

Update consultation on National Transmission System (NTS) flexibility capacity



Document type: Consultation

Ref: 161/10

Date of publication: 16 December 2010

Deadline for response: 4 February 2011

Target audience: Gas network licensees, gas shippers, gas transmission customers, gas storage developers, gas terminal developers, customer representatives and other interested parties

Overview:

National Grid Gas (NGG) uses system flexibility to meet National Transmission System (NTS) users' needs to vary the rates at which they enter and exit gas from the NTS.

As part of our 2009 Uniform Network Code (UNC) decision on the reform of the NTS exit capacity arrangements, we requested that NGG review the operational tools available to them in managing system flexibility requirements and, where appropriate, develop proposals which could enhance their ability to manage flexibility requirements in the future.

This consultation provides an update on the development of the industry dialogue on system flexibility since our 2009 UNC decision and sets out our views on the principles and framework for the further development of system flexibility provision.

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Context

Significant changes in the use of the National Transmission System (NTS) are forecast over the coming decade. The proportion of GB gas supplies coming from traditional gas supply sources is expected to fall relative to gas imported from Europe or via liquefied natural gas (LNG) import terminals; gas storage facilities are forecast to move increasingly from seasonal flow cycles to commercially driven flow cycles; and investment in renewable energy generation could change the way in which combined cycle gas turbine (CCGTs) electricity generators take gas from the NTS. Change in the use of the NTS is likely to impact gas flow patterns and gas entry and exit rates which, as a consequence, may impact system flexibility needs.

NTS users, such as gas distribution networks (GDNs), transmission connected customers (TCCs), NTS entry point operators and gas shippers value the ability to vary the rate at which they enter and exit gas from the NTS for commercial and operational reasons. System flexibility is used by National Grid Gas (NGG) to manage differences in NTS users' entry and exit rates. The efficient provision and allocation of system flexibility provides benefits to NTS users, contributes to reducing network charges for all gas customers, and can help reduce the environmental impact of gas transportation generally.

This consultation provides an update on the development of the industry dialogue on system flexibility capacity since we last addressed it in our 2009 decision to implement UNC0195AV 'Introduction of Enduring NTS Exit capacity Arrangements'. It also sets out our views on the principles and objectives which, in our view, should inform the future development of the flexibility capacity arrangements.

Associated documents

- 'UNC116: enduring offtake - information request on the availability of NTS exit flexibility capacity', 269/07, Ofgem, November 2007.
<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=87&refer=Networks/Trans/Archive/GasTrans/OfftakeReview>
- 'Cover Letter and National Grid Response to 'UNC116: enduring offtake - information request on the availability of NTS exit flexibility capacity', 269/07, Ofgem, January 2008.
<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=83&refer=Networks/Trans/Archive/GasTrans/OfftakeReview>
- 'Gas National Transmission System Offtake Arrangements: Initial Impact Assessment on modification proposals', 103/08, Ofgem, July 2008.
<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=66&refer=Networks/Trans/Archive/GasTrans/OfftakeReview>
- 'UNC195AV Introduction of Enduring NTS Exit Capacity Arrangements', Ofgem January 2009.
<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=286&refer=Licensing/GasCodes/UNC/Mods>
- NTS Exit Capacity Release Methodology Statement, National Grid Gas, June 2010
<http://www.nationalgrid.com/uk/Gas/Charges/statements/transportation/IExCR/>

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Summary

National Grid Gas (NGG) is the owner and operator of the National Transmission System (NTS). Gas shippers and gas distribution network (GDNs) operators need to book NTS entry capacity and NTS exit capacity from NGG in order to bring gas on and to take gas off the NTS. For commercial and operational reasons GDNs, shippers, transmission connected customers (TCCs) and entry point operators value the ability to vary the rate at which they enter and exit gas relative to the steady hourly rate implied by 1/24 of their capacity bookings. As system operator, NGG uses system flexibility to manage differences between entry and exit flow rates.

The arrangements applying to NTS users' ability to vary entry and exit capacity flows are set out in the industry agreement between gas shippers and gas transporters known as the Uniform Network Code (UNC). Under the current arrangements GDNs are required to book NTS exit (flexibility) capacity to be able to vary exit flows. Shippers are not required to book flexibility capacity. Instead TCCs' and entry point operators' ability to vary flows on entry and exit is a function of their flat entry and exit capacity bookings and is subject to the terms of their Network Entry Agreement or Network Exit Agreement.

In January 2009 we implemented UNC 0195AV 'Introduction of Enduring NTS Exit Capacity Arrangements'. The arrangements applying to users' ability to vary exit capacity flows was an important part of this decision. In reaching our decision we considered whether it would be appropriate to introduce arrangements for allocating the right to vary flows on exit to GDNs and shippers via capacity auctions. In the light of uncertainty over the likelihood of a future flexibility capacity scarcity, and industry concerns over the cost of a capacity auction regime, we decided to approve arrangements which did not introduce changes to the way in which exit flexibility capacity is booked. Instead, we placed obligations on NGG to monitor and publish information about flexibility capacity utilisation and requested they initiate a review of the operational tools available to them in managing flexibility requirements.

The purpose of this consultation is two-fold. First, we consider it is appropriate to provide interested parties with an accessible understanding of what NTS flexibility capacity is and why NTS users value it. Second, we consider it is appropriate to set out our views on the issues which we think should affect the development of the flexibility capacity debate in the future, and importantly, how we see it interacting with our new transmission price control, using the RIIO model ('Revenue = Incentives + Innovation + Outputs'), RIIO-T1, scheduled to take effect from 2013.

Under the Exit Reform project, flexibility capacity was largely considered in terms of NTS exit capacity only. But in our UNC0195AV decision we indicated that the availability of flexibility capacity was likely to be affected by behaviours on entry and exit. In the period since the implementation of UNC0195AV, NGG has confirmed, through its system flexibility workshops, that flexibility is a system wide issue. Accordingly, we think it is appropriate that the future development of system flexibility provision should take account of this interaction.

To identify and support the need for future system flexibility investment we propose that a system flexibility reporting regime should be developed and implemented by NGG under the RIIO-T1 price control framework. In our view it would be appropriate for this work to build on the system flexibility monitoring work initiated by NGG following the implementation of UNC195AV. We consider that it would be appropriate for NGG to seek views on the conclusions which it would be appropriate to draw from this information and the relative importance of the indicators identified.

In its October Forecast Business Plan Questionnaire (FBPQ) response to the fourth Transmission Price Control Review (TPCR4) adapted rollover¹, NGG has indicated that it has identified a significant need for system flexibility investment in the period 2012/13 to 2017/18. In our view any investment to provide increased system flexibility must be justified by supporting indicators and robust supply and demand modelling assumptions. Further, under the RIIO-T1 framework business plans must be justified in terms of the network outputs they will deliver and we expect NGG to define outputs in any investment proposals they intend to make.

We also consider that it would be appropriate for NGG and the GDNs to make explicit consideration of optimising investment efficiency across the NTS/GDN interface in formulating their business plans. The current UNC arrangements do not allow GDNs to signal a willingness to pay for additional NTS flexibility capacity. This has the potential to inhibit coordinated investment efficiency across the integrated GB gas pipeline system. In our view it is important that GDNs are able to compare the efficiency of additional NTS flexibility capacity alongside other capacity management options.

As part of thinking about future system flexibility requirements we also consider that it is important that NGG considers whether the commercial regime and use of system charging arrangements are providing them with enough information about NTS users' flexibility needs or providing NTS users with appropriate charging signals regarding the efficient use of capacity. We do not prescribe specific changes to the commercial regime or charging arrangements in this document, but if new costs are demonstrated to be imposed on the system by forecast changes in users' entry or exit flow requirements, in our view it is important that users of the system who benefit from this investment, contribute to funding it.

In parallel to this consultation, we will consult on the RIIO-T1 measures outlined in this document, in the 'Outputs and Incentives' paper of our December 2010 RIIO-T1 Strategy consultation document². Interested parties are invited to submit their views on these measures either as part of their response to this wider consultation on system flexibility, or as part of their response to the RIIO-T1 Strategy consultation. Responses to both documents will inform our RIIO-T1 Strategy decision document scheduled for publication in March 2011.

¹ In 2009 the Authority decided to rollover the fourth transmission price control review (TPCR4) by one year to allow the conclusions of Ofgem's RPI-X@20 project to inform the next price control. The next transmission control (RIIO-T1) is scheduled for implementation from 1 April 2013.

² This document will be published in December 2010 on Ofgem's website at www.ofgem.gov.uk/networks

1. Flexibility capacity on the NTS

Chapter Summary

This chapter explains what we mean by flexibility capacity in the context of the GB gas transmission system. It also explains why NTS users find it useful to be able to vary the rate at which they enter gas to, and exit gas from the NTS. A summary of the steps NGG may take to alleviate system constraints is also provided.

Question box

Question 1: Do you agree with our definition of system flexibility?

Question 2: Do you agree with our view that the ability to vary gas flows on entry and exit is valued by Gas Distribution Networks (GDNs), Transmission Connected Customers (TCCs), Aggregated System Entry Point (ASEP) operators and gas shippers?

Exit capacity and the National Transmission System

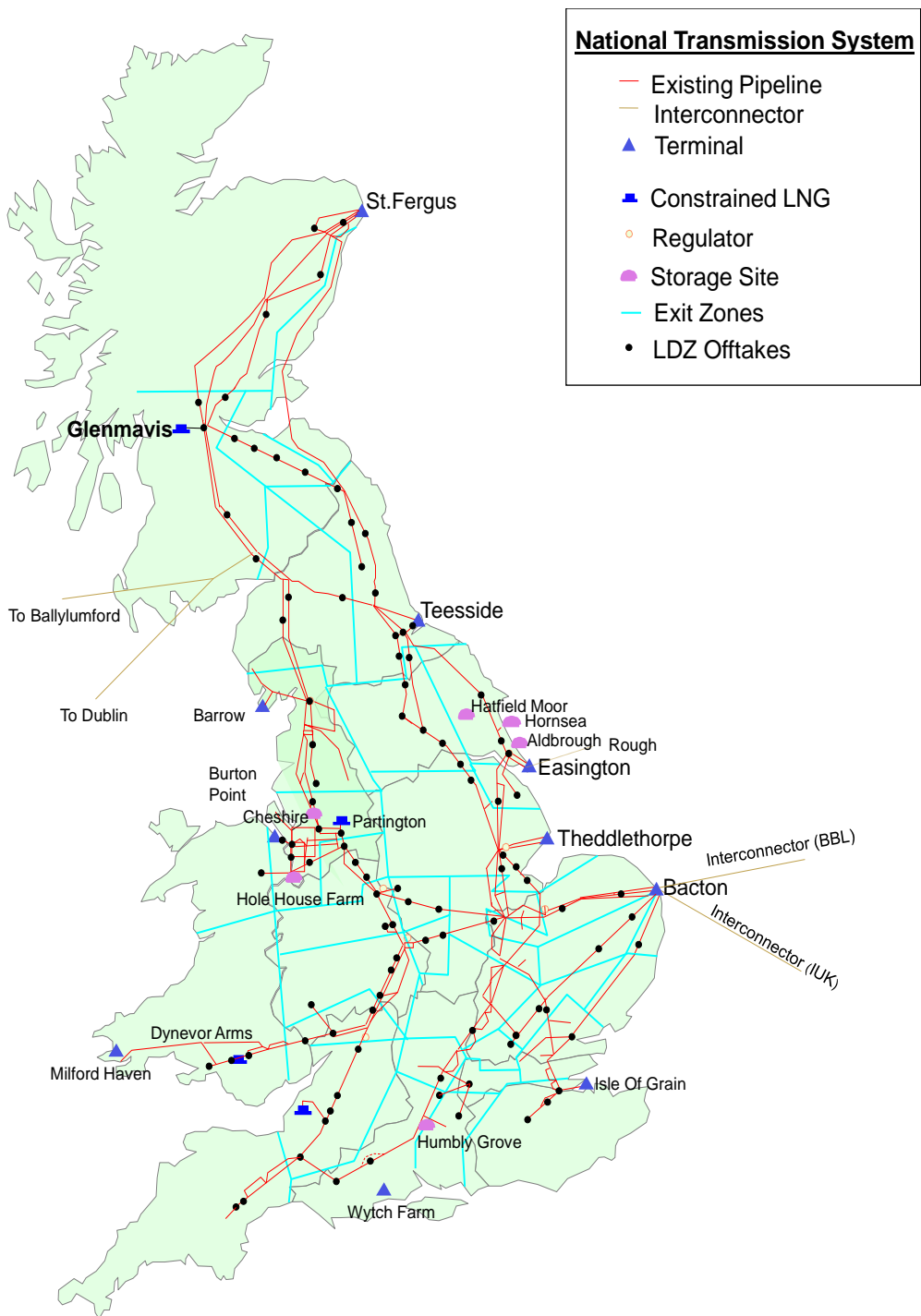
1.1. National Grid Gas plc (NGG) is the owner and operator of the high pressure gas pipeline system in Great Britain (GB) known as the National Transmission System (NTS).

1.2. Gas is brought on to the NTS by gas shippers at Aggregated System Entry Points (ASEPs) either from GB gas fields (UK Continental Shelf - UKCS), GB storage facilities, or as gas imports either from Europe via undersea pipelines or Liquefied Natural Gas (LNG) import terminals. Gas is taken directly from the NTS at NTS exit points by the eight Gas Distribution Networks (GDNs) and by gas shippers on behalf of a number of large transmission connected customers (TCCs) such as large industrial facilities; combined cycle gas turbine (CCGT) energy generators; and gas storage facilities.

1.3. Gas shippers and GDNs book NTS entry capacity and NTS exit capacity from NGG in order to bring gas on and to take gas off the NTS. For shippers this means booking sufficient entry capacity to accommodate the volumes of gas they intend to bring on to the system, and for shippers and GDNs, booking sufficient exit capacity to accommodate the volumes of gas they intend to take off the system. The information provided by these bookings allows NGG to plan the capacity needs of system, including whether investment for new capacity is required.

1.4. In total, the NTS has 30 entry points and in excess of 200 exit points, of which approximately two-thirds are NTS/GDN transfer points and the remainder are connections to TCCs, interconnectors and others. A representation of the NTS is presented at diagram 1.

