

The need to promote cross border trade and access to continental storage:
Why the Bacton IP needs equal charging with GB storage

18 August 2017

1. Executive Summary

There is a need to adapt National Grid's (NG) charging regime as it applies to the Bacton interconnection point (IP) . The current NTS charging review provides a unique window, at a critical time, to make necessary changes. We believe that the NTS capacity charging discounts applied to GB storage points should be applied equally to the Bacton interconnection point (IP) to remove the current distortion.

The key reasons to make this change are:

- a) Level playing field: To avoid double charging of bi-directional flows at the Bacton IP, and thereby to remove a market distortion. This reflects the fact that the Bacton interconnectors, working in partnership with continental storage, provide the same seasonal flexibility benefits to the GB market as GB Storage. The same arguments justifying storage discounts apply equally to bi-directional interconnectors. Double charging of bi-directional flows at the Bacton IP versus bi-directional flows at storage points is a competitive distortion.
- b) To reflect that the additional reasons why storage assets merit a discount apply equally to bi-directional interconnectors, including their contribution to security of supply and their contribution to system flexibility.
- c) Practical benefits: When the merchant interconnectors exit their initial long term contracts, the impact of distortionary treatment relative to GB storage will be felt strongly, and with it comes the risk of serious downside consequences for the GB system. So, the change is not only justified and necessary to remove a market distortion, it is practically needed now to help preserve interconnection and safeguard the GB system and GB consumers.

The paper outlines these arguments and presents two high-level options for how this change in charges could be introduced and the net impact on NG charges at other NTS points.

2. Introduction

The NTS Charging Review is considering how best to implement new obligations required by the Commission Regulation (EU) 2017/460¹ (the TAR Code) as well as considering further changes to the GB regime which further facilitate the charging objectives².

The Charging Review objectives include promoting cost reflectivity, efficiency, competition and compliance with European Regulation. The key objectives of European regulations include further facilitating well-functioning markets through cross border trade and having a high level of security of supply. Ofgem in making any final decision on any charging review modification proposals will need to ensure that existing and future consumers' interests are protected.

The Charging Review is currently considering whether there should be any discounts for capacity users at particular entry/exit points. Storage users under the TAR Code must receive at least a 50% capacity

¹ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017R0460>

² As set out in SSC A4 and A5 of National Grid's Transporter Licence.

discount. IUK believes that the same justifications for discounts at GB storage points also apply to the Bacton IP as a bi-directional connection providing access to continental storage. We therefore propose in this paper that the same discount as is to be applied to GB storage should equally be applied to the Bacton IP.

3. Background

TAR Code obligations

Article 9.1 of the TAR Code requires “A discount of at least 50% shall be applied at entry points from and exits to storage facilities”. The justification for the storage discount is for three reasons³:

- a) avoiding double charging (storage users pay to exit the network and pay again to enter the network, even though parking gas in storage is only temporal);
- b) to acknowledge the contribution to security of supply benefits of such assets; and
- c) to acknowledge the contribution to system flexibility of such assets.

Article 9.2 furthermore states that a discount may be applied at entry points from LNG facilities and “at entry points from and exit points to infrastructure developed with the purpose of ending the isolation of Member States in respect of their gas transmission systems”. Again, this is justified because of security of supply benefits.

Under Article 6.4(a), TSOs also have the flexibility to adjustment reference prices at any given entry or exit point to meet the competitive level of the reference price. Furthermore, under Article 7(e), TSOs must ensure that the reference prices do not distort cross-border trade.

IUK believes that a discount at the Bacton IP meets these criteria. This is explained in more detail below.

