nationalgrid

Winter 2006/07 Consultation Report

Annexes

Annex A: Winter Scenario Analysis

To supplement the load duration curve analysis shown in Chapter 1, here we present the output from simulations that we have undertaken of historical weather patterns. These are produced by forecasting the level of demand that would be experienced in 2006/07 if there was a repeat of one of the historical weather patterns seen within the last 78 years, and then matching available supplies to the forecast (restricted) demand.

This Annex focuses on four historical winters, chosen to provide a broad spread of winter severities. Table A.1 shows the severity of these winters when assessed against the Met Office reference period and two reference periods used by National Grid. For further information on these winter severity definitions please see the information note provided at the end of this Annex.

Table A.1 – Historical winter severities

	Met Office base	National Grid base	
	1971 - 2000	1928 - 2005	1987 - 2004
2002/03	1 in 3 warm	1 in 10 warm	Average
2005/06	Average	1 in 4 warm	1 in 3 cold
1995/96	1 in 8 cold	Average	>1 in 17 cold
1985/86	1 in 12 cold	1 in 11 cold	>1 in 17 cold

The Met Office's latest analysis, published on the same day as this report, indicates an equal probability of a milder than average or colder than average winter, with a slightly higher probability than normal of an average winter. The statement also notes a signal that the winter may become colder in relation to average temperatures as the season progresses. As Table A.1 indicates, winter 2005/06 was average against the Met Office definition.

We have analysed these four winters against seven different supply scenarios:

- Base Case;
- Base Case +20 mcm/d of additional non-storage supplies all winter;
- Base Case +10 mcm/d of additional non-storage supplies all winter;
- Base Case +20 mcm/d of additional non-storage supplies for Q1 2007;
- Base Case -20 mcm/d of non-storage supplies for Q1 2007;
- Base Case -10 mcm/d of non-storage supplies all winter;
- Base Case -20 mcm/d of non-storage supplies all winter;

Some of the key assumptions used to develop the model are as follows:

- The model uses a "bottom up" approach to matching supplies to demand. Use of UKCS gas is assumed first, then imports, then storage. For the purpose of this model, the order in which the importation sources

are assumed to be used is arbitrary; we have not based this on an economic 'merit-order' analysis and no such order should be inferred from the graphs.

- UKCS supplies are capped at the base case level of 240 mcm/d. Full use of UKCS supplies is not assumed until demand reaches 300 mcm/d. This is based on an analysis of historical demand and UKCS supply levels;
- Use of Long, Medium and Short range storage (LRS, MRS and SRS respectively) is modelled to reflect historical behaviour. This results in the simulation of some demand-side response prior to the use of maximum storage deliverability;
- Storage stocks are not allowed to drop below the relevant safety monitor level applying at the particular point in time. If necessary, it is assumed that the market responds by providing additional demand-side response. Once the relevant safety monitor has declined, further storage withdrawals from that storage type are permitted;
- All MRS sites are modelled separately, to take account of their respective space and deliverabilities;
- Storage re-injection is modelled for Rough (LRS) and each individual MRS site;
- In the supply scenarios, the total level of non-storage supply has been varied by adjusting each of the imported gas sources on a pro-rata basis. This is an arbitrary method of adjustment designed only to achieve a revised level of non-storage gas supply within the model.

The output from each simulation is presented in this Annex as a single chart, which shows:

- Restricted and unrestricted demand;
- Use of the respective supply sources, matched to restricted demand;
- The level of simulated demand-side response (measured against the restricted demand forecast);
- The lowest percentage of LRS (i.e. Rough), MRS and SRS (i.e. LNG) stocks reached through the winter.

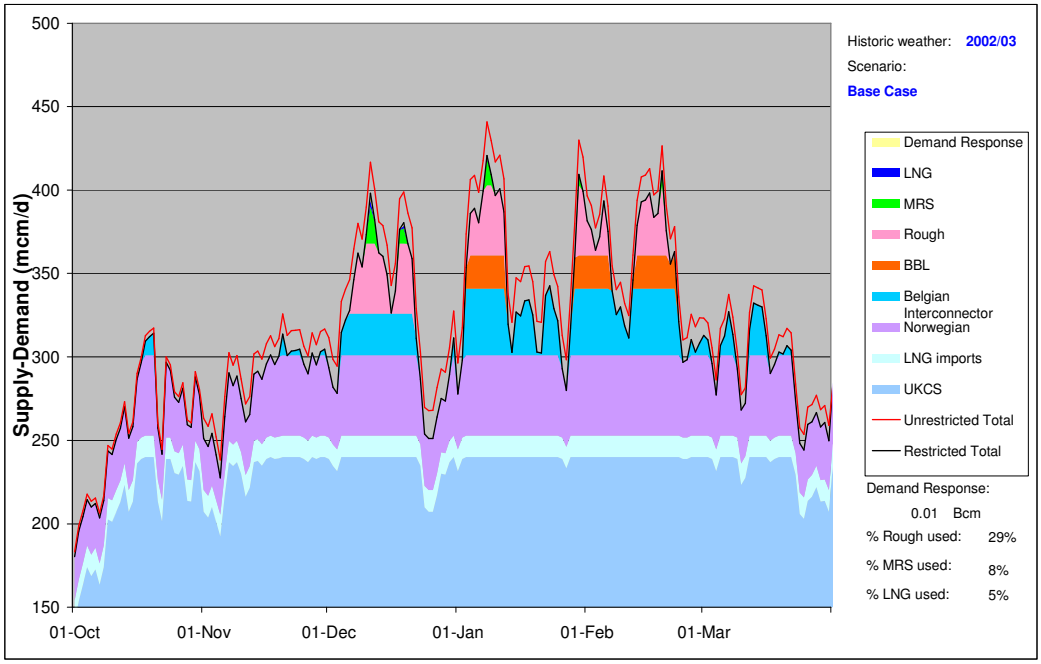
Key points arising from the individual simulations are noted under the respective charts. In general, this analysis indicates the following:

- Even the more pessimistic of the supply scenarios modelled do not lead to material levels of additional demand-side response in the 2002/03 and 2005/06 simulations (over and above the level implicit within the restricted demand forecast);
- In the coldest winter modelled (1985/86), under the more optimistic of the supply scenarios, relatively little additional demand-side response would be required (over and above the level implicit within the restricted demand forecast);
- Under some scenarios, the relatively low level of supply availability in Q4 2006 (compared with Q1 2007) would lead to material levels of storage use in November and December;
- Inevitably, the (unlikely) combination of a 1985/86-style winter and a poor supply scenario could be expected to lead to a safety monitor being

reached and a requirement for very high levels of demand-side response.

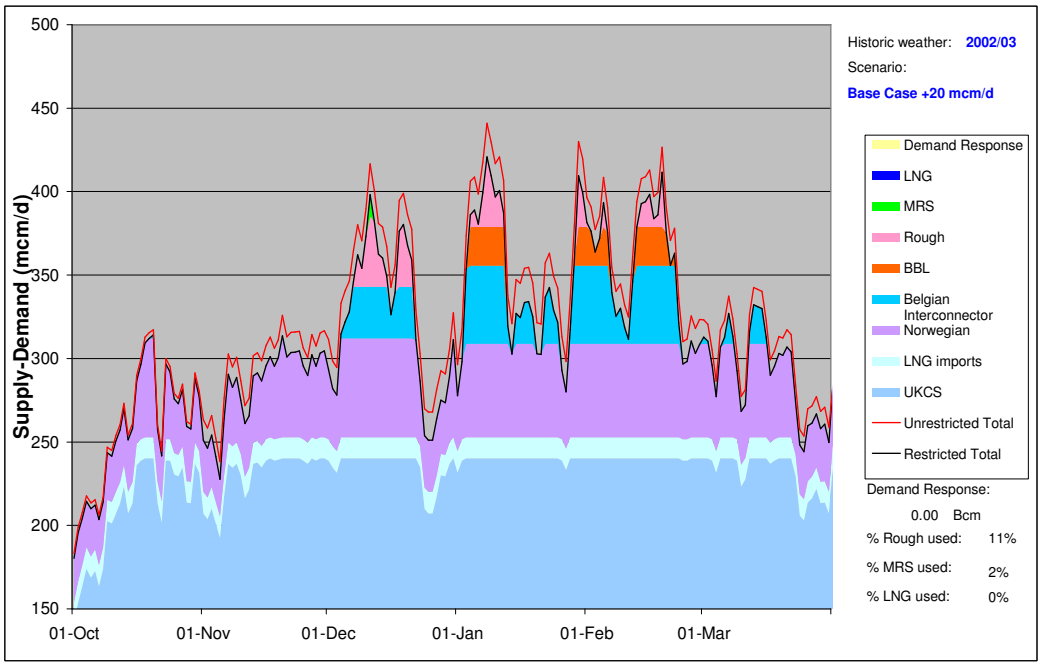
2002/03 scenarios (1 in 10 warm on the long-term basis)

Figure A.1 – 2002/03, Base Case



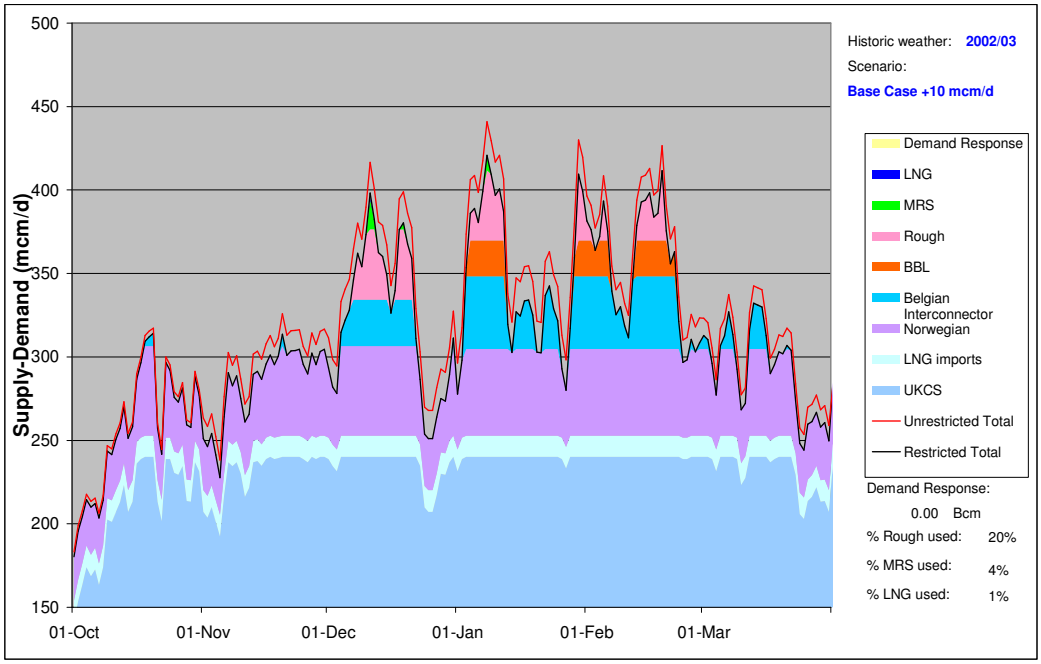
- Less than a third of Rough used. Very low use of MRS and LNG storage stocks
- Negligible additional demand response above that already included within restricted forecast

Figure A.2 – 2002/03, Base Case +20 mcm/d of additional non-storage supplies all winter



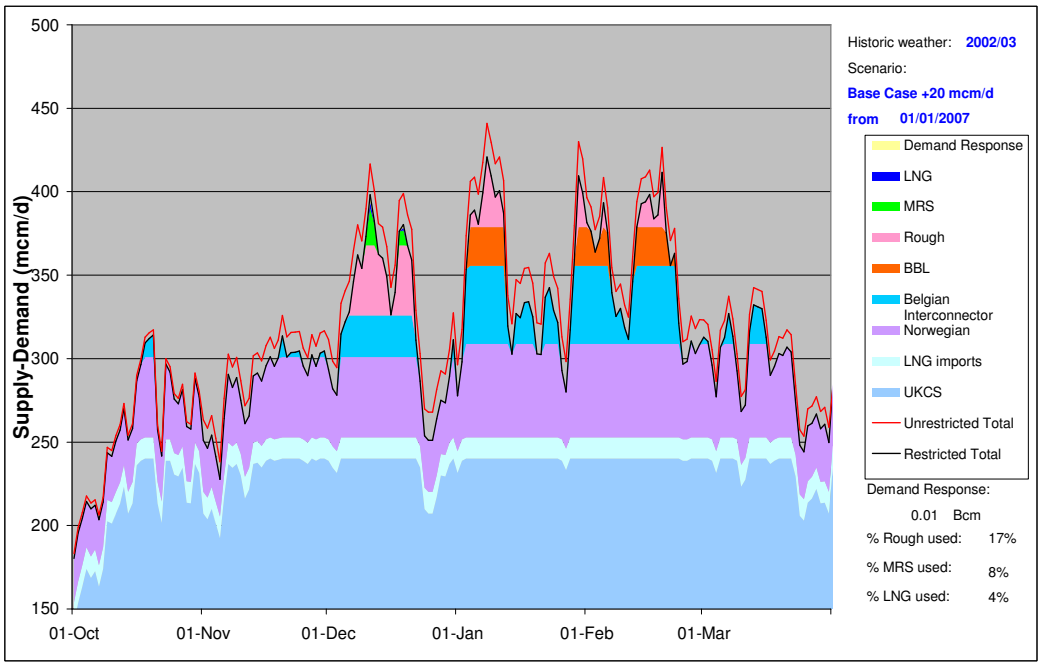
- Very low Rough use. Negligible MRS and no LNG storage used
- No additional demand response above that already included within restricted forecast

Figure A.3 – 2002/03, Base Case +10 mcm/d of additional non-storage supplies all winter



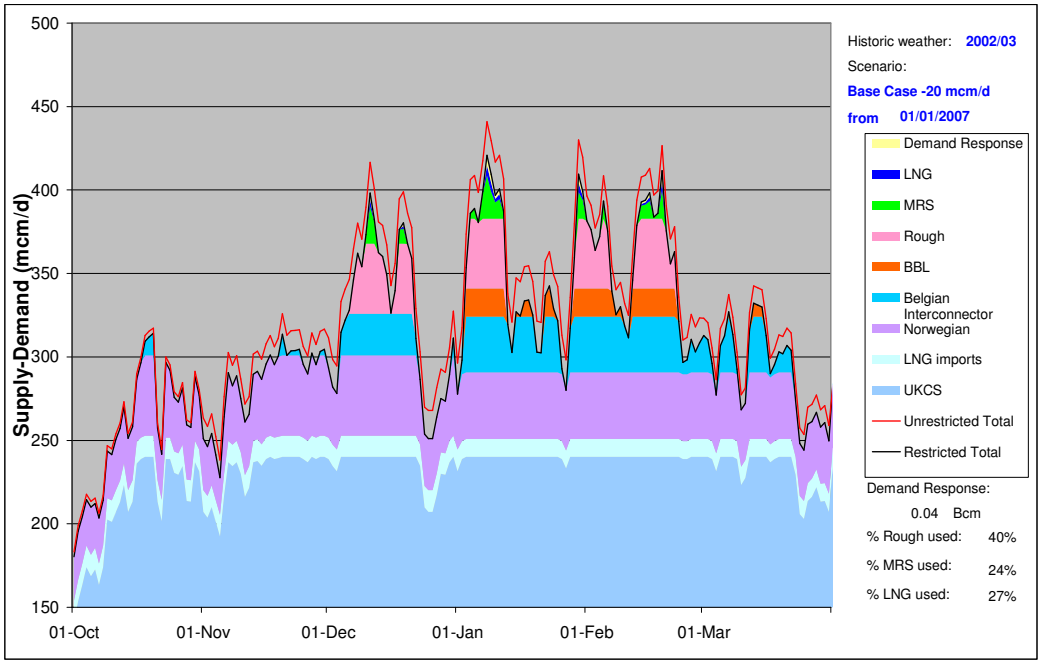
- Low Rough use. Negligible MRS and no LNG storage used
- No additional demand response above that already included within restricted forecast

