2008 Energy Market Outlook - Gas Demand Forecast Narrative

1 Introduction

This narrative provides an overview of our gas demand forecasts, which cover the period through to 2022/23, incorporating a commentary on a range of sensitivities around the Base Case. Note that these forecasts relate to demand taken from the transmission and distribution systems and excludes any direct supplies, off shore use and gas lost during gas processing.

2 Forecast Methodology

Gas demand is influenced by a number of factors, each having a varying degree of influence on the sensitivity of the forecast itself. A key sensitivity is the gas price but also the level of exports, level of energy conservation, CCGT developments, and the strength of the economy are examples of some of the key factors considered when producing the forecast.

2.1 Assumptions

The process that is employed to develop the annual gas demand forecasts is based upon a combination of different techniques, including econometric modelling, monitoring of information from the enquiries for new loads and analysis of the consumption history of existing large demands. Detailed analysis of certain sectors of the market, such as power generation, is also carried out. Each forecast is developed from a set of planning assumptions, which, if necessary, can be flexed to create alternative views. In the case of gas demand, these assumptions may take account of economic and fuel price factors, environmental legislation and Government energy policy.

Some of the data used to support the forecasts is obtained from independent organisations and we also use the Transporting Britain's Energy (TBE) consultation and a process of information exchange between ourselves and the Distribution Network businesses to validate our assumptions. This consultation process incorporates data-gathering questionnaires aimed at specific sectors of the industry (including consumers), and meetings with major industry demand-side stakeholders, such as the power generators and shippers.

Planning assumptions are subject to routine review and update in the period between each forecast. Our latest forecasts incorporate revisions to our projections of energy prices and economic output, both of which have a material impact on the annual and peak demands.

2.2 Key Forecast Drivers

Gas Prices

Fuel price forecasts are an important factor underpinning our gas demand and power generation forecasts. Historical trends, forward markets and the interaction between different fuel prices are all considered before consumer prices for different end user sectors are developed. The impact of fuel prices within different sectors can vary and the impact of other drivers is considered alongside our fuel price assumptions. Detailed

econometric modelling enables us to take into account the impact of fuel prices within each demand sector.

UK wholesale gas prices have increased steadily over the past six years, with these increases reflected in higher prices paid by end users. After a brief period of lower prices in early 2007, wholesale gas prices have increased significantly over the past twelve months. These price increases have been principally driven by the increase in global oil prices. The increased requirement for imported gas has seen this link reinforced, with continental gas prices traditionally indexed to the oil price.

The increase in end user prices has caused a reduction in total DN firm annual throughputs in each of the past three calendar years. Weather-corrected demand in the domestic sector has decreased by over 7% in the past three years, with the increasing domestic prices the main driver behind these reductions.

It is believed that this observed reduction has been driven principally by consumers taking short-term measures to reduce demand e.g. reduced thermostat settings, rather than a sudden increase in thermal efficiency. However, three consecutive years of falling demand suggest that greater levels of underlying energy efficiency may also be starting to affect demands.

Energy Efficiency

Increased thermal efficiency is forecast to have an impact on demand, but gradually, over a longer time frame. Growth rates in the DN sectors have been reduced over the period of the forecast to account for the impact of increased energy efficiency and changes to customer behaviour driven by such factors as government policy and concerns about global warming.

Economic Factors

Our econometric models also take into account the impact of other economic factors, such as household disposable income, the number of new households forecast, and commercial / manufacturing output. The UK economy is forecast to be weaker in the short term, when compared with last year's forecast, with economic growth forecast to increase in the medium to long term.

Power Generation

Despite the recent increases in the gas price, the commensurate rise in the price of coal has seen gas remain competitive as a fuel for power generation. Demand in this sector was strong in the early part of 2008, not only due to the relative fuel prices, but also driven by the impact of the early stages of the Large Combustion Plant Directive (LCPD), increased carbon prices and the loss of generation from other fuel sources such as nuclear power.

Our power generation forecast assumptions are supported by information received from customer enquiries, journals, press releases and other sources. Among the key factors affecting the amount of new gas-fired power generation to be connected are the Large Combustion Plant Directive (LCPD), European Emissions Trading Scheme (ETS), the rate of development of renewable energy sources, and the future of nuclear generation.