4. Why a discount at the Bacton IP is merited

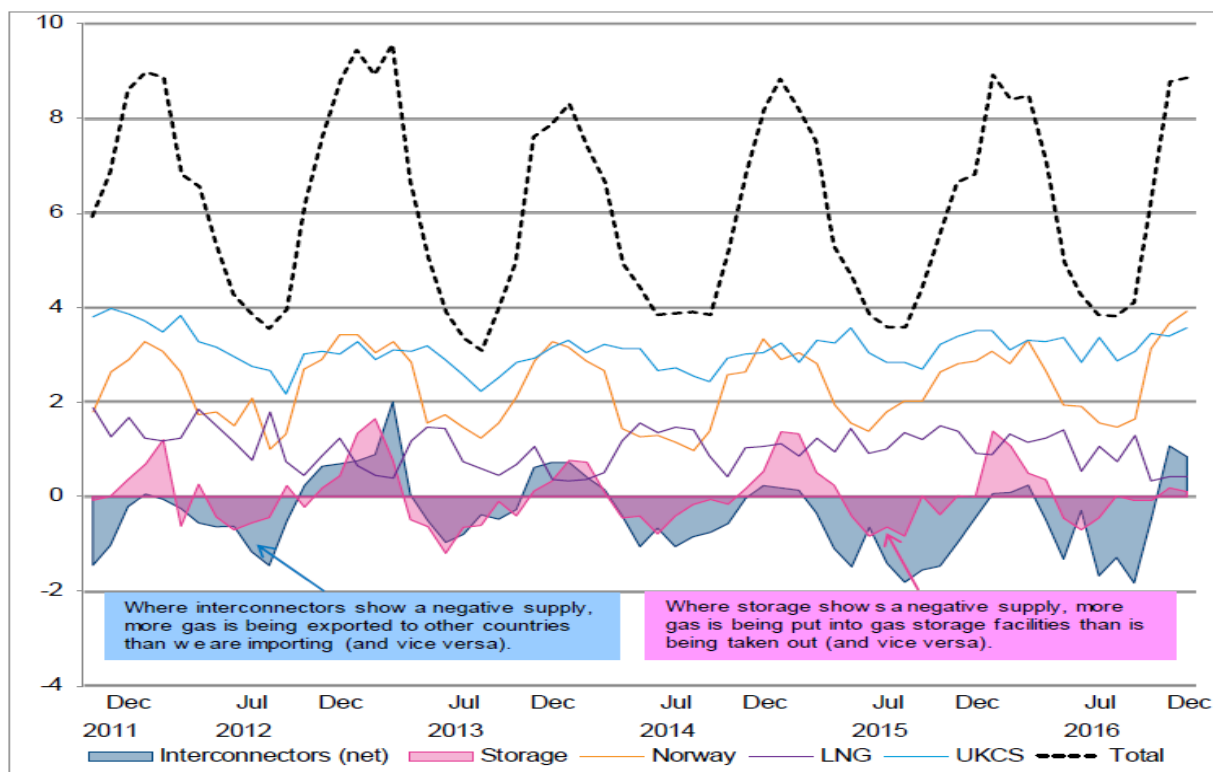
4.1 How the Bacton interconnectors are used in practice

Apart from GB storage, the Bacton IP is the only other point on the NTS which is physically bi-directional. Interconnectors flows respond to locational signals, and when the system requires it they also respond to seasonal flexibility needs. The data shows very clearly that the Bacton IP has historically provided strong seasonal flexibility to the GB market; and that observed flows show a very similar profile to GB seasonal storage flows. This is illustrated in Figure 1 below, which shows monthly gas supplies into the GB system over the period 2011 to 2016. Total supply to GB is very seasonal, reflecting the seasonal demand profile. In theory, seasonal flexibility could come from various sources: indigenous production (UKCS), Norway, LNG, GB Storage, and flows across gas interconnectors (IUK and BBL). The data shows that UKCS and LNG have not provided much seasonal flexibility, whereas aggregate interconnector flows have been strongly seasonal and have a similar (and complimentary) pattern to storage. Typical interconnector flows are out of GB in the summer period (with gas injected into continental storage facilities) and interconnector flows into GB in the winter period (drawing the gas from continental storage as well as upstream flexibility). The interconnectors compliment continental Storage facilities and in this way, compete with GB storage.

³ Recital 4 of Regulation (EC) No 715/2009 outlines the justification for a discount for storage and other points.

Flows across interconnectors, flows in and out of GB storage facilities, and variations in Norwegian imports together provide the GB system with the seasonal flexibility that it needs.