Figure A.4 – 2002/03, Base Case +20 mcm/d of additional non-storage supplies for Q1 2007



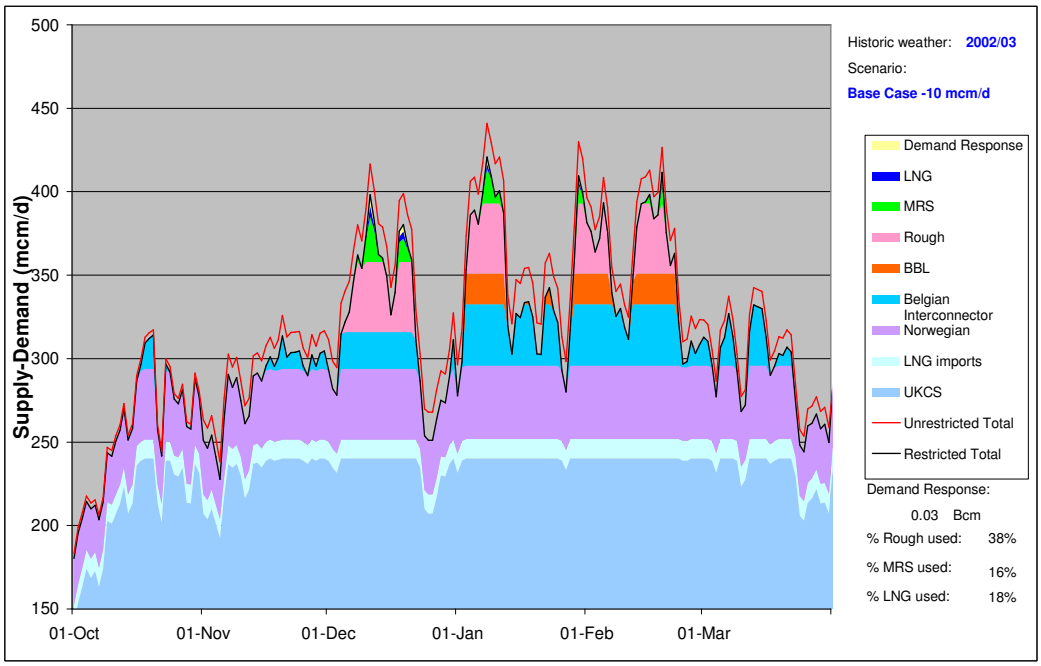
- Low Rough use. Very low use of MRS and LNG storage stocks
- Negligible additional demand response above that already included within restricted forecast

Figure A.5 – 2002/03, Base Case -20 mcm/d of non-storage supplies for Q1 2007



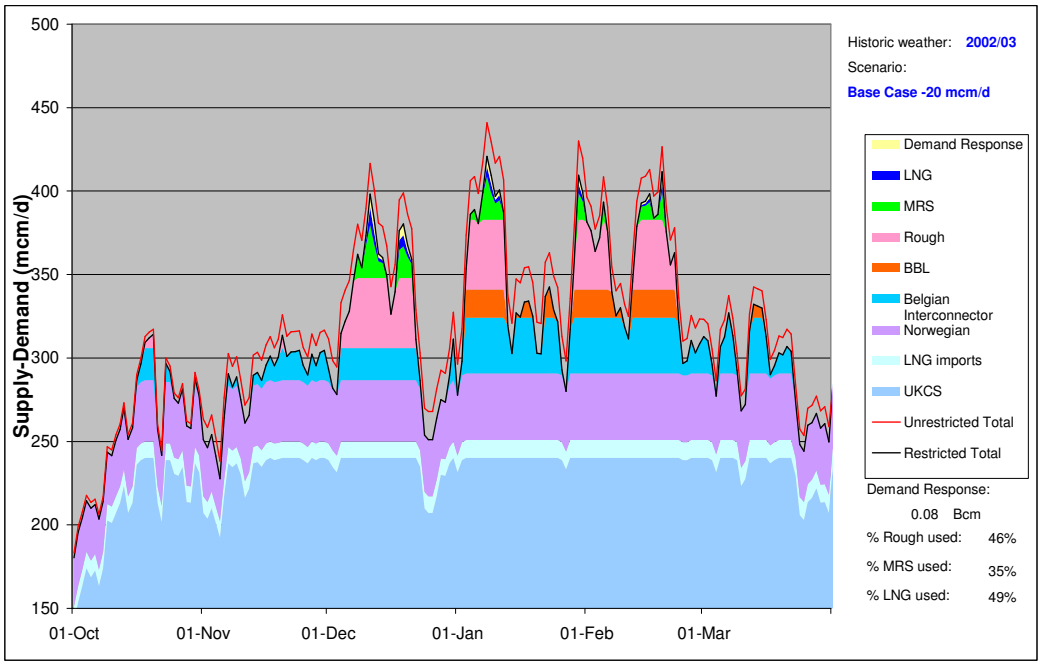
- More than one third of Rough used. Approximately one quarter of MRS and LNG storage stocks used
- Very small amount of additional demand response above that already included within restricted forecast

Figure A.6 – 2002/03, Base Case -10 mcm/d of non-storage supplies all winter



- More than one third of Rough used. Less than one quarter of MRS and LNG storage stocks used
- Negligible additional demand response above that already included within restricted forecast

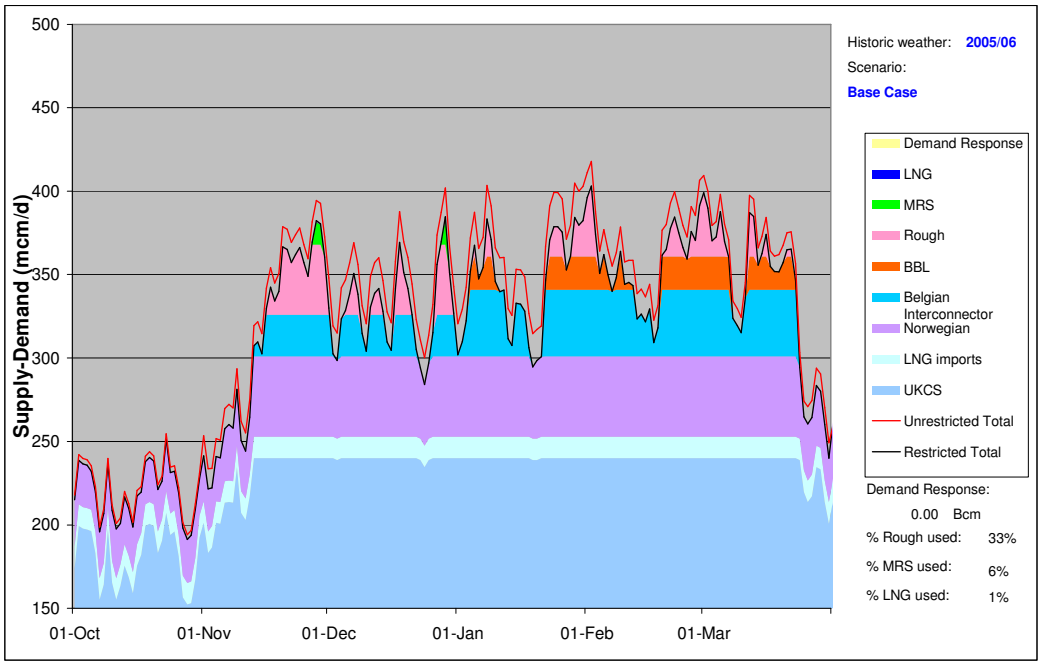
Figure A.7 – 2002/03, Base Case -20 mcm/d of non-storage supplies all winter



- Nearly one half of Rough used. Approximately one third of MRS and nearly one half of LNG storage stocks used
- Small amount of additional demand response above that already included within restricted forecast

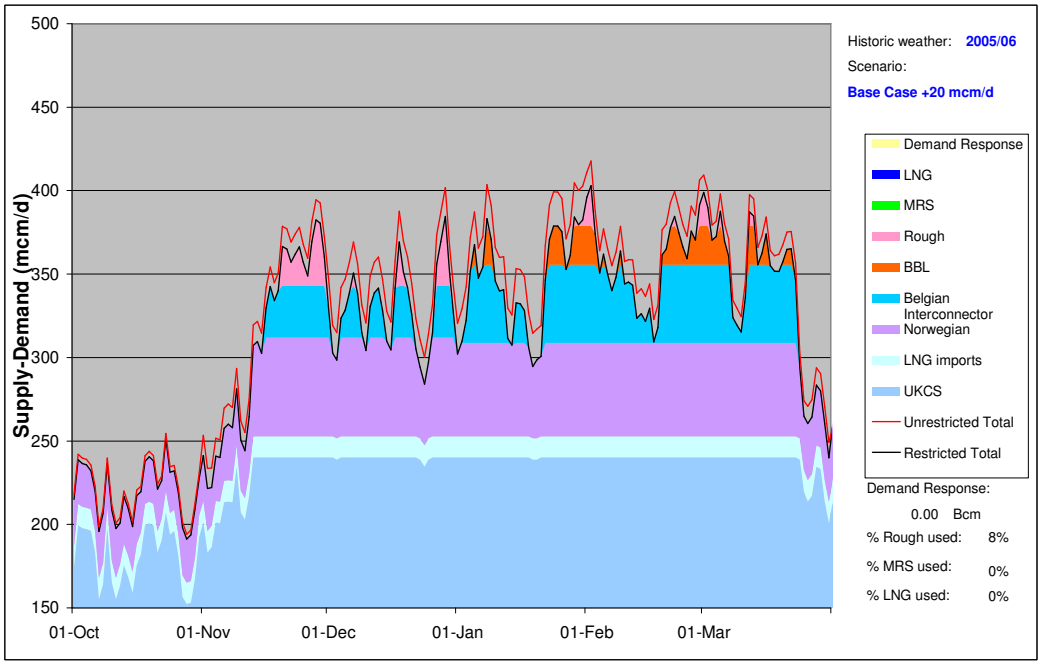
2005/06 scenarios (slightly warmer than the long-term average, but slightly colder than the shorter-term average)

Figure A.8 – 2005/06, Base Case



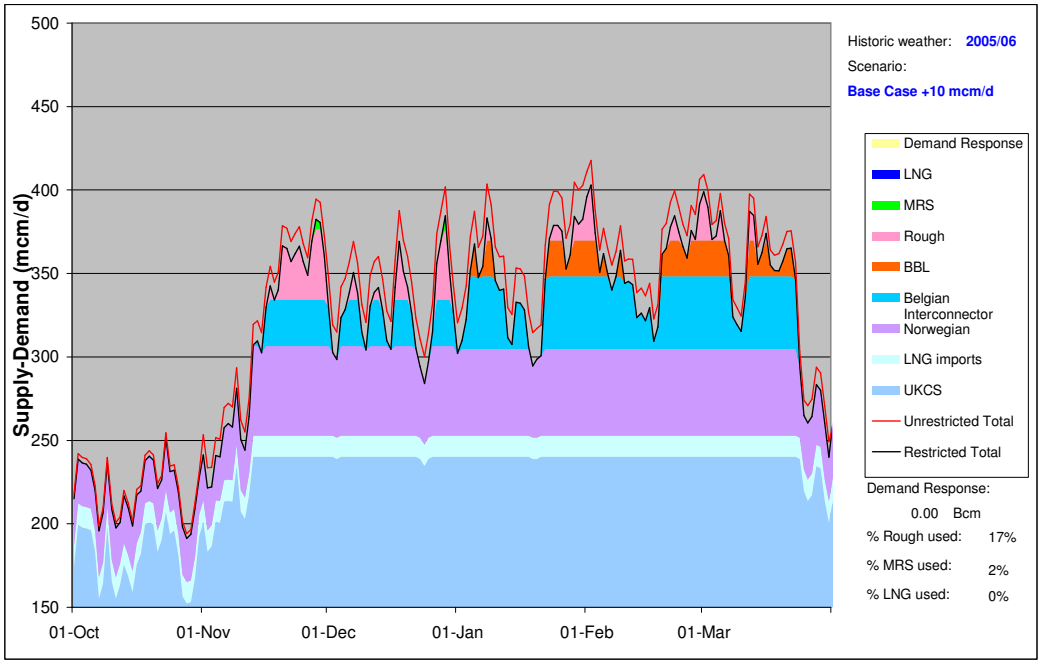
- A third of Rough used. Very low use of MRS and LNG storage stocks
- No additional demand response above that already included within restricted forecast

Figure A.9 – 2005/06, Base Case +20 mcm/d of additional non-storage supplies all winter



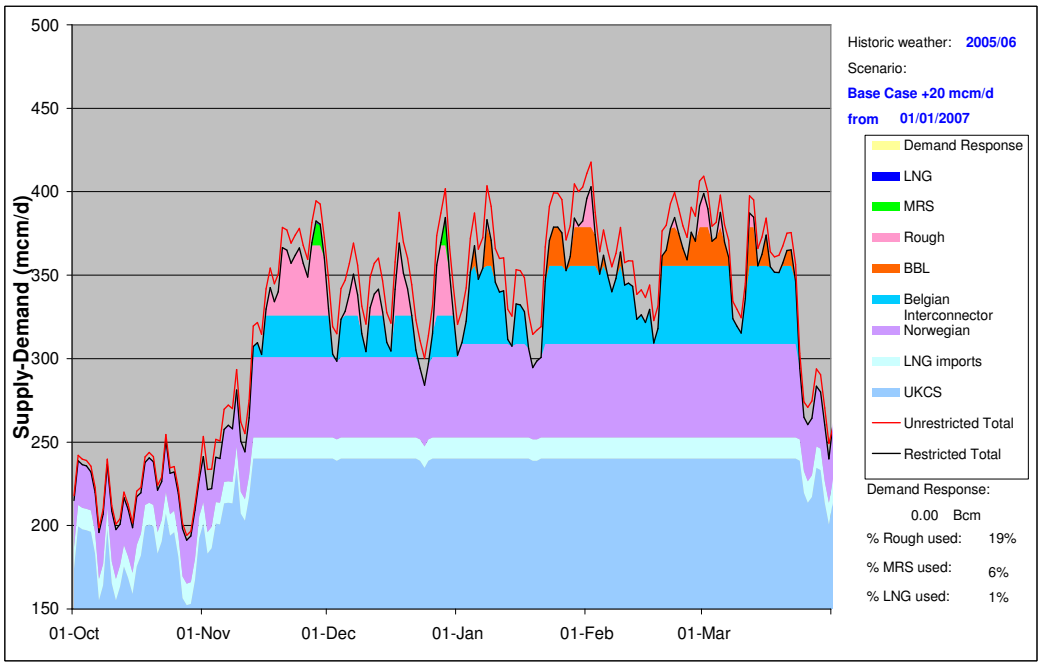
- Very low use of Rough. No use of MRS and LNG storage stocks
- No additional demand response above that already included within restricted forecast

Figure A.10 – 2005/06, Base Case +10 mcm/d of additional non-storage supplies all winter