Diagram 1: National Transmission System (NTS)



Capacity requirements and system flexibility

1.5. NTS entry and exit capacity bookings allow NTS users the option to enter gas to and exit gas from the NTS at a rate which (for a given quantity) is even over the course of a day (i.e. at an hourly rate equal to 1/24th of their total capacity holding). For operational and commercial reasons, NTS users find it useful to be able to vary the rate at which they flow gas relative to the steady rate. NGG uses system flexibility to manage NTS users' need to vary gas flows.

1.6. The ability to vary flows on entry is valued by ASEP operators handling shippers' imports of gas from continental Europe, from Norway, from storage and via LNG terminals. Gas supplies from these sources are subject to competing market demands and are not always able to deliver gas to a flat profile across the gas day. The ability to vary flows on exit can provide competitive benefits to TCCs to the extent that they are able to adjust their gas exit profile in response to movements in wholesale electricity prices (in contrast to gas which has one price a day, electricity is priced by the half hour, i.e. has 48 prices a day). GDNs require the ability to vary flows on exit to help manage the daily peaks in gas consumption by customers on their networks. All domestic gas customers are connected to the GDNs and gas consumption among domestic customers peaks significantly in the morning as people prepare for work and again in the evening when they return.

1.7. Under the existing capacity arrangements, in order to vary flows relative to the steady rate implied by 1/24th of their total capacity holding, GDN users are required to book separate capacity rights known as NTS exit (flexibility) capacity. Shippers are not required to book NTS exit (flexibility) capacity on behalf of TCCs, but an ability to vary flows relative to the steady rate implied by their flat capacity holding is available subject to the UNC Offtake Profile Notice³ (OPN) process and the terms of TCC's Network Exit Agreements (NExA)⁴. There is no flexibility capacity product relating to the ability to vary flows on entry, but ASEP operators flow profiles are subject to Implied Nomination Flow Rates, Daily Flow Notifications⁵ (DFNs) and the terms of their Network Entry Agreement.⁶

Managing flexibility capacity

1.8. NGG describe flexibility capacity as the capacity, inherent in the system, used to manage gas supply and demand mismatches without compromising safety or

³ Shippers are required under the UNC to submit an Offtake Profile Notice to NGG daily for the gas day ahead. The Offtake Profile Notice indicates the rate at which users propose to exit gas from the system across the gas day at a given exit point.

⁴ The NExA is an agreement between NGG and TCCs in respect of an individual NTS exit point and details the operational obligations, such as notice periods and ramp rates, which TCCs are subject to in respect of that exit point.

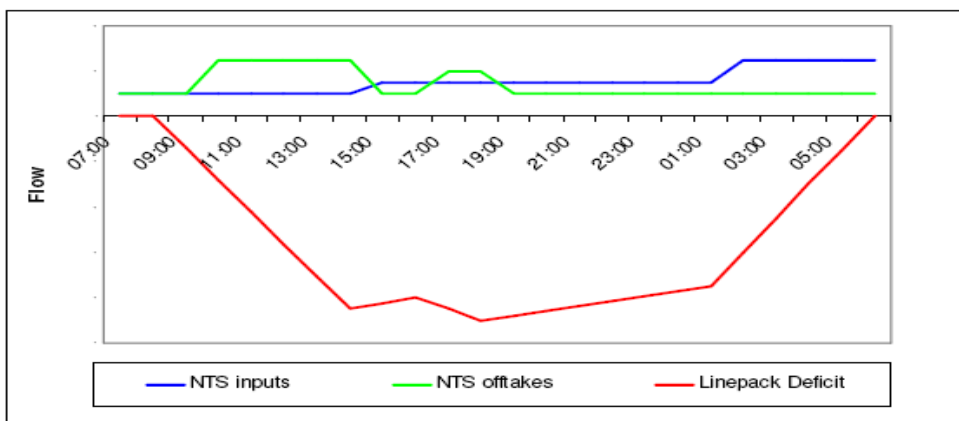
⁵ DFNs are a requirement of the Network Entry Agreements (NEAs) between Aggregated System Entry Point (ASEP) operators and NGG. The DFN indicates the rate at which an ASEP operator intends to flow gas on to the system across the gas day.

⁶ A Network Entry Agreement is an agreement between NGG and ASEP operators in respect of an individual ASEP and details the operational obligations, such as notice periods and ramp rates, which operators are subject to in respect of that ASEP.

security of supply. At a system wide level mismatches arise as a consequence of aggregate differences between the rates at which gas enters and exits the system. The availability of flexibility capacity within the NTS is not unlimited and is broadly dependent on the physical capability of the system (including plant availability, pressure, flows on the system and linepack). Linepack is the amount of gas which is in the system at any time and is used to maintain pressure and help affect the uninterrupted flow of gas to customers at exit points.

1.9. System flexibility on a given day is dependent on the physical capability of the pipeline system, and the location, interaction and coincidence of entry and exit flow profiles. When NTS users concurrently seek to take gas from the NTS at an hourly rate higher than that implied by 1/24th of their total capacity holdings this reduces the aggregate level of flexibility available. If exit and entry flow profiles are not managed constraints can arise. Diagram 2 provides a simplistic illustration of the relationship between entry and exit profiles and the availability of linepack. It demonstrates how system linepack can drop when demand exceeds supply, and is then replenished when supply picks up.

Diagram 2: NTS flex system level definition – linepack changes⁷



1.10. Flexibility capacity constraints can manifest themselves at specific NTS exit or entry points. In respect of NTS exit points localised constraints can arise as a consequence of a short fall in diurnal storage, but the cause of a constraint can also be the result of a shortage in linepack deeper in the system. To identify and avoid a situation in which this reduction will impinge on a GDN's ability to satisfy its security of supply obligations, NGG is obliged to enter dialogue with the GDN to address the situation. In the event that a constraint occurred because of the over-allocation or use of flexibility capacity on the NTS, action would be taken to resolve the constraint and avoid any unplanned loss of supply to any end user. Table 1 identifies the

⁷ This diagram was presented by NGG at its System Flexibility Industry Workshop 2 on 16 November 2009. A copy of the presentation is available at the following link:

<http://www.nationalgrid.com/uk/Gas/OperationalInfo/operationaldocuments/SystemFlexibility/>

capacity constraint management tools⁸ NGG utilises to address system capacity constraints.

Table 1 NTS system management tools

Operational event	System management tools
Entry capacity constraint	Scale back interruptible capacity ⁹ Buy back firm capacity Forwards/options contracts OCM ¹⁰ locational balancing action Terminal Flow Advice (TFA) ¹¹
Gas quality excursion	Terminal Flow Advice (TFA)
Exit capacity constraints (Pre 2012)	Interruption OCM locational balancing action Exercise bilateral contracts Constrained LNG Reject OPNs (if NExA limits/OCS bookings ¹² exceeded)
Exit capacity constraints (Post 12)	Scale back off peak flat capacity ¹³ Forward/options contracts for flat buyback Daily NTS Exit flat buyback Daily purchase of within-day flow reductions OCM locational balancing action Constrained LNG Reject OPNs (if NExA limits/OCS bookings exceeded)

1.11. NGG's system management tools are designed to deliver flow rate changes for the management of constraints on the system. To protect customers from bearing the cost of NGG's constraint management actions, NGG is incentivised under its Gas Transporter (GT) licence to make efficient use of the tools available to it. NGG's use of the tools will be influenced by the financial implications of its incentive arrangements, the necessity to achieve timely gas flow rate changes, and its broader obligations under the GT licence.

⁸ More detail on the constraint management tools available to NGG is available in NGG's System Management Principles Statement, at the following link:

http://www.nationalgrid.com/NR/rdonlyres/589DE37E-4DDB-4ACF-8C58-308752173A21/40448/AppB_SMPS_2010_2011_v2_6FINAL.pdf

⁹ Interruptible capacity is entry or exit capacity provided by NGG which can be interrupted during times of peak system use to manage firm capacity system constraints.

¹⁰ The On-the-day Commodity Market (OCM) is a gas trading system to which offers or requests for gas at a nominated price can be posted.

¹¹ TFA's can be issued by NGG to instruct shippers to reduce gas flows at a given entry point. Where TFA's are used NGG is required to compensate shippers for the value of gas lost.

¹² Under the UNC GDNs book NTS exit (flexibility) capacity via the Offtake Capacity Statement (OCS) process.

¹³ From 1 October 2012 reformed exit capacity arrangements take effect. Under the enduring regime off peak flat capacity can be interrupted during times of peak system use to manage firm capacity system constraints. The reformed arrangements are described in chapter two.

Flexibility capacity and reform of the exit capacity arrangements

1.12. Exit Reform was the name given to the reform of the NTS exit capacity arrangements which was progressed following the Authority's decision in 2005¹⁴ to approve the sale of four of NGG's distribution network businesses. Exit Reform concluded in January 2009 with the implementation of UNC0195AV 'Introduction of Enduring NTS Exit Capacity Arrangements'¹⁵.

1.13. The NTS exit flexibility capacity arrangements were an important part of the 'Exit Reform' project. In reaching our decision to implement UNC0195AV we considered whether it would be appropriate to introduce arrangements for allocating the right to vary flows on exit to GDNs and shippers via capacity auctions. Our decision was informed by NGG's response to our November 2007 information request¹⁶ which indicated that NTS exit flexibility capacity was affected by gas flows at a system wide level, and by industry responses to our April 2008 pro forma questionnaire¹⁷ on the cost impacts of the proposed modifications.

1.14. In the light of uncertainty over the likelihood of a future flexibility capacity scarcity, and industry concerns over the cost of a capacity auction regime, we decided to approve arrangements which did not introduce changes to the way in which exit flexibility capacity is booked. However, we placed obligations on NGG to monitor and publish information about flexibility capacity utilisation. We also requested NGG initiate an industry work stream to review the operational tools available to them in managing flexibility requirements and, where appropriate, to develop proposals which could enhance their ability to manage flexibility requirements in the future.

1.15. The following chapter summarises the information presented by NGG in its response to our 2007 information request and summarises the analysis presented by NGG in its 2009 and 2010 System Flexibility Workshops. The chapter also presents an overview of the changes within the energy sector forecast to affect system flexibility needs across the next ten years. A summary of the consideration of NTS exit flexibility capacity within the Exit Reform project is detailed in Appendix Two.

¹⁴ 'National Grid Transco Sale of gas distribution networks. Authority decision', Ofgem, February 2005.

¹⁵ Uniform Network Code (UNC): Reform of the NTS offtake arrangements (UNC 0116V, 0116BV, 0116CVV, 0116VD, 0116A) and Introduction of Enduring NTS Exit capacity Arrangements (UNC 0195 and 0195AV) decision document, January 2009
<http://www.ofgem.gov.uk/Licensing/GasCodes/UNC/Mods/Documents1/UNC195AVD.pdf>

¹⁶ Information request to National Grid Gas regarding the likely availability of NTS flexibility capacity, National Grid Gas' response and industry comments, National Grid, January 2008

¹⁷ 'Pro forma questionnaire on the cost impacts of enduring gas offtake and incentives' Ofgem, April 2008

2. System flexibility drivers and indicators

Chapter Summary

This chapter summarises the progression of the industry understanding of system flexibility in the lead up to and following our decision to implement UNC0195AV. In particular we highlight the proposals emerging from NGG's System Flexibility Workshops concerning the drivers and indicators of flexibility capacity supply and demand. We also present an overview of the changes within the energy sector forecast to affect the system flexibility needs of NTS users across the next ten years.

Question box

Question 1: Do you agree with the system flexibility indicators developed by NGG?

Question 2: Do you consider that the system flexibility indicators are capable of identifying future system flexibility investment needs?

Question 3: Do you agree with our high-level analysis of the factors likely to affect future gas flows on the NTS? Are there important trends which we have not considered?

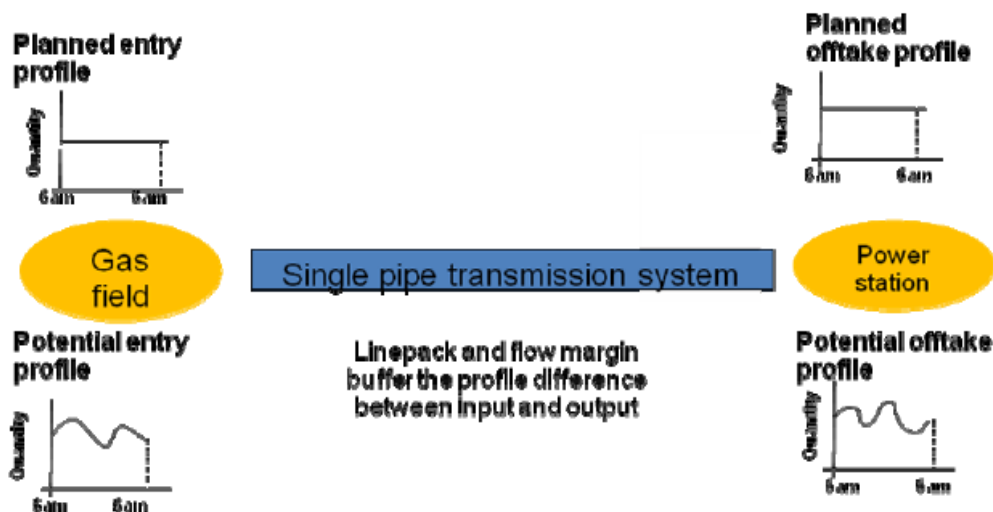
Understanding system flexibility

System wide flexibility issues

2.1. NGG's response to our November 2007 information request did not allow us to conclude whether a scarcity in exit flexibility capacity was likely or imminent. But the analysis provided by NGG indicated that, although Exit Reform was focused on exit capacity issues, the issue of flexibility capacity is a system wide issue which is contingent on entry capacity and system linepack factors as well as the level of diurnal storage available at system exit. It was for this reason that we requested in our UNC0195AV decision that NGG initiate an industry workstream to review the operational tools available to it in managing flexibility requirements and, where appropriate, to develop proposals which could enhance its ability to manage flexibility requirements in the future.

2.2. Diagram 3, which was published in our 2008 Impact Assessment¹⁸ on Exit Reform, provides a simple illustration of the connection between entry and exit profiles and system linepack.

¹⁸ 'Gas National Transmission System Offtake Arrangements: Initial Impact Assessment on modification proposals', 103/08, Ofgem, July 2008.