Figure 1: GB gas supplies 2011 -2016



Source: Graph from National Grid "Our energy insights" July 2017 with monthly data from Energy Trends

4.2 The distortion created by double-charging at the Bacton IP

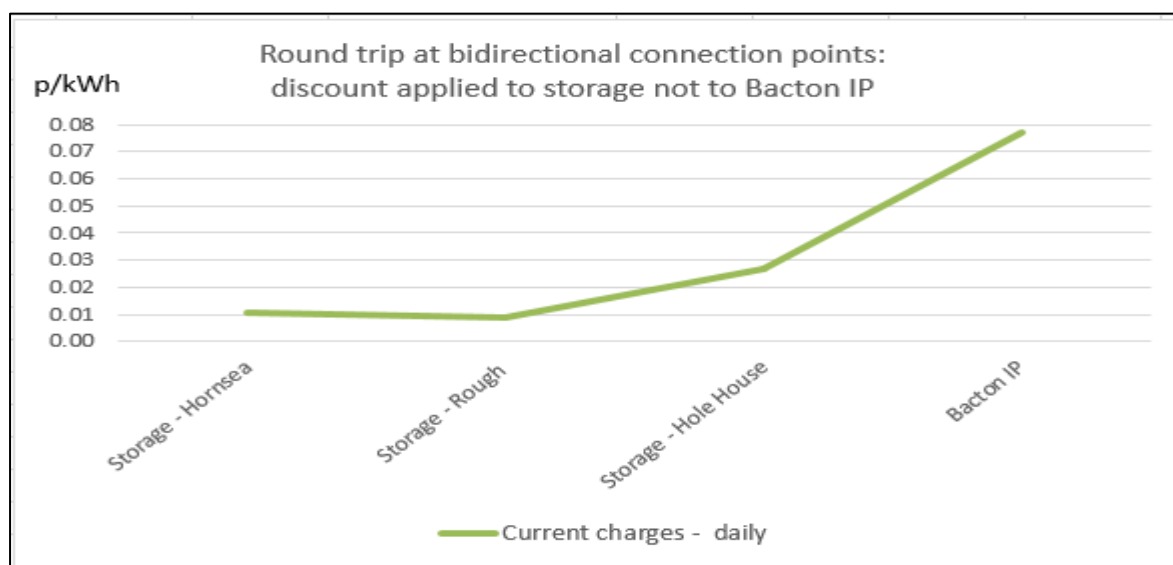
Despite the interconnectors complimenting continental storage, gas entering/exiting the NTS at Bacton, via IUK, pays far NG higher charges than gas entering/exiting the NTS via GB storage points. GB storage facilities are currently exempt from commodity charges levied on entry into NG's system while other bi-directional flows are not. In effect gas stored in continental storage facilities (and transmitted via the Bacton interconnectors) has to pay commodity charges twice before reaching consumers. High NG commodity charges currently account for a third of the cost of importing gas from Germany to GB and the distortions that high commodity charges create at Bacton was one of the reasons for this Charging Review⁴. A move to floating capacity charges with discounts only for storage capacity would maintain the status quo of double charging.

Figure 2 below illustrates the current unequal treatment between storage points and the Bacton IP. It shows the NG charges for a round trip exiting the Bacton IP and later re-entering the NTS⁵.

⁴ During a 2012/13 review of the gas interconnectors between GB, Belgium and Dutch markets by the GB, Belgium and Dutch regulators, ten of the thirteen respondents provided evidence that high commodity charges caused a distortive barrier to trade.

⁵ At the Bacton IP, the cost of the round trip includes commodity charges of 0.0693p/kWh.

