NTS Exit Capacity Incentive Review

Ofgem

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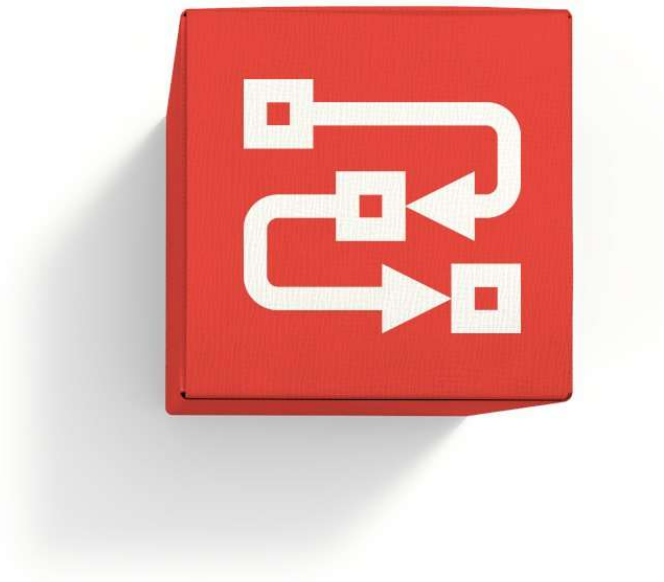

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1. INTRODUCTION

CEPA and AFRY[2] have been commissioned by Ofgem to review the NTS Exit Capacity incentive mechanism applied to gas distribution networks (GDNs) in RIIO-GD1 and assess the need for and the viability of keeping the incentive in RIIO-GD2.

This short note presents our analysis and recommendations. The first part of the note reviews the current incentive mechanism, its objectives and its performance during RIIO-GD1. We then set out and assess a range of potential future options that Ofgem may consider for RIIO-GD2.

[2] AFRY Management Consulting is the trading name of Pöyry Management Consulting Ltd., part of the ÅF Pöyry group of companies, trading as AFRY

2. OVERVIEW OF EXISTING INCENTIVE MECHANISM

2.1. CURRENT DESIGN AND MAIN OBJECTIVES

The NTS Exit Capacity incentive scheme was introduced in 2007 following the separation of some GDNs from National Grid and amidst an ongoing reform of exit capacity arrangements. The scheme was included in the RIIO-GD1 network price control which began in April 2013. Since October 2012, GDNs must book and pay for NTS exit capacity in order to be able to offtake gas from the transmission network and serve customer demand. The actual costs incurred are recovered by GDNs through allowed revenues – i.e. they are a cost pass-through element of the price control.

The incentive mechanism attempts to encourage GDNs to minimise the cost of booking sufficient NTS exit capacity to meet their 1-in-20 peak demand obligations.[3]

NTS exit capacity booking costs are determined by:

- volume of capacity booked – driven by 1-in-20 peak demand forecasts and partly by GDNs' capacity booking strategy; and
- the relevant exit capacity charge – set by National Grid Gas Transmission (NGGT) based on the approved charging methodology and not under the control of GDNs.

The incentive rewards GDNs for measures that help reduce pass-through costs. In theory, there are several advantages to the incentive scheme, such as:

- Short-term cost savings from efficient bookings leading to lower costs for consumers, since exit capacity bookings are a pass-through cost. This can include savings both in terms of the overall volume of bookings (limited by the obligation to book sufficient capacity to meet the 1-in-20 obligation) and in terms of GDNs booking capacity at cheaper offtakes, where a choice between multiple NTS exit points exists. These savings are limited by the fact that the overall NTS revenue recovered through capacity or commodity remains fixed although there are distributional impacts which we explain later in this paper.
- Efficient exit capacity bookings conveying accurate upstream investment signals for additional capacity requirements (i.e. avoiding triggering investment due to inefficient booking strategies). This can result in longer-term cost savings for consumers.
- Where possible under the current processes, encouraging GDNs to trade-off flat capacity bookings for flex capacity bookings enables the NTS to operate more efficiently and reduce distortions to the cost recovery model for NTS (assuming incremental flex bookings have no cost impact on the NTS).

The incentive scheme rewards/penalises GDNs if their NTS exit capacity booking costs are less/more than their NTS exit capacity cost allowances based on forecast volume of bookings set at the time of the price control determination. If a GDN's exit capacity costs are lower than its baseline, it receives a reward. The reward/penalty is calculated based on the difference between:

- **forecast NTS exit capacity costs at each NTS exit point** – these costs are calculated based on indicative T-3 exit capacity charges and the forecast volume of bookings at each NTS offtake on a GDN's network set at the price control; and

[3] Obligations arise from the GDN licence (standard condition 9 (Transportation Arrangements) and standard condition 16), the Network Code, and, as we understand it, each DN's Safety Case.

- **deemed NTS exit capacity costs at each NTS exit point** – these costs are calculated based on indicative T-3 exit capacity charges and the actual volume of bookings at each NTS offtake.[4]

Each year, the total reward for a GDN is calculated by aggregating the rewards and penalties across all exit points in their network.[5] The IQI % sharing factor is applied to the incentive revenue calculation. In RIIO-GD1 the sharing factor ranges between 62%-64% depending on GDN. The incentive revenue is paid with a two-year lag.

The actual NTS exit capacity costs incurred by GDNs, which are passed through to consumers, are calculated based on actual volume of bookings and the actual NTS exit capacity charge. NTS exit capacity costs across all GDNs over the first five years of RIIO-GD1 (up to 2017/18) were £1,024m.

2.2. PERFORMANCE OF THE INCENTIVE IN RIIO-GD1

At Initial Proposals, Ofgem stated their intention to set NTS offtake forecast capacity bookings volumes as the lower of GDNs' forecasts or constant offtake volumes. Almost all GDNs forecast falling peak day capacity demand. At Final Proposals, several GDNs submitted revised exit capacity bookings forecasts. Ofgem decided to take GDNs' latest capacity bookings for the first two years for RIIO-GD1 and hold these constant thereafter.

Ofgem also assumed constant NTS exit capacity prices, based on exit capacity charges published in October 2012, resulting in flat NTS exit capacity cost targets for all GDNs after the first two years of RIIO-GD1.

Most GDNs have so far benefited from the incentive during RIIO-GD1. Over the first five years of RIIO-GD1, GDNs' actual NTS exit capacity costs were 5% (£50m) below their target allowance as shown in Table 2.1 below. The incentive rewards for GDNs over the first five years of RIIO-GD1 sum up to an estimated £91.4m. The reason why incentive rewards are significantly higher than the perceived cost savings is because incentive rewards are calculated based on the difference between forecast and actual bookings evaluated at T-3 indicative prices, as explained in Section 2.1. The cost savings shown in Table 2.1 reflect the impact of the difference between forecast and actual volumes and the difference between forecast and actual prices.