The revised LCPD which became effective from 1st January 2008 restricts the operation of fossil fuel-fired power plants unless apparatus to restrict emissions is fitted. This will particularly affect coal-fired plant but will also impact oil-fired plant. The forecast assumes that over 12 GW of coal and oil-fired capacity will be lost over the forecast period, the majority towards the end of 2015, the final year of operation for any plant opting out of the LCPD.

Nuclear capacity is expected to reduce by around 7.4 GW by 2020/21, even with all the AGR stations being granted five year life extensions beyond their existing planned closure dates, except Dungeness B which has a ten year extension.

The cost of emissions under the ETS is likely to benefit gas-fired stations over the longer term when compared with coal. Phase I of the scheme (2005-2007) saw prices plummet to less than €1 / tonne as credits issued were greater than the actual reported emissions. As credits could not be transferred into Phase II (2008-2012) a surplus existed with little demand. The price of carbon has increased to over €20 / tonne in the early stages of Phase II due to lower carbon allocations. Surplus credits could potentially be transferred into Phase III (2013-2020). The price of carbon is likely to increase further in Phase III as carbon credits begin to be allocated through an auction process, beginning with the power generation sector.

There is still an associated emissions cost for gas-fired power generation, which will tend to reduce the spark-spread (with an associated impact on the economics of new gas-fired stations).

Over the course of the period new CCGT plant is predicted to make up the bulk of the shortfall caused by coal, nuclear and oil plant closures with around 14.7GW of new CCGT capacity forecast by 2022/23.

The forecast also includes 3.2GW of ‘clean coal’ capacity by 2022/23, with recent announcements made regarding potential new super-critical coal plants and also the possibility of carbon capture ready stations being built. Following the recent government Energy Review there is the possibility of new nuclear plant being built in the UK, and although there is no new nuclear plant anticipated within the next ten years, we have the expectation that the first new nuclear plants are likely to be commissioned from around 2020 onwards.

16GW of new renewable plant (of which 12.3GW is transmission contracted with the remaining being included embedded within the distribution networks) is forecast to be built by 2020 with the vast majority of this forecast to be onshore and offshore wind generation. This will result in around 16% of electricity supplied coming from renewable sources by 2020 (as per current ROC definition). It should be noted that the power generation forecast is based on a ‘business as usual’ projection, with no major changes to the current policy framework and incentives.

3 Gas Demand Forecasts

Over the 16 year forecast period, gas demand is projected to grow at a rate of around 1% per annum, with DN demand growing at 0.5% per annum and NTS demand forecast to grow at an average of 1.5% each year. NTS growth is driven by growth in the power generation sector, which is forecast to grow by almost 3% per annum out to 2023. Conversely, exports to the continent are forecast to fall significantly post 2011, thus reducing the overall average growth rates over the period.

Demand in 2008 is forecast to increase slightly, principally driven by growth in gas-fired power generation demand and exports to Ireland. This growth is predicted to be offset by a fall in exports to the continent, with DN demand remaining relatively flat following three years of falls.

DN growth rates are lower than in last year's forecast driven by the significant increase in fuel prices, a weaker economy in the short-term and greater levels of energy efficiency. The highest level of historical annual DN demand, approximately 730 TWh in 2002, is not forecast to be reached again over the 16 year forecast period.

NTS growth rates over the forecast period are mainly driven by a significant amount of new CCGT plant that is forecast to replace closures of existing nuclear, coal and oil-fired generation. 14.7 GW of new CCGT plant is forecast to connect over the forecast period.

Exports to Europe are forecast to increase in the early part of the forecast due to an increase in imported gas from other sources. As alluded to above, however, exports to the continent are forecast to fall over the entire forecast period as greater levels of imports are required due to the decline in gas supplies from the UK Continental Shelf.

Exports to Ireland also fall in the short to medium term as new indigenous supplies and import projects come on stream, before tailing off as indigenous volumes deplete, thus increasing the level of exports to 2007 levels by the end of the forecast.

4 Summary of Key Base Case Forecast Assumptions and Drivers

A brief summary of the Base Case forecast assumptions and drivers are shown below:

- Economic growth (GDP) averages around 2.4 % per annum over the period.
- End user prices rise significantly over the forecast period.
- Energy efficiency measures forecast to reduce growth rates over the medium to longer term.
- 15 GW of new CCGT capacity forecast over the forecast period to meet both increased electricity demand and to replace closing coal and nuclear plants
- Irish exports affected by new indigenous supplies and imports from 2010 onwards.
- Exports to Continental Europe rise initially as new supplies come on stream before tailing off as growth in new supplies fall

5 Demand Sensitivities

In developing a range of gas demand sensitivities a number of variables are required to be flexed. The impact of flexing some of the variables can be calculated by running them through our econometric models while the others are estimated using analytical modelling.