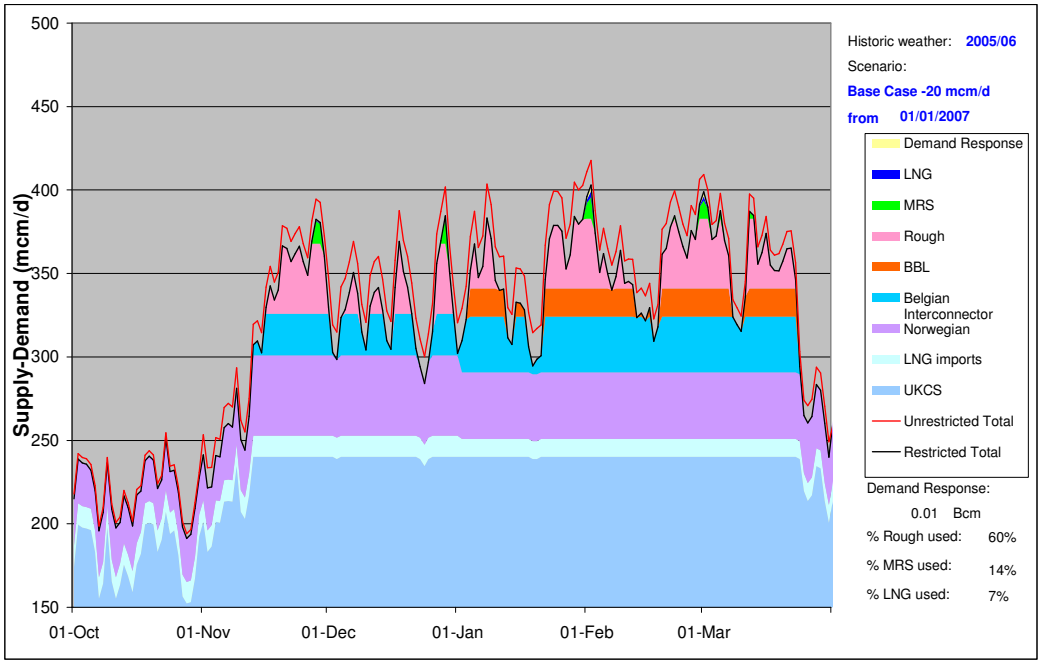
- Low use of Rough. Negligible use of MRS and no use of LNG storage stocks
- No additional demand response above that already included within restricted forecast

Figure A.11 – 2005/06, Base Case +20 mcm/d of additional non-storage supplies for Q1 2007



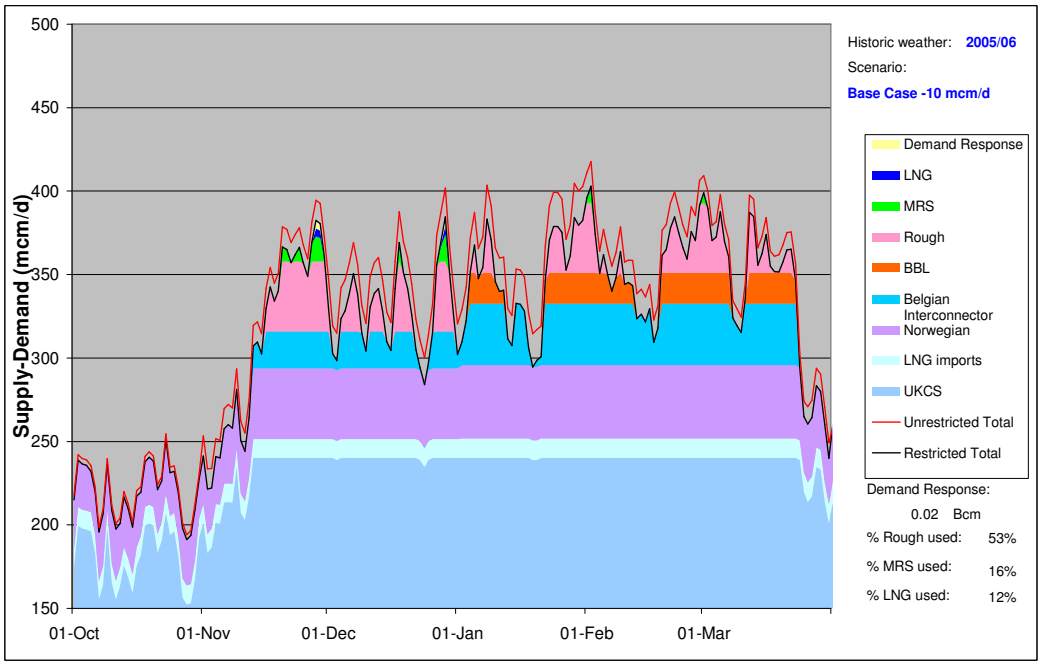
- Low use of Rough. Negligible use of MRS and LNG storage stocks
- No additional demand response above that already included within restricted forecast

Figure A.12 – 2005/06, Base Case -20 mcm/d of non-storage supplies for Q1 2007



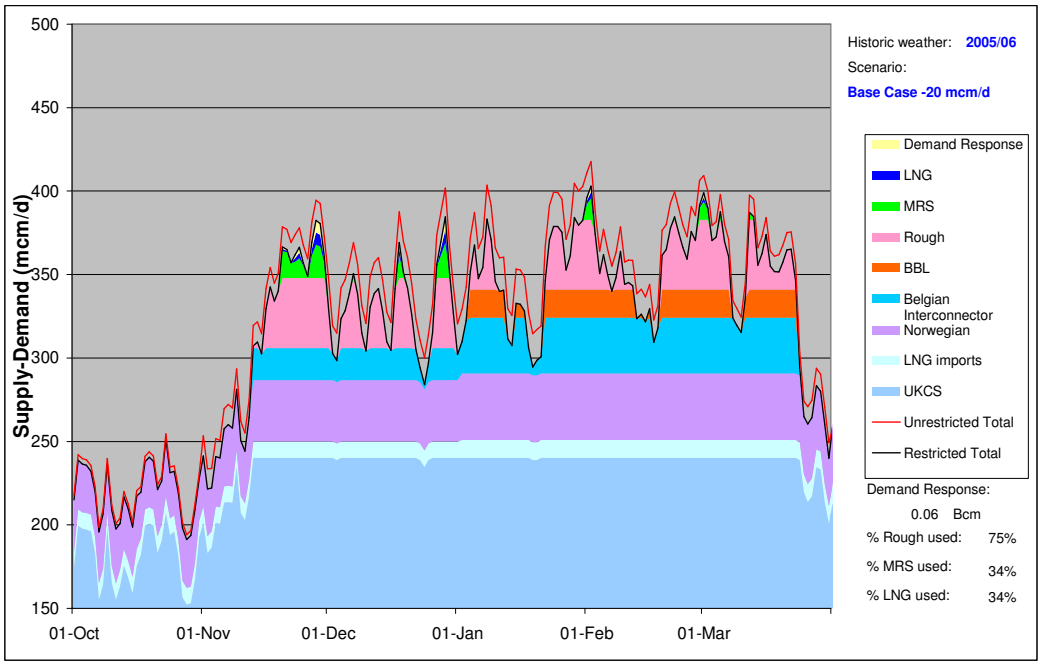
- Nearly two thirds of Rough used. Low use of MRS and LNG storage stocks
- Negligible additional demand response above that already included within restricted forecast

Figure A.13 – 2005/06, Base Case -10 mcm/d of non-storage supplies all winter



- More than one half of Rough used. Low use of MRS and LNG storage stocks used
- Very small amount of additional demand response above that already included within restricted forecast

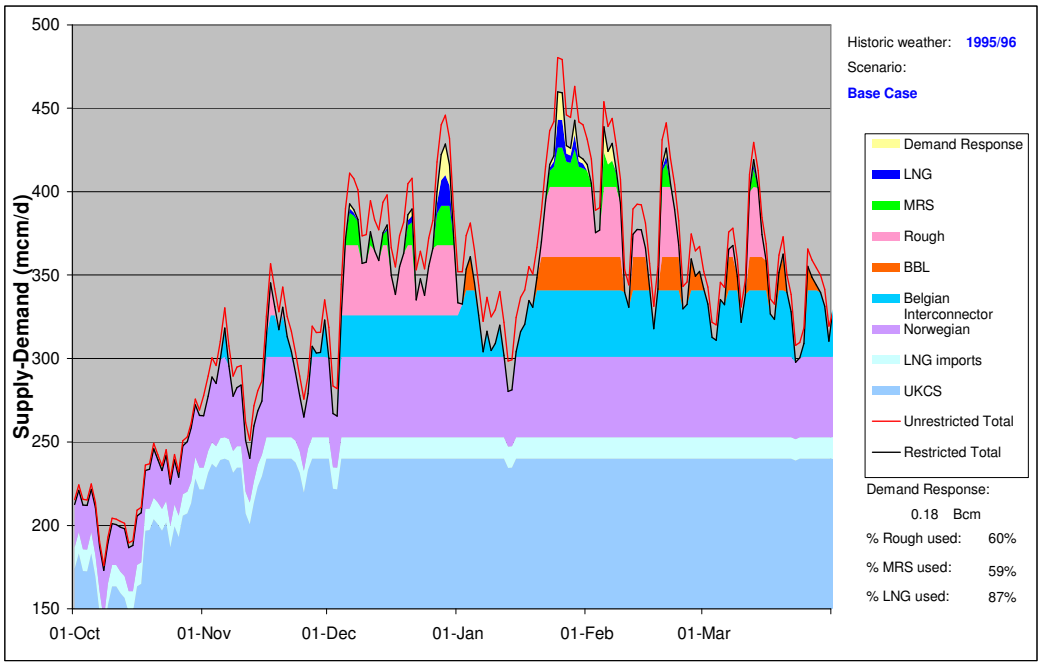
Figure A.14 – 2005/06, Base Case -20 mcm/d of non-storage supplies all winter



- Three quarters of Rough used. One third of MRS and LNG storage stocks used
- Small amount of additional demand response above that already included within restricted forecast

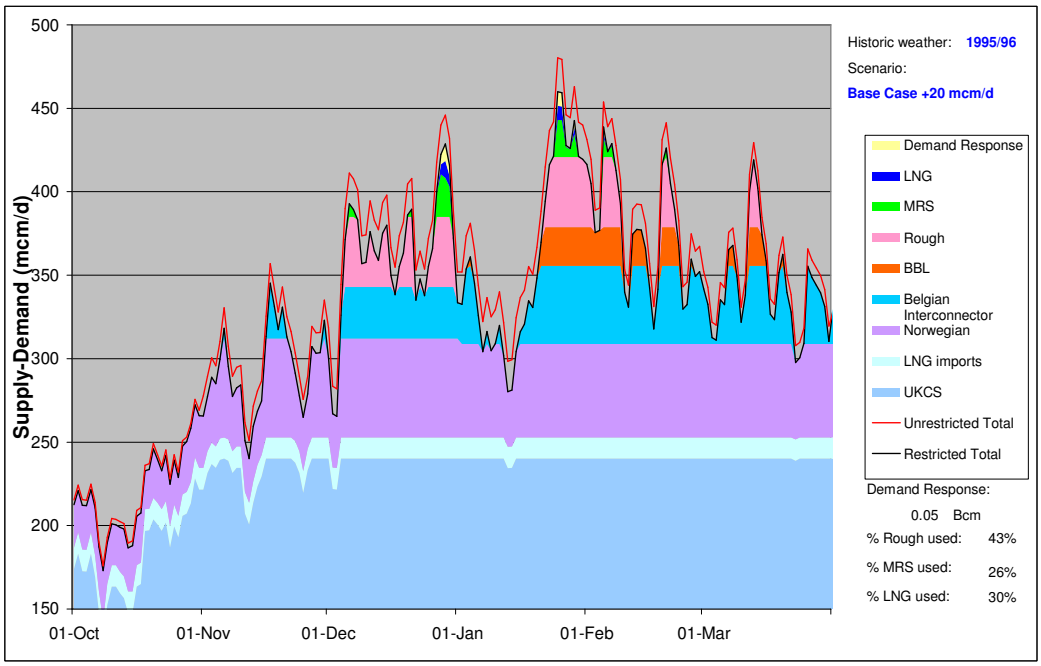
1995/96 scenarios (average on the long-term basis, but the second coldest experienced since 1986/87)

Figure A.15 – 1995/96, Base Case



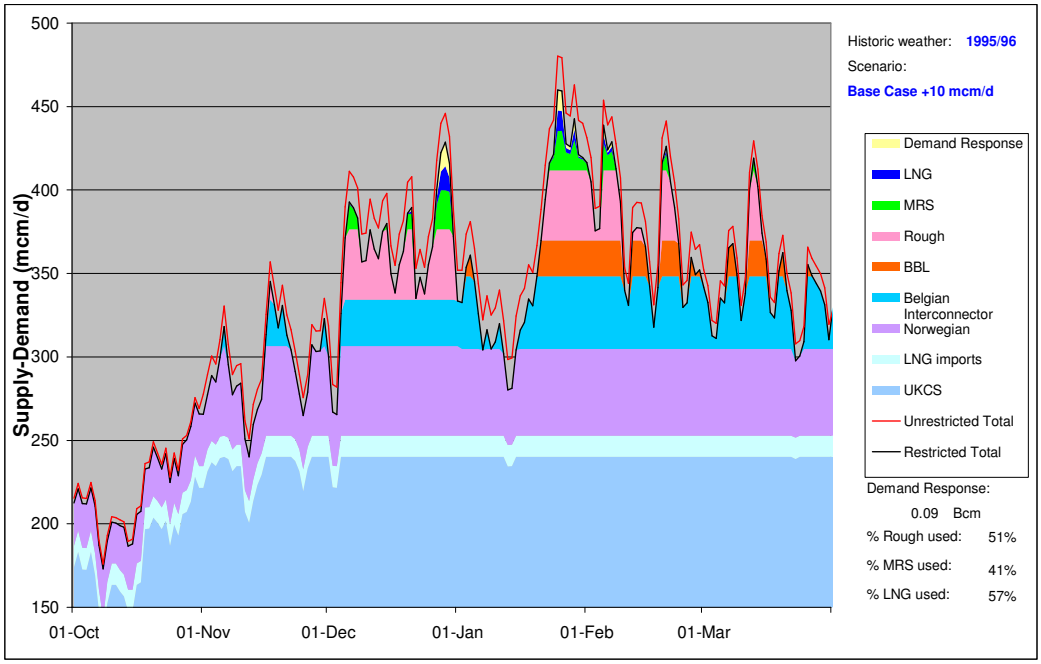
- Nearly two thirds of Rough and MRS storage used
- SRS monitor reached on 1 February. Very high use of LNG storage stocks due to high demands in December and January
- 0.18 bcm of additional demand response above that already included within restricted forecast, i.e. 10-15 mcm/d in a few short cold snaps

Figure A.16 – 1995/96, Base Case +20 mcm/d of additional non-storage supplies all winter



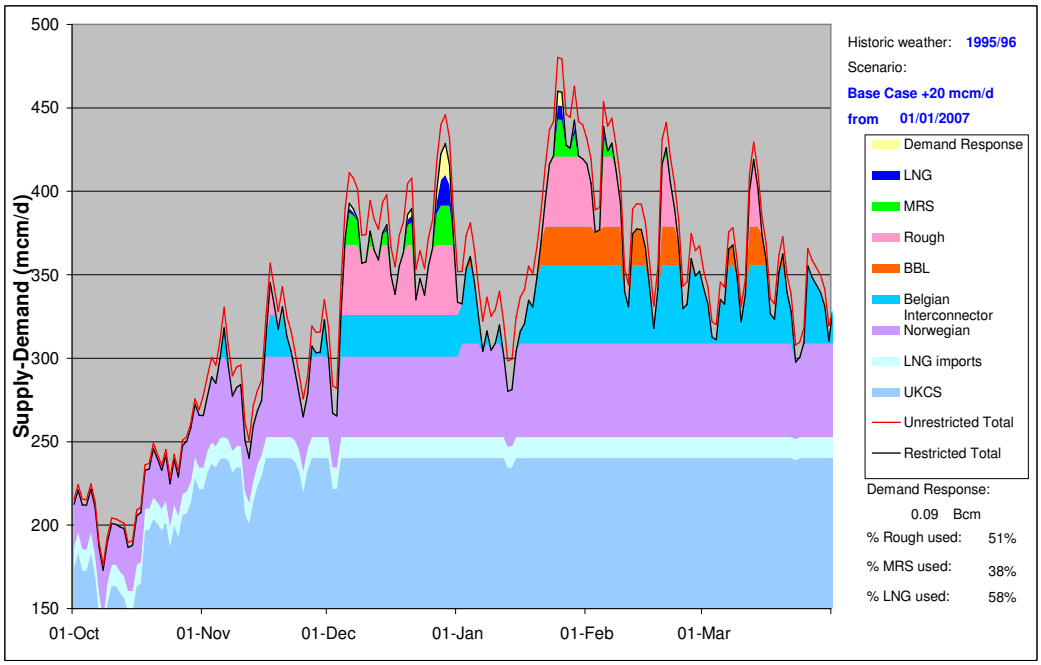
- More than one third of Rough used. Less than one third of MRS and LNG storage stocks used