Diagram 3. System linepack, entry and offtake profiles

2.3. The more detailed analysis in NGG's 2007 response set out that in NGG's view system flexibility was a function of the following factors:

- Size of the network - The quantity and configuration of pipelines and compressors that make up the NTS will self evidently be a major influence on the capacity of the network. NGG anticipated that investment to accommodate increasing gas flows from Milford Haven, Isle of Grain and the Easington area would result in a baseline flex capability of 22mcmd by 2010/11.
- Distribution of gas supplies – NGG's analysis provided evidence of the criticality of assumptions about sources of gas supplies when calculating baseline capabilities. At a high level NGG's conclusion was that higher levels of flexibility capability can be delivered if gas supplies enter the network through the full range of UKCS and imported gas entry points at rates that do not tend towards the extremes (either high or low flow) of capability at any single entry point. The converse, such as the examples of low Isle of Grain or high Easington presented in their example, would lead to a reduction in system flexibility. The most onerous supply pattern, assuming high east coast flows, reduces the peak day flexibility capability from 26mcmd to 21mcmd.
- Distribution of gas demands - The distribution of demand is also critical in determining how much flexibility is available at one time on the NTS. Enabling demand to be loaded onto discrete geographical areas is more restrictive than management of a balanced distribution across the NTS. Analysis indicates that localized requests for NTS exit flexibility capability can lead to a national capability of 19mcmd in 2010/11 under a balanced supply assumption.

- Profile of gas supplies - Within day profiling of gas supplies at entry points was identified as potentially impacting system wide flexibility capability. Back loading of entry flows (rather than a flat profile) can further reduce the NTS exit flexibility capability. NGG's 2007 analysis identified that the booked allocation of 17.5mcmd of flexibility capacity to the GDNs in 2010/11 could not be supported if back loading at Easington was to exceed 7% (around 9mcmd) on a peak day. Conversely, front loading of entry flows has a positive impact on the degree of NTS exit flexibility capability.
- Background level of demand - All things being equal, including balanced supplies and balanced demands, then the availability of flexibility capacity should increase as the demand for flat exit capacity reduces. However because flex capability is dependent on minimum pressure assumptions National Grid did not believe that this relationship holds outside winter periods.

System flexibility industry workshops¹⁹

2.4. In June 2009 NGG held the first of two System Flexibility Workshop meetings aimed at further progressing the flexibility issue in line with the requirements of the 0195AV decision. In connection with the issues addressed in the workshops, NGG met bilaterally with a number of industry parties throughout 2009. The substance of these meetings was relayed to industry via Transmission Workstream meetings throughout 2009 and NGG delivered its conclusions concerning the System Flexibility Workshops at the Transmission Workstream meeting on 4 February 2010.

2.5. At the first workshop meeting NGG set out its view that in order to understand the potential future requirements for system flexibility it proposed to define what constituted a flexibility service; define what indicators it would be useful to monitor to understand customers' future flexibility requirements; define what timescale it would be useful to monitor for trends; and to consider what would constitute a signal for change. In general industry participants were supportive of NGG's proposals to undertake a data gathering exercise in advance of reaching any conclusions about whether UNC or licence changes were necessary.

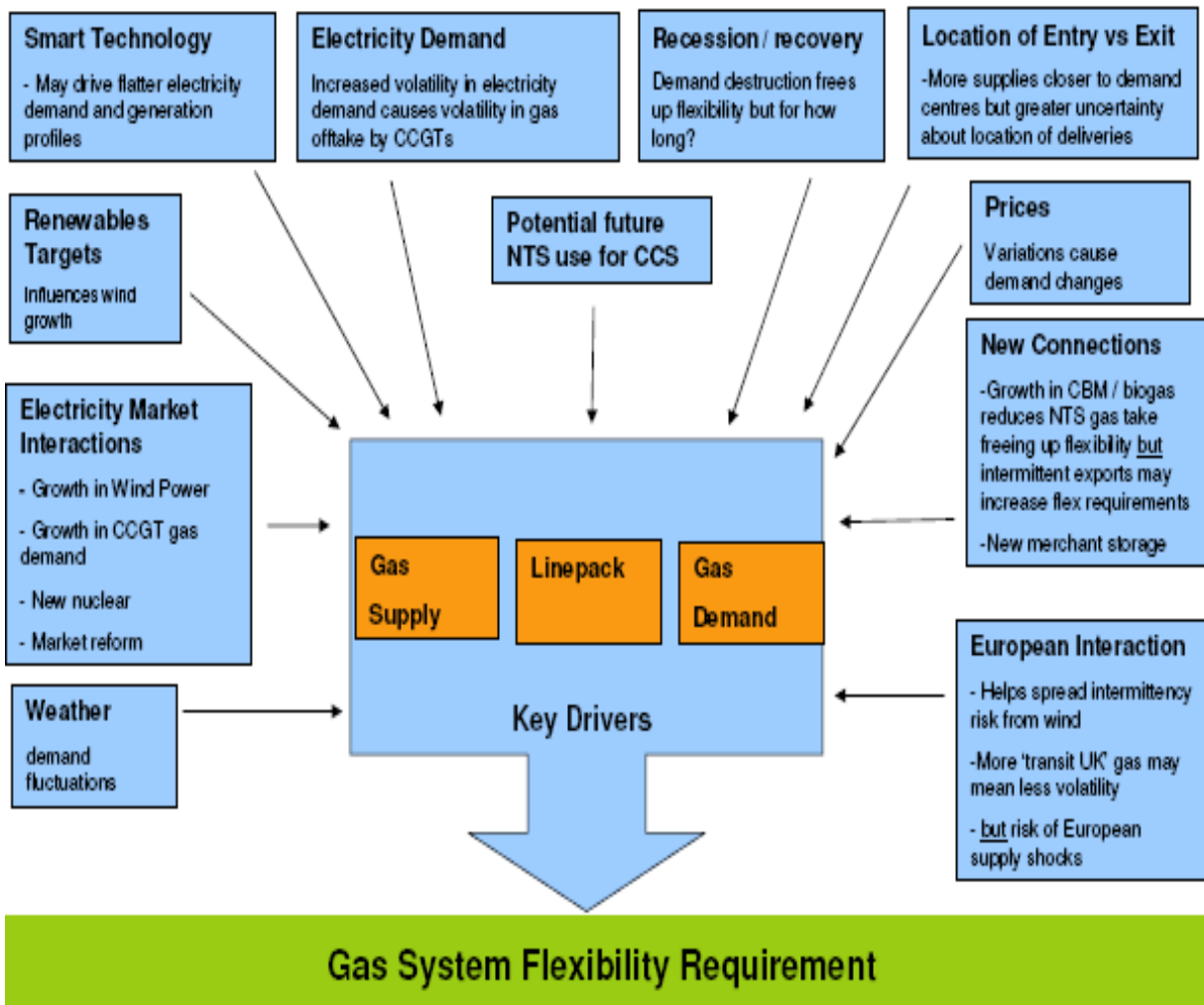
2.6. At the second industry workshop in November 2009 NGG presented the views and a summary of the responses it had received from industry participants concerning the flexibility issue and set out its further thinking on proposed flexibility drivers and indicators. From the feedback received NGG confirmed that industry participants had identified a number of potential industry changes which could impact future flexibility availability. These factors included additional reliance on gas as a mid-term source of new generation within the next decade; the potential system

¹⁹ Full detail on the analysis provided by NGG's System Flexibility Workshops can be found on NGG's website at the following link:
<http://www.nationalgrid.com/uk/Gas/OperationalInfo/operationaldocuments/SystemFlexibility/>

tightening effect of entry capacity substitution; the system impact of new gas storage investment; and the price elasticity of LNG importation.

2.7. Following further consideration, NGG presented its conclusions on system flexibility indicators at the Transmission Workstream meeting on 4 February 2010. At a high level NGG considers that the key drivers of flex capability can be divided into three categories: key gas supply drivers; key gas demand drivers; and, key linepack drivers. Diagram 4 highlights the range of factors which NGG NTS consider will impact the key drivers.

Diagram 4: System flexibility – key drivers and influences



2.8. NGG consider that the indicators can be split in to 'leading' and 'lagging' indicators, with data sets on 'leading' indicators capable of providing useful information sooner than the 'lagging' indicators (i.e. capacity buyback actions, which are less frequent events). They proposed to monitor and report on 'Phase 1' indicators for the May 2010 Operational Forum with a further report on 'Phase 1' and 'Phase 2' indicators scheduled for the December 2010 Operational Forum and at six

monthly intervals thereafter. Table 2 below summarises the indicators NGG propose to monitor.

Table 2: NGG's Proposed Phase One and Phase Two System Flexibility Workshop 'Leading' and 'Lagging' Indicators*

Phase	Indicator Category	Indicator Descriptor
Phase 1 'Leading' indicators	Supply	Day on day difference in supply from Northern and Southern ASEPs
	Supply	Day on day difference by supply group
	Linepack	Max daily range of within day linepack changes
	Linepack	Frequency of linepack changes at particular thresholds
	Linepack	Hourly zonal linepack
	Demand	Within day demand variation by sector
Phase 1 'Lagging' indicators	Supply	Use of Operating Margins gas
	Supply	Use of entry buybacks
	Supply	Use of entry scalebacks
	Supply & Demand	Residual balancing frequency
	Supply & Demand	Residual balancing volumes
	Supply & Demand	Residual balancing costs
Phase 2 indicators	Supply	Monitor within day changes in supply vs forecast and actual demand
	Supply	DFN correlations to within day supply flows
	Supply	Investigate additional locational indicators
	Demand	Correlation of OPNs to demand
	Other	Correlate forecast wind output with actual
	Other	Investigate accuracy of wind forecasts and implications for leadtimes
	Other	Report on compressor usage patterns

*The indicators DFN and OPN as referenced in the table stand for Daily Flow Notification and Offtake Profile Notice respectively.

2.9. In its presentation 'System Flexibility Indicators' at the Operational Forum on 26 May 2010 NGG confirmed the Phase 1 'Leading' and 'Lagging' indicators as described in Table 2. The proposed indicators each measure, in different ways, aspects of volatility in entry and exit flow patterns. NGG consider that evidence of increased volatility among the indicators is capable of signalling either a reduction in the availability of system flexibility, an increased demand for system flexibility, or a combination of the two. At the May Operational Forum they concluded that clear trends of increasing volatility are difficult to detect at this stage. They indicated that the majority of indicators show either flat profiles, seasonal profiles, or some volatility but with no underlying trend. For other indicators they advised the Forum that they do not have enough data to make an informed judgement but will continue to add datasets.

2.10. The data requires further monitoring and interpretation, but we note for example, that in the presentation at the Operational Forum the leading supply indicator 'Day on day difference in percentage of supply from LNG by month', updated for April 2010 data, confirmed the trend, witnessed since April 2009, of greater maximum day to day percentage change in supply from LNG. This trend appears to be coincident with the increase in total supplies coming from LNG since increased entry capacity was released at Milford Haven in 2009 and we welcome NGG's analysis of the implications of the continuation of this trend.

Impact of sector changes on NTS gas flows

2.11. Significant changes in the use of the NTS are forecast over the coming decade. The proportion of GB gas supplies coming from the UKCS has declined in recent years and is expected to continue to fall relative to gas imported from Europe or via LNG import terminals²⁰. Elsewhere, gas storage facilities are forecast to move from seasonal flow cycles to more frequent commercially driven flow cycles, and investment in renewable energy electricity generation could change the way in which combined cycle gas turbine (CCGTs) electricity generators take gas from the NTS, potentially moving towards less predictable demand patterns in response to energy intermittency elsewhere in the sector. The system flexibility indicators developed by NGG are intended to anticipate the impact of these sectoral changes on overall system flexibility needs.

Forecast changes in the energy mix

2.12. The UK's Climate Change Act (2008) set a target of reducing greenhouse gas emissions by 80 per cent by 2050, with an interim target for CO₂ reduction of at least 26 per cent by 2020. As part of meeting these targets it is the UK government's objective that by 2020 15% of Britain's energy will be generated from renewable sources. By 2020 a significant proportion of our existing conventional and nuclear generation capacity is forecast to reach the end of its expected life span. To meet the renewable generation targets and to ensure sufficient generation capability significant investment²¹ in new generation capacity including significant investment in renewable generation sources is required. This implies a greater role in the energy mix for energy sources such as wind, wave and tidal generation as well as Carbon Capture Storage (CCS) technology and new nuclear power plant.

2.13. Forecasts for the growth in renewable electricity generation depend on the modelling assumptions used. NGG has a licence obligation²² to publish annually a ten-year forecast of transportation system usage and likely system developments.

²⁰ This trend is forecast in a number of recent publications including the November 2010 'Statutory Security of Supply Report – A report produced jointly by DECC and Ofgem'. A copy of this document is available at the following location:

<http://www.official-documents.gov.uk/document/hc1011/hc05/0542/0542.pdf>

²¹ DECC's forthcoming Electricity Market Reform (EMR) consultation is intended, among other things, to identify and address barriers to substantial new investment.

²² The obligation is set out in Special Condition C2 of the Gas Transporters' Licence and Section O of the Uniform Network Code.

The latest Ten Year Statement was published in December 2009²³ (The 2010 Ten Year Statement is scheduled for publication at the end of 2010.) Under its 'gone green' scenario where the GB energy sector makes a rapid change to low carbon technologies, in 2009 NGG projected that renewable energy generation could grow from under 5GW in 2010/11 to just under 30GW by 2020/21.

2.14. As part of Project Discovery²⁴, Ofgem's year-long study of whether the current arrangements in GB are adequate for delivering secure and sustainable electricity and gas supplies over the next 10-15 years, we modelled gas demand to 2025 under four energy scenarios. The scenarios assume different combinations of economic growth and level of response to combating climate change and are known as:

- Green Transition (rapid economic growth and global agreement on tackling climate change);
- Green Stimulus (slow economic recovery but global agreement on tackling climate change);
- Dash for Energy (rapid economic growth but no global agreement on tackling climate change); and
- Slow Growth (slow economic recovery and no global agreement on tackling climate change).

2.15. Under the Slow Growth and Dash for Energy scenarios GB gas demand is assumed to grow significantly, moving from in the region of 85 billion cubic metres (bcm) per annum to just less than 100 bcm and 107 bcm per annum respectively. In the Dash for Energy scenario concerns over security of supply are assumed to trump climate change measures and, combined with high investment, lead to an expansion of gas demand both as a power source for CCGT and to meet economic growth. In the Slow Growth scenario significant investment in new generation is more constrained, but a growth in gas as a power source is still anticipated in large part to compensate for the reduction in generation capacity arising from the existing nuclear and coal fired power generation coming to the end of its life span. Both of these scenarios imply potential new investment in gas transportation capacity, but depending on flow profiles, we note that this investment in and of itself may not radically change the pattern of gas flows on the NTS.