Table 2.1: NTS exit capacity costs by GDN (target versus actual) and incentive reward for the first five years of RIIO-GD1, £m

GDN	Target	Actual	difference	% difference	NTS exit capacity incentive reward
EoE	157.4	132.4	(24.9)	(15.8%)	66.3
Lon	109.1	100.4	(8.7)	(8.0%)	
NW	1994	199.3	(0.2)	(0.1%)	
WM	108.5	108.4	(0.1)	(0.1%)	
NGN	56.1	39.8	(16.4)	(29.2%)	6.1
Sc	1.2	2.0	0.8	68.0%	16.7
So	295.5	294.2	(1.3)	(0.4%)	
WWU	146.9	147.2	0.3	0.2%	2.2
Total	**1074.2**	**1023.8**	**(50.4)**	**(4.7%)**	**91.4**

Source: Ofgem, RIIO-GD1 Annual Report 2017-18
NTS exit capacity incentive reward values presented in the table above have been converted from 2009/10 to 2017/18 prices

The reduction in actual NTS exit capacity costs relative to the target seems to be driven by:

[4] https://www.ofgem.gov.uk/ofgem-publications/53720/supporting-document-3-draft-riiogd1-gas-distribution-licence-changes.pdf

[5] Ofgem (2017) MPR parallel work decision

- fewer capacity bookings due to lower 1-in-20 peak gas demand levels relative to the baseline, which assumes flat booking volumes after the first two years of RIIO-GD1;
- lower NTS exit capacity prices than forecast, largely due to lower revenue requirements by NGGT which has the effect of reducing prices across all exit points; and
- optimised capacity bookings by GDNs, for example, by booking capacity at cheaper offtakes.

Only the last point (GDNs shifting capacity towards cheaper offtakes based on T-3 indicative charges) can be attributed to GDN actions.. The other outperformance factors are outside the control of GDNs and therefore any benefits to consumers resulting from these factors would likely have occurred even in the absence of the incentive. This means that only a portion of the £50m cost saving shown above can reasonably be attributed to the incentive mechanism.

Since rewards are only partially due to behaviour change by GDNs, this raises questions around whether the current incentive design is delivering the best value for consumers, particularly considering that the incentive reward paid out to GDNs is significantly higher than the direct cost savings achieved (even if not adjusting for factors outside the control of GDNs).

In addition, consumers do not see the full benefit of GDNs' reduced NTS exit capacity costs. The total allowed revenue recovered from gas transmission charges remains the same, except for any potential impact of GDN capacity booking patterns on NTS investment. This means that in the short-term there may be little benefit to customers from lower NTS exit capacity costs incurred by GDNs. There are potential cost reductions in the medium-long term if investment needs are lower. Under the current gas transmission charging methodology, any revenue shortfall due to lower capacity bookings is recovered from commodity charges which is ultimately a cost borne by consumers. Therefore, GDN network users are expected to pay back a part of any cost savings through higher commodity charges – though there is a distributional impact as the revenue shortfall due to a GDN's reduced capacity bookings costs is spread across all network users (all GDN and non-GDN users).

Some network users, such as Centrica, have voiced concerns over how the incentive scheme is operating[6] and whether it delivers net benefits for consumers. These concerns include:

- Incentive rates are based on NTS exit capacity price forecasts published three years in advance, which do not always reflect current prices. This can lead to perverse incentives. In these cases, GDNs are not motivated to book capacity at the most efficient exit points at the time of use, rather they are incentivised to book capacity at points that maximise reward via the incentive scheme.
- Some GDNs have adjusted their 1-in-20 peak demand obligations to rely more on flexible capacity, which is potentially a lower value service to consumers.
- Customers are worse off as a result of the incentive. The cost of exit capacity bookings has reduced over RIIO-GD1 but incentive payments have outweighed any cost savings from reduced bookings.[7]

Ofgem acknowledged the concerns of Centrica as part of their 2017 mid-period review of RIIO-GD1 and considered whether to adjust the incentive. Ofgem decided not to make changes to the exit capacity incentive before the end of RIIO-GD1, with a view to review the incentive before the next price control. Ofgem did this on the basis that mid-period changes would damage regulatory confidence and increase costs to consumers.

2.3. Analysis of key exit capacity cost drivers

In this section we present an initial analysis of how NTS exit capacity costs are affected by changes in volume of capacity booked and relevant NTS exit capacity charges. This is meant to provide context to the key drivers of

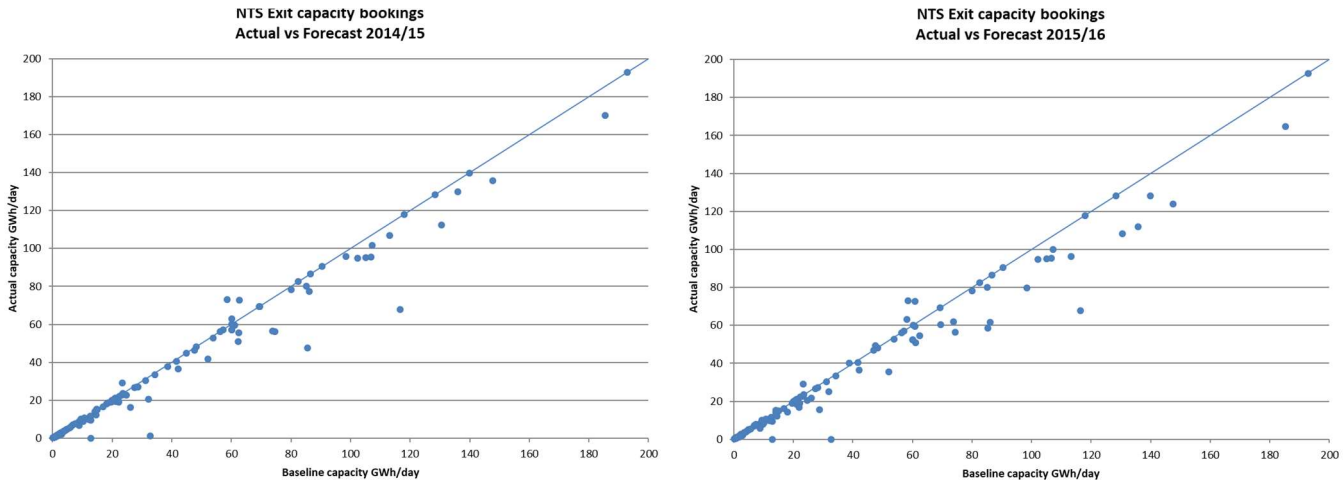
[6] British Gas, Consultation on a potential RIIO-T1 and GD1 mid-period review

[7] Although this does not consider potential savings from more accurate investment signals.