Figure A.17 – 1995/96, Base Case +10 mcm/d of additional non-storage supplies all winter



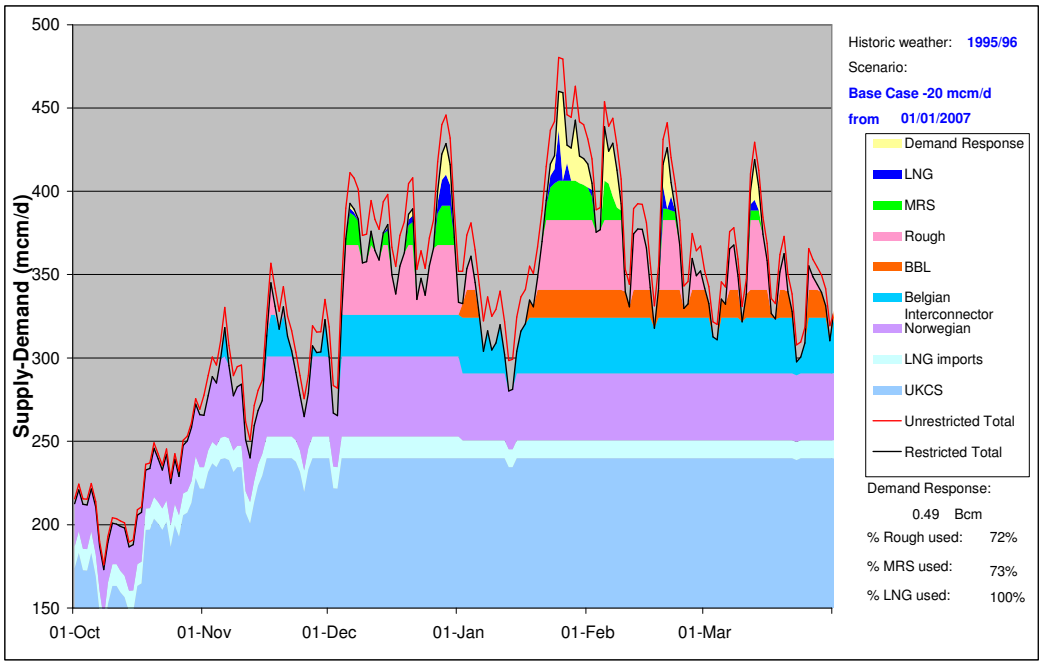
- More than one half of Rough used. More than one third of MRS and one half of LNG storage stocks used
- Small amount of additional demand response above that already included within restricted forecast

Figure A.18 – 1995/96, Base Case +20 mcm/d of additional non-storage supplies for Q1 2007



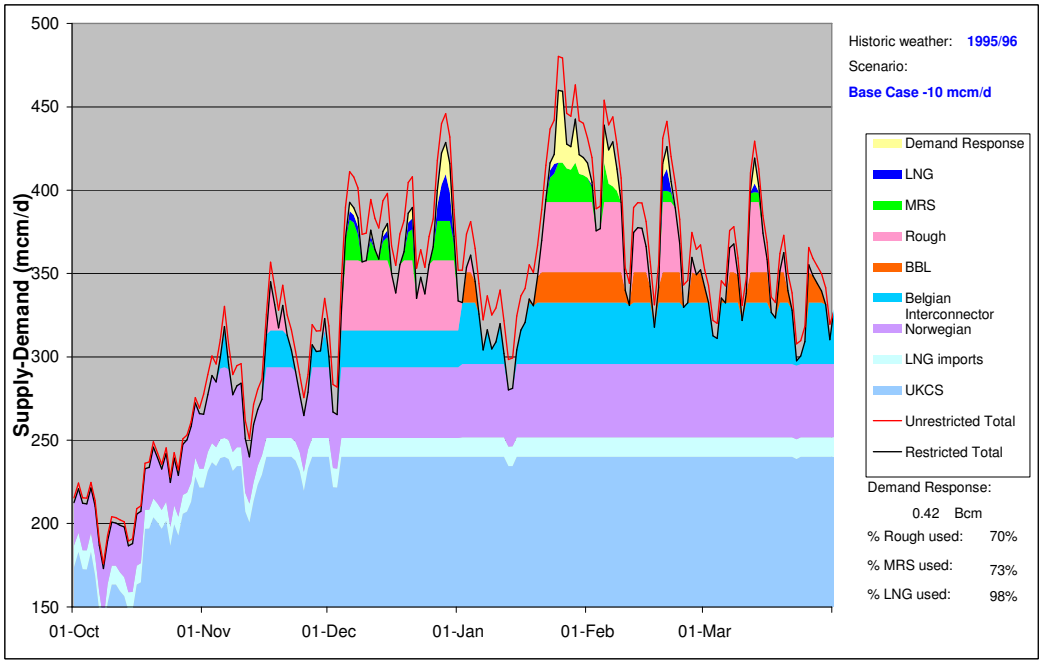
- More than one half of Rough used. More than one third of MRS and one half of LNG storage stocks used
- Small amount of additional demand response above that already included within restricted forecast, mostly during a cold snap in late December

Figure A.19 – 1995/96, Base Case -20 mcm/d of non-storage supplies for Q1 2007



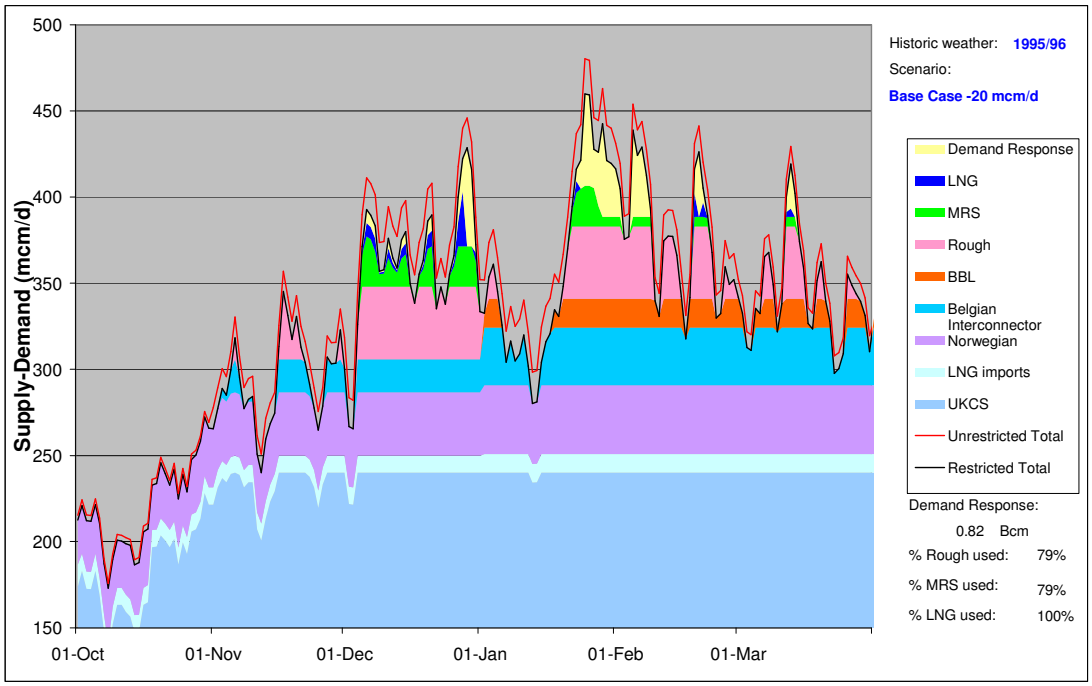
- Nearly three quarters of Rough and MRS storage used
- SRS monitor reached on 29 January. All LNG storage used by mid-March. High use of LNG storage in December and January
- 0.49 bcm of additional demand response above that already included within restricted forecast, i.e. approximately 23 mcm/d on average for three weeks

Figure A.20 – 1995/96, Base Case -10 mcm/d of non-storage supplies all winter



- Nearly three quarters of Rough and MRS storage used
- SRS monitor reached on 25 January. Very nearly all LNG storage used by mid-March. Very high use of LNG storage stocks in December
- 0.42 bcm of additional demand response above that already included within restricted forecast, i.e. approximately 20 mcm/d on average for three weeks

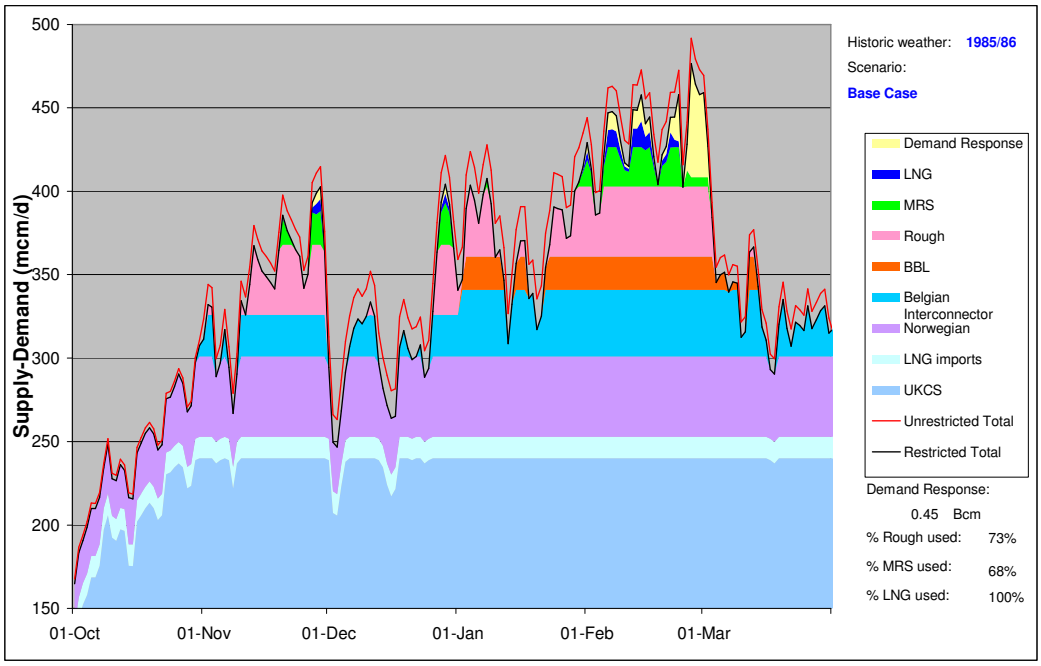
Figure A.21 – 1995/96, Base Case -20 mcm/d of non-storage supplies all winter



- Over three quarters of Rough and MRS storage used
- SRS monitor reached on 30 December. All LNG storage used by mid-March. Very high use of LNG stocks in December
- 0.82 bcm of additional demand response above that already included within restricted forecast, i.e. approximately 30 mcm/d on average for four weeks

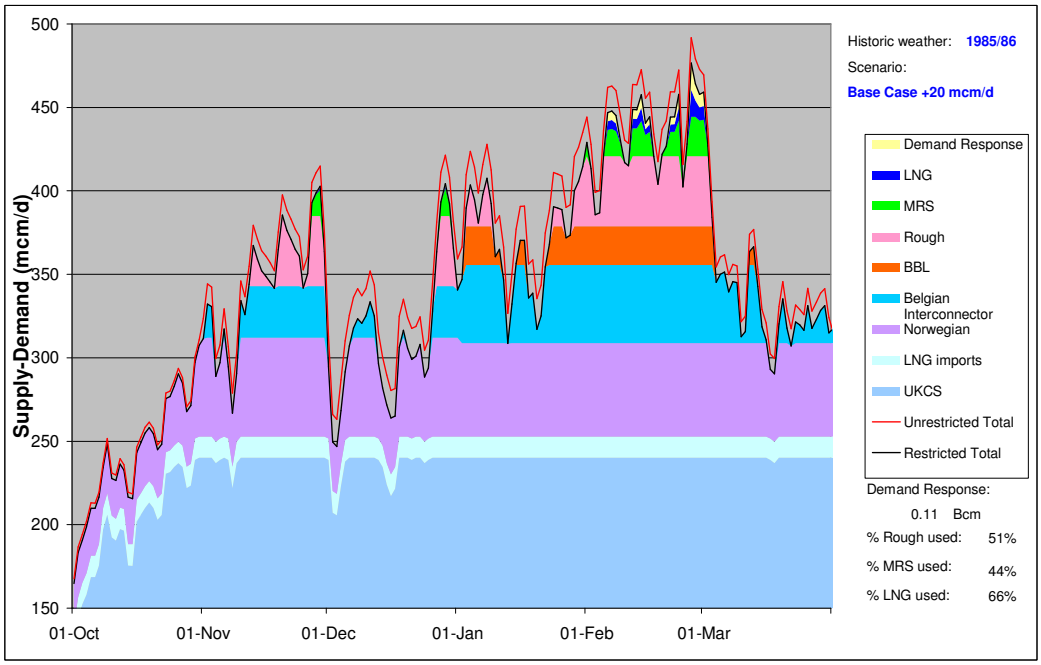
1985/86 scenarios (approximately 1 in 10 cold when compared with all winters since 1928/29)

Figure A.22 – 1985/86, Base Case



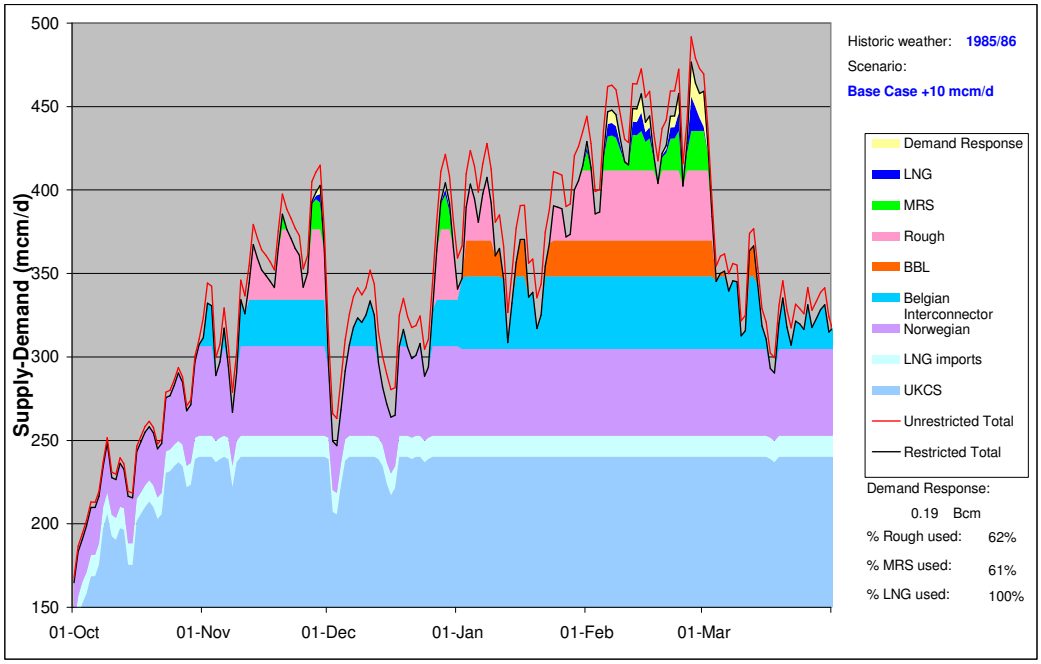
- Nearly three quarters of Rough and two thirds of MRS storage used due to high demands in November, January and February
- All of LNG storage stocks used due to high demands in February
- 0.45 bcm of additional demand response above that already included within restricted forecast, including a one week period in which 50-60 mcm/d of demand response would be required