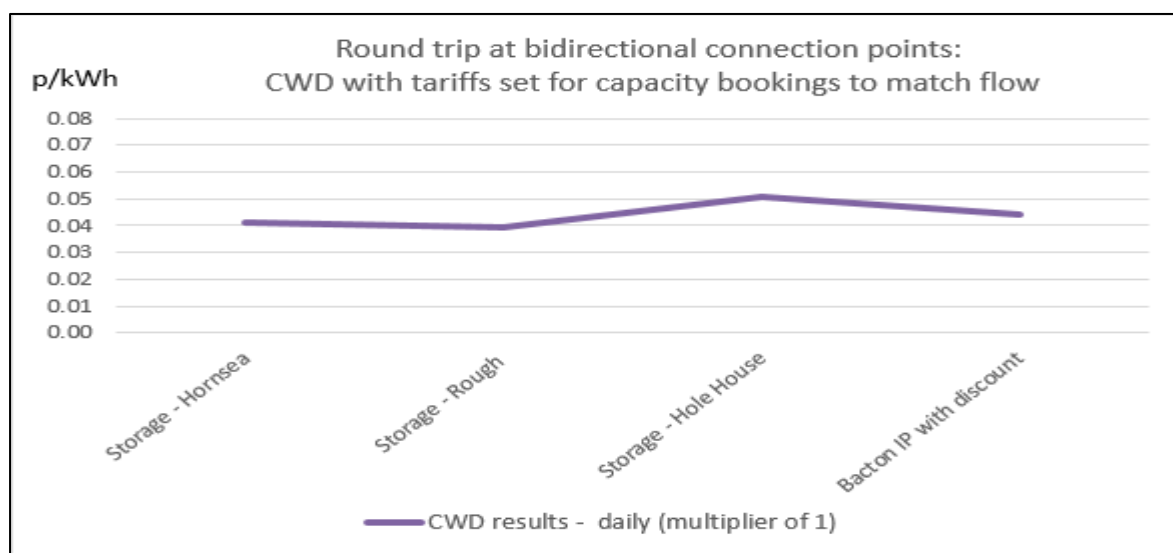
Figure 2: Current double charging at the Bacton IP⁶



Source: IUK analysis based on NG 2016 charges

A move to floating capacity charges without a discount for the Bacton IP would just maintain the distortion. Figure 3 below shows that an equal discount applied to storage and the Bacton IP under a capacity weighted distance approach is necessary to make the cost of the round trip exiting and later re-entering the NTS comparable to domestic storage.

Figure 3: Bacton IP capacity charges under a CWD approach⁷



Source: IUK analysis based on NGG Transmission Services CWD Model 2018/19 gas year

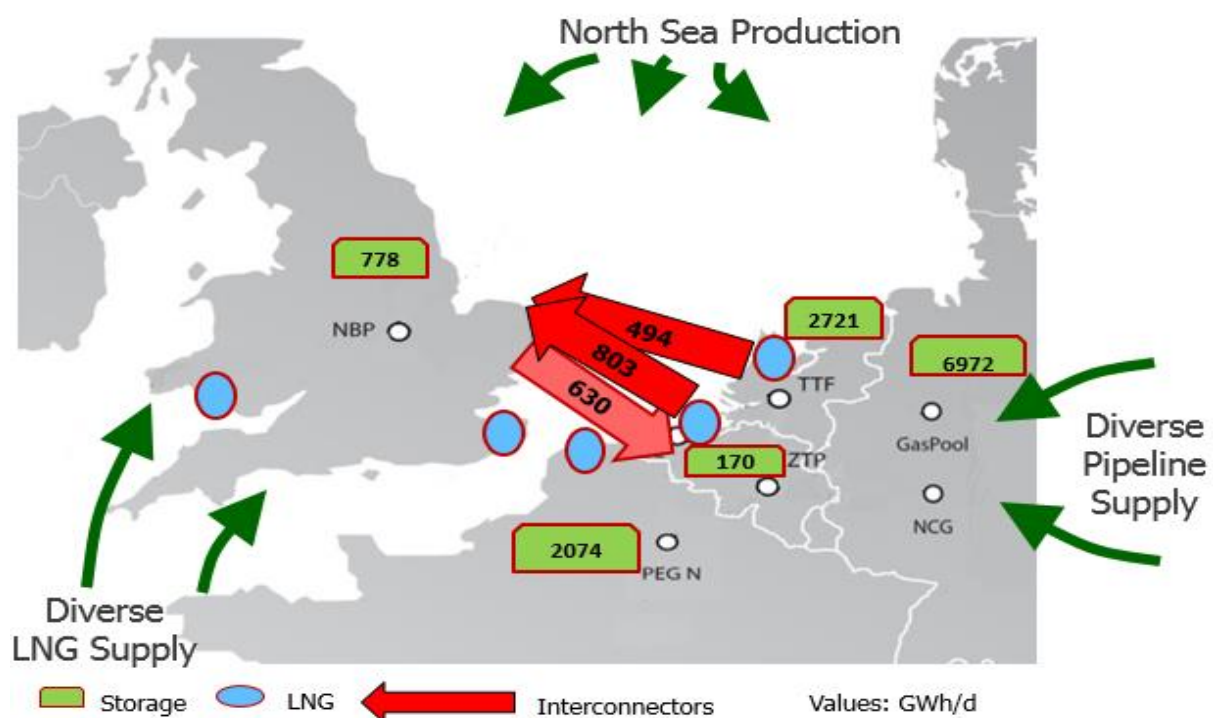
⁶ Tariffs are those applicable in 2016. Storage pays entry and exit capacity charges. Bacton IP pays entry and exit capacity charges plus the NTS commodity charges of 0.0693p/kWh. The figures assume a daily capacity product is booked.