GDNs performance over RIIO-GD1 and highlight areas where the incentive design may need to be changed to ensure better value for money for consumers.

Figure 2.1 plots NTS exit capacity booking volumes by offtake and compares baseline capacity booking forecasts (x-axis) with actual capacity bookings (y-axis). The 45-degree line in each graph is the point at which baseline capacity equals actual capacity. Points above the 45-degree line indicate actual capacity bookings are greater than baseline capacity bookings, and points below the 45-degree indicate actual capacity bookings are less than baseline capacity bookings.

Figure 2.1: NTS exit capacity booking volumes – actual vs forecasts (GWh/day)



Source: Ofgem Final Proposals for RIIO-GD1; MPR parallel work consultation

We observe a tendency for baseline offtake capacity bookings to be greater than actual offtake capacity bookings in both the 2014/15 and 2015/16 time periods. This is indicated by most plot points (74% in 2014/15, 74% in 2015/16) falling below the 45-degree line. Exit points with higher capacity bookings are particularly likely to fall below the 45-degree line. The result implies that GDNs were able to reduce overall NTS exit capacity costs because fewer capacity bookings were needed to meet their 1-in-20 obligation than was forecast.

In Table 2.2 below we present indicative results of an analysis of the key drivers of reductions in NTS exit capacity costs incurred by GDNs (in terms of the difference between forecast and actual costs), based on data for the first three years of RIIO-GD1 (April 2013 to March 2016). The analysis estimates savings in NTS exit capacity costs incurred by GDNs due to:

- NTS exit capacity charges being lower than forecast (this compares actual NTS capacity charges with T-3 indicative charges evaluated at forecast volumes); and
- NTS exit capacity bookings being lower than forecast (evaluated at actual prices).

Savings are larger when the difference between indicative and actual prices, or the difference between forecast and actual capacity volumes, are larger. For example, Table 2.2 outlines a material difference between indicative and actual offtake prices for SGN Southern (So), resulting in a large cost saving (£10.17m).

We have estimated the incentive reward by calculating the difference between the total expected value of bookings using baseline capacity and the total value of bookings using actual capacity, both at indicative T-3 prices, and applying the IQI sharing factor for each GDN.

Our indicative analysis suggests that most of the reductions in NTS exit capacity costs seen in the first few years of RIIO-GD1 are driven by lower than forecast NTS exit capacity charges. As mentioned above, this is not a factor that can be attributed to GDNs actions and the savings would also have been achieved in the absence of the incentive. The estimated savings due to reduced volumes are significantly lower than the estimated incentive reward because the incentive rewards for GDNs are based on T-3 forecast prices while cost savings are evaluated at actual prices (which have generally turned out to be lower than T-3 forecasts).

Table 2.2: Estimated NTS exit capacity cost savings and estimated incentive rewards for the first three years of RIIO-GD1, £m

GDNs	Savings due to lower prices	Savings due to lower volumes	Total cost savings	Incentive reward
EoE	5.96	5.34	11.30	15.08
Lon	3.55	2.07	5.63	6.32
NW	1.05	2.15	3.21	5.93
WM	1.69	1.38	3.07	3.62
So	10.17	1.64	11.81	4.45
Sc	9.46	0.00	9.46	0.03
NGN	9.70	0.25	9.95	2.85
WWU	2.56	0.40	2.96	1.01
Total	**44.14**	**13.24**	**57.38**	**39.28**

Sources: Ofgem Final Proposals for RIIO-GD1; MPR parallel work consultation

2.4. INCENTIVE UNDER RIIO-GD2

Arguments have been presented to Ofgem by some network users as to why the justifications for introducing the incentive are no longer valid including:

- There is no need for efficient signalling of upstream investment requirements if no additional investment is expected. GDN peak demand forecasts are flat or declining, meaning there is unlikely to be additional load-related investment in the NTS.
- Changes to capacity charging may result in the lowering or removal of price differentials between offtakes, meaning there are fewer benefits from incentivising GDNs to optimise between offtakes in their area. Proposed changes to the gas transmission charging methodology mean that the current LRMC-based charging methodology will be replaced by either a postage stamp (Ofgem's current preferred proposal) or a capacity-weighted distance (CWD) approach.[8] Under the postage stamp methodology, exit capacity charges at all offtakes would be equal while under the CWD, some price differentials would remain however these are likely to be much lower than currently observed.
- The use of more expensive/cheaper offtakes only leads to reallocation of overall charges but does not reduce charges due to the NTS fixed revenue model.

We observe that the first argument related to the declining need for upstream investment is true only in respect of load-related investment signalling. Even if declining gas demand could translate into a lower need for investment in new capacity, accurate signals from exit capacity bookings would still be needed for efficient decisions by NGGT regarding risk-related (asset health), replacement and decommissioning decisions. Inefficient signals from exit capacity bookings could therefore still result in higher overall network costs.

The NTS fixed revenue model means that, in the short term, the total cost paid by network users does not change with the total level of capacity bookings. As explained in the previous sections, inefficient booking decisions by one GDN could mean that its customers end up paying more than they should in NTS exit capacity costs, effectively providing a subsidy to other NTS network users.

The current design of the NTS exit capacity incentive partly relies on the signals provided by the LRMC-based charging methodology and the ability of GDNs to shift exit capacity bookings to cheaper offtakes. GDNs have some ability to shift bookings between some offtakes but not all. Their ability to do so depends both on network

[8] Ofgem published on 23 December 2019 its minded-to-decision on proposed amendments to the gas transmission charging regime submitted under UNC678. See: https://www.ofgem.gov.uk/system/files/docs/2019/12/unc678_minded_to_decision.pdf

configurations but also on flow patterns and supply/demand conditions at particular times. In this respect, if gas flows on the network reduce, then we might expect GDNs to have greater flexibility in choosing their gas offtake.

The main change affecting the incentive in RIIO-GD2 regards the proposed modification to the NTS capacity charging methodology. The adoption of a postage stamp methodology would mean there are no signals for GDNs as to what constitutes a cheaper offtake, and therefore no ability to reduce exit capacity costs by shifting bookings to certain offtakes. In this case, the incentive in its current form could only play a role in incentivising reduced overall bookings but not an efficient distribution of bookings as there would be no ability to consider the relative efficiency of different booking decisions. Even under the alternative CWD methodology, price differentials may not necessarily send accurate price signals for efficient use of transmission capacity. The implementation of any of the two alternative charging methodologies still under consideration would thus weaken the case for maintain the NTS exit capacity incentive in its current form for RIIO-GD2.