Figure A.23 – 1985/86, Base Case +20 mcm/d of additional non-storage supplies all winter



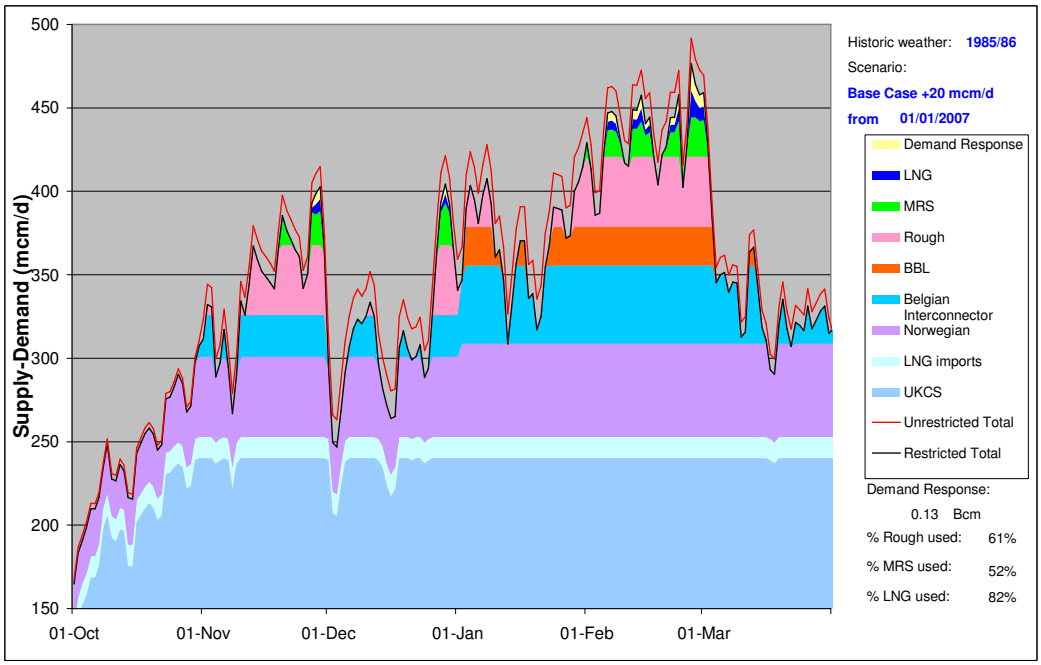
- Half of Rough and more than one third of MRS storage used. Two thirds of LNG storage stocks used due to high demands in February

Figure A.24 – 1985/86, Base Case +10 mcm/d of additional non-storage supplies all winter



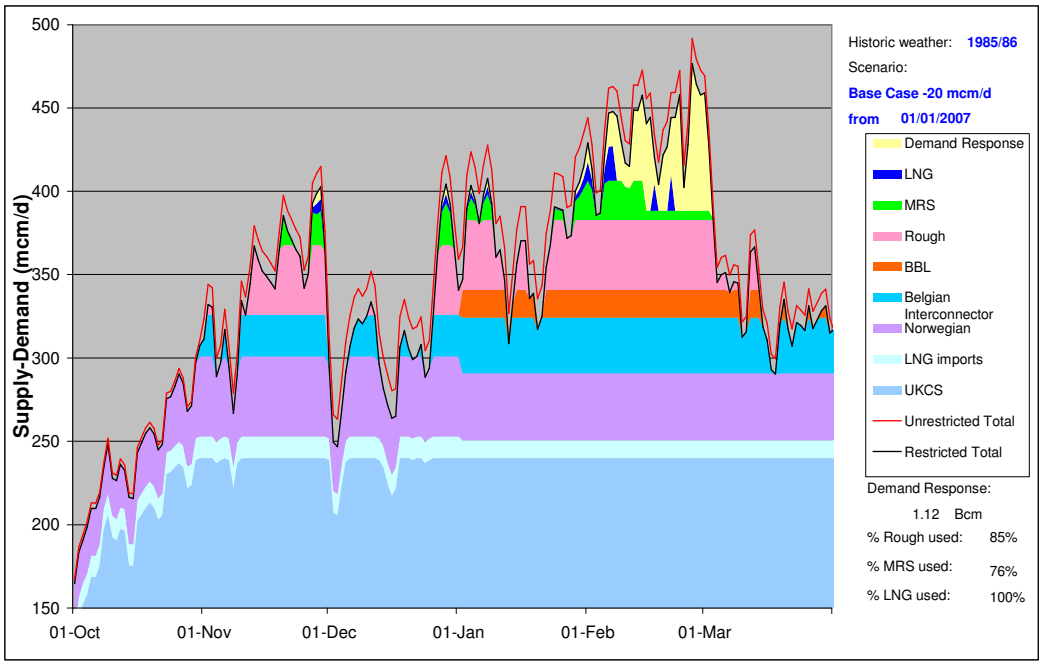
- Nearly two thirds of Rough and MRS storage used
- All of LNG storage stocks used due to high demands in February
- 0.19 bcm of additional demand response above that already included within restricted forecast, i.e. approximately 15 mcm/d for two weeks

Figure A.25 – 1985/86, Base Case +20 mcm/d of additional non-storage supplies for Q1 2007



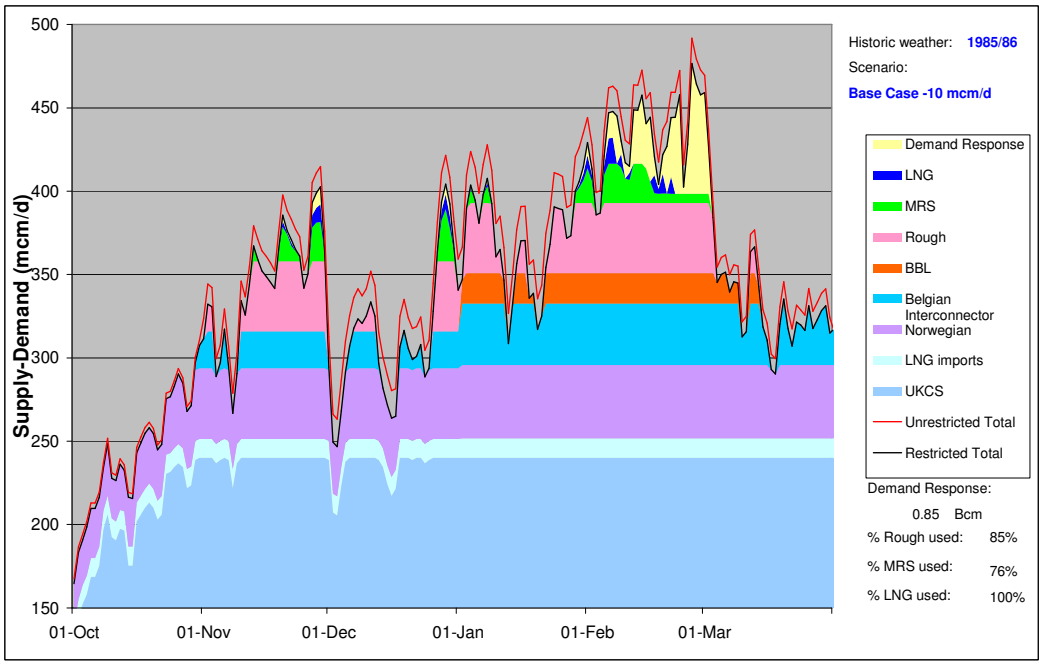
- Nearly two thirds of Rough and one half of MRS storage used
- Over three quarters of LNG storage stocks used due to high demands in February
- 0.13 bcm of additional demand response above that already included within restricted forecast, i.e. approximately 10 mcm/d for two weeks

Figure A.26 – 1985/86, Base Case -20 mcm/d of non-storage supplies for Q1 2007



- Over three quarters of Rough and MRS storage used due to high demands in November, January and February
- SRS monitor reached on 8 February. All LNG storage used by 21 February
- 1.12 bcm of additional demand response above that already included within restricted forecast, i.e. approximately 40 mcm/d on average for four weeks, and over 75 mcm/d on certain days

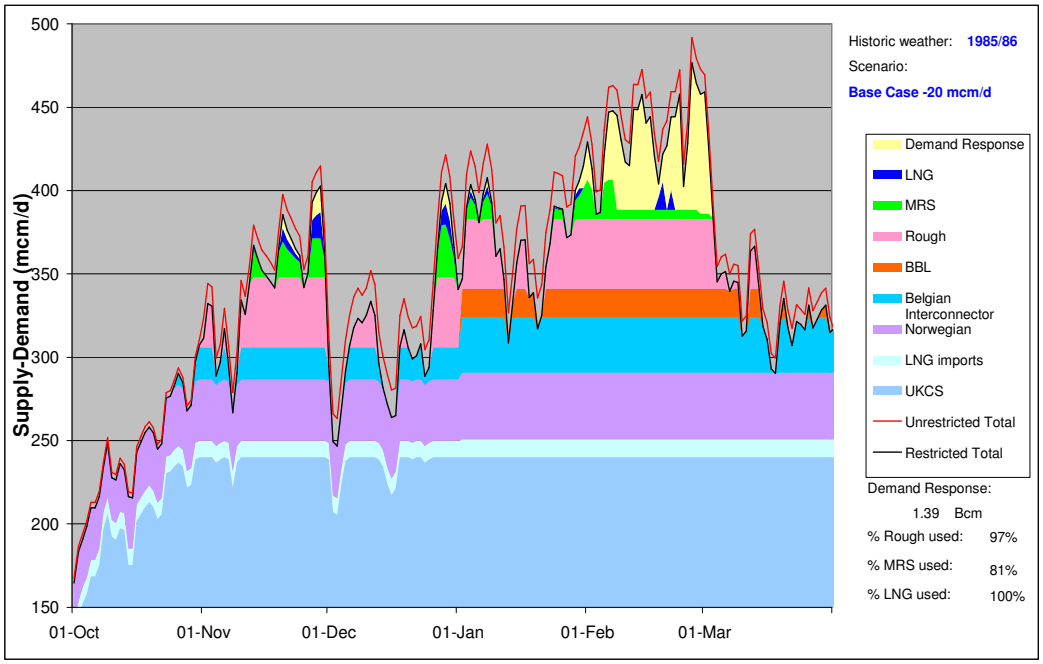
Figure A.27 – 1985/86, Base Case -10 mcm/d of non-storage supplies all winter



- Over three quarters of Rough and MRS storage used due to high demands in November, January and February. SRS monitor reached on 8 February. All of LNG storage used by 21 February

- 0.85 bcm of additional demand response above that already included within restricted forecast, i.e. approximately 40 mcm/d on average for three weeks, and over 65 mcm/d on certain days

Figure A.28 – 1985/86, Base Case -20 mcm/d of non-storage supplies all winter



- Nearly all of Rough and over three quarters of MRS storage used
- SRS monitor reached on 31 January. LNG depleted by 21 February
- 1.39 bcm of additional demand response above that already included within restricted forecast, i.e. approximately 50 mcm/d on average for four weeks, and over 75 mcm/d on certain days

Information note on weather severity definitions

The Met Office and National Grid use different definitions to describe winter severity. We are currently working together to clarify the definitions used. This note provides details on the basis for the respective definitions.

- National Grid's definition of the winter covers the period October to March. The Met Office's winter forecast period is December to February.

- National Grid bases its definition of an average winter on the 17 winters from 1987/88 to 2003/04 (inclusive), reflecting recent weather trends. The Met Office's reference period is 1971 to 2000, consistent with World Met Organisation practice.

- It should be noted that the climate has been warming, with December to February average temperatures for the UK increasing from 3.3°C for 1961-1990 to 3.7°C for 1971-2000 and 4.0°C for 1987-2001. Both the Met Office and National Grid average include a run of warm years from 1990 – 2000, but the Met Office average also includes the relatively cooler years from 1971 – 1990. Hence we would expect the Met Office average to be slightly cooler than the National Grid average. However these differences are not material.

- For analysis of severe winters, National Grid uses weather data that goes back to 1928. We use this to describe winters in terms of their frequency of occurrence on a long-term basis. For example, we last had a '1 in 10' cold winter in the UK in 1985/86, and we have had two winters that were colder than '1 in 50', in 1962/63 and 1946/47.

Annex B - Overview of Gas Transporter Capacity Issues

This Annex provides information on issues associated with capacity on the gas transportation system. It contains data on the potential for interruption by Gas Transporters and outlines the analysis that we have undertaken to explore the possibility of entry constraints arising on the gas transmission network.

Analysis of Gas Transporter Interruption

For a precise understanding of the commercial arrangements for interruption by Gas Transporters, the reader should refer to the relevant section of the Uniform Network Code (UNC).

Gas Transporters have rights under the UNC to interrupt Interruptible Supply Points (referred to here as "interruptible sites") in order to assist with the management of capacity on their networks. A site is eligible for interruptible status if it consumes at least 5,860,000 kWh (200,000 therms) per annum.

Gas Transporters' interruption rights are mirrored in the interruptible sites' contracts with their suppliers. We understand that the majority of such contracts only permit interruption where a Gas Transporter (National Grid Gas NTS or the relevant Distribution Network) has requested it. Some supply contracts, however, still permit interruption at the instigation of the supplier.

In return for being interruptible, the relevant shipper is not required to pay NTS (TO) Exit Capacity Charges or Local Distribution Zone (LDZ) Capacity Charges. In addition, the shipper is entitled to a transportation charge credit if interruption is required at the interruptible site on more than 15 days in any price control formula year.

There are approximately 1400 interruptible sites, most of which are connected within the Distribution Networks. The great majority of these have interruptible arrangements that permit interruption for up to 45 days per annum. Twelve interruptible sites, known as TNIs, are interruptible for more than 45 days to reflect particular transportation constraints. Approximately 80 interruptible sites are known as Network Sensitive Loads (NSLs). NSLs have a higher probability of interruption as a result of their particular location on the gas transportation system.

As part of the consultation process, we sought data from the DNs on the demand levels at which interruption might be expected, both in relation to NSLs/TNIs and to the other interruptible sites on their networks. The table below summarises their replies to the May document. We have not received new information from the DNs in response to the July document.

Table B.1 – Indicative Trigger Levels for DN Gas Transporter Interruption

LDZ (or NTS)	# NSLs[1]	Range of NSL Triggers (% firm peak day)[2]	non-NSL Trigger (% firm peak day)[2]
SC	19	78 - 97	92
NO	4	>77	not provided by DN
NW	14	78 - 98	96
NE	12	>83	not provided by DN
WA	1	unavailable[3]	not provided by DN
WM	0	N/A	96
EM	12	80 - 96	96
EA	0	N/A	97
NL	21	83 - 98	96
SE	0	N/A	92
SO	0	N/A	92
SW	0	N/A	not provided by DN

The trigger levels show the level of total LDZ demand above which it is estimated that interruption may be required. It should be noted that these are provided purely for illustrative purposes, and that interruption in practice will be subject to the particular circumstances prevailing at the time. These estimates are all based on 2005/06 data. Given the potential for variations in weather conditions across the country, it is possible for a trigger level to be reached in one LDZ when demand is well below the trigger level in another LDZ.