⁷ Tariffs are from the NG CWD Model for 2018/19 gas year. Storage receives a discount of 50% on entry and exit capacity charges. The Bacton IP receives an equal discount. All points pay the reduced commodity charge of 0.0106p/kWh (this value is taken from estimates for 2018/19 in NG's Non-Transmission Model). It has been assumed that charges in the NG CWD Model have been set on the basis that capacity bookings are optimised to match flow.

4.3 Future utilisation, system needs and risk

Avoiding double charging at the Bacton IP and the consequent competitive distortions will be all the more necessary in the future for two reasons. First, it was announced in June 2017 that Rough, the GB's largest storage facility, will close. Following the closure of Rough, it is in the interests of current and future GB consumers that the structure of NG's charges (and more generally the prevailing regulatory framework) facilitates cost-effective access to continental storage facilities. North West Europe has a large quantity of storage facilities, and some at least are facing conditions of excess supply with declining national gas demand. These facilities are highly accessible to GB consumers and consumers via the GB-EU interconnectors. This is illustrated in Figure 4 below. However, in these circumstances, it becomes even more important for GB consumers that NG charges at Bacton do not distort or discriminate against flows to/from continental storage.

Figure 4: GB access to significant continental storage via Bacton interconnectors



Source: IUK - with storage withdrawal capacity from GSE storage map Dec 2016 (values rounded up). Rough has been removed from the total GB withdrawal capacity.

A second practical consideration is that merchant interconnectors are emerging from their long-term contracts and, without a level playing field, their ability to maintain the capacity is at risk. Not all of the other asset classes are in a commensurate position. From October 1 2018, IUK's initial long term contracts expire. From this point in time, if shippers rely on short term capacity bookings (and there is strong evidence that this is the trend), then IUK's capacity costs will no longer be considered as a "sunk cost". Instead it will be part of the short run marginal cost calculation that will go into shippers' decisions as to whether or not to use the asset. In these circumstances, it cannot be taken for granted that interconnector capacity will necessarily remain in place. Put another way, continuing with preferential treatment for GB storage compared to interconnectors is no longer an inconvenience with no major impact on system capacity. There is a risk that it could have an acute effect on the interconnectors' ability to secure sufficient market revenues to maintain their economic viability. Ongoing distortionary treatment could in the future be a factor in the closure of capacity that could

deliver both market and societal benefits were it subject to a fair charging regime and a level playing field.

4.4 Interconnectors contribution to security of supply

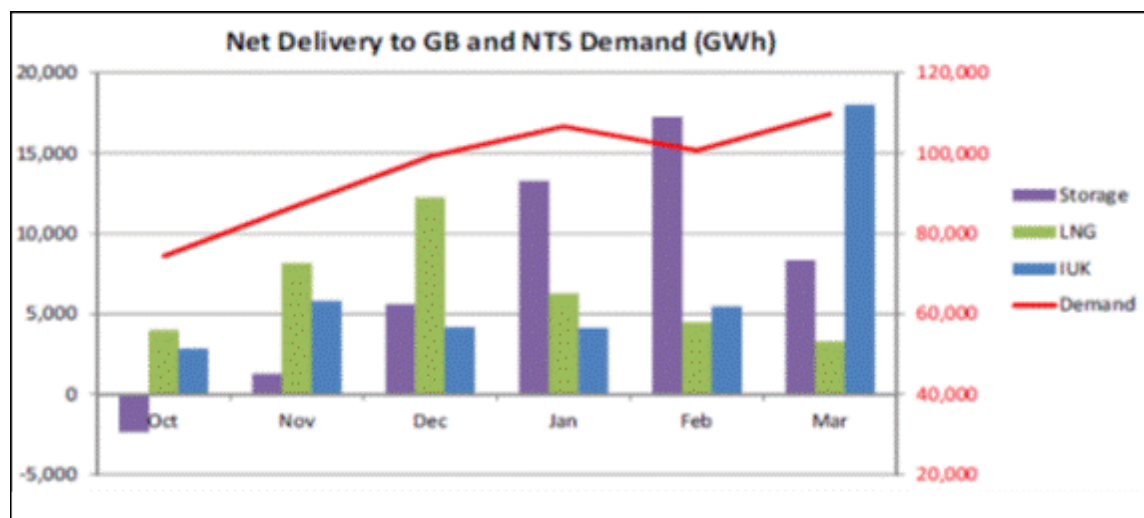
In both the EU TAR Code reasoning and in GB regulatory thinking, the contribution of storage to gas system needs is an additional and important factor explaining why storage merits a discount on transmission charges. In this section and sections 4.5 and 4.6, we show how the UK's merchant interconnectors equally contribute to GB system needs; and therefore, how this line of reasoning would also point to a discount for the merchant interconnectors.