Overall, we consider that the arguments that justified the introduction of the incentive still largely apply. Inefficient booking decisions by GDNs could potentially result in:

- increased NTS costs in the long-term; and
- distributional impacts in the short-term.

Therefore, there is still potentially a need going forward for some type of mechanism to encourage GDNs to book exit capacity on the NTS efficiently. This mechanism could involve a financial incentive (as the current incentive or a modified version) or other types of mechanisms that rely more on reputational incentives. The challenge is designing a mechanism that delivers this objective in a way that considers whole system impacts and also delivers value for money for consumers. We discuss some potential future options for incentivising efficient bookings in the next section.

3. FUTURE OPTIONS ANALYSIS

3.1. OPTIONS CONSIDERED

We have identified options for incentivising efficient bookings of NTS Exit Capacity by GDNs. We outline and compare the options below, with an aim to produce a recommendation for RIIO2. First, we outline each option including some variants for modification of the incentive, before moving on to assess each option against the following criteria:

- Does it facilitate gas system[9] efficiency?
- Is it resilient to the outcomes from UNC Mod 0678?
- Does it provide value for money to consumers?
- Are there any significant risks? ('Significant' in this context is considered in relation to the costs of NTS Exit Capacity procurement indicated by current capacity price levels).
- Is it difficult to implement?

The options we have identified are as shown in Table 3.1 below. We note that not all options presented are mutually exclusive (though some clearly are). For example, it would be possible to implement more than one of the modifications to the current incentive mechanism presented under option 3. An uncertainty mechanism (UM) to address the impact of UNC678 (option 2) can also be combined with a redesign of the current incentive scheme.

Table 3.1: Options outlined

No.	Option	Description
1	Retain as is	Keep the existing incentive, using a GDN capacity requirement and NGGT price forecasts for baseline(s)
2	Retain as is with an UM to address impact of UNC678	This keeps the incentive as is but introduces a mechanism to remove or modify the incentive upon UNC678 decision/implementation.
3	Modify incentive:	Retain the incentive but redesign it to apply from the start of RIIO2
3.1	Use alternative prices	Use nearer-term price forecasts or actual prices rather than the T-3 price forecasts of NGGT.
3.2	Apply stronger incentive sharing factor	This works to lower the reward to some fixed proportion – to be determined – of the current reward, mitigating RIIO-GD1 observation that rewards are greater than benefits
3.3	Introduce UM to adjust baselines	This enables baselines to be adjusted to mitigate the impact of price changes and/or GDN & NGGT 1 in 20 forecast changes
3.4	Discretionary reward	This would involve a more subjective assessment of efficient booking practices.
4	Remove incentive	Remove the incentive for RIIO-GD2
4.1	Unmitigated	Complete removal of the incentive mechanism with no alternative or mitigation measures put in place
4.2	Introduce enhanced obligations	Remove the incentive but introduce enhanced obligations to enable scrutiny of process and tests for efficiency under more general licence conditions, e.g. SLC9(1)b (which would require reliance on UNC), or the co-ordination requirement implied by 44(1)b.

Source: CEPA/AFRY

[9] 'System' in this context refers to the combined effect on gas distribution and gas transmission networks

We recognise that this is not an exhaustive list of options. For example, the impact that the use of flexible capacity has on GDNs' capacity booking practices and the operation of the NTS has been highlighted in stakeholder responses to Ofgem consultations.[10] Developing an option to account for such impacts would however require more analysis of the interaction between flat and flexible capacity products and the impact that this has on the efficient use of the NTS. We have therefore not included this in our list of potential options.

3.2. RETAIN AS IS

This option keeps the current incentive structure as is, using GDN capacity requirements (obtained during RIIO GD-2 process) and NGGT price forecasts (as produced at T-3) to set the capacity and cost baselines for the incentive.

The current incentive (as discussed above) was intended to encourage GDNs to make efficient decisions in planning their networks. These decisions are made three or more years in advance of gas consumption. The incentive has been reliant on price forecasts (which, in turn, were reliant on forecasts of NGGT recoverable revenue) which have proven to be inaccurate. The mechanism does not appear to have delivered value for money to consumers because indicated capacity bookings "savings"[11] of around £50m have been offset by incentive revenues to GDNs of around £91m.

UNC modification 678 and its variants seek to implement the EU Tariffs Network Code[12] ("TAR") by adopting either a "postage stamp" (i.e. all exit prices are the same) or a "capacity weighted distance" (which retains price differentiation) tariff model. Ofgem's minded to decision published in December 2019 is to approve a postage stamp methodology. This would replace the current approach of calculating charges on a "Long-Run Marginal Cost" basis. Both a postage stamp and a CWD methodology will result in changes (sometimes very significant changes) to the applicable NTS Exit Capacity tariffs. This could lead to changing price signals for efficient capacity bookings and significant differences between the forecast and actual capacity costs at individual offtakes. Without adjusting the incentive mechanism or otherwise accommodating this in the GDNs regulatory settlement, this will risk some significant shifts in revenue flows to GDNs.

During RIIO2 and beyond, there is still likely to be a small impact on NGGT spending as a result of GDN capacity booking practices – one pattern of booking by a GDN may lead to a future duty on the NTS which is greater than that imposed by another pattern of booking. This spending is not limited to load-related expenditure but will also impact assessments of network risk and asset health expenditure. Retaining the incentive therefore may encourage the GDNs to discover NTS Exit Capacity booking efficiencies.

3.3. RETAIN AS IS WITH A UNC678 SPECIFIC UM

These options mitigate the impact of changes to pricing structures brought about by the UNC678 variants. In practice, any form of UM may be either difficult to implement, or irrelevant, because the lead times on capacity bookings mean that only the final years of the RIIO-2 period would be affected (if at all) particularly if there is any delay in the UNC678 decision beyond 2020.[13] The UM could result in either removing or modifying the incentive.

[10] For example, Centrica response to MPR consultation and Cadent response to RIIO-2 Sector Specific Methodology.

[11] Noting that these do not directly translate to reductions in the revenue that NGGT will recover from users, and so these should not be considered as whole-system cost savings.

[12] EU/2017/460 - https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R0460

[13] Ofgem's proposed implementation date is currently 1 October 2020 as stated in its December 2019 minded to decision on UNC678. The proposed mechanisms discussed here are likely to be needed if there is a delay in the proposed implementation date.