In relation to the NTS, subject to plant failure or unexpected supply-demand patterns, the only part of the system potentially subject to demand-side constraints is the South-West. Here, there is sufficient capacity to transport forecast 1in 20 undiversified firm peak day demand in that part of the country. In practice, as total demand approached that level, we would consider the need for interruption based on prevailing operational circumstances.

Gas Transmission Entry Capacity

The rapidly changing profile of gas supplies in the UK will naturally lead to new patterns of gas flow on our transmission system. In our July document, we addressed the issue of whether we envisage constraints arising as a result of this in the 2006/07 winter. Our analysis of this question is repeated below for ease of reference.

With the arrival of new gas sources at Bacton, Easington and Teesside, there is the potential for greater flows on the East Coast of the country. The prime focus of our analysis, therefore, has been to investigate the potential for constraints to arise in this part of the system. In response to market signals, we have invested significantly over the last few years in anticipation of this shift in flow patterns. In addition, we are in the process of constructing a new

[1] Includes any TNIs

[2] Trigger levels are from 2005/06 winter

[3] Not available for reasons of commercial sensitivity as there is only one such site

pipeline across the Pennines, which will be commissioned prior to the 2007/08 winter, coincident with the anticipated arrival of gas from the giant Ormen Lange field into Easington.

Entry capacity is made available to Shippers commercially through a system of auctions, ranging from long-term (up-to 17 years ahead) to on-the-day. While the purchase of entry capacity (apart from short-term interruptible purchases) provides shippers with a firm financial product, the possibility of constraints is recognised in the framework through a set of arrangements in which National Grid may buy capacity back from the market if necessary. We are incentivised to minimise the cost of buy-backs actions. There is therefore a clear distinction between commercial capacity (which is made available to shippers) and physical capacity on the transmission system.
Physical capacity availability in relation to any particular entry point is a function not only of the transmission system but, critically, of the pattern of gas flows elsewhere on the network. Our analysis has centred on the following:

- Capacity availability under anticipated gas supply profiles at given demand levels
- The range of capacity physically available at each entry point given variations in demand and supply profiles
- Interactions and trade-offs between the capacity availability at different entry points
- Network configuration options for maximising capacity under a variety of flow supply and demand conditions

Given the commercial framework under which entry capacity is sold, and the associated buy-back regime, it is not appropriate for us to provide quantified details of this analysis. However, in summary, our analysis has confirmed that there is sufficient network capacity to meet anticipated flow patterns at all demand levels this winter. Furthermore, there is flexibility to meet other flow patterns, the extent of which is variable according to demand and other variables. Our expectations of flow patterns are based on an assumed 'merit order' taking account of the relative economics of the various supply sources and previous experience.

No transmission network has infinite capacity. It is therefore to be expected that constraints could arise given circumstances sufficiently different from expectations. For example, a material offshore supply loss affecting a non-East Coast terminal such as St Fergus or Barrow could potentially lead to such a situation if the market replaced this gas with additional East Coast supplies. In this event, the actual occurrence of a constraint would depend on the level of demand, the precise profile of supplies and the prevailing operational circumstances.

Annex C: Summary of winter 2006/07 consultation responses

May responses: general comments

We received thirty-three responses to our Winter 2006/07 Consultation Document issued in May 2006. Although largely qualitative the responses provided us with valuable additional information relating to the forthcoming winter, which alongside other information sources (such as our Transporting Britain's Energy, TBE, consultation process) helped us to shape the analysis contained within the consultation update document.

Respondents generally welcomed the opportunity to comment upon our May consultation document and a number expressed support for the revised multi-stage process. A few mentioned the additional value of the second consultation document recognising the importance of the inclusion of TBE data, providing National Grid with a unique position in its ability to assess the overall supply and demand situation regarding next winter.

Most respondents limited their responses to areas where they felt they were best able to comment. As a result, some of the specific questions raised in the consultation received only a limited number of responses. Most respondents felt they were not in a position to provide quantitative data.

A number of the respondents recognised the particular uncertainties associated with the coming winter, noting that gas supply issues had been given due prominence in the May consultation document. In line with this, most respondents tended to focus their responses on demand-side response and gas supply issues although substantial information was received on other areas too.

July responses: general comments

Sixteen responses were received to the update document published in July; fourteen were from those who responded to the May document plus an additional two respondents who responded as part of this year's process for the first time. Of those who were responding for the second time a number used the opportunity to reiterate and confirm information provided during the previous stage whereas others provided updated views, particularly on areas where there had been significant development between the May and July documents (for example revised gas demand forecasts, information on the study into blending at Bacton) and where we had highlighted continued uncertainties (for example in relation to the new import infrastructure). Generally respondents agreed with the assumptions presented, including those that had been revised. Despite some expressing disappointment and concern at the continued uncertainty, most respondents were still unable to provide quantitative views.

This annex provides an overview, by topic, of the responses received to the May document, before providing a more detailed summary of responses received to the July document on a question-by-question basis.[4]

Non-CCGT gas demand-side response

Gas demand

Most respondents to our May document who expressed an opinion considered that the lower levels of NDM demand observed in 2005/06 were likely to recur in 2006/07 due to continued high prices. A few respondents were more cautious, either expressing doubt over the price elasticity of this market or counselling caution over the extent to which this effect is built into future forecasts. A particular concern of one respondent related to the level of NDM demand that could be expected under severe conditions, with that respondent expressing the view that high prices would not affect the level of demand on the peak day.

Additional information provided in response to the July document;

Q1. We would welcome views on our latest NDM gas demand forecasts as set out in Annex A

Most respondents used the opportunity to comment under the sub-questions however a few provided additional information here.

Views on our latest NDM gas demand forecasts varied. A couple of responses welcomed the forecasts considering it appropriate to reflect recent experience of reduced NDM demand. Others thought that the forecasts were reasonable and assumptions plausible however they shared a concern that these revised assumptions were based on just one year's observations. One of these respondents added that it appeared that the forecast assumed that observed customer behaviour in winter 2005/06 is cumulative in nature. They also went on to suggest that an alternative hypothesis might assume that the price sensitivity effect observed in 2005/06 was in part a function of public awareness of prices created by the high level of media attention, stating that if this phenomenon is not repeated price sensitivity in winter 2006/07 may be reduced.

and in particular:
Q1a. The price assumptions underpinning these forecasts, and whether they represent a reasonable view of likely outturn levels

The majority of respondents who answered this question considered the price assumptions underpinning the forecasts to be 'reasonable' or 'fair' with one adding that this was the case 'at least until 2008'. Suppliers / shippers noted that price increases generally now come into force virtually immediately, however they noted that the take up of new fixed price contracts may have a dampening effect. One respondent explicitly agreed that fuel price would

[4] Specific questions asked were revised between the May and July documents, however subject areas consulted upon remained the same.

fluctuate, and they anticipated prices to peak in winter 2006/07. They noted that high prices would effect annual demand in both DM and NDM sectors, however they did not anticipate a reduction materialising on peak demand days.

Another respondent observed that the forward price for gas delivery (especially for Q1 2007) had fallen between the time at which the update document was published and the writing of their response.
Another respondent noted the relationship between spot price and temperature, but recognised that forward volatility of gas prices is not explained by the weather, concluding "we do not know of a better view of likely outturn levels of price than is indicated by the prevailing forward market".

Q1b. The approach that we have taken to validate the NDM forecasts

One respondent was content with the validation approach and another felt it gave comfort. Others considered our approach to be robust.

Other respondents expressed various concerns, however they noted that there was no alternative method available but suggested that analysis of model error may also be useful.

A couple of the respondents' concerns related to the use of data from last year. One cautioned against carrying assumptions from last year forward. Another noted that validation based on performance of the model compared to the past 12 months and actual outturn was risky given that data from the same timeframe was fundamental in developing the model.

Another respondent noted shortcomings in the weather correction methodology used in validating the NDM forecast but recognised that this should have no material impact.

One commented that energy efficiency changes will increase and be permanent, limiting domestic growth.

Q1c. How the recently observed reduction in NDM demand can be explained in behavioural terms

The majority of respondents to this question agreed that the reduction in NDM demand could be explained, at least in part, by price rises. One respondent suggested that they would expect price elasticity to be higher in winter due to greater awareness of gas use. However another suggested that price elasticities may be non-linear, due in part to media coverage, and demand previously lost could return as people become accustomed to higher prices. Many also noted the impact of increased environmental awareness (and therefore energy efficiency measures taken). Another respondent stated that the continued reduction in manufacturing was a factor in reduced demand but that this would be partially offset by growth in the service sector.

Some respondents felt that the extent to which these behavioural changes explained the reduction was uncertain and that due to limited data it was difficult to assess causes and impacts. Others noted the explanations

provided in the document were reasonable, with one respondent confirming they were consistent with the "extremely limited" feedback they had received from their customers. Another stated that (anecdotally) adjustments to thermostats and similar behaviour tended to be short-term and that the rate of reduction would be slow (irrespective of future price changes) as customers needed time to respond further (for example by upgrading boiler efficiency). As energy efficiency measures take effect reduced average consumption will continue.

One respondent asked whether National Grid had undertaken any research to confirm whether or not behavioural changes were occurring.

Q1d. The extent to which it should be assumed that these reductions in demand would be observed in the face of prolonged cold conditions

All respondents to this question recognised the uncertainty associated with NDM consumer behaviour in the face of prolonged cold conditions. This was attributed, in part, to the lack of data. A few respondents implied that they would expect behaviour to revert back to higher demands during cold conditions. One respondent noted that some behavioural changes would have continued impact in cold conditions (energy efficiency improvements, thermostatic reductions). However, they also noted that very cold conditions could cause some consumers to keep boilers on or the maximum consumption of boilers could be reached even with reduced thermostat settings.

In contrast, another respondent suggested that although the demand curve is lower it may not be parallel. They recognised a possible behavioural change and expected an upturn in demand associated with the weather severity of specific days. However, they believed prolonged cold spells may increase efforts to conserve energy due to cost concerns.

Q1e. Any additional risks or issues associated with these forecasts

The majority of respondents failed to identify any additional risks or issues associated with these forecasts.

One respondent stated that although they agreed with the reduction in demand they anticipated a fall of 0.5-1% rather than 1.5%.

Another respondent requested a breakdown of LDZ's where demand reduction was greatest and clarification of the impact on AQs (annual quantities).

Q2. We would welcome views on our latest DM gas demand forecasts as set out in Annex A

Most respondents used the more detailed sub-questions to comment on our latest DM gas demand forecasts.

One respondent summarised their view as “the forecasts appear to be reasonable and to be based on plausible assumptions”. Another recognised that DM forecasting was difficult and that a relatively high degree of uncertainty should be placed on DM demand.

and in particular:
Q2a. The price assumptions underpinning these forecasts, and whether they represent a reasonable view of likely outturn levels

Most respondents reiterated the response they had provided to question 1a (see above). One respondent expanded on their previous answer stating that the DM sector response was unclear and needed close monitoring during the winter in order to gauge effectiveness.

Q2b. The methodology for the development of a restricted demand forecast to incorporate reduced levels of demand in response to high spot prices

All but one of the respondents to this question explicitly considered the methodology for the development of a restricted demand forecast to be reasonable. One respondent recognised that recent outturn figures for the power market had deviated from forecasts following the drop in carbon prices. Another respondent noted the need to closely monitor performance throughout the forthcoming winter in order to fully understand impacts and benefits. Another respondent suggested that some demand is not price responsive and there may become a point where the demand – weather relationship terminates. For the price responsive market they anticipated that if the wholesale gas price exceeded £1/therm for a week, consumption would be determined by the weather and the extent to which customers have hedged their exposure.

Another respondent expanded on their view that the methodology was reasonable, stating that they expected it to be more accurate than for NDM demand due to a higher level of empirical evidence. However, they did caution against carrying observations forward from last year especially as the degree of price sensitivity changes according to contractual arrangements. In this context they noted that price sensitivity had potentially been reduced by DM consumers locking in volumes at forward curve prices.

Q2c. The approach that we have taken to validate the DM forecasts

The majority of respondents considered the validation approach adopted to be reasonable whilst acknowledging the complexity of the market and difficulty in collecting reliable data. One respondent reiterated their previous concern and cautioned against the use of last year’s data but still felt that the validation was sufficient to provide comfort that the revised forecast were reasonable. Another respondent believed that the validation method should suffice in the absence of rigorous quantitative validation.

Demand-side response

In our May consultation, we sought views on the ability of the demand-side to respond by reducing demand in response to high prices, and on how this might compare with the level of response seen last winter.

Respondents' views on the scope for additional levels of non-CCGT response in 2006/07 were mixed. On one hand, some respondents considered that increased market awareness and the development of new demand-side products could facilitate a greater level of response. Others, however, identified the possibility that some customers will seek to mitigate the impact of price volatility by locking in winter volumes at a fixed price, and that this will tend to reduce the level of demand-side response. This was reinforced by the view that the customers who responded in 2005/06 tended to be those exposed to day-ahead prices rather than those on monthly contracts.

On the question of back-up fuel facilities at non-CCGT DM sites, most respondents felt that there was little scope for new investment given the uncertainty of the economics and the limited amount of time available prior to the winter.

Additional information provided in response to the July document;
Q3. We would welcome further views on the extent to which the non-CCGT market is able to provide demand-side response, both in volume and duration terms

A limited response was received to this question with respondents opting to emphasise various different aspects. Suppliers generally felt that non-CCGT response would be limited to the levels seen last winter.

One respondent noted that reduced interest in price sensitive contracts may not necessarily represent an unwillingness to provide demand response but instead represent a change in the way customers are prepared to offer it. They anticipated a similar level of response to that previously observed (5-7 mcm/d) acknowledging this could rise if prices were very high or when approaching an emergency.

Another respondent noted that daily-priced customers were most likely to respond to high prices but that others (as still subject to cash-out) may choose to turn down and take the profit under sustained high spot prices.

Another respondent noted that consumers' ability to increase response may be time-limited (implementation of capital expenditure programmes take too long).

and in particular:
Q3a. Data from suppliers on the extent to which their non-CCGT DM portfolio has entered into contractual arrangements that would facilitate such a response, and the nature of any such arrangements

Suppliers responding to this question provided a variety of information whilst acknowledging that the overall extent of contractual arrangements was difficult to assess. A number of the respondents stated that contract negotiations were ongoing and therefore the position was continually changing. Respondents provided some information based on their individual portfolios, however as one respondent explicitly mentioned, the ability to reduce demand is dependent on the individual customer and is subject to change. They considered it unlikely that the full contracted volume reduction would occur, even in extreme conditions. One respondent was continuing to investigate new products to manage demand-side response. They also noted that the degree of price sensitivity and ability to reduce demand was individual to each consumer and subject to change.

Another respondent noted that although they were encouraging demand-side response they recognised some significant barriers for industry such as when the costs of ceasing activity exceeds costs associated with high gas prices.

One respondent suggested that transporters could formulate an aggregated total system figure for demand-side response plus any location-specific requirements, whilst another criticised a lack of information on DM flows and load profiles, suggesting vital information should be made available and UNC modifications may be required to ensure its provision.

Transportation capacity

In our May document we sought information from the Distribution Networks (DNs) on the demand levels at which such interruption might take place. According to those DNs who were able to respond, these 'trigger' levels for Network Sensitive Loads (NSLs) ranged from 77% to 98% of the relevant LDZ forecast firm peak day demand5. For non-NSLs, trigger levels ranged from 92% to 97%.

