IP flows for revenue recovery.</li> <li>• Application of a revenue recovery charge at Bacton IP also links to Existing or Interim Contracts.</li> </ul> |

*#Interim Contracts - Long Term Entry capacity allocated after 6 April 2017 but before the date of the Ofgem direction to implement this Proposal.*

*\*Both Existing Contracts and Interim Contracts are for both IP and Non-IP contracted Entry capacity. Therefore these can relate to contracted capacity at Bacton IP.*



# Gas Charging Review: Transmission Services Revenue Recovery

| Area                                      | Detail   |
|---|--|
| Proposal in draft discussed on 13 October | <ul style="list-style-type: none"> <li>Primarily managing Revenue Recovery through a flow based recovery charge</li> <li>Recovered across flows excluding storage flows (as flow based charges are currently)</li> </ul>   |
| Additional thinking for 22 November       | <ul style="list-style-type: none"> <li>Continue to review the justification for this as part of the overall proposal for the use of commodity from 2019</li> <li>Concerns on revenue recovery and impacts to charges could be mitigated for short period as behaviour changes in capacity bookings are understood more.</li> <li>As part of the transition, we are supportive of transmission charges being wholly capacity based after a short period to manage the impacts of unpredictable behaviour changes for capacity bookings. Use of commodity in this period can help mitigate some of these issues.</li> <li>Certainty of timing around these changes needed, ties with FCC change timetable that should also reduce the revenue recovery charge.</li> <li>Commodity from October 2019 with capacity as revenue recovery charge from October 2021.</li> </ul> |
| Rationale for the proposal                | <ul style="list-style-type: none"> <li>Commodity provides an established way for managing revenue recovery compared to the expected unpredictable changes in capacity bookings</li> <li>Storage exemption avoids double counting flows</li> <li>Expect to reduce in line with the transition for FCC under the CWD approach</li> </ul>   |
| Further Discussion                        | <ul style="list-style-type: none"> <li>Compliance still an outstanding question for levying a revenue recovery via a flow based charge</li> <li>Application of commodity from 2019 and capacity from 2021 - Materiality of options to be assessed.</li> </ul>  |

# Gas Charging Review: Non Transmission Services Charging

| Area                                      | Detail   |
|---|--|
| Proposal in draft discussed on 13 October | <ul style="list-style-type: none"><li>Primarily levied through a flow based recovery charge to recover revenues not anticipated to be collected from St Fergus Compression, DN Pensions and NTS Metering charges.</li><li>Recovered across flows excluding storage flows (as flow based charges are currently)</li></ul> |
| Additional thinking for 22 November       | <ul style="list-style-type: none"><li>No change.</li></ul>   |
| Rationale for the proposal                | <ul style="list-style-type: none"><li>Provides an established way for managing revenue recovery compared to the expected unpredictable changes in capacity bookings</li><li>Storage exemption avoids double counting flows</li></ul>   |
| Further Discussion                        | <ul style="list-style-type: none"><li>Are there any further questions for Non Transmission Charging?</li></ul>   |

## Gas Charging Review



Plan and change process

# Gas Charging Review: Plan and Change process

---

- UNC0621 and the EU requirements for consultation
- Discussed one consultation to be used for both based on the UNC0621 workgroup report incorporating any alternates
- Ofgem issued “Consultation on proposals to implement aspects of Regulation (EU) 2017/4601, the European Network Code on harmonised transmission tariff structures for gas (TAR NC)” on 4 October 2017
  - Responses were due on or before 1 November 2017

[https://www.ofgem.gov.uk/system/files/docs/2017/10/tar\\_nc\\_implementation\\_proposals.pdf](https://www.ofgem.gov.uk/system/files/docs/2017/10/tar_nc_implementation_proposals.pdf)

# Gas Charging Review: Impact Assessment Questions (1)

---

- At September, October and November NTSCMFs discussed providing input to help shape any impact assessment
- For any impact assessment, beneficial to capture thoughts on:
  - What should an Impact Assessment contain?
  - What impacts or analysis would parties like to see in an Impact Assessment?
  - What could be covered in UNC0621, if appropriate, that can support an impact assessment?