UM to remove incentive

This option removes the incentive (or switches it off) in the event of any one of a number of a specified UNC678 decisions.

The option is relatively simple to implement, and mitigates the risks introduced by the implementation of one of the UNC678 variants. It retains the potential for the existing incentive mechanism to encourage efficient booking, to the extent expected under the current arrangements, given the discussion of GD1 outcomes in Section 2.2.

This option might be particularly helpful if a "postage stamp" tariff model is introduced as the pricing information – on which the incentive relies to encourage an efficient distribution of bookings – contains no indication to GDNs of the relative efficiency of different network planning decisions.

UM to modify incentive

This option modifies the incentive in the event of any one of a number of specified UNC678 decisions.

There would need to be a decision on how the incentive mechanism would change, for example, accommodating changes to pricing (e.g. back-casting baseline prices with the new methodology) and/or resetting baseline capacities (taking into account new price signals from CWD).

This option retains the potential for the existing incentive mechanism to encourage efficient booking, although assumes there is an appropriate price signal on which GDNs can make a decision. It does not necessarily deliver value for money because of the potential for inaccuracy in the long-term (T-3) price signal.

This is likely to prove complicated to implement at the time the UM is triggered, and there is a risk of windfall gains or losses because of the fundamental "reset" approach. In addition, it is not clear that any of the UNC678 pricing methodologies will provide accurate pricing signals to indicate the relative impact on NGGTs costs; as such there is a risk that the modified incentive will deliver less value for consumers.

3.4. MODIFY INCENTIVE

These options consider one or more modifications to the existing incentive mechanism, set during RIIO2 to apply for the whole of RIIO2.

3.4.1. Use alternative prices

This option retains the NTS exit capacity incentive for RIIO-GD2 but modifies the existing design to calculate incentive revenue based on nearer-term price forecasts (e.g. T-1 prices) or actual prices rather than T-3 exit capacity charges. Using a nearer price forecast would reduce or remove the inconsistency between capacity prices used to determine the incentive reward and prices that determine the actual costs passed through to consumers. This should help minimise conditions which could make it possible for a booking strategy to maximise incentive revenue (based on T-3 prices) but not minimise pass through costs (based on actual prices).

On the other hand, where GDNs may need to make booking decisions three or more years in advance, there would be greater uncertainty regarding the exit capacity charges used to determine their incentive revenue. This may weaken the link between the incentive mechanism and GDNs' long term decision-making and booking strategies. GDNs would be less able to respond to price signals if the relevant prices are not known. In this case, however, GDNs are likely to book capacity based on their best view of near-term forecasts or actual prices. This could mean relying on NGGT's T-3 forecasts if these are deemed accurate or using an alternative forecast.

The option would be relatively simple to implement. The incentive would continue to operate in the same way as it currently does with the only change being the use of different exit capacity charges to calculate incentive outcomes. The option would not address all the issues with the current scheme design that may affect the value for money delivered for consumers. In particular, it would not remove the possibility of forecast errors related to baseline capacity booking volumes.

Without additional measures, the potential impact of UNC 0678 would still be significant under this option although the use of nearer-term price forecasts may mitigate some of this impact. For example, under the current incentive design, the use of T-3 capacity charges means that charges based on the current LRMC methodology would be

used in the incentive revenue calculations up to three years after the potential UNC modifications were implemented. If a T-1 price forecast were used instead, this impact would be limited to one year only.

3.4.2. Apply incentive sharing factor

This option seeks to retain most of the existing features of the existing incentive mechanism, but to weaken the value of the reward or penalty the GDN can earn – if effect it introduces a stronger sharing factor into the incentive, to ensure that that the capacity booking cost savings are not outweighed by the incentive reward.

The current incentive mechanism applies the RIIO-GD1 Totex Incentive Mechanism (TIM) sharing factor to the incentive revenue calculation. This sharing factor is however designed to apply to totex under/overspend where there is a direct impact on consumers (e.g. a £1m underspend in totex is a cost saving that is shared between consumers and network companies). In the case of NTS Exit Capacity costs, savings in exit capacity costs are partly offset by higher commodity charges because of the need to recover a fixed NGGT allowed revenue. As a result, consumers do not see the impact of the entire cost savings that the GDN are rewarded for. We believe this means there is an argument for having a lower sharing factor (i.e. equivalent to customers receiving a larger proportion of any underspend) than the totex incentive rate applied to NTS Exit Capacity incentive.

The option enables the continued facilitation of efficient capacity booking practices by the GDN (insofar as the pricing mechanism provides accurate price signals), but increases the chances that the mechanism will deliver better value for consumers by reducing the reward earned by GDNs (though the other shortfalls of the current incentive mechanism would remain). There would need to be a decision on the strength of the sharing factor, which perhaps could be calibrated on the outcomes of the existing RIIO-GD1 scheme.

This approach does not remove the risks associated with changes in demand levels, changes in pricing signals, or the likely impact of UNC678.

3.4.3. Introduce UM to adjust baselines

This option enables an adjustment to be made to the underlying capacity baselines, such as changes to a network's 1-in-20 forecasts, accommodating corrections to load growth assumptions (e.g. where a new large consumer defers connection).

This option has the effect of removing part of the incentive to better reflect the decisions that are under the GDNs' control.

The incentive may risk introducing a perverse incentive on GDNs to artificially inflate their 1-in-20 forecast, although this may be mitigated by wider incentives (e.g. totex incentives) that also rely on the 1-in-20 forecast (e.g. load-related capex).

3.4.4. Discretionary reward

This option severs the connection between incentive rewards and the capacity value expressed through capacity prices. In effect, it would provide a financial incentive that rewards capacity booking practices and structures that are generally considered to be more efficient, but which do not rely on a price signal provided through exit capacity charges.

This form of incentive has not been previously suitable because during previous GD price controls, NGGT had an interest in the incentive outcomes for (what is now) Cadent. It would involve a more subjective assessment of efficient booking practices. It could involve, for example, assessing that changes to bookings made by GDNs have followed consultation with NGGT and that there is evidence that the changes are efficient within the relevant context (e.g. considering specific load growth either within the GDN or on the NTS).

The strength of the incentive needs consideration. We note that the totex structure already incentivises both GDNs and NGGT to minimise costs, and so the incentive should be incentivising behaviour rather than outcomes.

The incentive should encourage networks to agree to implement the most efficient booking patterns.[14] This would require input from both GDNs (that have a clear understanding of the impact of NTS exit capacity bookings on their own costs) and NGGT (that would determine the impact on NTS of a change in booking pattern). Where the overall impact of a proposed booking pattern is positive (e.g. a proposed booking pattern would reduce GDN costs and have a minimal or positive impact on the NTS), an incentive reward would be triggered.