Additional information provided in response to the July document;
Q4. We would welcome updated information from Distribution Network owners on the demand levels above which interruption might be expected in winter 2006/07, both in respect of Network Sensitive Loads and other interruptible loads

Limited further information was provided from DNs in response to this question. One respondent noted no change from their previous notified position. Another (non-DN) respondent commented that DN interruption arrangements will impact NSLs in future periods.

UKCS gas supplies

With regards to UKCS supplies, almost all respondents who commented considered that the preliminary analysis presented in the May document seemed reasonable, although some noted that they would be able to

[5] Trigger levels are from the 2005/06 winter.

comment more fully once revised TBE data had been incorporated. One respondent felt that the preliminary forecast was conservative.

No respondents considered that we should have retained an assumption of 92.5% availability. Many supported 90% as a reasonable basis for the analysis, while a number highlighted the risk that reliability may suffer in the event of poor weather conditions offshore, as observed late in the 2005/06 winter. One respondent noted that poor weather may hamper operations but is unlikely to cause a prolonged reduction in output unless physical damage has occurred.

We also sought views through the May consultation on potential variations in UKCS supply availability across the winter months and, in particular, whether a lower level of availability should be expected in the early part of the winter. Those respondents who expressed a view believed that producers may have learnt from the experience of November 2005 when UKCS supplies were slow to ramp up as demand increased rapidly.

Additional information provided in response to the July document;
Q5. We would welcome views on our revised UKCS supply forecasts

A number of respondents used the opportunity to recognise the decline in the UKCS. Most broadly agreed with the revised forecasts with some noting the value of the TBE data. One respondent reiterated the importance of supply effectively responding to demand following the effect of last winter's ramp up period.

and specifically:
Q5a. Views on the revised assumption for maximum UKCS supply availability

The majority of respondents believed the revised UKCS supply availability assumption to be reasonable.

One respondent, despite considering the supply assumption to be reasonable, acknowledged inevitable uncertainties and reiterated a concern they had raised in their May consultation response regarding the timing of the TBE consultation process and the age of data considered.

Another respondent did not believe that new supplies had been fully taken into account and considered the overall position presented to be slightly cautious.

Q5b. Further views on the assumption that should be made for the average percentage UKCS supply availability

The majority of respondents considered the 90% availability assumption to be reasonable.

One respondent explicitly welcomed the additional sensitivity analysis. Another welcomed the news regarding cooler units.

Only one respondent questioned the approach, suggesting it would be more realistic to base this assessment on actual observations so that year-on-year decline can be determined and projected forward with new loads being considered separately.

Q5c. Further views on anticipated variations in UKCS supply availability across the winter months

Limited information was provided in response to this question.

A couple of respondents noted the importance of analysing a range of possibilities and explicitly supported the inclusion of a reduced reliability sensitivity (85%) noting that prolonged cold spells could affect the movement of people and equipment necessary to maintain reliability.

Another respondent thought that the current high winter prices would incentivise producers to maximise production throughout the winter.

One respondent noted that fields are depleting and losing pressure faster than anticipated resulting in less consistent field performance and increasing the risk that deliverability on a peak demand day will be less than the maximum field capability.

Gas imports

Belgian Interconnector

Responses to questions in the May document related to the Belgian interconnector were largely qualitative, with the key points made being as follows:

- No respondents expressed doubt over the timely completion of the capacity upgrade. However, respondents were generally cautious over the extent to which this capacity may be utilised this winter;
- A number of respondents anticipated a similar pattern of flows to that seen last winter, with lower flows in Q4 2006 than Q1 2007 as European storage stocks are preserved in the first half of the winter;
- From a transportation capacity perspective, a number of respondents believed that upstream capacity constraints were a factor in limiting imports through the Belgian Interconnector. In this context, no changes in the capacity in Belgium were reported, although two respondents noted that 'de-bottlenecking' projects in Germany could facilitate slightly higher flows through this Interconnector;
- The weight of respondents' views pointed towards a similar level of flows to those experienced in 2005/06, with some possibility of upside. Two respondents noted the potential for discretionary gas flows through Zeepipe to be diverted to Langeled, which could reduce the level of imports through the Belgian Interconnector.

Additional information provided in response to the July document;

Q6. We would welcome further views on the assumptions that should be made for levels of imported gas through the Belgian Interconnector for winter 2006/07

The majority of respondents explicitly supported the split-winter approach with one stating that more onerous supply obligations on the Continent would result in flows being held back until Q1 2007. Another stated that flows would respond to price differentials.

A couple of respondents agreed that maximum flow levels (i.e. flows equal to the upgraded capacities) were unlikely to be reached due to the continuation of problems experienced last winter including a lack of uncontracted for gas on the Continent, a lack of upstream transportation capacity and gas quality issues. One respondent went further, expressing doubt over the flow levels assumed.

No respondents expressed any doubt as to the project completion timescales.

and specifically:
Q6a. Any quantified views on the variations in import flow levels that might be expected across the winter months

The majority of respondents reiterated their support for the split-winter assumption, stating that higher flows in Q1 2007 could be anticipated as gas is released from storage on the Continent.

One respondent stated that they would anticipate upside on the forecast subject to favourable weather and political factors.

In contrast another respondent reiterated their view that flows would be below those assumed, suggesting alternative figures of 20 mcm/d in Q4 2006 and 30 mcm/d in Q1 2007.

<u>BBL</u>

In our May document we noted the significant level of uncertainty over BBL gas flows in 2006/07, and sought views on the various issues that give rise to this uncertainty. In summary, the feedback that we received was as follows:

- While some respondents had no information on the likely start time for BBL flows other than the planned commissioning date, a number of respondents noted the tight timescale associated with the construction of this Interconnector, highlighting the possibility of delay to commissioning. One respondent considered that the situation surrounding BBL flows in 2006/07 was highly uncertain and would remain so until the construction of the infrastructure is substantially complete. Two others identified the possibility of a delay of a month or more;
- Few respondents commented on the base case assumption of an average flow of 20 mcm/d through BBL once it was operational. Two respondents felt that this assumption was appropriate. One thought it “slightly cautious” although no rationale for an alternative assumption was offered;

- Three respondents made reference to the Grijpskerk-Workum-Wieringermeer Line (GWWL) connecting Balgzand to Emden, noting that this would not be completed until later in 2007, which could potentially limit the availability of gas through BBL in 2006/07;
- The responses did not suggest an expectation that parties other than Gasunie would make significant use of BBL capacity prior to March 2007.

Additional information provided in response to the July document;
Q7. We would welcome views on our revised base case assumptions in respect of imported gas through BBL for winter 2006/07

Respondents chose to provide further details on their views regarding BBL under the sub-questions below.

and specifically:
Q7a. Further views on the appropriate assumption for the date at which BBL becomes operational initially

Respondents, whilst aware that there was no current evidence of a delay, recognised that unforeseen events could prejudice the 1 December planned commercial gas flows. Therefore the majority of respondents considered the 1 January assumption for the date at which BBL becomes operational a prudent assumption for planning and forecasting in order to reflect construction and commissioning risks in Q4 2006.

Q7b. Views on the extent to which alternative gas sources or importation routes could be used to mitigate any delay to the availability of BBL beyond 1 December

One respondent noted that given the 1 January assumption no further mitigation was required.

Another respondent noted that if BBL were delayed gas could be rerouted via the Belgian Interconnector. However they did express doubts as to whether this could be put in place at short notice due to practical issues: transportation and interconnection constraints in The Netherlands / Belgium, compliance with GS(M)R and availability of transportation capacity on the Belgian Interconnector.

Q7c. Further views on the appropriate assumption for the level of sustained flows via BBL to the UK for winter 2006/07 once it is operational

One respondent noted that the contract with launching shippers would commence 1 December, with other shippers not participating until late 2007.

One respondent explicitly agreed with the assumed flow levels whilst another was less optimistic, suggesting 15 mcm/d was a more realistic flow assumption taking into account transportation constraints in The Netherlands.

Another respondent noted that the contract with the launching shipper was for delivery at the NBP and therefore there was no guarantee that this would be met via BBL flows. They suggested that there was no new gas supply in NW Europe and that extra gas would come from gas constrained in The Netherlands.

Q7d. Views on the extent to which physical transportation constraints in the Netherlands might limit the level of imports through BBL in winter 2006/07

Most respondents stated that due to transportation and interconnection constraints (e.g. whilst awaiting the completion of GWWL in winter 2007/08 and constraints at the Emden hub) the only gas flowing through BBL this winter would be surplus gas from The Netherlands. A tight supply-demand position could further constrain transit capacity.

One respondent suggested that if BBL flows were dependent on GWWL the BBL assumption should be revised downwards if GWWL was not to be complete for the forthcoming winter.

Norwegian imports

We sought views through the May consultation on the volume of Norwegian imports that should be assumed. The main points raised by respondents were as follows:

- All respondents who expressed a view believed that Langeled would be operational by October 2006;
- Views were mixed on the extent of incremental gas production available from Norwegian fields. One respondent noted Gassco's comment that there were "no significant incremental volumes of gas this winter". Another respondent, however, believed that incremental volumes might be available from the Troll and Kristin fields;
- One respondent identified the possibility of gas swaps between Norwegian producers and other gas suppliers into Continental Europe, while others identified the potential for discretionary gas flows to Europe to be diverted into Langeled;
- Overall, some respondents were circumspect over the potential level of Norwegian imports. Three respondents felt that the assumed level of Norwegian flows in the consultation base case (48 mcm/d) was slightly cautious on the basis of the above points, quoting numbers 5 –10 mcm/d higher.

Additional information provided in response to the July document;
Q8. We would welcome further views on the assumptions that should be made for levels of imported gas from Norway for winter 2006/07

Most respondents had little to add to the information already provided. They largely agreed with the assumptions for imports from Norway. One

respondent stated that key issues related to gas availability, capacity and constraints imposed by specification requirements (e.g. ICF).

A couple of respondents provided further detail by responding to the following sub-questions.

and specifically:
Q8a. Views on the level of incremental gas production that could be expected from the Norwegian Continental Shelf in 2006/07

Both respondents noted information (from Gassco, producers and the Norwegian Petroleum Directorate) that there was no incremental increase in production anticipated this winter. However, both stated that given high UK prices there was scope to increase flows this winter (offset via reduced summer flows). One respondent noted that this may have implications for storage refilling over the summer. Although they also noted Gassco's high reported bookings, suggesting incremental flows above 48 mcm/d, they supported retaining the assumption until the situation was clarified.

Q8b. Views on the extent of any potential gas swaps between Norwegian producers and other gas suppliers to Europe

Only one respondent provided additional information stating that UK volumes may benefit overall from exchanges by means of gas swaps across Europe, with Langeled providing the supply capacity to the UK to facilitate this.

Q8c. Views on the extent to which diversion of discretionary gas flows from Zeepipe to Langeled should be expected

One respondent noted that there was a lack of definitive information in this area, concluding that it seemed there was potential for some diversion of gas from Zeepipe to Langeled but this could not be meaningfully quantified. They stated it was reported that Norwegian production would continue to meet existing contractual requirements on Zeepipe (however the level necessary is unclear). They also stated that as Zeepipe is a primary source of gas close to / at GS(M)R it was possible that reduced flows on Zeepipe could result in reduced flows on the Belgian Interconnector.

Both respondents noted that producers would seek to make greatest use of the lowest cost importation route (reportedly Langeled).

Q8d. Views on the extent to which imports through the Belgian Interconnector may be reduced as a result of the diversion of gas away from Europe and into Langeled

The only respondent to this question suggested that the level of imports would be determined by key factors: price differential between markets, demand for gas on the Continent, contractual and public service obligations of suppliers on the Continent, pre-existing obligations to supply to UK shippers, availability

of GS(M)R compliant gas. They went on to state that the diversion of discretionary gas from UK via Langeled is likely to affect the interaction of the above factors but that the size and scope of diversion cannot be quantified.

Q8e. Any quantified views on the variations in import flow levels that might be expected across the winter months

One respondent summarised their answers to this sub-set of questions stating that producers will maximise value from any flexibility they have in supply and transportation routes. They would expect flexible supply to be attracted to the highest price markets using the lowest cost transport routes which could mean some gas will flow to the UK through Langeled rather than via the Continent and if total supply is constrained it could result in some seasonal shaping across the winter. Given gas price volatility it is difficult to quantify these effects. However, based on current high gas prices they would expect a net increase in imports from Norway through use of Langeled.

Total European imports

In our May document we sought views on a number of issues associated with the total level of European gas imports. This included information related to gas quality, and specifically to the study that we were undertaking in relation to the potential for a blending service to be offered at Bacton. No respondents identified a significant potential for additional gas flows at Bacton through such a service, although one felt that this would be beneficial in the longer term and another thought that it would be helpful to secure gas supplies in the event that operational difficulties are experienced by a sub-terminal.

Rather than answering specific questions regarding particular gas import infrastructure a couple of respondents to the July consultation provided comments on European imports as a whole. One respondent reiterated their concern that despite increased capacity via new / upgraded infrastructure, and despite high prices, gas may not flow. They also noted that if storage stocks are held on the Continent, we can not expect delivery regardless of the prices reached. They used this opportunity to highlight the requirement to consider strategic storage in the UK. The other respondent noted the continued uncertainty regarding flows, particularly in Q4 2006 and given the likelihood that cold weather in the UK would coincide with that on the Continent. This reinforced the need to take all possible measures to maximise imports.

In the July consultation we asked a number of additional questions regarding the study into blending at Bacton;

Q9. We would welcome views on our study into the potential for a blending service at Bacton as described in Annex C

All respondents to this question recognised the importance of considering gas quality issues due to the potential barrier they present to gas imports. One

noted that the "UK market will need all available means at its disposal to help manage the wider range of gas supplies on which it will increasingly depend in future". They also suggested that it may help exploitation of the UKCS by allowing developments of gas reserves which will otherwise not be recovered. Generally respondents welcomed the initiative. A couple of respondents urged quick completion and another expressed concerns that no action was to be taken prior to the forthcoming winter. This respondent urged a review and stressed that it was essential to take all actions to avoid restrictions noting that conditioning plant would have removed any uncertainty.

Another respondent stated that they had responded to the DTI consultation on gas quality issues suggesting three possible approaches to help manage the UK's position on combustion parameters: a change to the specification for new gas appliances; moving GS(M)R compliance to the outlet of the National Grid terminal, or; extension to the use of the GS(M)R emergency limits.

and in particular:
Q9a. Views on the initial findings of the study

Respondents raised a variety of issues in response to this question. A number of parties recognised the further work required with one summarising the study as "an encouraging first step" and another stating that the extent of the problem was far from clear. Respondents particularly noted the need for further work on commercial principles including the need to understand commercial requirements and costs of mitigating exposure (i.e. efficiency of service provision). It was acknowledged that due to all the further work required (developing new control and measurement systems, gaining HSE clearance and contractual negotiations) it would not be possible to offer a service for this winter.

Other points raised included:

- The study had correctly identified the interruptible nature of a blending service. If a firmer service was required there would be a need for ballasting;
- There should be a regulated offering to optimise ballasting requirements at entry points;
- Complexity of blending issues; may require empowerment of National Grid to enter location-specific option contracts (therefore involving a wider view of roles and responsibilities);
- Support for a separate study into ICF.

Q9b. An indication of the level of interest in such a service for future years, including the extent to which it may facilitate additional gas imports

Respondents used this question to raise a number of different issues associated with gas quality.

With regard to the level of interest in the service, one respondent felt that gas quality would be an issue this winter and those moving forward. In particular,

they noted that the expected separation of Norwegian gas to flow richer gas through Zeepipe and the expansion of the LNG terminal will raise Wobbe in the Zeebrugge area, increasing the risk that rich gas will be prevented from entering the Belgian Interconnector due to limited lean blend gas.

Another respondent stated that it was not possible to confirm the extent to which the service would facilitate imports until its scope is determined. However, they recognised that it may enable gas to be delivered at times of operational difficulties. They also suggested that delivery of off-spec gas to the NTS also needed consideration.