2.16. Under the Green Transition and Green Stimulus scenarios, by 2025, GB gas demand is forecast to fall to around 65 bcm and 62 bcm respectively. Under both scenarios total gas demand would fall as a result of the decarbonisation of the energy sector, and both scenarios assume a greater role for renewable generation in meeting base load electricity demand.

²³ The 2009 edition of the Ten Year Statement can be found at the following link:
<http://www.nationalgrid.com/uk/Gas/TYS/current/TYS2009.htm>

²⁴ 'Project Discovery - Options for delivering secure and sustainable energy supplies', Ofgem, February 2010.

2.17. On current technology, wind and tidal generation are considered to be intermittent generation sources and, as they are more dependent on prevailing weather conditions, may be less able to respond to market price signals under all circumstances than more conventional power sources. A greater role for renewable generation in the energy mix could, in the long run, shift the role of some CCGT generation from base load to providing back up power in response to energy intermittency.

2.18. This possibility was considered by Poyry²⁵ in its 2009 report on the impact of wind variability²⁶. Poyry suggested that assuming significant investment in renewable generation, by 2030, CCGTs could be responding to the wind not blowing. This view is also presented by the Committee on Climate Change (CCC) in their recent Fourth Carbon Budget publication²⁷. In its report the CCC indicate that unabated CCGT generation is likely to become more expensive than low-carbon alternatives at high load factors by the end of the 2020s and that while there will still be an important role for flexible gas capacity to provide back-up to wind generation and to generate at peak times, operation is likely to be at low load factors.

2.19. Intermittent and potentially unpredictable CCGT generation patterns could result in CCGT's having more intermittent and less predictable gas exit flow profiles. More volatile gas demand among CCGTs could result in an increased exit flow variability which could impact on NTS system flexibility.

Changes in sources of GB gas supply

2.20. Historically, the majority of GB gas has been supplied from the UKCS. In recent years the proportion of gas supplied from the UKCS has fallen and an increasing amount of gas is imported as LNG via LNG terminals; from Norway via the Langeled pipeline; and from continental Europe via interconnector pipelines.

2.21. Each of the four Project Discovery scenarios anticipates a continued decline in gas supplies from UKCS and, to varying degrees, an increase in reliance on gas imports over the next 10 to 15 years. This is supported by NGG's Ten Year Statement forecasts. In its 'base case' annual supply graph from its 2009 Statement NGG indicates that by 2018 more than half of GB gas supplies are likely to be imported, and that by that time gas supplies from LNG will have increased to just less than 20% of the total.

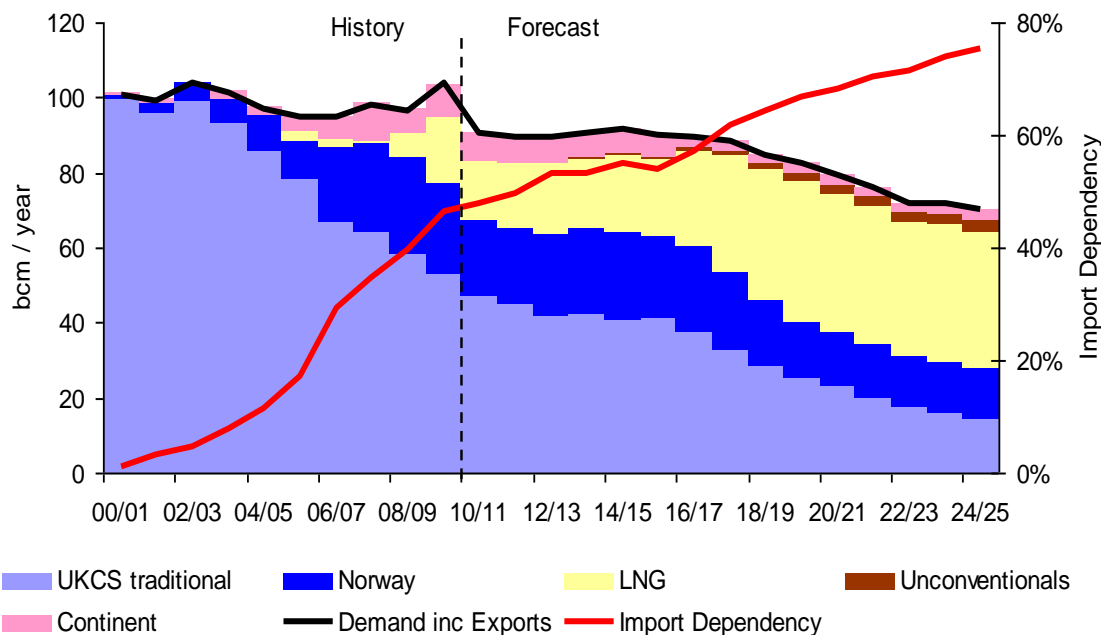
²⁵ Poyry is a global consulting and engineering firm focusing, among other things, on the energy and environment sectors.

²⁶ 'Impact of intermittency: How wind variability could change the shape of the British and Irish electricity markets', Summary Report, Poyry, July 2009
<http://www.poyry.com/linked/group/study>

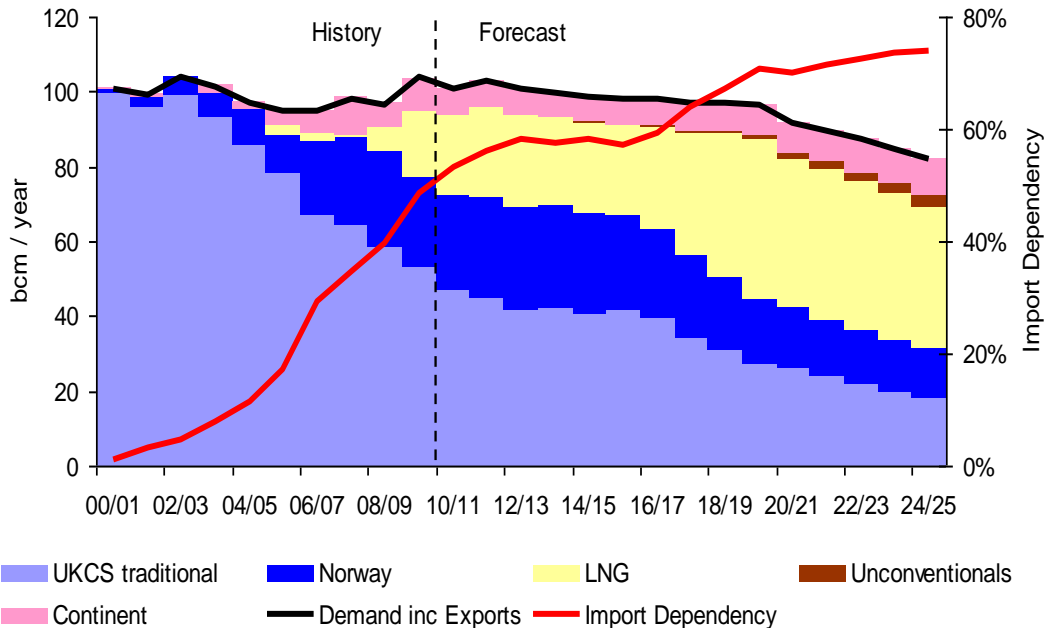
²⁷ 'The Fourth Carbon Budget - Reducing emissions through the 2020s', Committee on Climate Change (CCC), 7 December 2010 This report is available at the following link:
<http://www.theccc.org.uk/reports/fourth-carbon-budget>

2.22. In its 2010 Ten Year Statement²⁸ NGG intends to provide two annual gas supply scenarios: 'Gone Green and 'Slow Progression'. Slow progression represents a slower decarbonisation of the GB energy sector. In the 2010 statement NGG forecasts that more than half of GB gas supplies are likely to be imported by around 2015 in the 'Gone Green' scenario and that this could happen several years earlier under 'Slow Progression' assumptions. In the 2010 statement NGG also upgrades its forecast of supplies coming from LNG to in the region of 25% of total supplies under both scenarios by 2020. This change may be indicative of the inherent uncertainty of gas supply forecasts ten years out. NGG considers that the potential increase in LNG reliance may arise from a forecast decrease in supplies coming from Norway after 2014/15. Diagrams 5 and 6 illustrate NGG's annual gas supply forecasts under both scenarios.

Diagram 5 – NGG 2010 Annual Gas Supply Forecast – Gone Green Scenario



²⁸ NGG's 2010 Ten Year Statement will be published at the end of 2010. Ofgem has obtained early sight of NGG's gas supply forecasts for the purposes of this document. We reproduce them here with the consent of NGG.

Diagram 6 – NGG 2010 Annual Gas Supply Forecast – Slow Progression Scenario

2.23. The forecast continued decline in UKCS supplies in favour of LNG imports and imports from Norway and continental Europe has far reaching implications for the configuration of the NTS. Gas coming from the UKCS via St.Fergus in the North of Scotland implies an aggregate North to South GB gas flow. Gas imported via LNG terminals such as Milford Haven in South Wales, or via interconnectors on the East Coast of England, implies different gas flows.

2.24. Further, gas entered from the UKCS typically flows at a steadier rate than imported gas. This is in part because the UKCS predominantly serves the GB market, while imported gas flow rates are influenced by European contractual obligations and global gas market signals. For example, contractual obligations on Norwegian gas exporters to serve the continental gas market at the beginning of the gas trading day can result in "backloading" on the GB market, i.e. flows below the nominated amount towards the beginning of the gas day and above the nominated amount towards the end of the gas day. LNG imports are subject to global LNG prices, and the ability of shippers to land LNG is also subject to the physical location of LNG. Because of this LNG injections tend to have lower load factors than other sources of supply.

2.25. In addition, there are indications that gas storage sites are increasingly price driven rather than season driven and as a consequence may enter and exit gas to more frequent and unpredictable flow profiles. Gas storage sites are conventionally assumed to enter gas onto the system at times of peak capacity demand, but if storage operators are increasingly responding to gas market price signals from GB or

the continent, these assumptions may not hold under all circumstances in the future. Increased variability in gas storage flow cycles could also impact on the availability of system flexibility.

2.26. In the future the NTS may require increased system flexibility to accommodate the uncertainty and volatility of changing entry flow patterns. Increased reliance on gas imports may imply increased switching of flows between entry points which may have system flexibility investment implications. NGG's ongoing work in respect of System Flexibility indicators is designed to provide NGG with signals as to the extent of this volatility and the impact it will have on system flexibility across the NTS.

3. Prevailing exit flexibility capacity arrangements

Chapter Summary

UNC0195AV did not introduce changes to the operation of the exit flexibility capacity arrangements. This chapter sets out the arrangements in detail, and provides an overview of their effectiveness in the period since our decision to implement UNC0195AV in January 2009.

Question box

Question 1: Do you agree with Ofgem's representation of how shippers and TCCs manage their NTS exit flow variation requirements?

Question 2: Do you have any views on the effectiveness of the existing UNC Offtake Capacity Statement (OCS) process applying to GDNs' NTS exit (flex) capacity bookings and do you consider that the UNC adequately supports shippers flexibility capacity needs?

Question 3: Would it be appropriate for NGG to consider investment to provide GDNs with incremental exit flexibility capacity?

GDNs' and shippers' exit capacity arrangements

UNC arrangements for booking exit capacity

3.1. Following implementation of Exit Reform shippers and GDNs book NTS Exit (flat) capacity for the Gas Year starting 1 October 2012 under the same arrangements. These arrangements are set out in UNC TPD Section B3 and provide for the release of the following range of firm flat exit capacity products on a non-discriminatory basis:

- Enduring Annual NTS Exit (Flat) Capacity;
- Annual NTS Exit (Flat) Capacity; and
- Daily NTS Exit (Flat) Capacity.

3.2. Enduring Annual NTS Exit (Flat) Capacity is principally available via the Annual Application Window in Year Y for Years Y+4, Y+5 and Y+6²⁹ while Annual NTS Exit

²⁹ Subject to conditions Enduring Annual Exit (Flat) Capacity can be booked out with the Annual Application Window. Such applications are known as ad-hoc requests for capacity. The criteria for such requests is contained in NGG Exit Capacity Release (ExCR) Methodology Statement

(Flat) Capacity is made available by NGG via the Annual Application Window in Year Y for Years Y+1, Y+2 and Y+3. NGG will make Annual NTS Exit (Flat) Capacity available up to the baseline capacity level as set out in its licence for each exit point. Allocations of Enduring Annual NTS Exit (Flat) Capacity can be for levels of capacity above baseline as it is available from y+4 which is after NGG's default investment lead time obligation of 38 months³⁰.

3.3. Implementation of Exit Reform under UNC195AV did not impact the booking mechanism for NTS exit flexibility capacity. In keeping with the transitional arrangements, under the UNC Offtake Capacity Statement (OCS) process, NGG provides GDNs with a statement specifying an amount of flexibility capacity and Assured Offtake Pressures (AOPs) in relation to each of their NTS/LDZ Offtakes for each Gas Year up to and including Gas Year Y+5. AOPs affect the diurnal storage that the GDN can obtain from within its own system and are a trade-off to requesting flexibility from the NTS. What was known as NTS Offtake (Flex) Capacity under the transitional arrangements is known as NTS Exit (Flexibility) Capacity under reformed arrangements. Shipper Users continue not to have to book exit flexibility capacity rights separately, but their ability to vary flows is subject to the UNC Offtake Profile Notices process and the terms of TCC's NExAs.

NTS exit (flexibility) capacity booking process

3.4. The UNC OCS process allows GDNs to apply for NTS Exit (Flexibility) Capacity at an NTS/LDZ Offtake in any relevant Gas Year (year Y) or any relevant Gas Year up to year Y+5, by submitting an application to National Grid NTS during the July Annual Application Window in Gas Year Y-1. A GDN can also submit an application for an increase in NTS Exit (Flexibility) Capacity out with the Application Window where it has received a request for new or additional capacity by a Supply Point on its own network such that it might otherwise be unable to comply with the capacity obligations of its GT licence.

3.5. NGG can reject, or accept in part only, any application for an amount of or an increase in NTS Exit (Flexibility) Capacity in respect of an NTS/LDZ Offtake where it determines that it would not be feasible to supply that capacity (and associated pressure requirement) throughout the period for which the application is made. NGG is obliged to notify a GDN as soon as is reasonably practicable where they believe they are unlikely to be able to meet an application in full and are required to provide details of the circumstances surrounding any restrictions and the maximum available capacity.