There may be cases where:

- a partial change provides net benefit; or
- there are NTS cost reductions available for marginal GDN cost increases, implying that this booking pattern should be encouraged and rewarded.

We note that there are already processes established for enabling communication and collaboration between NGGT and GDNs which may enable the discovery of efficiencies in capacity and pressure arrangements (e.g. UNC Offtake Arrangements Document Section H). The process of assessing booking patterns could be integrated into or appended to these processes.

There are risks associated with subjective elements of the assessment under this option. Ofgem would need to undertake further consultation with industry to flesh out the implementation details of this option.

There are challenges around risk allocation between GDNs and NGGT – for example, if there are more booking pattern changes requested that can be accommodated by NGGT at 'sufficiently minimal cost', then there is a question of how to prioritise the bookings. However, as long as the incentive reward is modest, this might be mitigated by allowing the reward for the request rather than the resultant booking.

3.5. REMOVE INCENTIVE

These options consider removing the incentive for RIIO-GD2 with or without additional measures being put in place

3.5.1. Remove incentive without mitigation measures

This option would involve removing the NTS exit capacity incentive completely without introducing any alternative mechanisms that either try to achieve the same objectives or mitigate potential impacts.

Removing the incentive would eliminate one area of the price control where GDNs may have been overly rewarded. The potential for over-rewarding companies under the current incentive mechanism stems from the fact that the benefits for consumers are either hard to identify/quantify (e.g. benefits related to accurate investment signals) or likely to be over-estimated (e.g. lower exit capacity costs are partly offset by higher commodity charges). In addition, there is also the potential for windfall gains/losses due to incentive rewards being partly driven by factors outside the control of GDNs. If future incentive revenue were to exceed future savings from capacity booking efficiencies, then removing the incentive would result in a net benefit for consumers against a baseline counterfactual of retaining the incentive. Removing the incentive would also reduce the regulatory burden on both Ofgem and GDNs and protect GDNs and consumers from the uncertainty related to changes to the gas transmission charging methodology.

Without the incentive, GDNs would not be financially rewarded for booking efficiently and nor would they be penalised for inefficient bookings. Therefore, they would have no incentive to respond to any exit capacity price signals in their capacity booking pattern, or to reduce overall capacity bookings. There is a risk this could lead to booking behaviour that results in inefficient outcomes from a system-wide point of view (e.g. higher NGGT spending) and increased overall costs to consumers in the medium-long term compared to a status quo scenario.

[14] Where a "booking pattern" relates to the proportion of NTS Exit Capacity across a series of offtakes, or a similar metric

There may also be distributional impacts if only certain GDNs adopt inefficient booking strategies, resulting in higher costs for their network users as well as impacts on other users booking NTS exit capacity.[15]

This may be, at least partially, mitigated by existing industry processes such as those that require a dialogue between NGGT and GDNs with regard to capacity planning (the UNC contains several point of interaction in respect of NTS exit capacity and/or pressure requirements e.g. OAD H2.8; TPD J2.5) and investment decisions (we understand that there is regular dialogue to coordinate investment planning[16]). There may also be reputational factors that may deter GDNs from adopting inefficient booking strategies. However, there is a notable risk that removing the incentive without any additional measures could have unintended consequences.

There are also wider obligations on GDNs that could mitigate the impact of removing the incentive:

- a duty to be "economic & efficient" (Gas Act section 9, though this is limited to their own 'area');
- to be a "reasonable and prudent operator" (which is only contractual, in UNC and possibly elsewhere); and
- via licence conditions, e.g. SLC 9(1)b which requires UNC to be maintained to ensure the efficiency of Distribution and Transmission networks), or SSC.A17, etc.

These obligations may operate to encourage efficient capacity booking but would provide less certainty that GDNs will do so compared to a financial incentive.

3.5.2. Replace the incentive with enhanced obligations

This option could be considered to mitigate some of the potential risks involved in removing the incentive. It is not intended to result in financial reward or penalty, but rather to encourage GDNs to seek efficient outcomes.

Some of the measures that could be considered under this option include:

- Moving some of the detailed procedural obligations from the UNC into the licence.
- Improving transparency about GDNs booking patterns and outcomes.

Accommodate the detailed procedural obligations in the licence

Issues associated with relying on the broader obligations, facilitated through the process of the UNC arrangements, are that:

- the UNC arrangements were not designed to provide an economic incentive or to require efficiency; and
- they may be subject to industry-led changes via “self-governance” which individually may not be significant but collectively operate to frustrate the use of the process for the purposes of efficient capacity booking.

One possible route to mitigating this would be to design a process similar to the UNC arrangements and somehow incorporate it within the GDN and NTS licences. Allied to obligations of transparency (see below), this might provide some confidence that the licensees are seeking to establish efficient capacity bookings.

Requiring transparency

Ofgem could consider introducing obligations that require GDNs to be more transparent about their capacity booking decisions. This could be achieved through a relatively simple obligation on transporters to specify and publish that information that would enable a competent party to ascertain that the NTS capacity bookings were sufficient and efficient.

[15] Impacts on other users could, for example, shortage of available capacity at offtakes where a GDN has overbooked capacity.

[16] See for example, Long Term Development Statement 2019, SGN, available at https://www.sgn.co.uk/sites/default/files/media-entities/documents/2019-10/SGN-Long-Term-Development-Strategy-2019.pdf

The transparency requirements could include asking GDNs to publish at least the following elements, on an annual basis:

- the 1-in-20 peak day demand forecasts and the basis on which these were determined;
- the overall level of NTS exit capacity bookings for the current/latest year;
- the breakdown of NTS exit capacity bookings by offtake point within the GDN's area for the current/latest year;
- narrative providing justification for any changes to booking patterns; and
- a description of the steps taken to ensure that the NTS exit capacity bookings are efficient and exit capacity costs passed through to consumers are minimised.

It might also include, for example, technical information such as detailed network analysis models, assumptions and data, and/or non-technical information such as communication with NGGT.

Improved transparency would help Ofgem determine if:

- GDNs book sufficient overall NTS exit capacity to comply with their 1-in-20 obligation;
- overall NTS exit capacity bookings are not (significantly) in excess of what is needed to meet the 1-in-20 obligation;
- GDNs bookings at individual offtakes are indicative of a strategy that:
    - targets bookings at relatively cheaper offtakes, or
    - (where that cannot be determined) that are cognisant of wider system impacts.