Another respondent identified cost as a key factor. They noted that some blending occurs naturally in a commingled stream; and it was critical to identify gas which can be accommodated without additional cost / effort and then to calculate additional costs associated with acceptance of a wider specification. They identified a key risk that delivery of out of spec gas (which can not be blended) would result in a terminal flow advice (TFA), which would have serious impacts on security of supply if it occurred on a day of system stress.

Q9c. Views on whether it would be valuable to undertake a similar study for other entry points and, if so, on which entry point(s) to prioritise

Respondents generally thought it would be valuable to undertake a similar study for other entry points and welcomed the Ofgem seminar as an opportunity to discuss this further. Some respondents suggested a study would be useful at all other entry points whilst others recognised the need for prioritisation (for example, by total gas delivery volumes and the number of adjacent terminals). St Fergus, Easington and Theddletorpe were recognised as priorities. One respondent reiterated that it would be useful to consider nitrogen processing, as with increased Wobbe there may not be enough blend gas. Another respondent did note that all of this was subject to HSE clearance on GS(M)R requirements and new / revised contractual arrangements.

<u>LNG</u>

In our May document we sought views on the assumptions that should be made for LNG importation in 2006/07 and on how flow patterns are likely to differ from those observed in 2005/06. There was a general acknowledgement in the responses that the level of LNG imports would be determined by the economics of the global market. Half of the respondents who commented felt that an assumed level of 13 mcm/d was appropriate. Two respondents thought this optimistic, one noting that this depended both on market conditions and full plant availability, the other quoting 11 mcm/d as a more realistic level. On the question of flow patterns, respondents considered that Grain should operate as a baseload source, provided market conditions remained favourable towards the UK.

Excelerate LNG attracted fewer comments, with those who did respond seeing it as a potential bonus (given the uncertainties over planning at the time, for example) rather than one to be built explicitly into the base case.

Additional information provided in response to the July document;
Q10. We would welcome any further views on the assumptions that should be made for LNG importation quantities in winter 2006/07

The majority of respondents supported the assumptions made relating to LNG importation quantities. Most noted the global nature of the LNG market and the current UK price premium and therefore commercial arbitrage associated with flows to the UK.

Only one respondent explicitly opposed the assumption on the grounds that due to the global nature of the LNG market, modelling 100% of Grain's contracted capacity was hard to reconcile. They suggested LNG should be modelled and represented as a marginal source so as to recognise that flow levels could range from zero to maximum.

Another respondent welcomed the recent Ofgem correspondence regarding third party access.

All respondents who mentioned Excelerate considered its exclusion from the base case to be prudent but recognised this should be reviewed as the project progresses.

and specifically:
Q10a. Any variations that might be expected across the winter months

The couple of respondents to this question again recognised the importance of the global market and forward price, stating that it was possible short-term arbitrage opportunities could arise over the winter which could result in cargo diversion. One respondent therefore felt it was prudent to assume some variation across the winter however recognised that this potential variation was not quantifiable. The other respondent stated 13 mcm/d was reasonable on the basis that it is achievable in periods of highest demand.

Q10b. Any further information on the likely extent of daily flows at Grain above the contracted level of 13 mcm/d

Again, only a couple of respondents provided additional information here. The first noted that 17 mcm/d flows experienced last winter should ensure upside during colder spells.

The other stated that flows above 13 mcm/d would only be possible if additional LNG was delivered to Grain, and that this could only come from existing users or third parties via UIOLI. They thought there was only limited scope for third parties to make use of Grain via UIOLI due to a cargo lead time of 12-16 weeks. They recognised that this problem had been partially highlighted by Ofgem. They concluded that the potential for flows above 13 mcm/d was not quantifiable but they expected it to be low.

Storage

Many respondents to the May consultation commented on the likely patterns of use of the various gas storage facilities in 2006/07. The predominant view was that storage use was price driven, with trigger levels (for both withdrawal and re-injection) generally based on the forward curve, but varying according to the type of storage facility and the particular circumstances of the storage users. As highlighted above, a number of respondents believe that European storage is unlikely to be released to the UK until Q1 2007.

Of those respondents to the May consultation who commented on the appropriate basis for setting the monitor levels, one felt that the base case was "erring towards the conservative", while another took the view that there was "a much greater probability of potential downside…..than potential upside". Another respondent suggested that the assumptions surrounding the isolation process should be revisited, while a further respondent was concerned by the approach to the 2005/06 monitors, when we reflected supply-side uncertainty by the inclusion of a 'supply risk allowance', which was focused on the long-range storage monitor.

Other comments concerned the system of safety monitors more generally, with the need for transparency a common theme.

Additional information provided in response to the July document;
Q11. We would welcome any further views on the appropriate basis for setting the 2006/07 safety monitors

Respondents generally acknowledged the rationale behind setting the safety monitors and the need to take a prudent approach. On this basis a number of the respondents felt that the range presented provided a reasonable assessment of the supply and demand uncertainty with asymmetry (greater downside) against the base case. One respondent expressed concern that not using the base case to set safety monitors could cause confusion. Another was concerned that the use of 70 years of weather data failed to take account of climate change (whilst acknowledging there was insufficient evidence to apply a shorter period of weather data in setting the safety monitors).

Some respondents reiterated concerns over the limitations placed by the monitors on the use of storage. One respondent provided further detail stating that excessive restrictions on storage facilities would reduce the storage available to shippers as the primary system balancers in the short-term and in the long-term may reduce the value of storage in the market and therefore reduce investment in storage. Other respondents suggested means of avoiding this issue via the imposition of incentives on National Grid to keep monitors as low as possible or the need for National Grid to explain how they guard against monitors being set too high.

and specifically:
Q11a. Views on the appropriate approach to mitigating the risk associated with the new NDM demand forecasts

Respondents to this question felt that the new NDM demand forecasts should be used, however most recognised that some NDM demand could return under cold conditions. One of the respondents recognised that it was possible that some behavioural consumption would be unwound on particularly cold days, however they believed this was unlikely to occur in prolonged cold spells. Another respondent felt it was inappropriate to incorporate initial contingency to reflect the fact that assumed NDM demand response may not happen. They stated that if the risk was considered likely it should be reflected in initial load duration curves to allow the market to plan and manage their response accordingly. They also suggested that National Grid should monitor responsiveness of NDM demand to periods of cold weather and change safety monitors, as appropriate, if actual consumption does not accurately reflect assumptions.

Q11b. Views on the appropriate approach to mitigating the risk associated with new importation infrastructure

Again, only two respondents provided additional information in responding to this question. One respondent felt that risk had already been considered within the analysis of expected flows through new importation infrastructure which will inform the setting of the necessary levels for safety monitors.

The other respondent suggested that, to the extent that safety and firm gas monitor methodology allows, (as per the supply base case) a split-winter approach should be taken. In the event that the methodology does not allow this, because occurrence of cold weather days can not be assumed to occur in a particular quarter, they suggested that the monitors should be set for the Q4 2006 base case and reduced in Q1 2007 providing new infrastructure performed in line with assumptions.

Electricity market

Electricity demand levels for 2006/07

The majority of responses to our May document agreed that the assumed level of demand response was reasonable, although some commented that there may be possible additional incentives for demand response with the new cash-out regime.

Additional information provided in response to the July document;

Q12. We would welcome any further views on the extent to which electricity demand response might be expected given high electricity prices

The majority of responses agreed that the assumed level of demand response is reasonable under similar market conditions. A couple of respondents noted that customers would voluntarily load manage to avoid triads (i.e. transmission charge avoidance). Others noted they were in the process of discussions with customers regarding demand turn-down products, with one

experiencing a similar level of interest in these to previous years. They also stated that customers capable of delivering response contract directly with National Grid.

With regards to prices one respondent noted that industrial demand showed the most elasticity but may not be able to provide much more response than in 2005/06. In contrast, another noted that increased price awareness may increase interest in flexible purchase deals which could increase voluntary demand reduction at peak.

One respondent observed that commercial and domestic demand are less price sensitive and thus should be expected to increase further.

and in particular:
Q12a. Views on our demand assumption for winter 2006/07

Q12b. The impact of the revised cash out regime (P194) on the level of anticipated electricity demand response

Respondent's views on the impact of the revised cash out regime on the level of anticipated electricity demand response varied. Most acknowledged the impact was difficult to predict, although they anticipated it to be minimal. One respondent felt there would be limited interest (due to a lack of customers exposed to imbalance prices) and thought it would be difficult for an electricity supplier to develop a product to mitigate the risks posed by P194. Another considered that it may (indirectly) improve short term system reliance and / or it could deter returning physical capacity, therefore potentially resulting in a positive or a negative net effect.

Scenario for modelling purposes

We reported in the May document that there is some long-term mothballed generation, all of which is unlikely to be available for winter 2006/07. Responses to our May document concurred with our assumptions that the short-term mothballed plant is likely to return whilst the long-term plant is unlikely to return for next winter.

In our May document, we asked if there is scope for investment prior to winter 2006/07 to provide back-up capability at existing power stations. Most respondents said that such scope is infeasible due to the significant challenges posed by the need for physical modifications, environmental authorisations, planning, outages, etc.

In our May document, we asked specifically for views on expected average availability from nuclear generating plant. The majority of respondents to this question felt that an 80% availability factor from nuclear generating plant was low compared to historic averages. With regards to CCGTs one respondent questioned the 95% availability factor and suggested two-shifting would increase plant failure rates.

We also consulted in May on our assumption of a full 2 GW of capacity across the UK-France Interconnector at peak times. Most of the respondents who commented on this question felt that this was too optimistic, although it was also noted that import flows were not restricted to peak periods. Many respondents expressed the view that the flow would depend on prices only and it was noted that forward prices between the UK and the Continent suggest peak flow directions would be from France to the UK.

Additional information provided in response to the July document;
Q13. We would welcome any further views on our modelling assumptions for electricity generation availability

The majority of respondents considered our modelling assumptions for electricity generation availability to be reasonable overall and the assumptions plausible in relation to high price / demand periods. Respondents then used the opportunity to raise a variety of specific suggestions:

- A two quarter approach (e.g to reflect higher gas availability in Q1, closure of Dungeness A and Sizewell A requiring additional CCGT in Q1);
- To introduce an explicit wind power assumption as capacity increases;
- To consider geographical availability issues; the potential impact of physical export constraints out of Scotland;
- That the 'disappearance ratio' may be useful to this analysis;
- Reconsideration of the assumption that non-NTS CCGT run baseload.

and in particular:
Q13a. Views on our revised assumption for the average availability of nuclear generating plant

One respondent considered the revised assumption to be overly optimistic unless based on information from nuclear generators (as was assumed to be the case by another respondent). Another observed that they were in line with historic performance.

Q13b. Views on our revised assumption for the average availability of CCGT generation plant

Respondents welcomed the reduction in the assumption for the average availability of CCGT generation plant with one noting that the figures were in line with historic performance. However a number of respondents were concerned that this figure was still too high. One respondent stated the figure was not in line with market behaviour (when considering previously observed comparisons between declared maximum export limits and transmission entry capacity) and that there was no evidence to indicate 90% availability was likely or possible (apart from over high price / demand periods, which should be made explicit in planning). Nearly all respondents noted that with CCGT as marginal generation, a heavy two-shifting regime and multiple load changes

would increase the scope for downside in availability, particularly at times of system stress.

Q13c.Views on our revised assumptions regarding the level and direction of flow on the UK-France Interconnector based on historic flows and forward price differentials between the UK and the Continent

The majority of respondents considered the revised assumption to be reasonable with only one respondent stating that they believed the figures to be optimistic in light of the decrease in French reserve margin and the worsened hydro situation. A couple of respondents explicitly stated that forward prices could not be relied upon to predict flow direction (as evidenced in historical patterns and an increasing French reliance on reduced exports to meet peak demand). In contrast, one respondent stated that it must be assumed that flows would be a function of relative price.

CCGT demand-side response

Respondents to the May consultation raised a number of practical issues, that could limit the extent of any CCGT response including:

- Technical risks associated with frequent switching to/from and prolonged use of distillate;
- Potential limits on the extent to which fuel stocks can be replenished;
- Limitations on the levels of switching to coal and oil as a result of environmental constraints;
- Ability to replenish stock in prolonged severe weather conditions might be limited, in particular if stocks are delivered by road tankers;
- Behavior might be affected by potential exposure to high imbalance costs if plant fails to generate.

However, there were generators who noted that they do not foresee problems with re-stocking and that they would have similar or more distillate stock than that held in winter 2005/06.

We received a number of responses to our questions on distillate-switching ability and willingness, stock levels and potential re-stocking restrictions. This information broadly confirmed our assumptions.

Responses to our May consultation largely agreed with our generation modeling assumptions (e.g. coal and nuclear running as baseload whilst gas was the marginal fuel). Some respondents commented on environmental constraints, with a number suggesting that derogations and/or dispensation6 may be required in certain circumstances (as was the case in 2005/06).

[6] This would be the responsibility of the Environment Agency or the Scottish Environment Protection Agency

Additional information provided in response to the July document;
Q14. We would welcome any further views on our analysis of the potential for CCGT response in a severe winter

Respondents used this opportunity to raise a variety of issues. A couple of respondents explicitly agreed that the assumptions on potential response were reasonable, whilst another commented that the market was capable of delivering a maximum of 3.5 bcm (although it was difficult to say what had already been assumed). A couple of respondents noted that the level of response would depend upon clear market signals and the economics at the time. One respondent noted concerns that CCGT may be required to meet electricity security of supply and that P194 may reduce the response offered (suggesting that National Grid include its implementation as an uncertainty).

and in particular:
Q14a. Further views on the revised assumptions that underpin this analysis

A number of respondents used this opportunity to provide comments on the assumptions not included in their responses to question 13. The majority of respondents considered the assumptions to be reasonable with one noting that despite this the absolute level of response would depend on market fundamentals. In addition a couple of specific comments were raised:

- One respondent expressed concern that National Grid was overstating potential performance of non-NTS CCGT as certain plant were highly unlikely to run as baseload generation regime.
- Another respondent questioned the 95% availability assumption for OCGT over longer periods (although agreed it was reasonable for short periods). They suggested it may be worth analysing the events of 18 July 2006.

Q14b. Further views on the impact of environmental constraints on the potential for CCGT response, and on the potential need for any derogations or other forms of dispensation against environmental limits in the 2006/07 winter

One respondent noted that environmental limits do not really constrain CCGTs. Other respondents noted that environmental constraints may limit oil-fired stations daily generation capacity. A couple of stations are currently subject to applications for PPC permits. One respondent noted the impact of environmental constraints on the decision to switch to distillate at particular stations. They also stated that derogations from NOx limits may be required if the stations are running on distillate but run out of distillate water. Another respondent stated that no derogations will be issued for this winter.

Respondents

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BG Group
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British Gas Trading Limited
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Energywatch
Environment Agency
Gaselys
Gaz de France ESS
Global Insight
INEOS Chlor Ltd
International Power plc
Interconnector (UK) Limited
Magnox Electric Limited
Met Office
The Mineral Wool Energy Savings Company
National Grid Gas plc (in its capacity as a Gas Distribution Licence holder)
Northern Gas Networks
RWE Npower plc
Scotia Gas Networks
Scottish and Southern Energy
Scottish Power Energy Management
Shell Energy Europe
SEPA (Scottish Environment Protection Agency)
Statoil (U.K.) Limited
Total Gas and Power Limited
UKOOA
Wales & West Utilities Limited
Warwick Energy Limited

Annex D: Data

All non-confidential data used in the production of the charts and figures in the main body of the Winter 2006/07 Consultation Report can be accessed via the following link:
National Grid: Winter Consultation[7]

[7] http://www.nationalgrid.com/uk/Gas/TYS/outlook/