3.6. In respect of applications made during the Application Window NGG must provide GDNs with an indicative statement no later than 15 September notifying them whether their application has been accepted in whole or in part. GDNs can then seek clarification, reconsider and resubmit their application within 5 business days³¹. NGG is then obliged to use reasonable endeavours to consider and where

³⁰ The investment lead time obligation is the default period of time within which NGG is obliged to meet incremental capacity requests.

³¹ The process under which GDNs can resubmit their applications is currently subject to review under UNC proposal 0342 'Amendment to the DN adjustment window'

necessary discuss any proposed resubmission with the GDN with a view to agreeing by 30 September the finalised OCS volumes. Where NGG receives applications out with the Application Window it has 15 business days to provide a statement to the GDN and where provided such a statement is considered to be an OCS revision.

3.7. The UNC does not specify conditions under which NGG is obliged to provide incremental NTS Exit (Flexibility) Capacity in response to a request for more capacity. Further information concerning the release of NTS Exit (Flexibility) Capacity is available from NGG's 'NTS Exit Capacity Release (ExCR) Methodology Statement'³².

3.8. The ExCR statement describes the methodology that NGG uses for release of incremental and existing NTS exit capacity in the transitional and enduring periods. The statement is required to be consistent with the obligations imposed on NGG under the Gas Act, its GT Licence, and with the obligations in respect of exit capacity governance imposed on NGG by the UNC. The current ExCR statement was approved by the Authority on 26 May 2010³³ and came in to force on 1 June.

3.9. The NTS ExCR methodology sets out that in respect of existing capacity GDNs can obtain NTS Exit (Flexibility) Capacity, both in the transitional and in the enduring periods, via the annual Offtake Capacity Statement (OCS) process in accordance with UNC TPD Section B3.7. In respect of new capacity, paragraph 126 of the statement sets out that any request for incremental flexibility capacity will be rejected where: it requires system reinforcement; leads to an increase in costs; or, could reasonably be considered to lead to a conflict with the safe operation of the network.

Shipper arrangements for accessing exit flow variations

3.10. The NTS ExCR methodology states that the right to vary exit flows will be made available to shippers only via the daily Offtake Profile Notices (OPN). The OPN procedure is defined in the UNC under section TPD J4.5. The procedure requires a user to submit a notification to NGG setting out its rates of offtake throughout the day, with proposed rates being subject to a maximum Permitted Offtake Rate. For shipper users the maximum Permitted Offtake Rate is defined as the shipper user's flat capacity holding in respect of an exit point divided by 24. By this definition shipper users cannot vary their offtake profile by going above the rate implied by 1/24th of their flat capacity holding.

3.11. The exit arrangements applying in respect of all NTS exit points at which a shipper is the registered user are subject to the terms of the TCC's NEXA as required

<http://www.gasgovernance.co.uk/0342>

³² A copy of NGG's ExCR Methodology statement is available at the following link: <http://www.nationalgrid.com/uk/Gas/Charges/statements/transportation/1ExCR/>

³³ 'NTS Exit Capacity Release Methodology Statement in respect of the Transitional and Enduring Periods', Ofgem Approval Letter, 26 May 2010.

under the Network Exit Provisions section of the UNC. The NExA sets out a number of conditions including the ramp rates and rates of flow change permitted in respect of supply points. Shippers can match a TCC's exit profile to its exit requirements by varying flow rates subject to the NExA conditions. In this respect it would appear that the flexibility capacity available to shippers on behalf of TCCs relates to their ability to vary flows at a rate below the steady rate implied by their flat capacity holding.

GDNs system flexibility needs

GDN capacity obligations

3.12. GDNs have a licence obligation to meet 1 in 20 peak day capacity demand on their networks. GDNs can do this by: booking NTS Exit (flat) Capacity or NTS Exit (flexibility) Capacity; investing in new capacity, linepack or gas storage capability within their own networks; or, by accessing interruptible capacity on their own networks. The GDNs are incentivised under the GT licence to book NTS Exit (flat) Capacity and interruptible capacity efficiently under the Capacity Outputs Incentive³⁴. GDNs are also required under the GT licence to write to the Authority with an explanation in situations where they seek to book NTS Exit (flexibility) Capacity increases of greater than ten per cent year on year.

3.13. Booking additional NTS exit capacity, and making additional investment on their own pipeline system allows GDNs to meet a higher or increased 1 in 20 peak day capacity demand. Accessing additional DN interruptible capacity allows GDNs to manage their 1 in 20 obligations by reducing peak day capacity demand as in the event of a 1 in 20 peak gas day all interruptible customers are assumed to have been interrupted. Given the lumpy nature of network investment, where it is available interruptible capacity can be an economically efficient tool in allowing GDNs to manage incremental capacity obligations.

Recent trends in GDN flexibility capacity bookings

3.14. The 2007 OCS process revealed an apparent increase in GDN demand for additional amounts of flexibility capacity in the years up to and including 2011/12. Table 2 indicates that at an aggregate level GDNs requested 23.17mcmd for the gas year 2007/08, rising to 23.54mcmd by 2010/11 and jumping to 28.22mcmd by 2011/12. The 2011/12 step change in the level of flexibility capacity requested is thought to have been submitted by GDNs in anticipation of the potentially lower level of interruptible capacity they would have on their own networks following the

³⁴ A description of the Capacity Outputs Incentive is contained in Chapter 6 of the following document 'Gas Distribution Price Control Review Final Proposals Consultation Document', Ofgem, December 2006. A copy of the document is available at the following link:

<http://www.ofgem.gov.uk/Networks/GasDistr/GDPCR7-13/Documents1/final%20proposals.pdf>

implementation of the reformed interruption arrangements in that year. A summary of the revised GDN interruption arrangements is contained in Appendix 4.

3.15. The maximum amount of flexibility capacity allocated by NGG at the 2007 window peaked at 17.47mcmd for the year 2010/11. Table 3 illustrates the aggregate initial volumes of flexibility capacity requested and the aggregate final allocations of flexibility capacity allocated across all GDNs. A trend among GDNs to request increasing amounts of flexibility capacity in the years furthest from the OCS year in question is apparent in the 2007, 2008 and 2009 OCS data although this is not apparent for 2010. The aggregate amounts requested for 2010/11 and 2011/12 fall significantly in 2008 relative to 2007 and again in 2009 relative to 2008. The indicative Final Allocation of 17.448 mcm/d aggregate flexibility capacity allocated by NGG NTS in the 2007 OCS process for 2011/12 is some way short of the 28.22mcm/d initially requested, but by 2009 the aggregate amount initially requested for 2011/12 had fallen to 15.124mcm/d indicating a potentially high degree of sensitivity surrounding GDNs' actual flexibility capacity requirements.

Table 3. 2007 - 2010 OCS Process³⁵: NTS Exit (Flexibility) Capacity Initial Requests and Final Allocations

NTS Exit (Flexibility) Capacity – OCS Process							
	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Initial Request 07	22.446	23.535	28.221				
Initial Request 08	15.706	16.650	20.181	21.512			
Initial Request 09	12.015	12.193	15.124	16.677	17.230	17.691	
Initial Request 10		16.640	19.586	19.451	19.961	19.315	19.739
Final Allocations 07	15.742	17.471	17.448				
Final Allocations 08	14.934	15.925	19.190	19.189			
Final Allocations 09	13.450	12.974	15.926	16.421	16.614	17.023	
Final Allocations 10		16.696	19.426	18.313	18.827	18.216	18.655

3.16. The 2009 and 2010 OCS data³⁶ indicates that the GDNs' aggregate Initial Requests for flex for the years 2012/13, 2013/14, 2014/15 and 2015/16 have not been met in full. A difference between Initial Requests and Final Allocations is consistent with the OCS data for 2007 and 2008, but we note that the aggregate levels of flexibility capacity sought by the GDNs for 2012/13 and 2013/14 and 2014/15 are broadly equivalent to the levels of capacity confirmed as available between 2010/11 and 2012/13 by the 2007 and 2008 OCS processes.

3.17. In its 2007 response to Ofgem's request for information concerning the availability of NTS flexibility NGG indicated that under balanced demand conditions the aggregate level of available flexibility capacity could be in the region of 26 to 31

³⁵ Initial Requests for the Gas years 2012/13 to 2015/16 were not taken during the 2007 OCS process. Initial Requests for the Gas years 2013/14 and 2015/16 were not taken during the 2008 OCS process and Initial Requests for the Gas year 2015/16 were not taken during the 2009 OCS process. Following the introduction of Exit Reform Initial Requests for flex were taken up to and including year y+5 in the 2009 and 2010 OCS processes.

³⁶ This data was made available to Ofgem following an information request to NGG.

mcmd by 2010/11 while under less favourable conditions it could be less than 20 mcmd. The information relating to the 2009 and 2010 OCS processes would suggest that at an aggregate level the availability of NTS Exit (flexibility) capacity for 2012/13 is forecast by NGG to be towards the lower end of the projected scale.

Drivers of GDN flex requirements

3.18. In March 2007 Ofgem implemented UNC090 'Revised DN interruption arrangements'. The revised arrangements allow GDNs to offer interruptible capacity via interruptible capacity tenders in the locations and volumes where it is economically useful, and applies to interruptible capacity from 1 October 2011. The first interruptible capacity tender was held in June 2008. In the tender the GDNs agreed interruptible contracts for 2011 with a number of key customers who will provide economic benefit to the network in being interruptible, but at an aggregate level the tender resulted in a significant reduction in the total interruptible capacity available to the GDNs from 2011 onwards.

3.19. A possible consequence of the reduction in the availability of generic interruption on the GDNs from October 2011 is that the theoretical level of flexibility on the GDNs pipeline system may have been reduced. To offset this potential impact, in some instances it might have been expected that GDNs would have sought to book additional flexibility capacity from 2011/12 onwards.

3.20. A step change between 2010/11 and 2011/12 requests is apparent in both the 2009 and 2010 OCS data, however the 2011/12 aggregate request of 15.124mcmd from the 2009 process is a significant reduction on the 20.181mcmd requested for the same year in the 2008 process. It may be that in the 2009 process the impact of interruption reform was anticipated to be offset by the reduction in demand associated with the recession, but it is not clear what has caused the GDNs aggregate requests for 2011/12 in the 2010 process to increase to 19.586mcmd. NGG indicate that the GDNs aggregate bookings of NTS exit (flat) capacity in 2010 application window are slightly less than previous years. It may be that there is an element of interaction between these trends.

3.21. To a limited degree across all GDNs, in the 2009 and 2010 OCS processes NGG indicated difficulty in meeting all of the capacity requests received for the period 2012/13 to 2015/16 in full. In one instance NGG also indicated an inability to meet an increase to the Assured Offtake Pressure (AOP) in a particular NTS exit zone. From the information provided to us by the GDNs regarding the 2009 OCS process, it is apparent that the rejection in part is not as a result of a uniform flexibility capacity shortage across all NTS exit points. The potential capacity constraints identified typically relate to a discrete number of exit points.

3.22. At a localised level available exit flexibility capacity is dependent on diurnal storage availability within the NTS and patterns of exit capacity use at other relevant NTS exit points within a given exit zone. As a consequence aggregate information about system wide flexibility capacity does not provide information concerning the flexibility requirements between GDNs, within GDNs at a Local Distribution Zone

(LDZ) level, and within LDZs at an individual exit point level. The aggregate increased GDN flex requirement anticipated between 2010/11 and 2011/12 may not be entirely attributable to the revised GDN interruption arrangements, but it is possible that location specific GDN constraints arising from a shortfall in GDN interruptible capacity are driving increased flexibility capacity requests in locations where NGG NTS finds it difficult to provide it.

Transparency of the OCS process

3.23. Where NGG is unable to accept a GDN's initial or resubmitted flex request in whole or in part it is obliged under the UNC to offer to discuss the resubmission with the GDN concerned. The feedback we have had from GDNs confirms that NGG do engage with GDNs concerning potential capacity constraints, but there is some concern about the transparency of the methodology NGG uses to reach decisions. Concerns indicated to us include:

- uncertainty over how the methodology applies to AOP requests;
- the timing during the application window of the September indication that a capacity request may not be met and the tightness of the timescale offered to GDNs to make a resubmission;
- the availability of information concerning GDNs' options and potential transferability of flexibility capacity within a localised flex zone;
- the transparency of the methodology used to define flex zones;
- the transparency of information concerning the impact meeting additional flexibility capacity requests in one zone may have on others; and
- the availability of information concerning aggregate system flexibility.

3.24. The feedback we have had from NGG concerning the OCS process also indicates some concern about the transparency of the process. NGG concerns include:

- in some circumstance NGG is unclear why GDNs turn down pressure reduction requests when some NTS exit points feed much lower GDN pressure tiers than would be indicated by the AOP.
- NGG consider that there is also a lack of transparency concerning the methodology GDNs use to calculate their NTS exit (flexibility) capacity requirements and that it is not always very apparent what drives annual variations in their requests.

Shippers' experience

3.25. We have not received recent feedback from shippers concerning the effectiveness of the flexibility capacity arrangements from their perspective. As indicated above shippers are not required to book NTS Exit (Flexibility) Capacity. In the responses to the consultations on Exit Reform shippers did not generally

highlight significant issues concerning their ability to vary exit flows and were generally opposed to UNC proposals concerning the introduction of universal NTS flexibility capacity product. In the responses to this consultation we seek shippers' views on whether these assumptions still stand.

4. Next steps in the system flexibility debate

Chapter Summary

This chapter sets out the principles and objectives we consider should apply to the further development of the NTS system flexibility arrangements. We set out our views on the framework for this development and indicate how the issue will interact with the next transmission price control, RIIO-T1.

Question box

Question 1: Do you agree with our view of the principles and objectives which should apply to the further development of the system flexibility capacity arrangements on the NTS?

Question 2: Do you agree that it would be appropriate to introduce an obligation on NGG to report on system flexibility indicators under the RIIO-T1 framework?

Question 3: Do you agree that it would be appropriate for NGG to justify any system flexibility investment proposals under RIIO-T1 with reference to flexibility capacity system indicators and specific RIIO-T1 output measures?

Question 4: Do you agree that the commercial and use of system charging arrangements should reflect any costs imposed on the system by NTS users' needs to vary entry and exit flows?