The purpose of the transparency obligation would be to identify potential inefficient booking practices, if the right information is available to Ofgem. It would place reputational incentives on GDNs to show that they adopt a reasonably efficient NTS exit capacity booking strategy and it would allow Ofgem to take further steps if needed to address any failings.

The option would in principle be simple to implement through, for example, a licence condition introduced as part of the set of licence modifications required to implement the RIIO-GD2 price control (a detailed consideration of the relevant information requirements may be necessary). It may however also present challenges where, for example, GDN is reliant on confidential information in its decision making.

3.6. Assessment of options

Table 3.2 below provides an initial assessment of the options against the criteria set out above. We have scored each option against the criteria using a "traffic light" system:

- **Green**: the option performs well against the criteria.
- **Amber:** the option may meet some aspects of the criteria with some limitations/risks identified.
- **Red**: the option does not meet the criteria.

Table 3.2: Assessment of options

No.	Option	Facilitate system efficiency	UNC678 resilient	VFM	Significant risks	Complexity
1	Retain as is					
2	Retain as is with an UM to address impact of UNC678					
3	Modify incentive:					
3.1	Use alternative prices					
3.2	Apply stronger incentive sharing factors					
3.3	Introduce UM to adjust baselines					
3.4	Discretionary reward					
4	Remove incentive					
4.1	Unmitigated					
4.2	Introduce enhanced obligations					

Source: CEPA/AFRY

The options that involve maintaining the financial incentive for GDNs (in its current form or with modifications) would facilitate system efficiency by providing reliable investment signals through efficient capacity bookings. This assessment is impacted by the implementation of UNC678. The case is strongest under the current transmission charging methodology which provides price signals for GDNs to book capacity at cheaper offtakes. Changes to capacity charging may result in the lowering or removal of price differentials between offtakes, meaning there would be less benefits from incentivising GDNs to optimise between offtakes in their area. The option relying on alternative prices scores 'amber' on facilitating system efficiency as prices used may not be in line with efficient timing of capacity bookings.

All options involving an incentive mechanism may benefit from the use of an uncertainty mechanism to address the impact of changes to the transmission charging methodology. The only exception would be on the discretionary reward as this option does not rely on price signals from exit capacity charges for determining the incentive rewards.

The assessment of whether the options provide value for money for consumers is more negative for several reasons:

- For options involving a financial incentive based on value of capacity bookings, there is a risk that the rewards earned by GDNs will be higher than the benefits that the incentive brings to consumers. This risk is highest under the existing scheme design. Some of the proposed modifications are likely to increase net

benefits to consumers for money but it is uncertain whether they would deliver an overall benefit to consumers.

- The options that involve removing the incentive score 'amber' due to the uncertainty that removing the incentive would have on overall costs (NTS capacity costs and NTS investment).
- The option involving discretionary reward scores amber since the rewards would in theory be specifically linked to changes in booking patterns that deliver cost savings to consumers. The question is the level of confidence with which that adjustment can be made.

Removing the incentive without mitigation would introduce the risk of inefficient bookings and higher costs therefore this option scores poorly in terms of system efficiency and significant risks. Introducing enhanced obligations would mitigate these risks but not necessarily eliminate them (hence this option scores 'amber' on both these criteria).

Ease of implementation (or complexity) is likely to be an important consideration for Ofgem particularly given the limited time available to adopt any new proposals before the start of RIIO-GD2. Retaining the incentive in its current form or removing it without any mitigation measures would clearly be the easiest to implement. Introducing enhanced obligations would be slightly more complex to implement because of the need to monitor and evaluate booking practices. Introducing a discretionary reward represents a completely different design from the current scheme and it would require Ofgem to work out implementation details in time for the RIIO-GD2 determination.

3.7. Conclusions

Our review of the current NTS Exit Capacity suggests that retaining the incentive would continue to incentivise GDNs to minimise NTS exit capacity costs but there is a significant risk of the incentive continuing to expose consumers to the risks arising from windfall gains and inaccurate price signalling, and is likely to be affected by the implementation of UNC678.

We have identified several options to modify the design of the incentive mechanism to address some of the issues that have resulted in poor value for money for consumers:

- Using nearer-term NTS exit capacity price forecasts would address the disconnect that exists between capacity prices used to determine the incentive reward and prices that determine the actual costs passed through to consumers – although it would also mean that the prices used in the incentive calculation may not reflect the timing of GDNs booking decisions.
- Implementing a mechanism to adjust baseline bookings volumes during the price control would address the risk related to demand uncertainty and asymmetry of information that could result in forecasting errors and windfall gains.
- Applying a stronger sharing factor would mean GDNs receive a lower incentive reward for any perceived level of cost savings reflecting the fact that a reduction in NTS exit capacity costs is, at least partly, recovered from consumers through other means (currently commodity charges).

It is likely that a combination (possibly all) of these options would need to be implemented to ensure that the incentive scheme delivers benefits for consumers. In addition, an uncertainty mechanism specifically addressing the impact of UNC678 would need to be put in place. This would introduce significant additional complexity into the scheme particularly in terms of designing mechanisms for adjusting baselines but also setting parameters (e.g. incentive rate) at the price control determination. It is unclear whether the benefits that the scheme would deliver for consumers would justify the additional regulatory burden. There is also the risk of unintended consequences resulting from such modifications.

At the same time, removing the incentive without mitigation introduces the risk of inefficient capacity bookings. The impact on overall system costs may be small however there is also the risk that inefficient booking patterns could result in distorted investment signals which can lead to higher costs for consumers. We believe the risk is large enough to make this option unappealing, particularly when some mitigation measures appear relatively easy to implement.

Introducing certain enhanced obligations on GDNs such as placing more emphasis on existing UNC processes or requiring improved transparency with regard to NTS exit capacity booking practices would be relatively costless ways to encourage GDNs to follow an efficient booking behaviour. These obligations would not eliminate the risk of inefficient booking practices and they are likely to have limited impact in terms of encouraging GDNs to find efficiencies in their NTS exit capacity booking strategy. Ofgem would also need to consider what measures it can take to address any failings if needed.

We would recommend that Ofgem engages with stakeholders to better understand the potential risks involved in removing the NTS exit capacity incentive particularly in terms of inefficient investment on the NTS. If the risks are considered to be relatively small or can be reasonably mitigated through the type of enhanced obligations outlined in this paper, then Ofgem could consider removing the NTS Exit Capacity incentive for RIIO-GD2.