# Gas Charging Review: Impact Assessment Questions (2)

---

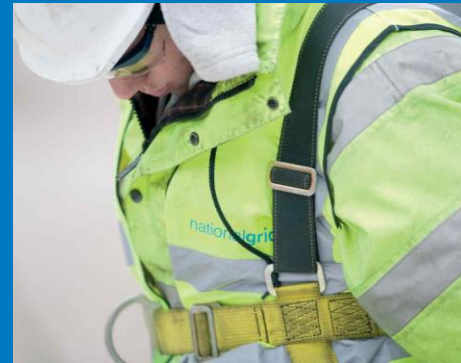
- This is to help shape the Ofgem impact assessment
- Suggestions can be collated and shared to NTSCMF and to Ofgem with any relevant parts potentially included into UNC0621 analysis where appropriate
- Suggestions or requests should be sent to:  
[box.transmissioncapacityandcharging@nationalgrid.com](mailto:box.transmissioncapacityandcharging@nationalgrid.com)
- A summary of the requests to date are shown in the following slide

# Gas Charging Review: Impact Assessment - Requests to date

**Impact Assessment – requests for what it could contain – some may fit within UNC0621 assessments, others will fit more with Ofgem’s impact assessment**

- The Impact of Mod 621 and any alternates need to be assessed against the counterfactual of the current methodology.
- Intended and unintended consequences need to be identified
- Wherever possible the impacts should be quantified as transparently as possible
- The impact on the GB gas market in terms of:
  - NBP liquidity; including in relation to other hubs in NW Europe, especially TTF
  - GB competitiveness in relation to NW European markets
  - Wholesale prices, including volatility and risk of extreme prices
  - Wholesale market competition
  - Competition in supply
  - Attractiveness of GB as a destination for gas, within EU and globally
  - Security of Supply / price
- Impact on the availability of flexible gas and on the operation of the NTS
- Impact on gas balancing costs
- Impact on the volatility and price level at the NBP
- Impact on the volatility and price level of the and electricity market
- Impact on the SoS and on required network investment to pass N-1 test
- The impact on stakeholders by type, existing and new
- Cross market impacts with electricity; impact on electricity wholesale prices, capacity mechanism, balancing costs and any issues arising from different approaches to charging
- Cost allocation in context of cost reflectivity, and cost reflectivity in the context of Article 8 relevant flow scenarios
- Environmental impacts, if any?

## Gas Charging Review



UNC0621 Modification  
Next Steps



# Gas Charging Review: UNC0621 Next Steps

---

- Further development and refinement of UNC0621 with updates applied to future draft
- Updated draft to be shared ahead of, and discussed at, future workgroups for UNC0621
- Development and publication of updated charging models

## Contact us:

[box.transmissioncapacityandcharging@nationalgrid.com](mailto:box.transmissioncapacityandcharging@nationalgrid.com)



Colin Williams  
Charging Development Manager  
Tel: +44 (0)1926 65 5916  
Mob: +44 (0)7785 451776  
Email: [colin.williams@nationalgrid.com](mailto:colin.williams@nationalgrid.com)



Phil Lucas  
Senior Commercial Analyst  
Tel: +44 (0)1926 65 3546  
Email: [phil.lucas@nationalgrid.com](mailto:phil.lucas@nationalgrid.com)



Adam Bates  
Commercial Analyst  
Tel: +44 (0)1926 65 4338  
Email: [adam.bates@nationalgrid.com](mailto:adam.bates@nationalgrid.com)

Jenny Phillips  
Gas Capacity and Charging  
Development Manager  
Tel: +44 (0)1926 65 3977  
Mob: +44 (0) 7776 318646  
Email: [jenny.phillips@nationalgrid.com](mailto:jenny.phillips@nationalgrid.com)

Colin Hamilton  
EU Code Development Manager  
Tel: +44 (0)1926 65 3423  
Mob: +44 (0) 7971 760360  
Email: [colin.j.hamilton@nationalgrid.com](mailto:colin.j.hamilton@nationalgrid.com)

Matthew Hatch  
Commercial Development Manager  
Tel: +44 (0)1926 65 5893  
Mob: +44 (0) 7770 703080  
Email: [matthew.hatch@nationalgrid.com](mailto:matthew.hatch@nationalgrid.com)