5.1 Econometric sensitivities modelled:

Economic:
The following adjustments were made to the annual growth rates of economic variables:

- Non-manufacturing output: base annual growth rate ± 0.3 percentage points
- Manufacturing output: base annual growth rate ± 0.5 percentage points

Fuel Prices:
End user fuel prices were adjusted to give high and low demand sensitivities:

- Gas prices on average 35-50% lower over the forecast period
- Gas prices on average 55-85% higher over the forecast period
- Coal prices on average 30% higher and 30% lower over the forecast period
- Oil prices on average 70% higher and 35% lower over the forecast period

Conservation:
The following reductions apply to business-as-usual consumptions predicted by the econometric forecast for the strong energy conservation variable within the domestic sector:

- By 2012: -6.6% (as opposed to base case -4.4%)
- By 2017: -12.7% (as opposed to base case -8.6%)
- By 2022: -18.4% (as opposed to base case -12.7%)

The following reductions apply to business-as-usual consumptions predicted by the econometric forecast for the weak energy conservation variable within the domestic sector:

- By 2012: -2.2% (as opposed to base case -4.4%)
- By 2017: -4.4% (as opposed to base case -8.6%)
- By 2022: -6.5% (as opposed to base case -12.7%)

5.2 Non-Econometric sensitivities modelled:

Power Generation:

- The base case assumes 14.7 GW of new CCGT capacity over the period
- In the high sensitivity it is assumed that super-critical coal plants (2 x1600MW developments in the base case) do not development and are replaced with additional CCGT
- In the low sensitivity gas developments are less attractive, due to relative fuel price movements, technology change and/or more rapid development of new nuclear, and 4GW of projects in the base case do not proceed
- The operation of CCGTs is also flexed with the high sensitivity assuming more competitive gas prices with CCGTs operating higher up the ranking order throughout the year, while the low sensitivity assumes the reverse.

CHP:

- In the base case total installed CHP capacity is anticipated to reach 8GW in 2010/11 and 11.7GW by 2022/23
- The high case increases these capacities to 8.2GW and 14GW respectively
- The low case reduced them to 7.5GW and 9GW
- These views are consistent with the embedded generation assumptions underpinning the electricity demand forecast sensitivities
- The gas demand arising from variations away from the base case includes allowances for existing heat-based demands being replaced (or retained as is the case in the low sensitivity) by CHP installations, i.e. our view reflects the net demand change resulting from CHP growth

Non-domestic (distribution) energy efficiency:

- In the base case we assume that improving energy efficiency will reduce generic growth in the non-domestic market by ~50% (of the growth that would otherwise have occurred) over the period
- In the high demand case it is assumed that the saving is reduced to 35% whilst in the low case it is increased to 65%
- It is assumed that the rate of efficiency improvement (above that observed in the historical demand) will be prompted by sustained energy policy focus and related legislation, giving rises to more widespread and onerous emissions trading/taxation arrangements, improving technology and a growing commitment on the part of industry to reduce its environmental impact

Ireland:

- Economic growth varied in line with the high and low cases (based on ESRI forecasts) presented in EirGrid's Generation Adequacy Statement 2008-2014 published in November 2007 – impacts on forecast gas and electricity demand growth
- Assumed new gas generation is varied from 1.6GW in the base case to 2.8GW in the high and 1.2GW in the low
- The amount of new gas generation is influenced by varying assumptions about the rate of growth in renewable generation, levels/utilisation of interconnectors and the generation mix going forward.
- Indigenous gas supply volumes are varied by changing assumption around the timing of gas delivered from Corrib. In the high demand (import) sensitivity Corrib is delayed by one year while the low sensitivity assumes Corrib gas is delivered one year early.
- LNG imports to Ireland are also varied with the Shannon LNG project cancelled in the high import sensitivity and brought on stream one year early and with a higher utilisation rate in the low import sensitivity.

Warm Weather:

- Adjustments to demand have been made to take account of the potential for warmer weather thus resulting in a low demand sensitivity.