System flexibility principles and objectives

4.1. In our view the interest of customers is best served by ensuring that system flexibility is allocated in an economically efficient manner taking account of the commercial and operational costs of achieving this. As a starting point this means that available flexibility capacity should be fully allocated to those parties who can benefit from it. Where system flexibility is constrained, in our view it is important that those parties who value it most are able to obtain it on an equivalent non-discriminatory basis. In a competitive tender this would mean that the most efficient user would obtain scarce capacity which, other things being equal, would be expected to contribute to lower prices for consumers.

4.2. Where NTS users signal a requirement for increased flexibility capacity we also consider that in principle NGG should be able to offer this service, and that users should be able to indicate a willingness to pay for it where it is economically efficient for them to do so. In the past it has been argued that because NGG has not historically invested to provide additional flexibility capacity that system flexibility exists as a by product of the physical properties of the NTS and comes at zero marginal cost. In our view if availability of flexibility capacity was restricted and

users were unable to access it to the extent they found economically useful, a marginal cost would be incurred. For instance where GDNs are unable to obtain incremental flexibility capacity, investment in storage or greater linepack capability on their own networks is required. Similarly if the provision of flexibility capacity was to be constrained or rationed to shippers a commercial alternative would have to be considered which would be likely to have a cost implication.

4.3. In our decision on UNC0195AV we restated our views on the benefits of an efficient and non-discriminatory allocation of NTS exit flexibility capacity but decided not to mandate the introduction of exit flexibility capacity auctions. In the absence of clear evidence of a future flex scarcity, and in the face of significant representation on behalf of shippers concerning the costs of the introduction of a flex product, we decided that we could not evaluate the case for a flex product without further information. We continue to consider that the principles of proportionality and evidence based policy should inform the flexibility capacity debate. To this end we consider that data relating to the levels of system flexibility and any costs likely to be incurred in relation to flex constraints should continue to inform the way ahead.

Developments in the system flexibility debate

4.4. Since our January 2009 decision to implement UNC0195AV the following factors have informed the system flexibility debate:

- Firstly, the analysis and presentations provided by NGG through its System Flexibility Workshops has confirmed and further developed industry's understanding that flexibility capacity is not solely an NTS exit related issue and a number of system wide factors affect its availability. Through its leading and lagging supply, linepack and demand indicators NGG has developed a range of system flexibility drivers capable of helping inform future system flexibility needs.
- Secondly, a number of studies, such as Ofgem's Project Discovery, DECC's December 2009 'Energy Markets Outlook Report', and NGG's 2010 'Development of Energy Scenarios' paper have confirmed the forecast changes in patterns of gas use on the NTS across the next decade. On entry, continued decline in UKCS supplies and growth in imports from LNG, Norway and Continental Europe will affect the nature of entry capacity flow rates into GB. Potential changes in the exit behaviour of CCGTs and storage facilities are also forecast. These changes are likely to impact on the supply and demand for system flexibility over the next decade.
- Thirdly, analysis of the OCS processes over the last number of years shows that a small number of locational NTS exit flexibility capacity constraints can arise from year to year. Further, when constraints do arise, NTS users consider that the methodology deployed to resolve them can lack transparency. We are also concerned about the implications for investment efficiency across the NTS/GDN interface of GDNs being unable to signal a

willingness to pay for incremental NTS exit flexibility capacity and for NGG's inability to invest under the current arrangements to provide it.

- And fourthly, the debate on the likelihood of a future system flexibility constraint has been informed by NGG's October 2010 Forecast Business Plan Questionnaire (FBPQ) response to the TPCR4 adapted rollover. NGG has submitted plans to make very significant investment in the period 2012/13 to 2017/18 to provide increased system flexibility in response to changing entry flow patterns. NGG's submission indicates that on current projections they consider significant investment in compressors, among other things, is required to avoid system flexibility constraints within the RIIO-T1 price control period.

Way forward

4.5. In view of the developments in the understanding of system flexibility since January 2009, we consider that it is appropriate to put in place measures which will ensure that NTS users' future system flexibility needs are fully anticipated and met. We consider that system flexibility should continue to be developed as a system wide NTS issue, and that the arrangements for allocating flexibility capacity should be considered alongside the arrangements for investing in system flexibility capability.

4.6. Following the Authority's decision to rollover the fourth Transmission Price Control Review (TPCR4) by one year to allow the conclusions of Ofgem's RPI-X@20 project to inform the next review, the next transmission control is scheduled for implementation from 1 April 2013. The review will be the first control under Ofgem's new RIIO ('Revenue = Incentives + Innovation + Outputs') price control framework. The RIIO price control framework emphasises the importance of customers and stakeholders views to informing network companies objectives and emphasises a shift towards more outputs led price control objectives. The RIIO-T1³⁷ Strategy consultation document is due for publication in December 2010. We intend to use the document to consult on the obligations applying to NGG in respect of system flexibility within the RIIO-T1 period³⁸.

4.7. NGG has argued that while the NTS is primarily planned to meet the requirements on the 1 in 20 peak day based on a stable and predictable set of entry supply scenarios and demand patterns, the potential volatility of future flows undermines this assumption. Based on its FBPQ TPCR4 rollover submission, NGG consider that significant new system flexibility investment is required to accommodate an increased probability of bi-directional flows at the Bacton Interconnector and to recalibrate the system to accommodate the reversal of net North to South flows associated with the decline of flows from St. Fergus.

4.8. In our view any investment to provide increased system flexibility under the RIIO framework must be justified by supporting indicators and robust supply and

³⁷ RIIO-T1 is the abbreviated name for the first transmission price control review under the new RIIO framework.

³⁸ The RIIO-T1 will be an 8 year control running from 1 April 2013 to 31 March 2021.

demand modelling assumptions. Further, under the RIIO-T1 framework, business plans must be justified in terms of the network outputs they will deliver and we expect NGG to link any investment proposals to specific output measures.

4.9. To identify and support NGG's future system flexibility investment plans we propose that a system flexibility reporting regime should be developed and implemented by NGG. We consider that this work should build on the flexibility capacity monitoring regime initiated by NGG following the implementation of UNC195AV 'Introduction of Enduring NTS Exit capacity Arrangements'. We consider that it would be appropriate for NGG to seek views on the conclusions which it would be appropriate to draw from the information and the relative importance of the outputs identified and that this data should support and identify NGG's system flexibility investment plans.

4.10. We also consider that it would be appropriate for NGG and the GDNs to make explicit consideration of optimising investment efficiency across the NTS/GDN interface in formulating their business plans. The current UNC arrangements do not allow GDNs to signal a willingness to pay for additional NTS flexibility capacity. This has the potential to inhibit coordinated investment efficiency across the integrated GB gas pipeline system. In our view it is important that GDNs are able to compare the efficiency of additional NTS flexibility capacity alongside other capacity management options.

4.11. Where significant costs are demonstrated to be imposed on the system by forecast changes in users' entry or exit flow requirements, it is appropriate that users of the system who require this investment, contribute to funding it. We note that the commercial arrangements applying to the allocation of NTS entry and exit capacity provide NGG with efficient financially backed signals for NTS users' future flat capacity needs, but under the current arrangements may not fully indicate the type of investment required to meet wider system flexibility needs. As part of thinking about future system flexibility requirements we consider that it is important that NGG considers whether the commercial regime and use of system charging arrangements are providing them with enough information about how much users value the ability to vary entry and exit flows or providing users with appropriate charging signals regarding the efficient use of capacity.

4.12. As noted in Chapter 5, we are aware that there are a number of concerns among NTS users about the transparency and effectiveness of the UNC OCS process. We would be supportive of any moves to improve the efficiency of the arrangements, but we note that shippers and gas transporters are signatories to the UNC and have the ability to propose changes to the transportation arrangements. Providing such proposals are not deemed 'self governance' proposals³⁹ under the new code governance arrangements applying to the UNC from 1 January 2011, we would be obliged to consider these when they are submitted to us.

³⁹ Following the implementation of Ofgem's Code Governance Review, from 1 January 2011, to improve the efficiency of the UNC's modification procedures, non-material proposals will be progressed under the new industry self governance procedure.

4.13. In our 2009 UNC195AV decision we indicated that in addition to the monitoring and publication of flexibility capacity information we considered that it may be appropriate to develop the flexibility capacity arrangements by 'clarifying and simplifying NGG's existing operational tools to limit shippers ability to vary flows at entry and exit, and establishing an incentive scheme for NGG on the management of system-wide flexibility'. We do not propose to mandate changes in this respect at this stage, but we note that the possibility of an NTS linepack product as a commercial balancing tool is under review by our Markets division at the moment. We do not consider that the potential introduction of an NTS linepack product would impact on the availability of system flexibility capacity, but we recognise the need to ensure development of both issues in a coordinated manner.

RIIO-T1 Strategy consultation document

4.14. In parallel to this consultation, we will consult on the RIIO-T1 measures outlined in this chapter, in the 'Outputs and Incentives' paper of our December 2010 RIIO-T1 Strategy consultation document⁴⁰. Interested parties are invited to submit their views on these measures either as part of their response to this consultation on system flexibility, or as part of their response to the RIIO-T1 Strategy consultation. Responses to both documents will inform our RIIO-T1 Strategy decision document scheduled for publication in March 2011.

⁴⁰ This document will be published in December 2010 and will be available under the networks section of Ofgem's website at www.ofgem.gov.uk/networks

Appendices

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Appendix 1 - Consultation response and questions

1.1. Ofgem would like to hear the views of interested parties in relation to any of the issues set out in this document. (In particular, we would like to hear from gas shippers, Transmission Connected Customers (TCCs) and their representatives, and Gas Distribution Networks (GDNs))

1.2. We would especially welcome responses to the specific questions which we have set out at the beginning of each chapter heading and which are replicated below.

1.3. Responses should be received by 4 February 2011 and should be sent to:

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1.4. Unless marked confidential, all responses will be published by placing them in Ofgem's library and on its website www.ofgem.gov.uk. Respondents may request that their response is kept confidential. Ofgem shall respect this request, subject to any obligations to disclose information, for example, under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004.

1.5. Respondents who wish to have their responses remain confidential should clearly mark the document/s to that effect and include the reasons for confidentiality. It would be helpful if responses could be submitted both electronically and in writing. Respondents are asked to put any confidential material in the appendices to their responses.

1.6. Next steps: Having considered the responses to this consultation, we intend to publish proposals on the further development of the arrangements applying to system flexibility on the NTS in our March 2011 RIIO-T1 strategy document. Any questions on this document should, in the first instance, be directed to Lewis Hodgart using the contact details listed above.

CHAPTER: One

Question 1: Do you agree with our definition of system flexibility?

Question 2: Do you agree with our view that the ability to vary gas flows on entry and exit is valued by Gas Distribution Networks (GDNs), Transmission Connected Customers (TCCs), Aggregated System Entry Point (ASEP) operators and gas shippers?

CHAPTER: Two

Question 1: Do you agree with the system flexibility indicators developed by NGG?

Question 2: Do you consider that the system flexibility indicators are capable of identifying future system flexibility investment needs?

Question 3: Do you agree with our high-level analysis of the factors likely to affect future gas flows on the NTS? Are there important trends which we have not considered?

CHAPTER: Three

Question 1: Do you agree with Ofgem's representation of how shippers and TCCs manage their NTS exit flow variation requirements?

Question 2: Do you have any views on the effectiveness of the existing UNC Offtake Capacity Statement (OCS) process applying to GDNs' NTS exit (flex) capacity bookings and do you consider that the UNC adequately supports shippers flexibility capacity needs?

Question 3: Would it be appropriate for NGG to consider investment to provide GDNs with incremental exit flexibility capacity?

CHAPTER: Four

Question 1: Do you agree with our view of the principles and objectives which should apply to the further development of the system flexibility capacity arrangements on the NTS?

Question 2: Do you agree that it would be appropriate to introduce an obligation on NGG to report on system flexibility indicators under the RIIO-T1 framework?

Question 3: Do you agree that it would be appropriate for NGG to justify any system flexibility investment proposals under RIIO-T1 with reference to flexibility capacity system indicators and specific RIIO-T1 output measures?

Question 4: Do you agree that the commercial and use of system charging arrangements should reflect any costs imposed on the system by NTS users' needs to vary entry and exit flows?

Appendix 2 – Flexibility capacity and exit reform

Exit reform

1.1. Changes to the NTS exit flexibility capacity arrangements were an important consideration of the Exit Reform project. Reform of the NTS Exit Capacity arrangements, "Exit Reform", was progressed following the Authority's decision in 2005 to approve the sale of four of NGG's distribution network businesses and concluded in January 2009 with the implementation of UNC195AV 'Introduction of Enduring NTS Exit Capacity Arrangements'. Exit Reform mainly considered system flexibility from an NTS Exit perspective and, in the main, did not consider implications for the NTS entry arrangements. This section provides a background summary of the significant developments in the consideration of flexibility capacity within NTS Exit Reform.

Reviewing the flexibility capacity arrangements

1.2. The flexibility capacity arrangements were considered as far back as 2002 in the context of NGG's (formerly known as Transco) network code review proposal 0513 "Reform of Energy Balancing Regime". The proposal established a review group with the remit of assessing the effectiveness of the gas balancing arrangements. The review group considered, as part of a package of measures, that there could be merit in considering the introduction of gas flexibility capacity contracts which could allow Transco to strike bilateral agreements at entry and exit points to turn up or turn down gas flows within-day as a means of addressing some within-day linepack depletion concerns.

1.3. In April 2003, Ofgem concluded that fundamental reform of the gas balancing regime was not required at that time.⁴¹ It was noted that the problems experienced by Transco with respect to linepack depletion within-day should continue to be monitored on an ongoing basis. In the event that the risks associated with within-day linepack depletion increased, the introduction of more fundamental reforms to the regime could be reviewed again.

DN Sales and the Enduring Offtake Working Group (EOWG)

1.4. In February 2005, the Authority published its decision⁴² to permit the sale by NGG (then National Grid Transco) of four of its gas distribution network businesses. In our decision, we concluded that benefits from comparative regulation would be likely to arise from a divested distribution network industry structure and that these would be likely to benefit consumers. However our consent to DN Sales was conditional on the development of reformed arrangements for the allocation of NTS exit capacity, and the review of the NTS exit flexibility capacity arrangements was considered an important part of this process.

