



INTERNATIONAL

Prepared for:

Centrica

Defining the UK gas flexibility market:

An economic commentary on Ofgem's approach in the Aldbrough TPA exemption applications

Prepared by:

Diana Jackson

CRA International

5 Upper St Martin's Lane

London WC2H 9EA

Date: 14th June 2007

CRA Project No: D09550-00

1. DEFINING THE MARKET FOR FLEXIBILITY

We have been asked to comment on Ofgem's definition of the relevant market in its discussion of the STUK and SSE TPA exemption applications for the Aldbrough storage facility. Market shares are not the "be all and end all" of competition analysis, as direct assessment of competitive effects can often serve as an alternative approach. However, a definition of the relevant market and subsequent calculation of market shares can be a useful first step in identifying competitive strength. In this case, that involves determining which sources of gas flexibility are to be considered as likely competitive constraints on the operation of the Aldbrough facility.

This note is divided into two parts. In this section we discuss how the principles of market definition can be applied to flexible gas sources. In Section 2, we then go on to raise several concerns over the methodology used by Ofgem to exclude certain sources of flexibility from its market share calculations.

1.1. PRINCIPLES OF MARKET DEFINITION AND THE MARKET FOR FLEXIBLE GAS

There is a wide array of different methods by which flexible supply of gas can be achieved. Whether the variation in gas demand over time is met from storage, through import/export and production pipelines, through LNG import terminals, or by turning down the consumption of gas fired power stations, the key characteristics that matter are the same: at what rate gas can be provided to/removed from the market, and for how long this rate can be sustained. All these different flexibility assets will be to some extent substitutes, with the question of market definition being, as ever, one of degree.

Implementing a formal SSNIP test to define the precise boundaries of this flexibility market empirically is always difficult. However, it is notable that typically all these flexibility sources effectively price "to market" (that is, they buy gas/sell gas out at the market price, or a contracted price based on expected market pricing). Where prices are available for specific flexibility sources, they tend to bear out this observation, with pricing strongly related to expectations of market prices that the asset will be able to arbitrage across. For example, data presented in the Competition Commission (CC) Centrica/Dynegy¹ inquiry showed that the prices achieved in Rough auctions were closely related to the "winter/summer spread" anticipated in forward markets: reflecting the value of the arbitrage opportunity provided by Rough.²

The linkage of all these sources through variations in the market price for gas is important for market definition. If any source were to significantly reduce its supply of flexibility, that reduction would have an impact on the spread of gas prices between "high demand" and "low demand" periods. This in turn would feed through to the valuation of all the other sources. Therefore in principle any of these other sources might respond in a way that could undermine the profitability of the initial supply restriction. Under these circumstances a simple exclusion of certain flexibility sources from the market share calculation on the basis of their physical characteristics will tend to be an unduly crude approach.

¹ Centrica plc and Dynegy Storage Ltd and Dynegy Onshore Processing UK Ltd: A report on the merger situation; Competition Commission (http://www.competition-commission.org.uk/rep_pub/reports/2003/fulltext/480c5.pdf)

² Centrica/Dynegy, page 109 (figure 5.4).

1.2. PREVIOUS APPROACHES: THE COMPETITION COMMISSION

The Competition Commission, in its investigation into Centrica's acquisition of Rough, defined a market for all flexible gas. It recognised that it is "difficult to carry out the hypothetical monopolist test", and that while it did not consider "that all types of flexibility are equally good substitutes for one another, we have not been able to identify a robust basis for excluding any sources of flexibility from the market definition. We broadly accept Centrica's argument that all sources of flexibility contribute to some extent to the summer/Q1 spread which constrains the price of Rough."³

As a result of this, the CC decided to capture the differentiated nature of different flexibility products by looking at a range of measures of market share: using measures designed to capture *both* "seasonal" and "daily" flexibility (which place emphasis respectively on longer and shorter duration sources, without entirely excluding any source). Although the CC did also calculate shares excluding LNG storage and Interruption rights, the higher shares seen as a result were not used as a basis for prohibiting the transaction.⁴

It is important to note that the Commission's assessment was also forward looking: although it did consider evidence of historic flows, it also used information on the flexibility *capacity* of each source to estimate both current and future market shares. Using these flexibility capacity measures, it looked at the impact of the merger not only for the current gas year (2002/3) but also out to 2006/7 and 2010/11, calculating the likely share of each asset on the basis of the flexibility *capacity* of existing and new flexibility sources. These forecasts also took account of likely changes to the flexibility capabilities of existing sources: for example, the expansion of the IUK, and the continuing decline in beach gas.

1.3. OFGEM'S APPROACH

In Ofgem's consultation documents regarding the Aldbrough TPA exemption application (for Statoil and SSE Hornsea respectively), it appears to accept in principle the precedents set down by the Competition Commission in its Centrica/Dynegy Storage decision: namely that gas storage facilities operate in a wider market for gas flexibility. However, in contrast to the Competition Commission's methodology in that case, Ofgem takes the route of excluding various sources from its market definition on the basis of an analysis of gas flows over 4 months in 2006/7. On this basis it concludes that it should consider two alternative market definitions in its assessment:

- o MRS, LRS and IUK; and
- o MRS, LRS, IUK and Flexible Beach.