The interconnectors connected at the Bacton IP provide increased energy security for GB consumers, and reduce gas price volatility. In times of system constraints in GB and Continental Europe, IUK in particular has proven to be a vital security of supply asset. IUK's average utilisation is generally low but there are times when IUK's maximum capacity is critical to meeting demand and mitigating supply shocks. There have been a number of times when markets have relied strongly on IUK's full capacity. Specific examples include:

- Rough Incident in February 2006
- Norwegian supply disruptions in January 2010
- Extended cold winter in March 2013

In March 2013, for example, there were record IUK import flows into GB in response to a very cold period late in winter when storage was depleted and LNG cargoes had diverted to Asia due to high demand in the Far East. Throughout that winter IUK supplied the GB market (40,371 GWh) with more gas than Rough (38,607 GWh) or LNG (38,387 GWh) as shown in Figure 5 below.

Figure 5: High UK demand, March 2013



Source: IUK

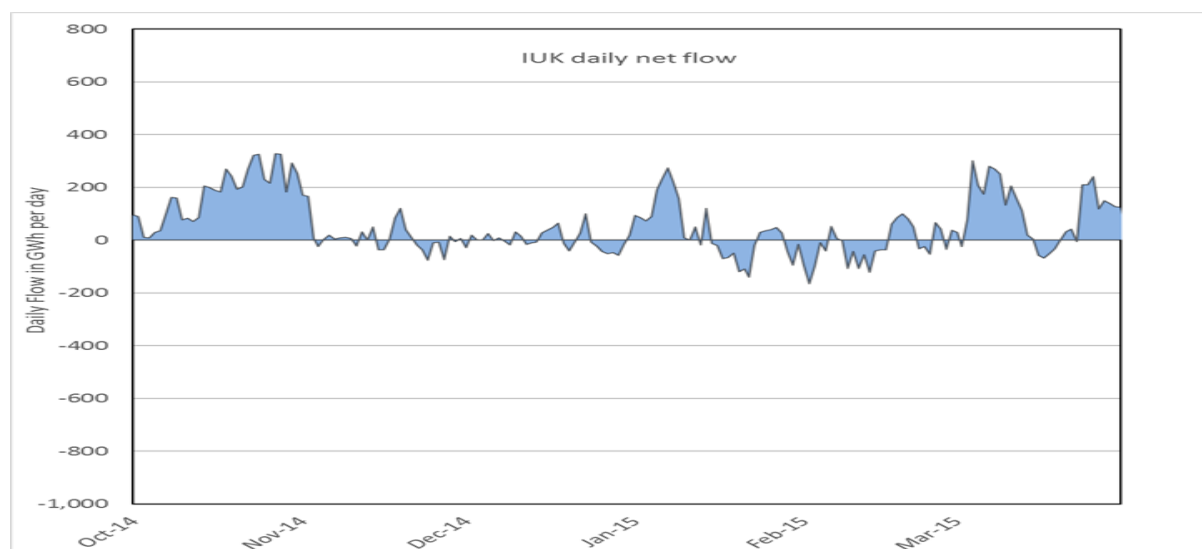
When a fire caused Rough to be taken out of service in February 2006, shippers were able to meet GB demand through increased utilisation of IUK, with flows increasing across a period of 3 days from around 300GWh/day (~28mcm/day) to over 500GWh/day (~46mcm/day).