1.5. Prior to DN sales, NGG owned all of the low pressure GDNs as well as the NTS and so operated a fully integrated pipeline business. The creation of formalised arrangements to govern the interface between the two types of networks was considered necessary for several reasons. These included:

⁴¹ 'The gas trading arrangements: Reform of the gas balancing regime Next steps', Ofgem, April 2003.

⁴² 'National Grid Transco Sale of gas distribution networks. Authority decision', Ofgem, February 2005.

- Optimising the efficiency of investment across the NTS/GDN interface. A single integrated network owner can optimise its investment across both networks, with multiple owners arrangements needed to indicate to GDNs the relative cost of using transmission network capacity compared to investing in their own network.
- Establishing a user commitment framework under which NGG NTS could obtain financially backed signals from GDNs and from shippers on behalf of TCCs with regard to new exit capacity. A user commitment framework was seen as important to protect consumers from bearing the costs of inefficient investment.
- Introducing access arrangements which ensured that all GDNs and shippers had equivalent non-discriminatory access to NTS exit capacity following the GDN sales process.

1.6. In 2006 the Enduring Offtake Working Group (EOWG) was established to progress development of appropriate exit arrangements for the new industry structure. The objectives for the arrangements were detailed in the December 2005 TPCR consultation, and intended to be applied to all forms of capacity equally, were namely:

- Compliance with applicable legal requirements (such as those within the Gas Act, the Electricity Act and relevant European law);
- Efficient network development and system operation;
- Preventing undue discrimination;
- Promotion of competition;
- Appropriate allocation of risk;
- Preservation of security of supply;
- Simplicity and transparency;
- Stability;
- Minimise implementation costs; and
- Clear and appropriate accountability and responsibility.

1.7. Building on these principles, during 2006 the EOWG developed an exit reform model based on the following key features:

- Common NTS Exit Capacity services should be made available to all Users (shippers and GDNs) to avoid the scope for undue discrimination and meet EU Gas Regulation requirements;
- "pay-as-bid" release mechanisms should be used where investment cannot be completed in time (or is unlikely to be efficient) as a means of seeking to minimise the risk of any potential undue discrimination in the allocation of constrained amounts of Capacity;
- Capacity products embracing the concept of "flexibility" utilisation should be implemented that will support efficient and economic network operation;
- A "User commitment model" should be promoted requiring UNC (and non-UNC) Users to provide financially backed signals for Capacity requirements to minimise the risk of investment inefficiencies and, in the extreme, asset stranding.

Uniform Network Code (UNC) proposal 0116

1.8. The operational and commercial arrangements applying to the use of exit capacity are set out in the UNC. Implementing changes to the arrangements requires modification of the UNC. Drawing on the work of the EOWG, in 2006 UNC 0116V 'Reform of the NTS Offtake Arrangements' was raised by NGG. Following the raising of

UNC0116V four variant proposals (0116A, 0116BV, 0116VD and 0116CVV) were raised such that Ofgem received five variations to consider when the Final Modification Report was submitted in December 2006.

1.9. Each of the UNC 0116 variants addressed the key exit reform areas of flat capacity user commitment; interruptible capacity rights; and flexibility capacity. 0116A proposed the retention of the prevailing exit arrangements⁴³, known as the transitional arrangements, across all three areas. (A summary of the transitional exit arrangements is contained in Appendix One). The critical difference between the other variants related to the proposed flexibility capacity arrangements. Proposals 0116V, 0116BV and 0116VD proposed the introduction of a long term and short term flexibility capacity product allocated via capacity auctions but 0116BV and 0116VD also proposed the introduction of limits on flex overruns alongside increased flex tolerances. Proposals 0116A and 0116CVV proposed the retention of the prevailing flex capacity arrangements albeit 0116CVV proposed the introduction of a new flex monitoring regime.

1.10. Ofgem published an initial impact assessment on the UNC proposals in June 2006, a final impact assessment in February 2007 and on 5 April 2007 reached the decision to direct implementation of proposal 0116V⁴⁴. The difference between proposal 0116V and the other variants on the issue of flexibility capacity was integral to this outcome. The transitional flexibility capacity arrangements differed between GDN users and shipper users. GDNs were required to book flexibility capacity via the OCS process, but this did not apply to shippers. At the time we considered that flexibility capacity should be made available on an equivalent basis to ensure that those NTS users who valued it most were able to obtain it.

1.11. For these reasons, although the Authority considered that 0116V, 0116BV, 0116CVV and 0116VD would better facilitate achievement of the relevant objectives of the UNC, on the issue of flexibility capacity the Authority considered that 0116V, 0116BV and 0116VD would better meet the relevant objectives than 0116CV. Because the Authority did not consider the extension of flexibility tolerances as proposed by 0116BV and 0116VD would better achieve UNC relevant objective (a) 'the efficient and economic operation of the pipeline system', on the issue of flex it considered that 0116V was the most appropriate proposal.

Industry appeal of UNC 116V

1.12. The introduction of exit flexibility capacity auctions was not supported by a number of industry parties and was opposed in particular by a number of shippers. In April 2007 E.ON appealed the Authority's decision to direct implementation of 0116V, and its decision not to direct implementation of 0116A, to the Competition Commission (CC). The CC considered each component of the Authority's decision, and in July 2007 published a decision⁴⁵ to allow E.ON's appeal by quashing the decision to implement 0116V. The CC did not make a recommendation as to which if any of the UNC 0116

⁴³'Transitional arrangements' was the name given to the exit arrangements applying following DN sales but before implementation of the reformed exit arrangements. The arrangements were designed to accommodate the divested industry structure but did not mandate fundamental changes to flat capacity allocation and user commitment, or to the flexibility capacity or interruptible capacity arrangements. Following implementation of UNC0195AV, the reformed exit arrangements apply for the use of capacity from 1 October 2012. Appendix One contains a summary of the transitional exit arrangements.

⁴⁴ 'Uniform Network Code (UNC): Reform of the NTS offtake arrangements (UNC 0116V, 0116BV, 0116CVV, 0116VD and 0116A)', Ofgem, April 2007

⁴⁵ 'An appeal under section 173 of the Energy Act 2004 - Decision and order of the Competition Commission, CC02/7, July 2007:

http://www.competition-commission.org.uk/appeals/energy/eon_final_decision.pdf

variants should be implemented. In respect of the Authority's decision on flexibility capacity the CC concluded that the Authority had not provided sufficient evidence concerning the likelihood of a future flex scarcity or fully explained the benefits which might arise from the introduction of a flexibility product. In the absence of this evidence the CC concluded that the Authority had not demonstrated that benefits would arise from a market allocation of the product.

2007 flexibility capacity request

1.13. Following the CC's decision to allow the appeal of UNC116V, in November 2007 Ofgem wrote to NGG requesting information on the likely future availability of flexibility capacity in the period 2007-2017.

1.14. In its response⁴⁶, NGG's analysis indicated that, based on a projection forward of actual flexibility capacity usage, its assumed National Maximum Flexibility Capacity of 22 million cubic metres day (mcmd) could be exceeded by Winter 2012/13. NGG also described a number of scenarios, which it deemed plausible, where the current National Maximum Flexibility Capacity could be exceeded before 2012/13. Among these was the possible effect of the introduction of revised DN interruption arrangements in 2011/12. Based on a 2010/11 network forecast and optimal assumptions concerning a balanced distribution of gas supplies, a flat delivery profile of gas supplies and a balanced distribution of gas demand, NGG estimated that the national network capability on a peak day would be 26mcmd.

1.15. There were a number of responses to National Grid's analysis⁴⁷. Among them some considered that although the information provided by NGG was useful, insufficient data had been made available to fully support the conclusions reached and that the assumptions regarding future network expansions and compressor operations were not sufficiently transparent. Generally, respondents felt that NGG had tended to understate the future availability of flexibility capacity. In particular some considered that the worst case figures concerning flex availability were overly pessimistic and queried the likely coincidence of a 1 in 20 peak day demand, combined with locally targeted demand, high east coast flows and predominance of back loading at entry.

Uniform Network Code (UNC) proposal 0195

1.16. Following the CC's decision, UNC Review Group 166 was established to consider a number of elements of the proposed exit arrangements including those aspects of the flexibility capacity proposals addressed by the CC. Drawing on this work, two new modification proposals (UNC 0195 and UNC 0195AV) were raised in early 2008. The difference between these two variants related to the proposed obligations on NGG concerning the provision of daily interruptible capacity (what would become known as 'Off-Peak' NTS Exit (Flat) Capacity), but both closely resembled 0116CVV in that they would incorporate those aspects of 0116CVV that related to flat capacity user commitment but would not introduce flexibility capacity auctions.

⁴⁶ Information request to National Grid Gas regarding the likely availability of NTS flexibility capacity, National Grid Gas' response and industry comments, National Grid, January 2008

⁴⁷ Responses are available to view on Ofgem's website at <http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=17&refer=Networks/Trans/GasTransPolicy/offre>

1.17. Ofgem published a new impact assessment (IA) in respect of Exit Reform in July 2008⁴⁸. The IA assessed the UNC0195 variants alongside the five original proposals submitted prior to the Authority's April 2007 decision, and was informed by NGG's response to our November 2007 information request, and by industry responses to our April 2008 pro forma questionnaire⁴⁹ on the cost impacts of proposed modifications. Following consideration of industry responses, on 19 January 2009 the Authority published its decision to direct implementation of UNC 0195AV with effect from April 2009⁵⁰.

1.18. In our decision we concluded that introducing an exit-based flexibility product was not justified, at that time, for two main reasons. First, in their response to the IA, shippers continued to maintain that the costs of implementing a flexibility product would be high. Secondly, following NGG's response to our information request, there was conflicting evidence from NGG and shippers about whether flexibility capacity would become scarce in the near future. In the context of the CC's views concerning the significance of a likely flexibility capacity scarcity, we considered that this uncertainty made it difficult for us to fully assess the potential inefficiencies and costs that would arise if a flexibility capacity product was not introduced, albeit we continued to consider that the existing arrangements had deficiencies and would not necessarily provide NGG with signals about future flexibility scarcities

1.19. UNC0195AV does not introduce changes to the exit flexibility capacity arrangements. Instead it obligates NGG to monitor and publish information about flexibility capacity utilisation. In our decision we also requested NGG initiate an industry workstream to review the operational tools available to them in managing flexibility requirements and, where appropriate, to develop proposals which could enhance their ability to manage flexibility requirements in the future. We introduced these obligations to ensure that the issue of NTS flexibility capacity continued to develop, and in particular, to obligate NGG to further develop and explain its understanding of the relationship between NTS entry and exit flows, which the Exit Reform project had not principally addressed.

1.20. Following our January 2009 decision, NGG has held a series of System Flexibility Industry Workshops. The analysis presented in these workshops has led NGG to define a number of key flex capacity drivers and indicators which they propose to monitor and report at six monthly intervals with a view to identifying future flexibility capacity constraints.

⁴⁸ 'Gas National Transmission System Offtake Arrangements: Initial Impact Assessment on modification proposals', Ofgem, July 2008.

⁴⁹ 'Pro forma questionnaire on the cost impacts of enduring gas offtake and incentives' Ofgem, April 2008

⁵⁰ Uniform Network Code (UNC): Reform of the NTS offtake arrangements (UNC 0116V, 0116BV, 0116CVV, 0116VD, 0116A) and Introduction of Enduring NTS Exit capacity Arrangements (UNC 0195 and 0195AV) decision document, January 2009

<http://www.ofgem.gov.uk/Licensing/GasCodes/UNC/Mods/Documents1/UNC195AVD.pdf>

Appendix 3 – Transitional exit arrangements

Transitional exit arrangements

1.1. Following the Authority's consent to DN sales, and its decision to allow more time for the implementation of Exit Reform, the transitional arrangements were facilitated by the implementation of UNC 046 'Extension of the Sunset Clauses for Registration of Capacity at NTS Exit Points', which allowed GDNs to register capacity rights for the period beyond 1 October 2008; this was approved by the Authority in January 2006. Under the transitional arrangements, GDNs and shippers, on behalf of TCCs, acquire NTS flat and flexibility offtake capacity under separate arrangements. The arrangements applying to each party are described at a high level below.

GDNs

1.2. Under the transitional arrangements, GDNs signal their NTS exit capacity requirements through their bookings of two separate products: NTS Offtake (Flat) Capacity and NTS Offtake (Flexibility) Capacity. NTS Offtake (Flat) Capacity gives the holder the right to offtake a volume of gas during the day at an even rate across the gas day. NTS Offtake (Flexibility) Capacity gives the holder the right to offtake gas from the NTS according to a profile that varies across the day.

1.3. GDNs book NTS Offtake (Flat) Capacity and NTS Offtake (Flexibility) Capacity via the UNC Offtake Capacity Statement (OCS) process beginning on 1 June each year. Via this process GDNs are required to book revisions to existing capacity and increments of new capacity, by individual exit/offtake point, in annual tranches up to the gas year ending 30 September 2012. Where a GDN has sought incremental flat capacity and the request is judged by NGG NTS to require additional investment, GDNs must enter into an Advance Reservation of Capacity Agreement (ARCA) with NGG NTS. The ARCA is negotiated bilaterally (with Ofgem determining on any disputes) and is designed to protect NGG NTS, and ultimately customers, from the risk that investment is undertaken unnecessarily and becomes stranded. This also provides the GDN with certainty over when capacity will be delivered. There is no mechanism for the GDN to initiate NTS investment in flexibility.

Transmission Connected Customers (TCCs)

1.4. Under the transitional arrangements, the shipper for a TCC⁵¹ purchases a bundled "NTS exit capacity" product, covering both flat and flexible capacity, on behalf of its customer. Capacity is automatically allocated in respect of NTS daily metered (DM) supply points on a monthly basis, based on the shipper's prevailing Supply Point Capacity (i.e. this is on an "evergreen" basis with no renewal process required). TCCs can only reduce their capacity requirements during the period October to January and cannot reduce it below their maximum daily consumption in the previous winter. TCCs can obtain incremental flat capacity that does not require NTS investment, so long as NGG will release it.

⁵¹ TCCs can be their own shippers.

1.5. If TCCs require incremental capacity that will necessitate investment, then they, like GDNs, are required to enter into an ARCA with NGG NTS. As in the case of GDNs, ARCAs generally require users to make a commitment for at least one year, although this is subject to a case by case assessment.⁵² The provision of additional capacity under an ARCA is generally subject to a lead time of about three years.

