Gas Transmission Charging Review

Market modelling – Part 2 of Slide Pack

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Issues

Some further assumptions in our modelling…

- **Some where we are seeking verification of our approach**
- **Others that we are noting FYI**

… important to remember that for us to incorporate changes into our draft model we need feedback in the next 3-5 days…….

Norwegian Gas

Norwegian gas can play an arbitrage role….

Our approach to deciding whether Norwegian gas should flow, and if it does whether that is to the UK or the continent depends on two factors:

- **The relative net profit that can be made from flowing gas to GB rather than the continent (this depends on the relative gas prices in each market and the transaction costs associated with getting the gas to market – effectively the same decision as being made for the ICs)**
- **The amount of gas which is contracted to GB rather than available for arbitrage (we have assumed that this is 80% of the 10 year statement value)**

This is an input which can be varied and so less vital to the model

This is a key assumption

Arbitrage flows from Norway are important and it is especially vital that we adequately reflect the arbitrage decision being made….

The decision to use storage

The incorporation of storage and its place in the merit order are important

The storage decision:

- **Long-term storage is assumed to be driven by the seasonal price difference and so unaffected by the entry tariff changes**
- **Short/medium-term storage is different and could be affected by the entry tariff changes if this impacts on arbitrage profitability. There are a range of possibilities:**
  - **The impact of the entry tariff change is the same on all supply sources/ASEPs. Therefore the change in entry prices is assumed to be reflected in wholesale prices at the margin and so storage decisions should be unaffected by the change in policy**
  - **Alternatively the impact of the entry tariff change (e.g. in capacity prices) differs by entry point and storage arbitrage opportunities that may have previously been profitable are not profitable * because the increase in storage costs are not reflected in wholesale prices**

* There is also a scenario (similar to what is assumed for long-term storage) where an increase in entry cost may reduce the *profitability* of storage trade but still allow the trade to be economic

Modelling peak day flows (1)

Which peak day flows should be used in the tariff modelling?

Under the existing National Grid Transportation modelling policy, we understand that MRS and SRS is at the top of the merit order and the structure of supplies is drawn from the Ten Year Statement

The GTCR model will <u>determine</u> dispatch and the structure of GB supplies on each gas day, including peak day supplies which could be used in the Transportation tariff modelling

Under our proposed approach to dispatch:

- **The quantities of supply sources that are not already determined through the arbitrage modelling are dispatched according to marginal cost**
- **This means that LNG rather than MRS and SRS is the last determined source of supply and is effectively the discretionary source of supply on peak days**

This means that LNG importation, rather than MRS and SRS, may need to be scaled (rather than being fully utilised at physical capability) to achieve a daily supply and demand balance

Modelling peak day flows (2)

Which peak day flows should be used in the tariff modelling?

Our current proposal is to model on a mixed basis using:

- **One merit/dispatch order for tariffs (forecast peak day supplies in NG TYS by ASEP)**
- **One for dispatch / price responsiveness modelling (determined by the GTCR model)**

This should give absolute LRMC numbers more in-line with Grid's numbers and consistent LRMCs used across policy scenarios

The alternative would be to model tariffs in the Transportation model based on the GTCR model merit order to ensure internal model consistency, this would:

- **Mean that there is a difference with NG's tariff modelling policy**
- **Mean that absolute answers could be different across modelled policy scenarios**

We think our approach is appropriate, however, if we have time at the end of the project we will seek to test the assumption through the second approach

Continental Shelf allocation

In our allocation of flows to ASEPS….

- We have assumed that all Continental Shelf sources of gas are affected proportionately by the overall change in Continental Shelf gas
- An alternative approach would be to consider the depletion of specific gas fields and we allocate those to specific ASEPs
- The former approach is simple and is our starting point
- BUT a more accurate approach would be to consider field depletion
  - Is there a simple source of this information?

Would allow for more accurate decisions about future bookings

… we think our starting assumption is a good working assumption…..

Another model – LT bookings

Our model for deciding if LT bookings are made considers:

- The full economic (opportunity) cost (by supply source) of a requirement for NTS capacity not being available to support flow into the NTS
- The probability of a constraint at an ASEP – we propose that the probability of a constraint is assumed to correlate inversely with the surplus of physical or contracted capacity and projected peak flows at individual ASEPs
- Combining the above determines the *expected* loss of revenue (we propose to model summer and winter separately) and therefore value of winter and summer constraints
- For a given supply load factor, we then propose to determine what the break even ST multiplier would need to be for an incentive to book ST over LT capacity

… we think this is a good working assumption of how to quantitatively assess potential price responsiveness of demand for NTS capacity products …

Another model – LT bookings

Our model for deciding if LT bookings applies:

A number of assumptions on the value of lost gas supplies (and avoided costs) for different gas supply sources at individual ASEPS in the event of a constraint

Assumptions	Associated	Condensate	Dry Gas	LNG Import	SRS/MRS	LRS	IC/ arbitrage
Expected load factor of supply	✓	✓	✓	✓	✓	✓	✓
Upstream profit margin [1]	✓	✓	✓	✓	×	×	×
Value multiplier of source [2]	✓	✓	✓	✓	✓	✓	×
NBP prices at different times of year	✓	✓	✓	✓	✓	✓	×
NBP – Euro hub spread	×	×	×	×	×	×	✓
Oil prices & production	✓	×	×	×	×	×	×
Liquids price & production	×	✓	×	×	×	×	×

… we propose to model summer and winter periods to capture the economic value of lost supplies

Note 1: On traded gas price at ASEP Note 2: proportion of the traded gas price the supplier can reasonably expect to realise

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