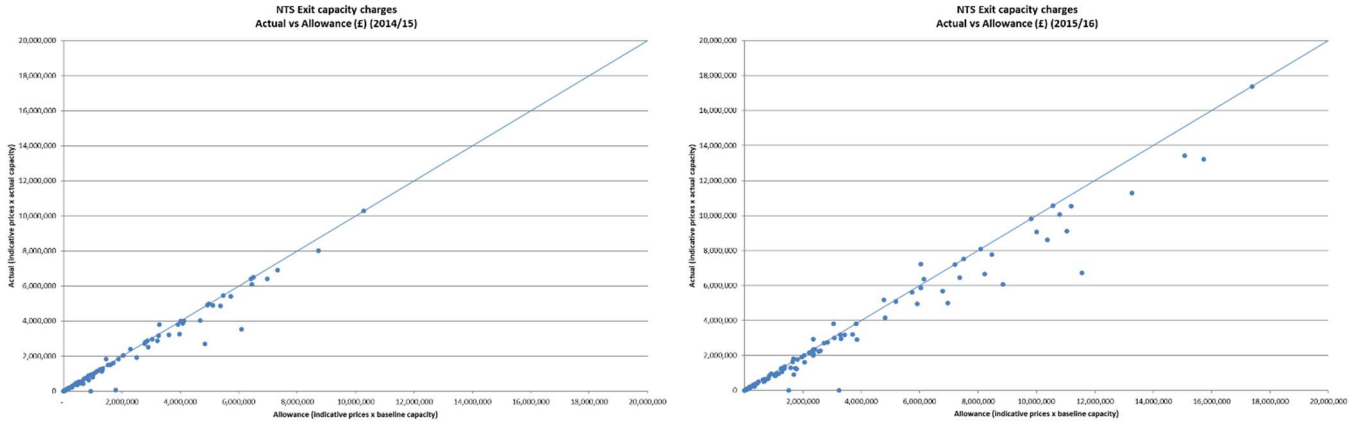
If, however the risks are considered substantial then maintaining some form of financial incentive may be the best course of action. In this case, Ofgem should consider an alternative design for the incentive mechanism that aims to improve value for money for consumers and ensure that the mechanism can accommodate potential changes to gas transmission charges related to the implementation of UNC678. This could mean implementing several of the modifications to the current incentive identified above and potentially introducing an uncertainty mechanism to address the impact of UNC678.

Appendix A FURTHER ANALYSIS OF NTS EXIT CAPACITY COSTS AND PRICES

In this appendix we present some additional analysis of NTS exit capacity costs and prices and how these have impacted on the incentive reward earned by GDNs in the first few years of RIIO-GD1.

Figure A.1 plots NTS exit capacity costs by offtake and compares cost baselines (x-axis) with deemed[17] exit capacity costs (y-axis). Baselines are the product of indicative T-3 prices and baseline capacity bookings, while deemed costs are the product of the indicative T-3 prices and actual capacity bookings. The 45-degree line in each graph is the point at which deemed costs equal baselines allowances. Points above the 45-degree line indicate deemed capacity costs are greater than baseline allowances, and points below the 45-degree indicate deemed capacity costs are less than baseline allowances.

Figure A.1: NTS Exit capacity deemed vs baseline costs (£)



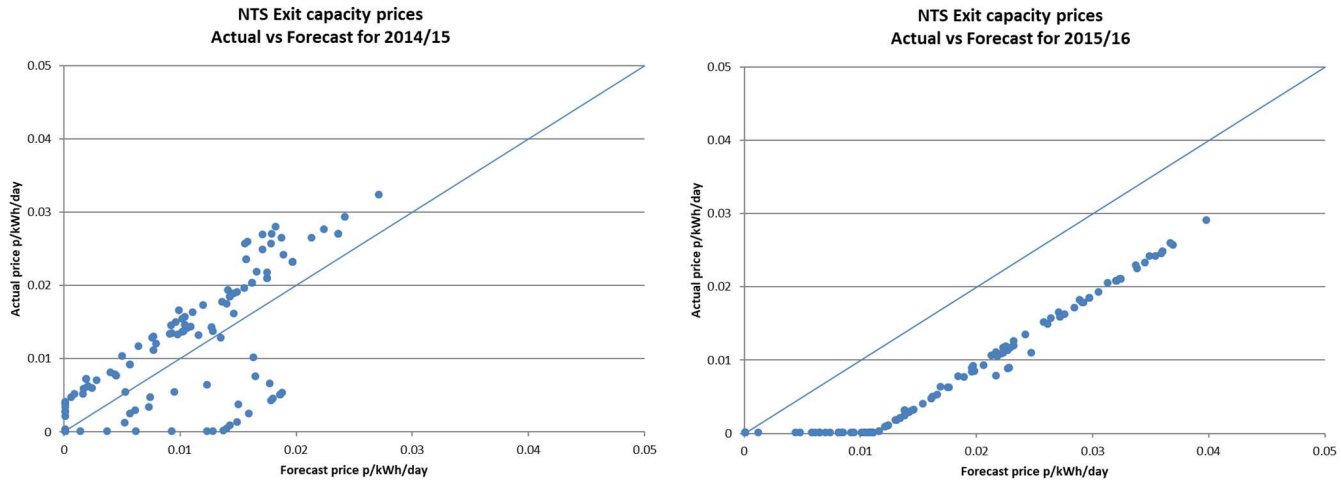
Source: Ofgem Final Proposals for RIIO-GD1; MPR parallel work consultation

The figure shows that deemed capacity costs were generally lower than baselines across most offtakes, particularly in 2015/16. This was due to lower than forecast capacity bookings (as shown in Figure 2.1) and resulted in GDNs earning rewards under the NTS Exit Capacity incentive.

Figure A.2 compares T-3 indicative prices (x-axis) with actual capacity prices (y-axis) at each offtake point. The 45-degree line in each graph is the point at which actual prices equals forecast prices. Points above the 45-degree line indicate actual prices are greater than forecast prices, and points below the 45-degree indicate actual price are less than forecast prices.

[17] These are the costs used to calculate the incentive reward for GDNs.

Figure A.2: NTS Exit capacity prices actual vs forecast (p/kWh/day)



Source: Ofgem Final Proposals for RIIO-GD1; MPR parallel work consultation

The figure shows that actual capacity prices can vary significantly from those forecast at T-3. In 2014/15, actual exit capacity prices at most offtakes were higher than forecast (though actual prices at some offtakes were significantly lower than forecast). In contrast, in 2015/16, actual capacity prices were considerably lower than forecast for virtually all offtakes. We note that these differences do not affect the incentive rewards earned by GDNs (which are based solely on forecast prices) but they illustrate the disconnect between indicative prices used to set rewards and actual prices which determine the exit capacity costs passed through to consumers.

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