1.6. TCC shippers may also elect to nominate a supply point as having NTS interruptible status. Sites that are nominated by shippers as interruptible can be interrupted for up to 45 days a year. In turn, interruptible sites receive a 100 per cent discount on exit capacity charges. Currently all storage sites are treated as interruptible.

CSEPs

1.7. Capacity booking processes for NTS connected system exit points (CSEPs) is on a 12 monthly rolling basis, with proactive renewal of existing capacity required.

GDN shippers (shippers supplying customers connected to a GDN rather than the NTS)

1.8. GDN shippers purchase and pay for rights to use the GDNs and the NTS separately. As part of the GDN sales process, it was proposed that GDNs would pay the NTS directly for transmission exit capacity and subsequently recover these costs through GDN shippers. This is known as the "Option 2A" payment flows model. It was originally intended that this model take effect from 1 October 2008 for the transitional offtake period. However, as part of the TPCR process we concluded that it was appropriate to delay the implementation of the model until 1 October 2010 to coincide with the proposed introduction of the enduring offtake arrangements. This was to allow any changes to charging systems to be coordinated and managed efficiently. The implementation of the model has subsequently been delayed to October 2012, in line with the extension of the sunset provisions for the transitional arrangements.

⁵² In September 2006, we issued our first determination in respect of an ARCA, in which we stated that a one year commitment would normally be appropriate for incremental capacity, although an additional commitment could be levied for loads that were riskier than the overall portfolio of loads on the NTS

Appendix 4 – Revised GDN interruption arrangements

1.1. Reforming the GDN interruption arrangements was considered by Ofgem to be an important condition of DN sales. On 1 May 2005, we introduced a licence condition requiring each GDN licensee to use reasonable endeavours to develop and review proposals for reforming the arrangements. In connection with this obligation UNC 90 'Revised DN interruption arrangements' was raised by National Grid Distribution in 2006. The proposal was developed at a work group throughout the remainder of that year, and in March 2007 was directed for implementation by the Authority with effect from 1 April 2008. The first interruptible capacity rights under the new regime will take effect from 1 October 2011.

1.2. Under the prevailing GDN interruption arrangements large GDN customers determine their own interruptible status at one year's notice in return for a standing discount on GDN use of system capacity charges. Historically the GDNs have made relatively limited use of interruptible capacity and yet in excess of 1000 large customers continue to be registered as interruptible. Ofgem was concerned that the arrangements did not necessarily reflect customers' willingness or in some cases ability to interrupt and that the capacity charges discount received by interruptible customers did not reflect the benefit each provided to the system in being interruptible. For these reasons we had concerns about the efficiency of the regime, security of supply, and the potential cross subsidy of interruptible customers by firm.

1.3. The reformed GDN interruption arrangements as introduced by UNC 90 change the way that interruptible capacity rights are allocated with effect from 1 October 2011. Via annual tenders with three year lead times, the reformed arrangements allow GDNs to offer interruptible capacity in the locations and volumes where it is economically useful. Shippers on behalf of eligible GDN customers can offer interruptible capacity to the network and can indicate the volumes, number of days they are willing to be interrupted, and the price at which they are willing to contract as interruptible (both option and exercise price). By allowing customers to reveal the value they place on interruptible capacity the reformed arrangements allow GDNs to make more discrete tradeoffs between contracting for interruption and investing in their own network or booking incremental offtake capacity.

1.4. The first DN interruptible capacity tender was held in June 2008. In the tender the GDNs agreed interruptible contracts for 2011 with a number of key interruptible customers on their networks. Many of these customers are designated under the prevailing interruption arrangements as Network Sensitive Loads (NSLs) and are of particular value to the GDNs as interruptible because to varying degrees significant investment would be required to reinforce the network to support such customers as firm on peak gas days. However, in part because the marginal economic benefit to GDNs of contracting for interruption with individual non-NSL customers is relatively low, at an aggregate level interest among GDN customers in contracting for interruption was low. In winter 2009/10 GDNs had access to in the region of 36.8 mcm/d of interruptible capacity. In winter 2011/12 the GDNs anticipate that they will have approximately 1.5 mcm/d of interruptible capacity albeit spread across 23 customers who will provide a direct benefit to the network and therefore the generality of customers in being interruptible.

Appendix 5 – The Authority’s powers and duties

1.1. Ofgem is the Office of Gas and Electricity Markets which supports the Gas and Electricity Markets Authority ('the Authority'), the regulator of the gas and electricity industries in Great Britain. This appendix summarises the primary powers and duties of the Authority. It is not comprehensive and is not a substitute to reference to the relevant legal instruments (including, but not limited to, those referred to below).

1.2. The Authority's powers and duties are largely provided for in statute (such as the Gas Act 1986, the Electricity Act 1989, the Utilities Act 2000, the Competition Act 1998, the Enterprise Act 2002 and the Energy Acts of 2004, 2008 and 2010) as well as arising from directly effective European Community legislation.

1.3. References to the Gas Act and the Electricity Act in this appendix are to Part 1 of those Acts.⁵³ Duties and functions relating to gas are set out in the Gas Act and those relating to electricity are set out in the Electricity Act. This appendix must be read accordingly.⁵⁴

1.4. The Authority’s principal objective is to protect the interests of existing and future consumers in relation to gas conveyed through pipes and electricity conveyed by distribution or transmission systems. The interests of such consumers are their interests taken as a whole, including their interests in the reduction of greenhouse gases and in the security of the supply of gas and electricity to them.

1.5. The Authority is generally required to carry out its functions in the manner it considers is best calculated to further the principal objective, wherever appropriate by promoting effective competition between persons engaged in, or commercial activities connected with,

- the shipping, transportation or supply of gas conveyed through pipes;
- the generation, transmission, distribution or supply of electricity;
- the provision or use of electricity interconnectors.

1.6. Before deciding to carry out its functions in a particular manner with a view to promoting competition, the Authority will have to consider the extent to which the interests of consumers would be protected by that manner of carrying out those functions and whether there is any other manner (whether or not it would promote competition) in which the Authority could carry out those functions which would better protect those interests.

1.7. In performing these duties, the Authority must have regard to:

- the need to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met;
- the need to secure that all reasonable demands for electricity are met;

⁵³ Entitled “Gas Supply” and “Electricity Supply” respectively.

⁵⁴ In exercising a function under the Electricity Act the Authority may have regard to the interests of consumers in relation to gas conveyed through pipes and vice versa in the case of it exercising a function under the Gas Act.

- the need to secure that licence holders are able to finance the activities which are the subject of obligations on them⁵⁵; and
- the need to contribute to the achievement of sustainable development.

1.8. In performing these duties, the Authority must have regard to the interests of individuals who are disabled or chronically sick, of pensionable age, with low incomes, or residing in rural areas.⁵⁶

1.9. Subject to the above, the Authority is required to carry out the functions referred to in the manner which it considers is best calculated to:

- promote efficiency and economy on the part of those licensed⁵⁷ under the relevant Act and the efficient use of gas conveyed through pipes and electricity conveyed by distribution systems or transmission systems; protect the public from dangers arising from the conveyance of gas through pipes or the use of gas conveyed through pipes and from the generation, transmission, distribution or supply of electricity; and secure a diverse and viable long-term energy supply, and shall, in carrying out those functions, have regard to the effect on the environment.

1.10. In carrying out these functions the Authority must also have regard to:

- the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed and any other principles that appear to it to represent the best regulatory practice; and
- certain statutory guidance on social and environmental matters issued by the Secretary of State.

1.11. The Authority may, in carrying out a function under the Gas Act and the Electricity Act, have regard to any interests of consumers in relation to communications services and electronic communications apparatus or to water or sewerage services (within the meaning of the Water Industry Act 1991), which are affected by the carrying out of that function.

1.12. The Authority has powers under the Competition Act to investigate suspected anti-competitive activity and take action for breaches of the prohibitions in the legislation in respect of the gas and electricity sectors in Great Britain and is a designated National Competition Authority under the EC Modernisation Regulation⁵⁸ and therefore part of the European Competition Network. The Authority also has concurrent powers with the Office of Fair Trading in respect of market investigation references to the Competition Commission.

⁵⁵ Under the Gas Act and the Utilities Act, in the case of Gas Act functions, or the Electricity Act, the Utilities Act and certain parts of the Energy Acts in the case of Electricity Act functions.

⁵⁶ The Authority may have regard to other descriptions of consumers.

⁵⁷ Or persons authorised by exemptions to carry on any activity.

⁵⁸ Council Regulation (EC) 1/2003.

Appendix 6 - Glossary

A

Assured offtake pressure (AOP)

AOP is the pressure of the gas at exit point which NGG allocates to GDNs via the annual OCS booking process. AOPs impact on the diurnal storage that the GDN can obtain from within its own system and are a trade-off to requesting flexibility from the NTS.

The Authority

The Gas and Electricity Markets Authority (GEMA) is the body established by Section 1 of the Utilities Act 2000 to regulate the gas and electricity markets in Great Britain.

B

Baseline

Baselines are minimum levels of capacity that the transmission licensee is obligated under its GT licence to provide. Baselines also determine the levels above (or below) which incremental capacity is defined.

Buy Back

Buy back is the process of compensating users if NGG is unable to deliver its baseline or incremental capacity obligations.

C

Capital Expenditure (Capex)

Expenditure on investment in long-lived transmission assets, such as gas pipelines or electricity overhead lines.

D

Daily flow notification (DFN)

DFNs are a requirement of the Network Entry Agreements (NEAs) between Aggregated System Entry Point (ASEP) operators and NGG. The DFN indicates the rate at which an ASEP operator intends to flow gas on to the system across the gas day.

E

Entry capacity

Entry capacity is the capacity which gas shippers need to book from NGG in order to bring gas onto the NTS.

Exit capacity

Exit capacity is the capacity which gas shippers and GDNs need to book from NGG in order to take gas off the NTS at system exit points.

F

[Forecast Business Plan Questionnaire \(FBPQ\)](#)

FBPQs are submitted to Ofgem by network companies and provide operational and expenditure information used by Ofgem to determine price control allowances.

G

[Gas Distribution Networks \(GDNs\)](#)

Gas Distribution Networks, of which there are eight, four of which are owned by National Grid Gas plc, and four of which were sold by Transco plc (now National Grid Gas plc) to third party owners on 1 June 2005.

L

[Liquefied Natural Gas \(LNG\)](#)

LNG consists mainly of methane gas liquefied at around -260 degrees Fahrenheit. Cooling and liquefying the gas reduces its volume by 600 times such that a tonne of LNG corresponds to about 1,400 cubic metres of methane in its gaseous state. LNG may be stored or transported by special tanker.

N

[National Grid Gas plc \(NGG \)](#)

The licensed owner and operator of the gas national transmission system, and four of the regional gas distribution networks.

[National Transmission System \(NTS\)](#)

The NTS is the high pressure gas transmission system in Great Britain.

[NTS Exit \(flexibility\) capacity](#)

NTS Exit (flexibility) capacity is the capacity which GDNs require to book from NGG in order to vary the rate at which they exit gas from the NTS.

O

[Offtake Profile Notice \(OPN\)](#)

Shippers are required under the UNC to submit an Offtake Profile Notice to NGG daily for the gas day ahead. The OPN indicates the rate at which users propose to exit gas from the system across the gas day at a given exit point.

[Ofgem](#)

Ofgem is the Office of Gas and Electricity Markets, which supports the Gas and Electricity Markets Authority (the 'Authority').

Operating Margin (OM)

In relation to gas the OM is gas in storage which is reserved by the NTS to ensure the supply of gas is maintained in the event of a network emergency.

'One in twenty' peak day capacity obligation

Subject to Section 9 of the Gas Act, Standard Special Condition A9 of the GT licence requires NGG and the GDNs to plan and develop their pipeline systems to enable them to meet '1 in 20' peak aggregate daily demand. '1 in 20' peak aggregate daily demand is defined as the peak aggregate demand level which, having regard to historical weather data derived from at least the previous 50 years, is likely to be exceeded (whether on one or more days) only in 1 year out of 20 years.

RIIO

'RIIO' is the abbreviated name for Ofgem's new price control framework and stands for Revenue = Incentives + Innovation + Outputs. The RIIO price control came from the conclusions of Ofgem's RPI-X@20 review. The RIIO price control framework will apply to the next transmission price control review (RIIO-T1) scheduled for implementation on 1 April 2013.

Revenue Driver

A means of linking revenue allowances under a price control to specific measurable events which are considered to influence costs. Under the gas transmission price control framework NGG receives revenue drivers in order to provide incremental entry and exit capacity.

S

System Operator (SO)

The system operator has responsibility to construct, maintain and operate the NTS and associated equipment in an economic, efficient and co-ordinated manner. In its role as SO, NGG is responsible for ensuring the day-to-day operation of the NTS.

System flexibility

System flexibility is used by NGG to manage differences in NTS users' entry and exit capacity rates.

Ten year statement

Special Condition C2 (Long Term Development Statement) of the GT licence requires NGG to publish annually a ten year forecast of NTS usage and likely developments.

Terminal flow advice (TFA)

Terminal flow advice (TFA) is an instruction to turn down or cease entering or exiting gas at a given entry or exit point. NGG may issue a TFA in circumstances where it is unable to meet its capacity obligations.

Update consultation on NTS flexibility capacity

December 2010

Transmission Connected Customer (TCC)

A customer directly connected to the gas or electricity transmission system.

Transmission Owners (TO)

TOs are companies which hold transmission asset owner licenses. NGG is the gas TO.

Transmission Price Control Review (TPCR)

The TPCR is used to establish the price controls for the transmission licensees. The last price control, TPCR4, took effect on 1 April 2007. It was scheduled to end on 31 March 2012, but in 2009 Ofgem took the decision to extend it by one year to end on 31 March 2013. The next transmission price control, RIIO-T1, will take effect on 1 April 2013.

U

Uniform Network Code (UNC)

As of 1 May 2005, the UNC replaced NGG's network code as the contractual framework for the NTS, GDNs and gas network users.

Appendix 7 - Feedback questionnaire

1.1. Ofgem considers that consultation is at the heart of good policy development. We are keen to consider any comments or complaints about the manner in which this consultation has been conducted. In any case we would be keen to get your answers to the following questions:

1. Do you have any comments about the overall process, which was adopted for this consultation?
2. Do you have any comments about the overall tone and content of the report?
3. Was the report easy to read and understand, could it have been better written?
4. To what extent did the report's conclusions provide a balanced view?
5. To what extent did the report make reasoned recommendations for improvement?
6. Please add any further comments?

1.2. Please send your comments to:

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