That is, Ofgem excludes from its analysis demand flexibility, import facilities other than IUK (e.g. BBL, Langed, LNG imports or any future import source), beach gas (other than Sean and fields delivering at the Barrow terminal), and LNG storage. As we lay out in the following section, we believe that this approach is unlikely to give a reliable guide to the extent of market power in the provision of flexible gas.

³ Centrica/Dynegy, page 117 (paragraph 5.43).

⁴ Centrica/Dynegy, page 119 (paragraph 5.50).

2. WEAKNESSES OF THE MARKET DEFINITION METHODOLOGY

We have two main concerns over Ofgem's market definition methodology. First, the approach is based on an analysis of historic flows of gas over a very short period of time that is unlikely to be representative of the operations of the gas market even in the near future. Second, the methodology simply excludes certain sources of flexibility on the basis of apparently arbitrary cut-off points in measures that are not clearly related to the SSNIP test. These concerns are explained in more detail below.

2.1. THE USE OF HISTORIC FLOWS OVER A SHORT TIME PERIOD

The use of historic flows is problematic for several reasons, and can at best only give an idea of how a facility like Aldbrough might fit into *today's* market. The Aldbrough facility will be coming on line partially this winter, but fully only by 2010, and will continue to provide flexible gas to the UK for many years to come. Over this period, significant developments in the UK's gas infrastructure will continue. Therefore the key question is what Aldbrough's role is likely to be in that future landscape of gas flexibility resources.

In assessing that landscape, the use of historic data on flows can only ever tell part of the story. Most obviously, new infrastructure that comes on line over the next few years as UK beach supplies decline will change the set of options available to gas consumers, and therefore alter the way in which different flexibility sources interact. For example, the role of LNG imports is as yet unclear, but may well contribute to UK flexibility (as Ofgem itself has noted in previous statements).⁵ There is also potential for a number of new import pipelines and storage facilities being developed over the timeframe that Aldbrough will be in operation.

Even if a historic flow analysis is employed as one of a range of tools, the choice of a very short study period (4 months, from 25th November to 31st March) across a single unusually warm winter is likely to result in an unrepresentative outcome. This is illustrated by the rather strange pattern of supply seen in Ofgem's Chart 1, when Rough is compared with MRS. As would be expected, Rough – with its relatively long duration – flowed gas on a larger number of days than the MRS facilities. However, more surprisingly it can be seen that Rough, despite having a longer duration than MRS sources, in fact had a higher "flexible range" over this period (suggesting that its supplies to the market on the lowest days were only around 5-10% of those on the highest days, while for MRS the figure appears significantly higher: around 30%). It is far from clear that this pattern of deliveries is "typical" for these assets: illustrating that a historic picture of such a short time frame may well not be representative, even of the current state of competition.

Therefore, the short-term flow analysis appears to be giving counter-intuitive results even for established supply assets. Moreover, BBL, Langede and Grain supplies are all relatively new, so recent usage patterns are even less likely to be reliable indicators of their long term role. Rather, their use is likely to change as new import/export infrastructure is developed, and as experience of the existing infrastructure is gained.

For example, as more new links are built from Norwegian gas fields (e.g. Ormen Lange and Troll) to the UK and Continental Europe, it may well be the case that constraints on arbitrage between these markets (whether physical or contractual) become less binding,

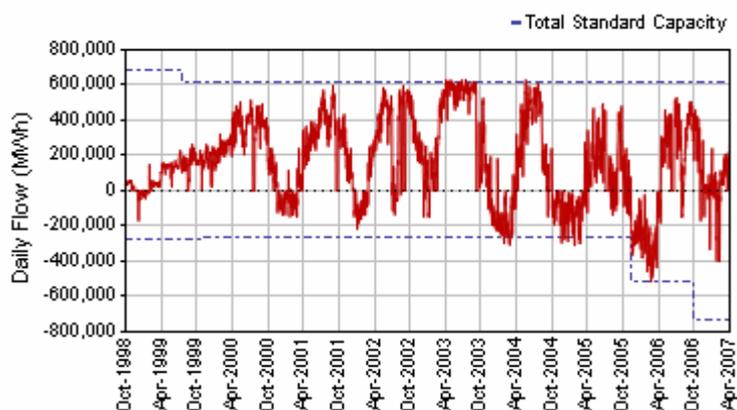
⁵ "Our Energy Challenge: Ofgem's response", April 2006, paragraph 3.18 (available at <http://www.ofgem.gov.uk/About%20us/CorpPlan/Documents1/13924-8206.pdf>).

resulting in more price-sensitive gas flows. Not only will the capacity to send gas to Germany or the UK increase, but so will the commercial experience of taking advantage of the arbitrage opportunities that will exist between various European markets.