With Rough storage recently announcing it is ceasing operations, the importance of the Bacton interconnectors to GB (and indeed Ireland) in meeting the EU N-1 security of supply standards has become more important.

4.5 Interconnectors contribution to system flexibility

Flows in and out of the Bacton IP play an import role in enabling GB shippers to address short run system flexibility needs on the NTS. As shown in Figure 6, IUK's daily flows are highly volatile and the physical capability afforded by having compressor stations at both ends of the pipeline means that the direction of flow can rapidly switch from GB import to export and vice versa. For example, this flexibility, was used extensively in the period from October 2014 to March 2015 when the daily net flow changed directions 39 times during the 6 months of winter. In fact a change in flow can happen at any hour of the day meaning that the flexibility is available for hourly or daily balancing.

Figure 6: Interconnector flows are highly variable on a day to day basis supporting system flexibility in neighbouring markets



Source: ICIS

Interconnector linepack also plays a useful role in system flexibility. IUK is an important source of linepack for its customers which is used to manage balancing needs in the GB market. IUK linepack, (up to 11 mcm of fast cycle storage) can be cycled up to 3 times a day. It is not unusual for the linepack inventory to be increased by shippers (injected) at the weekend for it then to be (withdrawn) out of the pipe again in the week when GB demand is typically higher. Note that this means that gas flows into the interconnector at Bacton, is parked for a short duration, and then returns to the NTS again - just like fast response storage. Post 2018, IUK capacity will be sold separately to linepack services. The success of any future interconnector linepack service (and therefore its availability to the NTS) will be very dependent on NG charges at the Bacton IP. NG charges need to be commensurate with storage charges, otherwise this source of system flexibility will be lost.

4.6 Interconnectors contribution to market integration

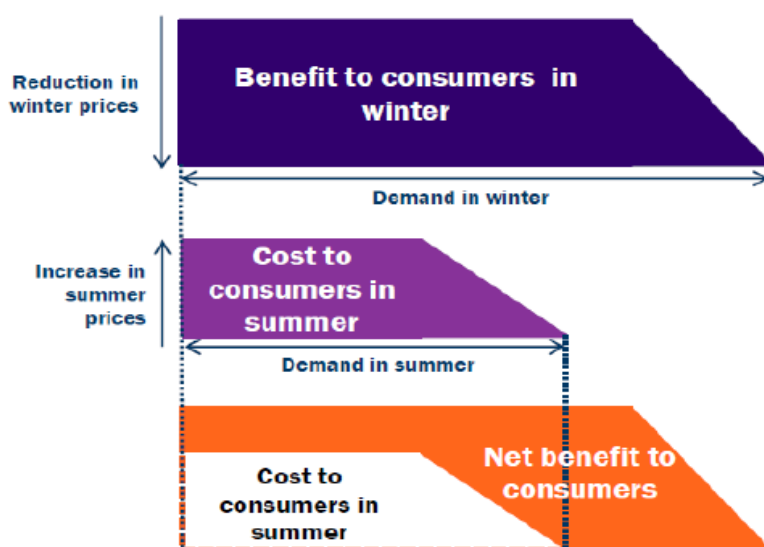
IUK was the first interconnector between the UK and Continental Europe and has played a crucial role in the price convergence that we see today between the NBP and continental hubs. IUK started operations in October 1998 and has been a major catalyst in the creation of spot gas markets in Europe. It enabled NG and the GB market to connect to continental gas markets and has played a key

role in creating liquid hubs in the north west of Europe. The BBL interconnector furthermore established an additional link with continental markets in 2006/7.

The interconnectors have led to substantial price convergence in the markets that they connect. Paradoxically this creates a low intrinsic value of capacity, when considered purely in the context of the price spread between adjacent hubs. Interconnectors remove the price difference used to justify their construction but nonetheless continue to deliver the benefits of price stability, harmonisation and lower overall prices than would be the case if they did not exist. How their economic value differs from their market value is an issue which comes to the fore only once the initial long term contracts expire.

Figure 7 illustrates conceptually how market integration benefits GB consumers: gas costs in summer are higher than they would otherwise be, but this is more than outweighed by the lower wholesale winter prices, impacting a larger volume of consumption.