Similarly, as the international LNG market develops (for example with an increase in US regassification capacity, and a reduction in LNG supply constraints), the degree of price sensitivity is likely if anything to increase, with shipments being diverted between different destinations based on relative price. Indeed, Centrica believes that the Grain LNG terminal's imports have already shown some price sensitivity, with zero flows from Grain during several days in February and March 2007 when the SAP was unusually low.

Indeed, the history of IUK itself illustrates that past flow patterns (even over a full year, let alone over such a short period) are an unreliable guide to future behaviour in the context of the dynamic UK gas market. In particular, it can be seen from the figure below that the IUK flows appear to have been characterised by a "ramp up" phase when it was first opened in 1998 – and that the patterns of import/export have continued to develop and change over time. This illustrates the difficulties of drawing meaningful conclusions on substitutability in a future gas landscape based on historic flow behaviour. There is no reason to expect that, in contrast to IUK, the pattern of use of other import and export facilities (e.g. BBL) would remain constant over time.

Figure 1 – Daily flows through the Bacton interconnector



Source: <http://www.interconnector.com/online/services/historicflows.htm>

As has been noted above, the Competition Commission's assessment of the Centrica/Rough transaction took a more forward looking approach, focusing not only on historic flow data but also on the forecast *capacity* of different sources to supply gas flexibility in future years. Such forecasting is not entirely straightforward: clearly there are many more potential flexible gas projects available than are required to meet the UK's needs and therefore assumptions need to be made on the likely rate of development. However, estimates are available of developments in both the flexibility of demand and the supply options available to the UK, which should be sufficient to put together meaningful forward-looking estimates. Aldbrough will be supplying flexible gas (potentially exempt from TPA) for many years to come, and therefore a forward looking approach would give a much more reliable assessment of its likely competitive impact.

2.2. METHOD FOR EXCLUDING SPECIFIC SOURCES

Even if the use of historic flow data over such a short and unrepresentative period were accepted, the reasoning used to exclude certain sources from the relevant market is not clear and does not appear to be robust. At paragraph 2.8 Ofgem suggests that it has started with the Aldbrough facility and added potential substitutes "to find the first market

definition that might enable the SSNIP test to be met.” However, the reasoning behind the “cut-off” chosen, and its relation to the SSNIP test, is opaque. It appears that Ofgem has calculated two summary measures of flows over the period studied:

- o % of days with no gas flowing; and
- o “Flexible range” (defined as the percentage by which the average flows on the highest flow 10 days exceeded those in the lowest flow 10 days).

On the basis of these measures, Ofgem has concluded that IUK, MRS and Rough should certainly be included in the market, and possibly also flexible beach gas. The precise cut-off criteria used are not specified, although we note that all the sources listed above have a “flexible range” of 60%+ (or 50%+ including flexible beach).

Regardless of how the “cut off point” is set, it is not clear that these measures are a good proxy for the SSNIP test. In particular, they do not capture the relative scale or importance of different flexibility sources. For example, a source that provides relatively low flexibility relative to its base load flows (e.g. certain beach sources) will show a much lower “flexible range” than a source that has identical flexibility characteristics except that it is not associated with any base load supply. Therefore, while these measures may give *some* indication of product differentiation, they do not represent a robust method for focusing in on a narrower market than flexible gas.

In reaching its conclusion, Ofgem also refers to a load duration curve for gas over the four month period studied (Chart 2). It argues that “the load duration curve supports the view that LRS and IUK provide similar levels of flexibility to MRS (given these sources tend to flow on the same highest demand days)”.⁶ This again does not seem to be a very useful proxy for the SSNIP test: there may well be sources that flow on all days of the year, but flow more on high priced days than low priced days, and are a sufficient competitive constraint on MRS to be included in the relevant market.

2.3. EXCLUSION OF DEMAND FLEXIBILITY

The exclusion of demand flexibility from the analysis is also puzzling. Demand flexibility is not considered as even a potential source of flexibility in Chart 1, and although the paper points out that this exclusion is likely to result in an overstatement of the share of any given supply source,⁷ there is no discussion of *why* it has been excluded. This is a source that has already in the past been a useful contributor to flexibility, and is likely to be a source with limited duration but significant deliverability – rather like a storage site. Indeed, this comparison with storage has been made by Ofgem in the past, describing demand flexibility in the winter of 2005/6 as providing “storage deliverability equivalent to the Rough storage facility”.⁸

6 Paragraph 2.15

7 Paragraph 2.10

8 “Our Energy Challenge: Ofgem’s response”, April 2006, paragraph 3.18 (available at <http://www.ofgem.gov.uk/About%20us/CorpPlan/Documents1/13924-8206.pdf>).

3. CONCLUSIONS

The market definition exercise undertaken by Ofgem in its consultation on the Aldbrough TPA exemption applications does not appear to us to set down a clear and robust method for identifying the relevant market for flexibility. While we accept that this market definition exercise is not straightforward, we believe that the method applied by Ofgem is would benefit from being more forward looking, and relying less heavily on a very short run of data across a period that is unlikely to be representative of normal market operations (being characterised by unusually warm weather and the presence of several new supply sources). In our view a more appropriate approach would take account of the capacity of existing and new flexibility sources to meet the demand for flexible gas in the UK in the future.