Figure 7: Benefit to GB Consumers of physical bi-directional interconnection at the Bacton IP



Source: FTI consulting⁸

The estimation of an asset's societal or economic benefits is an approximate exercise and highly dependent on assumptions (for instance relating to annual and peak gas demand and supply scenarios, the probability and impact of supply events, and what would happen in the market in the absence of the asset). IUK has commissioned recent work in this area which estimates IUK's economic value at over €300 million per annum, reflecting above all the substantial market integration price benefits for consumers in the UK and in North West Europe. In this exercise, IUK's security of supply benefit was estimated at around €60 million per annum. These estimates are currently being refined and will be published probably later in the year. Estimates are necessarily approximate, but it is clear that the economic value of the asset far exceeds its realisable market value. This is a simple outcome from the benefits of price convergence being shared with the market following the creation of the asset.

⁸ Original diagram on the societal benefits of storage, which we believe equally applies to physical bi-directional interconnection at the Bacton IP.

5. Bacton IP discount options and the impact on users

5.1 Bacton IP discount options

We propose that two options are considered by the NTS Charging Review forum:

- a) Equal capacity discounts to GB storage applied to all capacity bookings at the Bacton IP; or
- b) Equal capacity discounts to GB storage applied to net capacity bookings at the Bacton IP.

The first option would be easier to implement. If a 50% discount is applied to GB storage a similar discount would be applied ex-ante to the Bacton IP entry and exit capacity bookings.

The second option would require some form of ex-post calculation and rebate at the end of the gas year which would be made to those shippers according to their bookings, for equal amounts of entry and exit capacity booked at the Bacton IP. This would ensure that any discount is targeted to those shippers who had provided bi-directional benefits the market, avoiding double charging on matched flows in and out of the NTS. For example, if a shipper booked 120 units of NTS Bacton exit capacity typically in summer and 100 units of NTS Bacton entry capacity typically in winter, a discount rebate would be given on two lots of 100 units of capacity.

5.2 Impact of the Bacton IP discount on consumers and users of the network

Under option (a), based on the National Grid CWD⁹, the amount of money to be recovered by the redistribution of NG charges to other entry/exit points to meet any discount at the Bacton IP would be in the region of £16m assuming a 50% discount at the Bacton IP (as well for storage). This would amount only to an additional 2.7% increase in charges to these other points.

Under option (b), using an estimate based on historical flows, the additional increase in charges to other entry/exit points would amount to a 2.1% increase in charges (to recover around £12m) at other NTS points¹⁰.

However, whilst there would need to a redistribution of NG's charges to other entry/exit points, this is happening anyway as part of the NTS Charging Review. It is important to note that NG's overall revenues would be unchanged following this redistribution. There would therefore be no additional net burden on GB consumers. Indeed, any additional cost that could arise from having to subsidise new GB seasonal storage would be avoided and by facilitating effective competition at the Bacton IP, GB can continue to benefit from the wider societal benefits that the interconnectors provide.

6. Conclusion

We believe that the current charging regime unfairly discriminates against non-storage bi-directional connection points and that identical arguments for a discount apply to the Bacton IP. The current NTS

⁹ IUK analysis based on NG Transmission Services CWD Model for the 2018/19 gas year. We have based the revenue estimate on the obligated capacity bookings but have assumed that, as the Bacton IP is bidirectional the full obligated capacity will be booked in one or other direction, but not both at the same time.

¹⁰ We have used the 2014/15 gas year as an illustration assuming profiled capacity bookings. In this year, there were 42TWh of GB exports and 31TWh of GB imports through the Bacton IP with a total NTS transmission volume of 750TWh (Energy Trends monthly data shown in Figure 1). Applying a discount of 50% to the Bacton net IP total of 62TWh compared to total entry + exit of $2 \times 750\text{TWh} = 1500\text{TWh}$ would mean 2.1% of TSO revenue would be redistributed and recovered from other points on the network ($62/1500 \times 50\%$). A 50% discount on the gross Bacton IP flows under this illustration for an option (a) approach would mean a 2.4% increase in charges at other points ($73/1500 \times 50\% = 2.4\%$ impact).

Charging Review provides the opportunity to correct this distortion and this paper sets out the arguments supporting this position and provides two options to make the necessary correction.